PROJECT MANUAL

City of Portsmouth

Portsmouth, NEW HAMPSHIRE

Corporate Drive
Maintenance Dredging and Outfall Improvements

FOR CONSTRUCTION

April 4, 2022

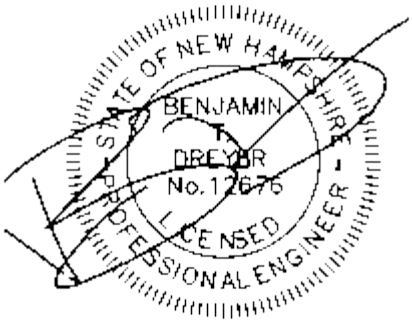
UNDERWOOD engineers

Portsmouth, New Hampshire
FILE NO. 2693

City of Portsmouth

Portsmouth, NEW HAMPSHIRE

Corporate Drive
Maintenance Dredging and Outfall Improvements



FOR CONSTRUCTION

April 4, 2022

Prepared and Copyrights by

Underwood Engineers, Inc.
25 Vaughan Mall
Portsmouth, New Hampshire 03801

FILE NO. 2693

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City of Portsmouth
Portsmouth, New Hampshire
Department of Public Works

Corporate Drive Maintenance Dredging & Outfall Improvements

INVITATION TO BID

Sealed bid proposals, **plainly marked, Corporate Drive Maintenance Dredging & Outfall Improvements Project**, Bid Proposal #37-22 **on the outside of the mailing envelope as well as the sealed bid envelope,** addressed to the Purchasing Department, 1 Junkins Avenue, Portsmouth, New Hampshire, 03801, will be accepted until **10:30 a.m. on Wednesday, June 8, 2022**; at which time all bids will be publicly opened and read aloud.

This project includes, but is not limited to, wetland dredging and channel reconstruction at three outfall locations along Corporate Drive. The project also includes the construction of plunge pools and check dams.

Electronic Bidding Documents may be obtained at the City's website http://cityofportsmouth.com/finance/purchasing.htm. Hard copies of the Bidding Documents will not be furnished by the City. Addenda to this bid document, if any, including written answers to questions, will be posted on the City of Portsmouth website under the project heading. Questions may be addressed to the Project Engineer, Benjamin T. Dreyer, P.E. at Underwood Engineers, via email at bdreyer@underwoodengineers.com and to purchasing@cityofportsmouth.com or by phone at (603) 436-6192.

The Contractor shall have 60 calendar days to achieve substantial completion but in no case after October 1, 2022. All sections of the work shall be completed within 90 calendar days or no later than November 1, 2022. Liquidated damages shall be assessed at $800.00 for each calendar day of delay from the date established for substantial completion, and $400.00 for each calendar day of delay from the date established for final completion.

The Contractor will be required to keep the roadway passable for local traffic, emergency vehicles, and pedestrians to the maximum degree possible.

Bidders must determine the quantities of work required and the conditions under which the work will be performed.

A non-mandatory pre-bid meeting will be held at 9:00 am on Wednesday, May 25, 2022 on-site at 273 Corporate Drive. In case of inclement weather, the alternate location will be at the first floor conference room located at the City of Portsmouth located at 680 Peverly Hill Road. Notice of alternative location will be by addendum 24 hours in advance.

The City reserves the right, after bid opening and prior to award of the contract, to modify the amount of the work in the event that bids exceed budgeted amounts. The City of Portsmouth further reserves the right to reject any or all bids, to waive technical or legal deficiencies, to re-bid, and to accept any bid that it may deem to be in the best interest of the City.

Each Bidder shall furnish a bid security in the amount of ten percent (10%) of the bid. The Bid Security may be in the form of a certified check drawn upon a bank within the State of New Hampshire or a bid bond executed by a surety company authorized to do business in the State of New Hampshire, made payable to the City of Portsmouth, N.H.

Bidders must be pre-qualified by the New Hampshire Department of Transportation for site and/or road work. Any Bid submitted by a Bidder not pre-qualified will be rejected as non-conforming.

The General Contractor will be permitted to subcontract portions of the work not to exceed an aggregate dollar value of 50% of the total contract bid amount in complete accordance with Section 108 of the State of New Hampshire Standard Specifications for Road and Bridge Construction.

INSTRUCTIONS TO BIDDERS

BIDDING REQUIREMENTS AND CONDITIONS

1. Special Notice to Bidders

Appended to these instructions is a complete set of bidding and general contract forms. These forms may be detached and executed for the submittal of bids. The plans, specifications, and other documents designated in the proposal form will be considered as part of the proposal, whether attached or not.

Bidders must submit a Statement of Bidder's Qualifications with their bid submittal.

A non-mandatory pre-bid conference will be held at the time and location stated in the Invitation to Bid. Representatives of the Owner and Engineer will be present to discuss the Project. Bidders are highly encouraged to attend and participate in the conference.

Questions may be addressed to the Project Engineer, Benjamin T. Dreyer, P.E., via email at bdreyer@underwoodengineers.com and to purchasing@cityofportsmouth.com or by phone at (603) 436-6192. Questions received less than seven days prior to the date for opening of bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

Addenda to this proposal, including pre-bid meeting minutes and written answers to questions, will be posted on the City of Portsmouth website at http://www.cityofportsmouth.com/finance/purchasing.htm under the project heading. Addenda and updates will NOT be sent directly to firms. Contractors submitting a proposal should check the web site daily for addenda and updates after the release date. Firms should print out, sign and return addenda with the proposal. Failure to do so may result in disqualification.

2. Interpretation of Quantities in Bid Schedules

The quantities appearing in the bid schedule are approximate only and are prepared for the comparison of bids. Payment to the contractor will be made only for actual work performed and accepted in accordance with the contract. Any scheduled item of work to be done and materials to be furnished may be increased, decreased or omitted as hereinafter provided, and no claim for loss, anticipated profits or costs incurred in anticipation of work not ultimately performed will be allowed due to such increase or decrease.

3. Examination of Plans, Specifications and Site Work

The bidder is expected to examine carefully the site of the proposed work, the plans, standard specifications, supplemental specifications, special provisions and contract forms before submitting a proposal. The submission of a bid shall be considered conclusive evidence that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the contract. It will be conclusive evidence that the bidder has also investigated and is satisfied with the sources of supply for all materials.

Plans, surveys, measurements, dimensions, calculations, estimates and statements as to the condition under which the work is to be performed are believed to be correct, but the contractors must examine for themselves, as no allowance will be made for any errors or inaccuracies that maybe found therein.

4. Familiarity with Laws

The bidder is assumed to have made himself or herself familiar with all federal and state laws and all local by-laws, ordinances and regulations which in any manner affect those engaged or employed on the work or affect the materials or equipment used in the work or affect the conduct of the work, and the bidder, if awarded the contract, shall be obligated to perform the work in conformity with said laws, by-laws, ordinances and regulations notwithstanding its

ignorance thereof. If the bidder shall discover any provision in the plans or specifications which is in conflict with any such law, by-law, ordinance or regulation the bidder shall forthwith report it to the engineer in writing.

5. Preparation of Proposal

a) The bidder shall submit its proposal upon the forms furnished by the Owner. The bidder shall specify a lump sum price in figures, for each pay item for which a quantity is given and shall also show the products of the respective prices and quantities written in figures in the column provided for that purpose and the total amount of the proposal obtained by adding the amount of the several items. All words and figures shall be in ink or typed. If a unit price or a lump sum bid already entered by the bidder on the proposal form is to be altered it should be crossed out with ink, the new unit price or lump sum bid entered above or below it and initialed by the bidder, also with ink.

b) The bidder's proposal must be signed with ink by the individual, by one or more general partners of a partnership, by one or more members or officers of each firm representing a joint venture; by one or more officers of a corporation, by one or more members (if member-managed) or managers (if manager-managed) of a limited liability company, or by an agent of the contractor legally qualified and acceptable to the owner. If the proposal is made by an individual, his or her name and post office address must be shown, by a partnership the name and post office address of each general and limited partner must be shown; as a joint venture, the name and post office address of each venturer must be shown; by a corporation, the name of the corporation and its business address must be shown, together with the name of the state in which it is incorporated, and the names, titles and business addresses of the president, secretary and treasurer.

6. Nonconforming Proposals

Proposals will be considered nonconforming and may be rejected in the Owner's sole discretion for any of the following reasons:

- If the proposal is on a form other than that furnished by the Owner, or if the form is altered or any portion thereof is detached;
- If there are unauthorized additions, conditional or altered bids, or irregularities of any kind which may tend to make the proposal or any portion thereof incomplete, indefinite or ambiguous as to its meaning;
- If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award; or
- If the proposal does not contain a unit price for each pay item listed except in the case of authorized alter pay items.

7. Proposal Guaranty

No proposal will be considered unless accompanied by a bid bond, surety, or similar guaranty of the types and in an amount not less than the amount indicated in the Invitation to Bid. All sureties shall be made payable to the "City of Portsmouth". If a bid bond is used by the bidder it shall be:

- In a form satisfactory to the Owner;
- With a surety company licensed, authorized to do business in, and subject to the jurisdiction of the courts of the State of New Hampshire; and
- Conditioned upon the faithful performance by the principal of the agreements contained in the sub-bid or the general bid.

In the event any irregularities are contained in the proposal guaranty, the bidder will have four business days (not counting the day of opening) to correct any irregularities. The corrected guaranty must be received by 4:00 p.m. If irregularities are not corrected to the satisfaction of the Owner, the Owner, in its sole discretion, may reject the bid.

8. Delivery of Proposals

When sent by mail, the sealed proposal shall be addressed to the Owner at the address and in the care of the official in whose office the bids are to be received. All proposals shall be filed prior to the time and at the place specified in the invitation for bids. Proposals received after the time for opening of the bids will be returned to the bidder, unopened.

9. Withdrawal of Proposals

A bidder will be permitted to withdraw his or her proposal unopened after it has been submitted if the Owner receives a request for withdrawal in writing prior to the time specified for opening the proposals.

10. Public Opening of Proposals

Proposals will be opened and read publicly at the time and place indicated in the invitation for bids. Bidders, their authorized agents, and other interested parties are invited to be present.

11. Disqualification of Bidders

Any or all of the following reasons may be deemed by Owner in its sole discretion as being sufficient for the disqualification of a bidder and the rejection of his proposal:

- More than one proposal for the same work from an individual, firm, or corporation under the same or different name;
- Evidence of collusion among bidders;
- Failure to submit all required information requested in the bid specifications;
- If the Contractor is not listed with the New Hampshire Department of Transportation as a pre-qualified contractor under the classification of paving and/or road work;
- Lack of competency or of adequate machinery, plant or other equipment, as revealed by the statement of bidders qualification or otherwise;
- Uncompleted work which, in the judgment of the owner, might hinder or prevent the prompt completion of additional work if awarded;
- Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts;
- Default or unsatisfactory performance on previous contracts; or
- Such disqualification would be in the best interests of the Owner.

12. Material Guaranty and Samples

Before any contract is awarded, the bidder may be required to furnish a complete statement of the origin, composition and manufacture of any or all materials to be used in the construction of the work, and the Owner may, in its sole discretion, reject the bid based on the contents of the statement or as a result of the failure of the bidder to submit the statement.

BID SECURITY BOND

(This format provided for convenience, actual Bid Bond is acceptable in lieu of, if compatible.)

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned

_____, as Principal, and

_____, as Surety, are hereby

held and firmly bound unto _____

IN THE SUM OF _____

as liquidated damages for 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 this obligation is such that whereas the Principal has submitted to the _____
A CERTAIN Bid attached hereto and hereby made a part hereof to enter into a contract in writing, hereinafter referred to as the "AGREEMENT" and or "CONTRACT", for

_____
_____
_____

NOW THEREFORE,

(a) If said Bid shall be rejected or withdrawn as provided in the INFORMATION FOR BIDDERS attached hereto or, in the alternative,

(b) If said Bid shall be accepted and the Principal shall duly execute and deliver the form of AGREEMENT attached hereto and shall furnish the specified bonds for the faithful performance of the AGREEMENT and/or CONTRACT and for the payment for labor and materials furnished for the performance of the AGREEMENT and or CONTRACT,

then this obligation shall be void , otherwise it shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder in no event shall exceed the amount of this obligation.

AWARD AND EXECUTION OF CONTRACT

1. Consideration of Proposals

a) After the proposals are opened and read, they will be compared on the basis of the total price for all sections of work to be charged to perform the work and any such additional considerations as may be identified in the bid documents. The results of such comparisons will be immediately available to the public. In case of a discrepancy between the prices written in words and those written figures, the prices written in words shall govern. In case of a discrepancy between the total shown in the proposal and that obtained by adding the products of the quantities of items and unit bid prices, the latter shall govern.

b) The Owner reserves the right to reject any or all proposals, to waive technicalities or to advertise for new proposals, if, in the sole discretion of the Owner, the best interest of the City of Portsmouth will be promoted thereby.

2. Award of Contract

Within 30 calendar days after the opening of proposals, if a contract is to be awarded, the award will be made to the lowest responsible and qualified bidder whose proposal complies with all the requirements prescribed. The successful bidder will be notified, in writing, emailed to the address on his or her proposal, that his or her bid has been accepted and that the bidder has been awarded the contract.

The award shall not be considered official until such time that a Purchase Order, fully executed contract or an award letter has been issued by the Finance Director. No presumption of award shall be made by the bidder until such documents are in hand. Verbal notification of award is not considered official. Any action by the bidder to assume otherwise is done so at his/her own risk and the City will not be held liable for any expense incurred by a bidder that has not received an official award.

Determination of the lowest bidder will be based on the total contract price as shown on the bid proposal form. Due to fluctuating prices and possible budget limitations, the City reserves the right to delete portions of the work from the contract prior to execution.

3. Cancellation of Award

The Owner reserves the right to cancel the award of any contract at any time before the execution of such contract by all parties without any liability of the Owner.

4. Return of Proposal Guaranty

All proposal guaranties, except those of the three lowest bidders, will be returned upon request following the opening and checking of the proposals. The proposal guaranties of the three lowest bidders will be returned within ten days following the award of the contract if requested.

4. Contract Bond

At the time of the execution of the contract, the successful bidder shall furnish:

- Performance bond in the amount of 100 percent of contract amount.
- Labor and materials payment bond in the amount of 100 percent of the contract amount.

Each bond shall be: (1) in a form satisfactory to the Owner; (2) with a surety company licensed and authorized to do business and with a resident agent designated for services of process in the State of New Hampshire; and (3) conditioned upon the faithful performance by the principal of the agreements contained in the original bid. All premiums for the contract bonds are to be paid by the contractor.

6. Execution and Approval of Contract

The successful bidder is required to present all contract bonds, to provide proof of insurance, and to execute the contract within 15 days following receipt of the City's notification of acceptance of the bid. No contract shall be considered as in effect until it has been fully executed by all parties.

7. Failure to Execute Contract

Failure to execute the contract and file an acceptable bond within 15 days after notification of acceptance of bid shall be just cause for the cancellation of the award and the forfeiture of the proposal guarantee which shall become the property of the Owner, not as a penalty, but in liquidation of damages sustained. Award may then be made to the next lowest responsible bidder, or the work may be re-advertised as the Owner may determine in its sole discretion.

CONTRACTOR'S BID SCHEDULE							
Item No.	Est. Quantity	Units	Item Description (and Unit Price written in words)		Unit Price		Amount
201.01	0.3	Ac.	Clearing (F) _____ Dollars and _____ Cents per	Ac.		/ Ac.	
201.1	0.6	Ac.	Clearing and Grubbing (F): _____ Dollars and _____ Cents per	Ac.		/ Ac.	
201.8822	4,400	SY	Invasive Species Control Type I and/or II (Mechanical) _____ Dollars and _____ Cents per	SY		/ SY	
203.1	425	CY(*)	Common Excavation (where directed): _____ Dollars and _____ Cents per	CY(*)		/ CY(*)	
203.4	525	CY	Muck/Unsuitable Material Excavation (F): _____ Dollars and _____ Cents per	CY		/ CY	
203.6	100	CY	Embankment-in-Place (F): _____ Dollars and _____ Cents per	CY		/ CY	
203.67	1	Unit	Managing and stockpiling surplus soils (Muck) _____ Dollars and _____ Cents per	Unit		/ Unit	

CONTRACTOR'S BID SCHEDULE						
Item No.	Est. Quantity	Units	Item Description (and Unit Price written in words)		Unit Price	Amount
209.4	600	CY	Granular Backfill (Gravel) _____ Dollars and _____ Cents per	CY	/ CY	
304.4	100	CY	Crushed Stone (Fine) _____ Dollars and _____ Cents per	CY	/ CY	
503.4	1	Unit	Water Diversion and Dewatering _____ Dollars and _____ Cents per	Unit	/ Unit	
585.31	30	CY	Stone fill, Class C1: (For Check Dam): _____ Dollars and _____ Cents per	CY	/ CY	
585.33	15	CY	Stone fill, Class C3: (For Plunge Pool): _____ Dollars and _____ Cents per	CY	/ CY	
593.211	1,300	SY	Geotextile; Separation, CL 1, Non-woven _____ Dollars and _____ Cents per	SY	/ SY	
593.304	400	SY	Geotextile; Stabilization, CL 0, Geogrid _____ Dollars and _____ Cents per	SY	/ SY	

CONTRACTOR'S BID SCHEDULE						
Item No.	Est. Quantity	Units	Item Description (and Unit Price written in words)		Unit Price	Amount
603.0002	510	LF	Video Inspection & Heavy Cleaning (Existing Culverts) (where directed) _____ Dollars and _____Cents per	LF	/ LF	
603.00336	16	LF	36" Rein. Conc. Pipe 3000D _____ Dollars and _____Cents per	LF	/ LF	
618.7	150	Hrs.	Flaggers _____ Dollars and _____Cents per	Hrs.	/ Hrs.	
619.1	1	Unit	Maintenance of Traffic: _____ Dollars and _____Cents per	Unit	/ Unit	
644.21	10	Lb	Scrub/Scrub Wetland Seed Mix _____ Dollars and _____Cents per	Lb	/ Lb	
645.44	2,700	SY	Temporary Slope Stabilization Type D (Wildlife Friendly) _____ Dollars and _____Cents per	SY	/ SY	
645.531	1,500	LF	Silt fence: _____ Dollars and _____Cents per	LF	/ LF	

CONTRACTOR'S BID SCHEDULE						
Item No.	Est. Quantity	Units	Item Description (and Unit Price written in words)		Unit Price	Amount
645.7	1	Unit	Storm Water Pollution Prevention Plan: _____ Dollars and _____Cents per	Unit	/ Unit	
645.701	1	Unit	Implement and Maintain Storm Water Pollution Prevention Plan: _____ Dollars and _____Cents per	Unit	/ Unit	
645.71	20	HR	Monitoring SWPPP and Erosion and Sediment Controls _____ Dollars and _____Cents per	HR	/ HR	
645.9	25	LF	Turbidity Curtain _____ Dollars and _____Cents per	LF	/ LF	
646.412	1,650	SY	Turf establishment with mulch, tackifiers and humus (Wetlands) (F): _____ Dollars and _____Cents per	SY	/ SY	
646.512	950	SY	Turf establishment with mulch, tackifiers and loam (Lawns) (F): _____ Dollars and _____Cents per	SY	/ SY	
692	1	Unit	Mobilization: _____ Dollars and _____Cents per	Unit	/ Unit	

CONTRACTOR'S BID SCHEDULE							
Item No.	Est. Quantity	Units	Item Description (and Unit Price written in words)		Unit Price		Amount
697.11	1	Unit	Invasive Species Control and Management Plan _____ Dollars and _____ Cents per	Unit		/ Unit	
703.1	125	CY	Graded Coarse Aggregate #4 _____ Dollars and _____ Cents per	CY		/ CY	
900.30	1	Unit	Concrete Headwall 24" to 30" Pipe (P.C.-7) _____ Dollars and _____ Cents per	Unit		/ Unit	
900.42	2	Unit	Concrete Headwall 30" to 42" Pipe (P.C.-7) _____ Dollars and _____ Cents per	Unit		/ Unit	
1008.2	1	Allow.	Alterations and Addition as Needed -Soil Testing Allowance **Two Thousand** _____ Dollars and _____ Cents per	Allow.	**$2,000**	/ Allow.	**$2,000**
1010.2	1	Allow.	Fuel Adjustment **Two Thousand** _____ Dollars and _____ Cents per	Allow.	**$2,000**	/ Allow.	**$2,000**
						Line 1 - Total Bid	
			Name of Contractor: _____				
			Date: _____				

Notes to Bidders:

1. The lowest bid will be determined based on the value shown on Line 1 -Total Bid
2. * Means Indeterminate Quantity.
3. (F) means final quantity
4. The Owner reserves the right to waive any informalities or minor defects or reject any and all bids and to take any other action that is in the owners best interest.
5. Unit prices in words shall govern over unit prices in numbers in determination of bid total.

BID SECURITY BOND

(This format provided for convenience, actual Bid Bond is acceptable in lieu of, if compatible.)

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned

_____, as Principal, and

_____, as Surety, are hereby

held and firmly bound unto _____

IN THE SUM OF _____

as liquidated damages for 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 this obligation is such that whereas the Principal has submitted to the _____
A CERTAIN Bid attached hereto and hereby made a part hereof to enter into a contract in writing, hereinafter referred to as the "AGREEMENT" and or "CONTRACT", for
_____
_____
_____

NOW THEREFORE,

(a) If said Bid shall be rejected or withdrawn as provided in the INFORMATION FOR BIDDERS attached hereto or, in the alternative,

(b) If said Bid shall be accepted and the Principal shall duly execute and deliver the form of AGREEMENT attached hereto and shall furnish the specified bonds for the faithful performance of the AGREEMENT and/or CONTRACT and for the payment for labor and materials furnished for the performance of the AGREEMENT and or CONTRACT,

then this obligation shall be void , otherwise it shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder in no event shall exceed the amount of this obligation.

BID SECURITY BOND (continued)

The Surety, for value received, hereby agrees that the obligation of said surety and its bond shall be in no way impaired or affected by any extensions of the time within such BID may be accepted, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the parties hereto have duly executed

this bond on the _____ day of _____, 20__.

_____L.S.
(Name of Principal)

(SEAL)

BY _____

_____
(Name of Surety)

BY _____

STATEMENT OF BIDDER'S QUALIFICATIONS

Note: This is a required submittal, fill out completely.

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. Add separate sheets if necessary

1. Name of Bidder

2. Permanent Main Office Address

3. Form of Entity

4. When Organized

5. Where Organized

6. How many years have you been engaged in the contracting business under your present name; also state names and dates of previous firm names, if any.

7. Contracts on hand; (schedule these, showing gross amount of each contract and the approximate anticipated dates of completion).

8. General character of work performed by your company.

9. Have you ever failed to complete any work awarded to you? _____(no)____(yes). If so, where and why?

10. Have you ever defaulted on a contract?
_____(no)_____(yes). If so, where and why?

11. Have you ever failed to complete a project in the time allotment according to the Contract Documents?
_____(no)_____(yes). If so, where and why?

12. List the most important contracts recently executed by your company, stating approximate cost for each, and the month and year completed.

13. List your major equipment available for this contract.

14. List your key personnel such as project superintendent and foremen available for this contract.

15. List any subcontractors whom you will use for the following
(unless this work is to be done by your own organization, if so please state).
    a. Crack sealing and Joint adhesive _____
    b. Adjusting Structures _____
    c. Pavement Markings _____
    d. Curbing _____
    e. Guardrail _____
    f. Concrete Sidewalks _____
    g. Other (please list) _____
    _____
    _____

_____

(The City reserves the right to approve subcontractors for this project)

STATEMENT OF BIDDERS QUALIFICATIONS (continued)

16. With what banks do you do business?

a. Do you grant the Owner permission to contact this/these institutions?
____(yes) ___(no).

b. Latest Financial Statements, certified audited if available, prepared by an independent certified public accountant, may be requested by Owner. If requested, such statements must be provided within five (5) business days or the bid proposal will be rejected. Certified Audited Statement are preferred. Internal statements may be attached only if independent statements were not prepared.

Dated at _____ this _____ day of _____, 20___.

_____
Name of Bidder

BY_____

TITLE_____

State of_____

County of_____

_____being duly sworn, deposes and

says that the bidder is _____of_____
(Name of Organization)

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

Sworn to before me this ____day of _____, 20__.

_____
Notary of Public

My Commission expires_____

CONTRACT

CONTRACT AGREEMENT

Corporate Drive Maintenance Dredging and Outfall Improvements

THIS AGREEMENT made as of the _____ in the year **2022,** by and between the City of Portsmouth, New Hampshire (hereinafter called the Owner) and _____(hereinafter called the Contractor),

WITNESSETH; that the Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE I – Work - The Contractor shall perform all work as specified or indicated in the Contract Documents for completion of the Project. The Contractor shall provide, at his expense, all labor, materials, equipment and incidentals as may be necessary for the expeditious and proper execution of the Project.

ARTICLE II – ENGINEER - The Director of Public Works or his authorized representative will act as City Engineer in connection with completion of the Project in accordance with the Contract Documents.

ARTICLE III – CONTRACT TIME - The work shall commence in accordance with the Notice to Proceed. Substantial completion of all work included in the Bid Schedule must be achieved within 60 calendar days from the Notice to Proceed date, but in no case after October 1, 2022. Final project completion must achieved within 30 days of substantial completion of the entire project, and no later than November 1, 2022.

ARTICLE IV – CONTRACT PRICE - Owner shall pay Contractor for performance of the work in accordance with the Contract Documents as shown under item prices in the Bid Proposal and as set forth in the Notice of Intent to Award if the bid amount exceeds budgeted amounts. Owner makes no representation that it will undertake all of the work estimated in the bid proposal form.

ARTICLE V – PAYMENT - Partial payments will be made in accordance with the Contract Documents. Upon final acceptance of the work and settlement of all claims, Owner shall pay the Contractor the unpaid balance of the Contract Price, subject to additions and deductions provided for in the Contract Documents.

ARTICLE VI – RETAINAGE - To insure the proper performance of this Contract, the Owner shall retain **ten percent** of the monthly payments claimed by the Contractor until 50% of the original contract work is invoiced and approved by the City. Once the Contractor has invoiced more than 50% of the original contract value, provided that the Contractor has satisfied the City regarding the quality and timeliness of the work and provided further that there is no specific cause for withholding additional retainage, no further amount will be withheld. Upon substantial completion of the work the amount of retainage shall be reduced to 2% of the total contract value plus any additional retainage amounts required by the City based on the City's estimate of the fair value of any remaining punch list items. Any additional retainage held for punch list items shall be held until such time as all items on the punch list are repaired or completed to the City's acceptance. The final 2% of retainage shall be held until the warranty period has expired.

CONTRACT AGREEMENT (continued)

ARTICLE VII – LIQUIDATED DAMAGES - In event the Contractor fails to successfully execute the work within the specified contract time the Owner shall assess the Contractor liquidated damages in the amount of **eight hundred dollars ($800)** for each calendar day beyond the specified completion date for each calendar day of delay from the date established for substantial completion, and **four hundred dollars ($400.00)** for each calendar day of delay from the date established for final completion. Liquidated damages shall be deducted from the Contract Price prior to final payment of the Contractor.

ARTICLE VIII – CONTRACT DOCUMENTS – The Contract Documents which comprise the contract between Owner and Contractor are attached hereto and made a part hereof and consist of the following:

8.1 This Agreement
8.2 Contractor's Bid and Bonds
8.3 Notice of Intent to Award, Notice to Proceed
8.4 Instruction to Bidders
8.5 General Requirements, Control of Work, Temporary Facilities, Measurement and Payment, Standard Specifications
8.6 Insurance Requirements
8.7 Standard and Technical Specifications
8.8 Drawings
8.9 Special Provisions
8.10 Any modifications, including Addenda, and change orders duly delivered after execution of this Agreement.

ARTICLE IX – TERMINATION FOR DEFAULT – Should contractor at any time refuse, neglect, or otherwise fail to supply a sufficient number or amount of properly skilled workers, materials, or equipment, or fail in any respect to prosecute the work with promptness and diligence, or fail to perform any of its obligations set forth in the Contract, Owner may, at its election, terminate the employment of Contractor, giving notice to Contractor in writing of such election, and enter on the premises and take possession, for the purpose of completing the work included under this Agreement, of all the materials, tools and appliances belonging to Contractor, and to employ any other persons to finish the work and to provide the materials therefore at the expense of the Contractor.

ARTICLE X – INDEMNIFICATION OF OWNER – Contractor shall defend, indemnify and hold harmless Owner and its officials and employees from and against all suits, claims, judgments, awards, losses, costs or expenses (including without limitation attorneys' fees) to the extent arising out of or relating to Contractor's alleged negligence or breach of its obligations or warranties under this Contract. Contractor shall defend all such actions with counsel satisfactory to Owner at its own expense, including attorney's fees, and will satisfy any judgment rendered against Owner in such action.

ARTICLE XI – PERMITS – The Contractor shall secure at its own expense, all permits and consents required by law as necessary to perform the work and shall give all notices and pay all fees and otherwise comply with all applicable City, State, and Federal laws, ordinances, rules and regulations.

ARTICLE XII – INSURANCE – The Contractor shall secure and maintain, until acceptance of the work, insurance with limits not less than those specified in the Contract.

ARTICLE XIII – MISCELLANEOUS –

A. Neither Owner nor Contractor shall, without the prior written consent of the other, assign, sublet or delegate, in whole or in part, any of its rights or obligations under any of the Contract Documents; and, specifically not assign any monies due, or to become due, without the prior written consent of Owner.

B. Owner and Contractor each binds himself, his partners, successors, assigns and legal representatives, to the other party hereto in respect to all covenants, agreements and obligations contained in the Contract Documents.

C. The Contract Documents constitute the entire Agreement between Owner and Contractor and may only be altered amended or repealed by a duly executed written instrument.

D. The laws of the State of New Hampshire shall govern this Contract without reference to the conflict of law principles thereof.

E. Venue for any dispute shall be the Rockingham County Superior Court unless the parties otherwise agree.

IN WITNESS WHEREOF, the parties hereunto executed this

AGREEMENT the day and year first above written.

BIDDER:

BY: _____

TITLE: _____

CITY OF PORTSMOUTH, N.H.

BY: _____
Karen S. Conard

TITLE: City Manager

NOTICE OF INTENT TO AWARD

Date:

TO:

IN AS MUCH as you were the low responsible bidder for work entitled:

Corporate Drive Maintenance Dredging and Outfall Improvements

You are hereby notified that the City intends to award the aforesaid project to you.

Immediately take the necessary steps to execute the Contract and to provide required bonds and proof of insurance within fifteen (15) calendar days from the date of this Notice. If you are a new vendor to the city, please provide a completed W-9 form.

The City reserves the right to revoke this Notice if you fail to take the necessary steps to execute this Contract.

City of Portsmouth
Portsmouth, New Hampshire

Judie Belanger,
Finance Director

NOTICE TO PROCEED

DATE:

PROJECT: **Corporate Drive Maintenance Dredging and Outfall Improvements**

TO:

YOU ARE HEREBY NOTIFIED TO COMMENCE WORK IN ACCORDANCE

WITH THE AGREEMENT DATED, _____**, 2022** ALL WORK SHALL BE COMPLETED PRIOR

TO OCTOBER 1, 2022.

THE FOLLOWING WORK IS HEREBY AUTHORIZED:
(See specifications for descriptions of work areas and tasks)

PROJECT BID SCHEDULE

CITY OF PORTSMOUTH, N.H.

_____
BY: Peter H. Rice

TITLE: Public Works Director

ACCEPTANCE OF NOTICE

RECEIPT OF THE ABOVE NOTICE TO
PROCEED IS HEREBY ACKNOWLEDGED BY

_____

This the _____day of_____ 20__

By:_____

Title:_____

CERTIFICATE OF SUBSTANTIAL COMPLETION

OWNER's Project No.:_____ ENGINEER's Project No.: _____

Project: Corporate Drive Maintenance Dredging and Outfall Improvements

CONTRACTOR: _____

Contract For:_____ Contract Date: _____

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

To: City of Portsmouth, New Hampshire
(Owner)

And To: _____
(Contractor)

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR and ENGINEER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on

_____
(Date of Substantial Completion)

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by CONTRACTOR within_____calendar days of the above date of Substantial Completion.

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as follows:

RESPONSIBILITIES:

OWNER: _____

_____

CONTRACTOR: _____

_____

The following documents are attached to and made a part of this Certificate:

_____

_____

_____

_____

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

Executed by ENGINEER on _____ , 20 _____

_____
(Engineer)

By: _____

CONTRACTOR accepts this Certificate of Substantial Completion on _____ , 20 _____

_____
(Contractor)

By: _____

OWNER accepts this Certificate of Substantial Completion on _____ , 20 _____

_____
(Owner)

By: _____

CHANGE ORDER

No. ___

PROJECT:	**Corporate Drive Maintenance Dredging & Outfall Improvements**	DATE OF ISSUANCE:	
OWNER:	City of Portsmouth, New Hampshire	Owner' Project No.	
(Name & Address)	1 Junkins Avenue, Portsmouth, NH 03801		
CONTRACTOR:		ENGINEER:	Underwood Engineers, Inc. 25 Vaughan Mall Portsmouth, New Hampshire
CONTRACT FOR:	Corporate Drive Maintenance Dredging & Outfall Improvements	ENGINEER's Project No.	2693

You are directed to make the following changes in the Contract Documents.
Description:

Justification:
Purpose of Change Order:

Attachments:

CHANGE IN CONTRACT PRICE	**CHANGE IN CONTRACT TIME**		
Original Contract Price	Original Contract Time:	Days	Date
	Substantial Completion		
	Final Payment		
Previous Change Orders **$0.00**	Net change from previous Change Orders		
	Substantial Completion	**0**	Days
	Final Payment	**0**	Days
Contract Price prior to this Change Order **$0.00**	Contract Time prior to this Change Order:		
		Days	Date
	Substantial Completion	0	
	Final Payment	0	
Net-Increase (Decrease) of this Change Order	Net Change of this Change Order		
	Substantial Completion (add)	**0**	Days
	Final Payment (add)	**0**	Days
Contract Price with all approved Change Orders **$0.00**	Contract Time with all approved Change Orders		
		Days	**Date**
	Substantial Completion	**0**	
	Final Payment	**0**	

This document will become a supplement to the CONTRACT and all provisions will apply hereto. The attached Constractor's Revised Project Schedule reflects increases or decreases in Contract Time as authorized by this change order.

Stipulated price and time adjustment includes all costs and time associated with the above described change. Contractor waives all rights for additional time extension for said change. Contractor and Owner agree that the price(s) and time adjustment(s) stated above are equitable and acceptable to both parties.

Recommended:	Approved:	Approved:
Engineer: Benjamin T. Dreyer, PE	City Manager: Karen Conard	Owner/DPW: Dave Defosses
Approved:	Approved:	Approved:
Owner/ Finance: Judie Belanger	Contractor:	

UNDERWOOD engineers

Field Order No. _____

Effective Date: Date of Issuance:

Owner: City of Portsmouth Owner's Contract No.:

Contractor: Contractor's Project No.:

Engineer: Underwood Engineers, Inc. Engineer's Project No.: 2693

Project: Corporate Dr. Maintenance Dredging & Outfall Improvements Contract Name:

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

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

Description:

Attachments:

ISSUED:	RECEIVED:
By: _____ Benjamin T. Dreyer, P.E.	By: _____ Contractor (Authorized Signature)
Title: Project Manager	Title: _____
Date: _____	Date: _____

Copy to: Dave Desfosses
Terry Desmarais, P.E.
Jared Sheehan

25 Vaughan Mall
Portsmouth, NH, 03801-4012
Tel: 603-436-6192 Fax: 603-431-4733

WORK CHANGE DIRECTIVE NO. ___

Effective Date:	Date of Issuance:
Owner: City of Portsmouth	Owner's Contract No.:
Contractor:	Contractor's Project
Engineer Underwood Engineers, Inc.	Engineer's Project No.: 2693
Project: Corporate Dr. Maintenance Dredging & Outfalls	Contract Name:

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

Attachments: *[List documents supporting change]*

Purpose for Work Change Directive:

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

☐ Non-agreement on pricing of proposed change.

☐ Necessity to proceed for schedule or other Project reasons.

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

Contract Price $ [increase] [decrease][maximum] [minimum]

Contract Time days [increase] [decrease].

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price

☐ Cost of the Work ☐ Other

Recommended: **Received:**

_____ _____

Engineer: Contractor's Representative
Benjamin T. Dreyer, P.E

Distribution:
☐ Contractor ☐ Owner ☐ Project Manager ☐ Field Office ☐ Office File No. _____

Contractor's Application for Payment No. 1

Application Period: | Application Date:

From Contractor: | Via Engineer: **Underwood Engineers, Inc.**

Contract: Corporate Drive Maintenance Dredging & Outfalls Improvements

Owner's Project No. | Contractor's Project No. | Engineer's Project No.: **2693**

Funding Agency Project No.

Application for Payment

Change Order Summary		
Approved Change Orders		
Number	Additions	Deductions
Totals	$0.00	$0.00
Net Change by Change Order		$0.00

Payment Summary	
1. Orignal Contract Price	
2. Net Change by Change Order	
3. Current Contract Price (Line 1±2)	
4a. Total Completed	
4b. Total Stored	
4. Total completed and Stored	
5a. ____% x Work Completed	
5b. ____% x Stored Materials	
5. Total Retainage (Line 5a. + 5b.)	
6. Amount Eligible for Payment (Line 4-5)	
7. Less Previous Payments	
8. Amount Due this Application	
9. Balance to Finish plus Retainage	

Contractor's Certifications

The undersigned Contractor certifies that: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By: _____
(Contractor) (Date)

Payment of: _____
(Line 8 or other - attach explanation of other amount)

is recommended by: _____
(Engineer) (Date)

Payment of _____

_____
(Line 8 or other - attach explanation of other amount)

is approved by: _____
(Owner) (Date)

Approved by: _____
(Funding Agency) (Date)

15. Contractor's application for Payment No. 1

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter called **PRINCIPAL**,
(Corporation, Partnership or Individual)

and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

City of Portsmouth, New Hampshire
(Name of Owner)

Department of Public Works, 680 Peverly Hill Road, Portsmouth NH 03801
(Address of Owner)

hereinafter called **OWNER**, in the total aggregate penal sum of _____

_____ Dollars, $ (_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the **PRINCIPAL** entered into a certain contract with the **OWNER**, dated the _____ day of _____ 20____, a copy of which is hereto attached and made a part hereof for the construction of:

Corporate Drive Maintenance Dredging and Outfall Improvements

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extension thereof which may be granted by the **OWNER**, with or without notice to the Surety and during the one year guaranty period, and if the **PRINCIPAL** shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the **OWNER** from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the **OWNER** all outlay and expense which the **OWNER** may incur in making good any default, then this obligation shall be void: otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to **WORK** to be performed thereunder or the specifications accompanying same shall in any way affect its obligation on this **BOND**, and it does hereby waive notice of any such change, extension of time alteration or addition to the terms of the contract or to the **WORK** or to the specifications.

PROVIDED, FURTHER, that it is expressly agreed that this **BOND** shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the **PRINCIPAL** and the **SURETY** to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this **BOND** and whether referring to this **BOND**, the contract or the loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the **OWNER** and the **CONTRACTOR** shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in **6** counterparts, each one of
(number)

which shall be deemed an original, this _____ day of _____, 20 .

ATTEST:

_____
Principal

By: _____
(Principal) Secretary

(SEAL) **BY**

_____

_____
(Address)

By: _____

_____
Witness as to Principal

_____
(Address)

_____

_____
(Surety)

ATTEST: **BY**

_____

Attorney - in - Fact

By _____

_____

Witness as to Surety
(
Address)

_____ _____

_____ _____

(Address)

NOTE: Date of **BOND** must not be prior to date of Contract.
If **CONTRACTOR** is Partnership, all partners should execute BOND

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of New Hampshire

LABOR AND MATERIAL PAYMENT BOND

(This format provided for convenience, actual Labor and Material Bond is acceptable in lieu, if compatible)

Bond Number _____

KNOW ALL MEN BY THESE PRESENTS:

that _____

as Principal, hereinafter called Contractor, and _____ (Surety Company) a corporation organized and existing under the laws of the State of

_____ and authorized to do business in the State of New Hampshire hereinafter called Surety, are held and firmly bound unto the City of Portsmouth, N.H. Obligee, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the

amount of _____ Dollars ($_____), for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____ entered into a

contract with Owner for _____ in accordance with drawings and specifications prepared by the Public Works Department, 680 Peverly Hill Road, Portsmouth, N.H. 03801, which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract and for the hire of all equipment, tools, and all other things contracted for or used in connection therewith, then this obligation shall be void, otherwise it shall remain in full force and effect, subject however, to the following conditions:

(1) A claimant is defined as one having a direct contract with the Principal or, with a subcontractor of the Principal for labor, material, equipment, or other things used or reasonably required for use in the performance of the Contract. "Labor and material" shall include but not be limited to that part of water, gas, power, light, heat, oil and gasoline, telephone service or rental of equipment applicable to the Contract.

(2) The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such a claimant, may sue on this bond for the use of such claimant, prosecute the suit by final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any such suit or any costs or expenses of any such suit, and principal and surety shall jointly and severally indemnify, defend and hold the Owner harmless for any such suit, costs or expenses.

(3) No suit or action shall be commenced hereunder by any claimant:

(a) Unless Claimant, other than one having a direct contract with the Principal, shall have given notice to all the following:

The Principal, the Owner and the Surety above named, within six (6) calendar months after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified

LABOR AND MATERIAL PAYMENT BOND (continued)

mail, postage prepaid, in an envelope addressed to the Principal, Owner, and Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the State of New Hampshire save that such service need not be made by a public officer.

(b) After the expiration of one (1) year following the date on which Principal ceased all work on said contract, it being understood , however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

(c) Other than in a State court of competent jurisdiction in and for the county or other political subdivision of the State in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere. (4) The amount of this bond may be reduced by and to the extent of any payment of payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed on record against said improvement, whether or not claim for the amount of such lien by presented under and against this bond.

Signed and sealed this _____ day of _____, 20____. In the presence of:

_____ BY: _____
(Witness) (Principal) (Seal)

_____
(Surety Company)

_____ BY: _____
(Witness) (Title) (Seal)

Note:
If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by its duly authorized Officer or Officers.

If this bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly certified copy of his Power of Attorney showing his authority to sign such Bonds.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Agreement.

CONTRACTOR'S AFFIDAVIT

STATE OF _____:

COUNTY OF _____:

Before me, the undersigned, a _____
(Notary Public, Justice of the Peace)

in and for said County and State personally appeared, _____
(Individual, Partner, or duly authorized representative of Corporate)

who, being duly sworn, according to law deposes and says that the cost of labor, material, and equipment and outstanding claims and indebtedness of whatever nature arising out of the performance of the Contract between

CITY OF PORTSMOUTH, NEW HAMPSHIRE

and _____
(Contractor)

of _____

Dated: _____

has been paid in full for Construction of: **Corporate Drive Maintenance Dredging and Outfalls Improvements**

_____
(Individual, Partner, or
duly authorized
representative of
Corporate Contractor)

Sworn to and subscribed
before me this _____day
of _____ 20____

_____

CONTRACTOR'S RELEASE

KNOW ALL MEN BY THESE PRESENTS that _____ (Contractor) of

_____, County of _____and State of

_____ does hereby acknowledge

that_____(Contractor)

has on this day had, and received from the CITY OF PORTSMOUTH NEW HAMPSHIRE, final and completed payment for the

Construction of:

Corporate Drive Maintenance Dredging and Outfalls Improvements

NOW THEREFORE, the said _____

(Contractor)

for myself, my heirs, executors, and administrators) (for itself, its successors and assigns) do/does by these presents remise, release, quit-claim and forever discharge the City of Portsmouth, New Hampshire, its successors and assigns, of and from all claims and demands arising from or in connection with the said Contract dated _____, and of and from all, and all manners of action and actions, cause and causes of action and actions, suits, debts, dues, duties, sum and sums of money, accounts, reckonings, bonds, bills, specifications, covenants, contracts, agreements, promises, variances, damages, judgments, extents, executions, claims and demand, whatsoever in law of equity, or otherwise, against the City of Portsmouth, New Hampshire, its successors and assigns, which (I, my heirs, executors, or administrators) (it, its successors and assigns) ever had, now have or which (I, my heirs, executors, or administrators) (it, its successors and assigns) hereafter can shall or may have, for, upon or by reason of any matter, cause, or thing whatsoever; from the beginning of record time to the date of these presents.

IN WITNESS WHEREOF,

Contractor:

_____ By:_____

print name of witness:_____ Its Duly Authorized _____

Dated: _____

CONDITIONS

GENERAL REQUIREMENTS

SCOPE OF WORK

1. INTENT OF CONTRACT

The intent of the Contract is to provide for the construction and completion in every detail of the work described. The Contractor shall furnish all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the terms of the Contract. The Contractor shall be required to conform to the intent of the plans and specifications. No extra claims shall be allowed for portions of the work not specifically addressed in the plans and specifications but required to produce a whole and complete project, such work will be considered subsidiary to the bid items.

2. INCIDENTAL WORK

Incidental work items for which separate payment is not measured includes, but is not limited to, the following items:

a. Clearing, grubbing and stripping (unless otherwise paid for)
b. Clean up
c. Signs
d. Mobilization/Demobilization (unless otherwise paid for)
e. Restoration of property
f. Cooperation with other contractors, abutters and utilities.
g. Utility crossings, (unless otherwise paid for)
h. Minor items - such as replacement of fences, guardrails, rock wall, etc.
i. Steel and/or wood sheeting as required.
j. Accessories and fasteners or components required to make items paid for under unit prices or lump sum items complete and functional.

3. ALTERATION OF PLANS OR OF CHARACTER OF WORK

The Owner reserves the right, without notice to Surety, to make such alterations of the plans or of the character of the work as may be necessary or desirable to complete fully and acceptably the proposed construction; provided that such alterations do not increase or decrease the contract cost. Within these cost limits, the alterations authorized in writing by the Owner shall not impair or affect any provisions of the Contract or bond and such increases or decreases of the quantities as a result from these alterations or deletions of certain items, shall not be the basis of claim for loss or for anticipated profits by the contractor. The contractor shall perform the work as altered at the contract unit price or prices.

4. EXTRA WORK ITEMS

Extra work shall be performed by the Contractor in accordance with the specifications and as directed, and will be paid for at a price as provided in the Contract documents or if such pay items are not applicable than at a price negotiated between the contractor and the Owner or at the unit bid price. If the Owner determines that extra work is to be performed, a change order will be issued.

5. CHANGE ORDERS

The Owner reserves the right to issue a formal change order for any increase, decrease, deletion, or addition of work or any increase in contract time or price. The contractor shall be required to sign the change order and it shall be considered as part of the Contract documents.

6. FINAL CLEANING UP

Before acceptance of the work, the contractor shall remove from the site all machinery, equipment, surplus materials, rubbish, temporary buildings, barricades and signs. All parts of the work shall be left in a neat and presentable condition. On all areas used or occupied by the contractor, regardless of the contract limits, the bidder shall clean-up all sites and storage grounds.

The items prescribed herein will not be paid for separately, but shall be paid for as part of the total contract price.

7. ERRORS AND INCONSISTENCY IN CONTRACT DOCUMENTS

Any provisions in any of the Contract Documents that may be in conflict with the paragraphs in these General Requirements shall be subject to the following order of precedence for interpretation.

1. Technical Specifications will govern General Requirements.
2. Special Provisions will govern Technical Specifications.
3. Plans will govern Special Provisions, Technical Specifications, and General Requirements.

CONTROL OF WORK

1. AUTHORITY OF ENGINEER

(a) All work shall be done under supervision of the City Engineer and to his satisfaction. The City Engineer will decide all questions which may arise as to the quality and acceptability of materials furnished and work performed and as to the rate of progress of the work; all questions that may arise as to the interpretation of the plans and specifications; and all questions as to the acceptable fulfillment of the Contract by the Contractor.

(b) The City Engineer will have the authority to suspend the work wholly or in part for such periods as he may deem necessary due to the failure of the Contractor to correct conditions unsafe for workers or the general public; for failure to carry out provisions of the Contract; for failure to carry out orders; for conditions considered unsuitable for the prosecution of the work, including unfit weather; or for any other condition or reason deemed to be in the public interest. The Contractor shall not be entitled any additional payments arising out of any such suspensions.

(c) The Owner reserves the right to demand a certificate of compliance for a material or product used on the project. When the certificate of compliance is determined to be unacceptable to the City Engineer the Contractor may be required to provide engineering and testing services to guarantee that the material or product is suitable for use in the project, at its expense (see Sample of Certificate of Compliance).

2. PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPES

(a) The Contractor shall use every precaution to prevent injury or damage to wires, poles, or other property of public utilities; trees, shrubbery, crops, and fences along and adjacent to the right-of-way, all underground structures such as pipes and conduits, within or outside of the right-of-way; and the Contractor shall protect and carefully preserve all property marks until an authorized agent has witnessed or otherwise referenced their location.

(b) The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in his manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted.

(c) When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or as a result of the failure to perform work by the Contractor, the Contractor shall restore, at its own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing rebuilding, or otherwise restoring as may be directed, or the Contractor shall make good such damage or injury in an acceptable manner.

(d) The Contractor shall paint with tree paint all scars made on fruit or ornamental trees by equipment, construction operations, or the removal of limbs larger than one inch in diameter. Damaged trees must be replaced if so determined by the City Arborist, in his or her sole discretion.

(e) If the Contractor fails to repair, rebuild or otherwise restore such property as may be deemed necessary, the Owner, after 48 hours' notice, may proceed to do so, and the cost thereof may be deducted from any money due or which may become due the Contractor under the contract.

(f) It is the intent of the Parties that the Contractor preserve, to as great an extent as possible, the natural features of the site.

(g) Manhole and/or catch basin castings, frames, covers, and grates shall be protected and preserved during construction. A careful inventory shall be keep regarding which frames and covers/grates were removed so they can be replaced in the proper location. Any damaged or missing frames, covers, or grates shall be replaced by the contractor at no cost to the owner.

CONTROL OF WORK (continued)

3. MAINTENANCE DURING CONSTRUCTION

The Contractor shall maintain the work during construction and until the project is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and workers to ensure that the structure is kept in satisfactory conditions at all times.

4. SAFETY PRECAUTIONS

Upon commencement of work, the Contractor shall be responsible for initiating, maintaining and supervising all safety precautions necessary to ensure the safety of employees on the site, other persons who may be affected thereby, including the public, and other property at the site or adjacent thereto.

5. PERMITS

It will be the responsibility of the Contractor to obtain all permits required for the operation of equipment in, or on, all city streets and public ways.

6. BARRICADES, WARNING SIGNS AND TRAFFIC OFFICERS

(a) The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices, and shall take all necessary precautions for the protection of the work and safety of the public. Roadway closed to traffic shall be protected by effective barricades. Obstructions shall be illuminated during hours of darkness. Suitable warning signs shall be provided to control and direct traffic in a proper manner, as approved by the engineer.

(b) The Contractor will be held responsible for all damage to the work from traffic, pedestrians, animals or any other cause due to lack of adequate controlling devices.

(c) The Contractor shall provide such police officers as the City Engineer deems necessary for the direction and control of traffic within the site of project.

The work prescribed herein will not be paid for separately but will be paid for as part of the Contract Price unless specifically appearing as a bid item.

TEMPORARY FACILITIES

1. STORAGE FACILITIES

(a) The Contractor shall not store materials or equipment in a public right-of-way beyond the needs of one working day. Equipment and materials shall be stored in an approved location.

(b) The Contractor shall protect all stored materials from damage by weather or accident and shall insure adequate drainage at and about the storage location.

(c) Prior to final acceptance of the work all temporary storage facilities and surplus stored materials shall be removed from the site.

2. SANITARY FACILITIES

(a) The Contractor shall provide for toilet facilities for the use of the workers employed on the work.

(b) Temporary toilet facilities may be installed provided that the installation and maintenance conform with all State and local laws, codes, regulations and ordinances governing such work. They shall be properly lit and ventilated, and shall be kept clean at all times.

(c) Prior to final acceptance of the work all temporary toilet facilities shall be removed from the site.

3. TEMPORARY WATER

The Contractor shall make all arrangements with the local water department for obtaining water connections to provide the water necessary for construction operations and shall pay all costs.

4. TEMPORARY ELECTRICITY

The Contractor shall make all arrangements with the Public Service Company for obtaining electrical connections to provide the electrical power necessary for construction operations and security lighting and shall pay all electrical connection and power costs.

The Contractor shall be responsible with obtaining an electrical permit from the City Electrical Inspector.

INSURANCE REQUIREMENTS

Insurance shall be in such form as will protect the Contractor from all claims and liabilities for damages for bodily injury, including accidental death, and for property damage, which may arise from operations under this contract whether such operation by himself or by anyone directly or indirectly employed by him.

AMOUNT OF INSURANCE

A) Commercial General Liability:
Bodily injury or Property Damage - $2,000,000
Per occurrence and general aggregate

B) Automobile and Truck Liability:
Bodily Injury or Property Damage - $2,000,000
Per occurrence and general aggregate

Additionally, the Contractor shall purchase and maintain the following types of insurance:

A) Workers Comprehensive Insurance coverage in at least statutorily required amounts for all people employed by the Contractor to perform work on this project.

B) Contractual Liability Insurance coverage in the amounts specified above under Comprehensive General Liability.

C) Product and Completed Operations coverage to be included in the amounts specified above under Comprehensive General Liability.

ADDITIONAL INSURED

All liability policies (including any excess policies used to meet coverage requirements) shall include the City of Portsmouth, New Hampshire as named Additional Insured.

1) The contractor's insurance shall be primary in the event of a loss.
2) The Additional Insured endorsement must include language specifically stating that the entity is to be covered for all activities performed by, or on behalf of, the contractor, including the City of Portsmouth's general supervision of the contractor.
3) City of Portsmouth shall be listed as a Certificate Holder and Additional Insured. The City shall be identified as follows:

City of Portsmouth
Attn: Legal Department
1 Junkins Avenue
Portsmouth, NH 03801

MEASUREMENT AND PAYMENT

1. MEASUREMENT OF QUANTITIES

(a) All work completed under the contract will be measured according to the United States standard measure.

(b) The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice. Unless otherwise stated all quantities measured for payment shall be computed or adjusted for "in place" conditions.

(c) Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures having an area of 9 square feet or less. Unless otherwise specified, transverse measurements for area computations will be the dimensions shown on the plans or ordered in writing.

(d) Structures will be measured according to lines shown on the plans or as ordered unless otherwise provided for elsewhere in the specifications.

(e) In computing volumes of excavation, embankment, and borrow, the average end area method will be used. Where it is impracticable to measure by the cross-section method, acceptable methods involving three-dimensional measurement may be used. When measurement of borrow in vehicles is permitted, the quantity will be determined as 80 percent of the loose volume.

(f) In computing volumes of concrete, stone and masonry, the prismoidal method will be used. The term "ton" will mean the short ton consisting of 2,000 pounds avoirdupois.

(g) Except as specified below, all materials that are measured or proportioned by weight shall be weighed on scales which the Contractor has had sealed by the State or by a repairman registered by the Commissioner of Agriculture. All weighing shall be performed in a manner prescribed under the Rules and Regulations of the Bureau of Weights and Measures of the New Hampshire Department of Agriculture.

(h) Weighing of materials on scales located outside New Hampshire will be permitted for materials produced or stored outside the state, when requested by the Contractor and approved. Out-of-state weighing in order to be approved, must be performed by a licensed public weigh master or a person of equal authority in the state concerned on scales accepted in the concerned state.

(i) Each truck used to haul material being paid for by weight shall bear a plainly legible identification mark, and if required, shall be weighed empty daily at such times as directed.

(j) When material is weighed, the individual weight slips, which shall be furnished by the Contractor, for trucks, trailers, or distributors, shall show the following information: the date; the project; the material or commodity; the dealer or vendor; the Contractor or Subcontractor; the location of the scales; the vehicle registration number or other approved legible identification mark; the tare and net weights, with gross weights when applicable; and the weigher's signature or his signed initials.

(k) The right is reserved to weight any truck, trailer, or distributor, at locations designated, before and after making deliveries to the project.

(l) Bituminous materials will be measured by the gallon or ton.

(m) When material is specified to be measured by the cubic yard but measurement by weight is approved, such material may be weighed and the weight converted to cubic yards for payment purposes. Necessary conversion factors will be determined by the Owner.

(n) The term "lump sum" when used as an item of payment will mean complete payment for the work described in the item.

(o) When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories, so as to provide the item complete and functional. Except as may be otherwise provided, partial payments for lump sum items will be made approximately in proportion to the amount of the work completed on those items.

(p) Material wasted without authority will not be included in the final estimate.

MEASUREMENT AND PAYMENT (continued)

2. SCOPE OF PAYMENT

(a) The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials and for performing all work under the contract in a complete and acceptable manner and for all risk, loss, damage or expense of whatever character arising out of the nature of the work or the prosecution thereof.

(b) The Contractor shall be liable to the Owner for failure to repair, correct, renew or replace, at his own expense, all damage due or attributable to defects or imperfections in the construction which defects or imperfections may be discovered before or at the time of the final inspection and acceptance of the work.

(c) No monies, payable under the contract or any part thereof, except the first estimate, shall become due or payable if the Owner so elects, until the Contractor shall satisfy the Owner that the Contractor has fully settled or paid all labor performed or furnished for all equipment hired, including trucks, for all materials used, and for fuels, lubricants, power tools, hardware and supplies purchased by the Contractor and used in carrying out said contract and for labor and parts furnished upon the order of said Contractor for the repair of equipment used in carrying out said contract; and the Owner, if he so elects, may pay any and all such bills, in whole or in part, and deduct the amount of amounts so paid from any partial or final estimate, excepting the first estimate.

3. COMPENSATION FOR ALTERED QUANTITIES

(a) Except as provided for under the particular contract item, when the accepted quantities of work vary from the quantities in the bid schedule the Contractor shall accept as payment in full, so far as contract items are concerned, at the original contract unit prices for the accepted quantities of work done. No allowance will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation among the contract items of overhead expense on the part of the Bidder and subsequent loss of expected reimbursements therefore or from any other cause.

(b) Extra work performed will be paid for at the contract bid prices or at the price negotiated between the Owner and the Contractor if the item was not bid upon. If no agreement can be negotiated, the Contractor will accept as payment for extra work, cost plus 15% (overhead and profit). Costs shall be substantiated by invoices and certified payroll.

4. PARTIAL PAYMENTS

Partial payments of work accepted by the City will be made on a monthly basis during the contract period minus the retainage amount. See Article VI of the Contract Agreement regarding retainage schedule.

5. FINAL ACCEPTANCE

Upon due notice from the Contractor of presumptive completion of the entire project, the City Engineer will make an inspection. If all construction provided for and contemplated by the contract is found complete to his satisfaction, this inspection shall constitute the final inspection and the City Engineer will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of the final inspection.

If, however, the inspection discloses any work in whole or in part, as being unsatisfactory, the City Engineer will give the Contractor the necessary instructions for correction of such work, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made which shall constitute the final inspection provided the work has been satisfactorily completed. In such event, the City Engineer will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

6. ACCEPTANCE AND FINAL PAYMENT

(a) When the project has been accepted and upon submission by the Contractor of all required reports, completed forms and certifications, the Owner will review the final estimate of the quantities of the various classes of work performed. The Contractor may be required to certify that all bills for labor and material used under this contract have been paid.

MEASUREMENT AND PAYMENT (continued)

(b) The Contractor shall file with the Owner any claim that the Contractor may have regarding the final estimate at the same time the Contractor submits the final estimate. Failure to do so shall be a waiver of all such claims and shall be considered as acceptance of the final estimate. From the total amount ascertained as payable, an amount equal to two percent (2%) of the whole will be deducted and retained by the Owner for the guaranty period.

(c) All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

7. GENERAL GUARANTY AND WARRANTY OF TITLE

(a) Neither the final certification of payment nor any provision in the contract nor partial or entire use of the improvements embraced in this Contract by the Owner or the public shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express or implied warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of twelve (12) months from the date of final acceptance of the work. The Owner will give notice of defective materials and work with reasonable promptness.

(b) No material, supplies or equipment to be installed or furnished under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease purchase or other agreement by which an interest therein or in any part thereof is retained by the Seller or supplier. The Contractor shall warrant good title to all materials, supplies and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed thereon by him to the Owner free from any claims, liens or charges. Neither the Contractor nor any person, firm or corporation furnishing any material or labor for any work covered by this Contract shall have the right to a lien upon any improvements or appurtenances thereon.

Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this paragraph shall be inserted in all subcontractors and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

8. NO WAIVER OF LEGAL RIGHTS

(a) Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or be stopped from recovering from the Contractor or his Surety, or both, such overpayment as it may sustain by failure on the part of the Contractor to fulfill his obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

(b) The Contractor, without prejudice to the Contract shall be liable to the terms of the Contract, shall be liable to the Owner for latent defects, fraud or such gross mistakes as may amount to fraud, and as regards the Owner's right under any warranty or guaranty.

9. TERMINATION OF CONTRACTOR'S RESPONSIBILITY

Whenever the improvement provided for by the Contract shall have been completely performed on the part of the Contractor and all parts of the work have been released from further obligations except as set forth in his bond and as provided in Section 8 above.

SHOP DRAWINGS

Shop Drawings for this project shall be submitted under the following conditions:

1. The Contractor shall submit working and detail drawings, well in advance of the work, to the City Engineer for review.
2. The Contractor's drawings shall consist of shop detail, erection and other working plans showing dimensions, sizes and quality of material, details and other information necessary for the complete fabrication and erection of the pertinent work.
3. The Contractor shall submit two (2) sets of drawings to the City Engineer.
4. Prior to the approval of the drawings, any work done or materials ordered for the work involved shall be at the Contractor's risk.
5. One (1) set of the drawings will be returned to the Contractor approved or marked with corrections to be made. After approval has been given, the Contractor shall supply the City Engineer with two sets of the revised detail working drawings.
6. The City Engineer's approval of the Contractor's working drawings will not relieve the Contractor from responsibility for errors in dimensions or for incorrect fabrication processes, or from responsibility to complete the contract work.

SPECIFICATIONS

STANDARD SPECIFICATIONS

The Standard Specifications for Road and Bridge Construction of the State of New Hampshire Department of Transportation and any Addenda shall apply to all technical and measurement aspects of this project only.

However, the Standard Specifications for Road and Bridge Construction of the State of New Hampshire Department of Transportation and any Addenda shall NOT apply to General Requirements, Control of Work, Temporary Facilities, Payment, Insurance Requirements, etc. **with the exception that pavement escalation will be allowed in accordance with the NHDOT standard specifications.**

TECHNICAL SPECIFICATIONS

As noted above, the Technical Specifications for this project are the Standard Specifications for Road and Bridge Construction of the State of New Hampshire Department of Transportation and any Addenda shall apply to all technical and measurement aspects of this project only.

AMENDMENTS TO NHDOT SPECIFICATIONS

The NHDOT specifications are hereby amended as follows:

Section 206 – Structure Excavation for Pipes and Other Minor Structures

Classification of Material

Amend Paragraph 2.2 to read:

2.2 Rock structure excavation shall consist of all solid rock that can be removed only by blasting, hammering or ripping. It shall also consist of boulders and parts of masonry structures when found to measure 2 cy (2 cubic yards) or more, except as provided in 604.5.2.2.

Section 645 – Erosion Control

Method of Measurement

Add paragraph 4.10:

4.10 Implementing and maintaining SWPPP will be measured for payment based on the percentage of work completed as follows:

4.10.1 The number of days erosion control measures (i.e. silt fence, mulch berms, dust management, hay bales, etc.) have been maintained in accordance with all local, State and Federal requirements up to 30% of the unit item.

4.10.2 Days where erosion control measures are not maintained in a satisfactory manor will not be measured for payment upon notification of non-compliance by the Engineer.

4.10.3 Measurement of the final 10% will be upon removal of all erosion control measures and completion of any restoration as required following removal of erosion control items following adequate stabilization of surrounding areas.

4.10.4 Regular maintenance of erosion control measures that have become defective or damaged will not be measured to additional payment.

4.10.5 Total measurement of this item shall not exceed 100%

Basis of Payment

Delete paragraph 5.7.2 entirely and **replace** with the following:

5.7.2.1 Implementing and maintaining SWPPP shall be paid at the Contract unit price.

5.7.2.2 Payment shall be considered full compensation for all materials, equipment, and labor required to adequately install and maintain all required erosion control and sediment control measures as required or as shown.

5.7.2.3 Payment shall be considered full compensation for all materials, equipment, and labor required to implement and maintain all temporary flow diversion structures in accordance with section 503 of this manual in order to complete all required work in the dry.

5.7.2.4 The Owner and Engineer reserve the right to request additional control measures or modification to existing control measures based on performance and actual conditions observed in the field.

Pay Items and Units

645.701	Implement and Maintain SWPPP	UNIT

Section 646 – Turf Establishment

Basis of Payment

Add the following paragraph:

5.4 Said contract unit prices will be considered full compensation for protecting loamed areas from erosion. Loamed areas that have eroded will be repaired by the Contractor at no additional cost through the project warranty period.

SPECIAL PROVISIONS

The following Special Provisions are to be used in conjunction with the NHDOT Standard Specifications and are herein made a part of the Construction Documents and apply to this project:

Special Provisions

Section	Description
110	Prosecution of Work
201	Invasive Species Control
585.0	Stone Fill (Sizes C1 to C3)
697	Invasive Species Control and Management Plan
900	Precast Headwalls
1008.1	Alterations and Additions as Needed
1008.2	Soils Testing
1010.2	Fuel Adjustment

S P E C I A L P R O V I S I O N

SECTION 110 – Prosecution of Work

Description

The Prosecution of Work is intended to provide the Contractor a summary of project requirements. The information is provided for convenience and is not a comprehensive list of all project requirements. The Prosecution of Work shall be used together with the rest of the Project Manual and the Drawings.

1. DESCRIPTION OF WORK

The following work is included:

Outfall 1 – Oak Avenue

- Pre-drain soil 1ft. below soil elevation before proceeding with the work
- Clear and dredge channel 350'L x 8'W x 1.5'D
- Construct headwall, plunge pool, and check dam
- Reconstruct channel to elevation shown on the plans and as specified

Outfall 2 – Ashland Drive

- Pre-drain soil 1ft. below soil elevation before proceeding with the work
- Cut vegetation STA 1+35 to STA 6+00
- Clear and dredge channel 215'L x 8'W x 1.5'D
- Construct headwall, plunge pool, and check dam
- Reconstruct channel to elevation shown on the plans and as specified

Outfall 3 – 273 Corporate Drive

- Pre-drain soil 1ft. below soil elevation before proceeding with the work
- Dredge channel 60'L x 8'W x 1.5'D
- Construct headwall, plunge pool, and check dam
- Reconstruct channel to elevation shown on the plans and as specified
- Construct Maintenance Access

2. WORK SEQUENCES AND OPERATIONS

2.1 CHANNEL DREDGING

Channel dredging will require coordination with stream flow conditions (weather).

- The channel flow will need to be diverted to construct work in the dry
- The soil will need to be pre-drained one foot below existing soil elevation before dredging begins.

- The work will be done under low flow conditions when no rain is forecasted for at least 5 consecutive days. If forecasts change or the work does not progress at the necessary speed, the Contractor may need to reschedule the operation and attempt the installation again.
- Quantity tables are provided on the plans and identify items subsidiary to the work that will not be measured for payment.
- The dredged channel material will be managed on-site in the area specified on the plans, allowed to dry, and stockpiled for future use as topsoil.

2.2 HEADWALL, PLUNGE POOL, AND CHECK DAM

Headwall, plunge pool, and check dam installation will require coordination with steam flow conditions (weather). Headwall installation will consist of NHDOT standard precast concrete headwall P.C. -7. Installation of the headwalls will be dependent upon contractor's sequencing and work schedule. Construct plunge pool at culvert outlets to the widths and lengths shown on the drawings. Stone dams will be constructed as permanent structures in locations specified on plan.

2.3 OPERATIONAL PLANS AND APPROVALS

The following operational plans must be submitted and approved prior to proceeding with the work:

- Project Schedule (updated for each regular progress meeting)
- Flow Diversion and Dewatering Plan
- Stormwater Pollution Prevention Plan (SWPPP)
- Invasive Species Control Plan
- Traffic Control Plan
- City of Portsmouth Flagging Permit
- Pease Development Authority Excavation Permit

3. CONSTRUCTION LAYOUT

Work is to be constructed as shown on the Drawings. The Contractor will be responsible for construction layout. A list of horizontal control points (and coordinates) and TBM's will be provided for the Contractor's use.

4. EXCAVATION

The Contractor is responsible for completing the project under safe work conditions consistent with OSHA requirements. Underwood may discuss any concerns regarding the Contractor's

work with the Contractor's safety coordinator. Excavations adjacent to the traveled way or shoulders shall be backfilled during non-work hours.

5. TEMPORARY EROSION CONTROL

The Contractor shall exercise caution to minimize the intrusion of any spillage, sediment, turbidity, or pollution into the waterways. Sediment and erosion controls shall be operational prior to commencing earth moving activities and/or trench de-watering operations.

A Storm Water Pollution Prevention Plan (SWPPP) will be required and must be kept on site at all times. The SWPPP may be amended as necessary to provide continued erosion and sediment control throughout the project. Appropriate measures shall be implemented to prevent sedimentation migration resulting from the Contractor's construction operations.

6. MAINTENANCE OF TRAFFIC

6.1 TRAFFIC CONTROL PLAN

A Traffic Control Plan (TCP) shall be submitted for review and approval by the City of Portsmouth and Pease Development Authority. Traffic impacts are expected to be minimal since the work areas are outside the roadway. Any changes to the normal two-way traffic flow shall be approved in advance.

Construction warning signs must conform to MUTCD standards, as applicable. The Plan shall also include the anticipated number of flaggers or other traffic control devices for the work area. Variations to the TCP will be dependent on the Contractor's schedule and operations. The Contractor shall maintain access to properties and driveways throughout construction. Provide necessary barricades, signs and traffic control devices in accordance with the approved TCP.

6.2 DUST CONTROL

The Contractor is required to control dust generated from paved and unpaved surfaces using a combination of water and/or Calcium Chloride and regular sweeping.

6.3 STAGING AREA

The Contractor is required to locate and secure all staging and material storage areas. At the completion of work, the Contractor shall receive a release from the property owner(s) of the staging area(s). The Contractor shall provide a copy of each release prior to final payment.

7. WORK LIMITS

The limits of work are within the Corporate Drive ROW and Pease Development Authority property. The Contractor shall not enter upon nor occupy with men, equipment or materials any abutting property outside the limits of work, unless written consent of the owner is obtained prior to entry. In general, abutting properties are occupied by corporate business entities. At the completion of work, any impacts to property outside the limit of work shall be restored to pre-existing condition or otherwise improved to the satisfaction of the property owner.

8. CONFLICTS AND COORDINATION WITH EXISTING UTILTIES

The location of the existing utilities shown on the Drawings are approximate and are based on information provided by others. It shall be the responsibility of the Contractor to verify the location of any questionable utilities that may conflict with the work. Any utilities damaged by the Contractor's activities shall be repaired immediately by the Contractor at no cost to the Owner.

9. WORK HOURS

It is anticipated that the Work will be completed Monday through Friday during daylight hours (7 AM to 5 PM) unless specifically approved otherwise. Requests to perform nighttime, holiday or weekend operations must be approved by the Owner at least 2 weeks prior to the anticipated construction operations. Additional costs associated with work operations beyond regular hours will be at the Contractor's expense.

10. PERMITS AND ENVIRONMENTAL REQUIREMENTS

10.1 WETLAND PERMIT

A NHDES and ACOE Wetlands and Non-Site-Specific Permit for the dredging of the outfall areas has been obtained by Pease Development Authority. The Contractor is responsible for adhering to the permit requirements included in Appendix A and B.

10.2 INVASIVE SPECIES

Invasive Species (Type I and II) have been identified within the work limits at all three outfall areas. The Contractor is responsible for preparing an Invasive Species Control and Management Plan in accordance with NHDOT BMP's (Appendix D) for review and approval. The contractor shall coordinate an on-site meeting with the Engineer and Owner to review the approved Plan prior to the work. The work is to be conducted in accordance with Special

Provision 201 – Invasive Species Control. Payment items are provided for additional work above and beyond normal earthwork operations required by the Plan.

The intent and basis of unit item quantities for this work is noted below:

- Brush material generated from clearing may be dried and or piled (NHDOT BMP's - Page 6)
- Soil material generated from excavation not reused within the limits of infestation may be stockpiled on an impervious surface and covered until viable plant material is destroyed (NHDOT BMP's – Page 7)
- Material may be buried, only when directed by the City of Portsmouth and approved by the Pease Development Authority.

Refer to Appendix E – Wetland Delineation and Functions Values report for details on invasive species identified in the project area.

10.3 WETLAND RESTORATION

Impacted wetland areas are to be restored using wetland seed mix to the limits shown on the drawing (see typical channel section on Drawing D2). See Appendix F for New England Wetmix (pre-approved wetland planting seed). Note that other acceptable seed mixes may also be available.

11. MEETINGS

11.1 PRECONSTRUCTION MEETING

A preconstruction meeting shall be held prior to the start of construction. The meeting shall be attended by the Contractor, Owner, Engineer, regulatory officials, funding agency officials, and subcontractors as appropriate. The Contractor shall provide a proposed schedule for construction and schedule of values for payment for approval by the Engineer prior to the meeting.

- Scheduling and sequencing.
- Special requirements during construction
- Access and traffic control
- Safety

11.2 PROJECT COORDINATION MEETINGS

Informal meetings will be held on site periodically on an "as needed basis" between the Contractor's Superintendent, Owner, and Resident Project Representative to review progress/schedule, sequence and other day to day issues. Coordination meetings are typically weekly.

12. PAYMENT APPLICATIONS

At the end of each day's work, the Contractor's Superintendent or other authorized representative of the Contractor will meet with the Owner's Representative and determine and agree upon the quantities of unit price work accomplished and/or completed during the workday. The Owner's Representative will then prepare a "Field Report" which shall be signed by both the Owner's Representative and Contractor's Representative indicating complete agreement on the quantities listed.

Once each month the Owner's Representative will prepare a "Monthly Progress Summation" form from the month's accumulation of "Field Report" quantities which shall also be signed by both the Owner's Representative and Contractor's Representative indicating complete agreement on quantities listed. These completed forms will provide the basis of the Engineer's monthly quantity estimate upon which payment will be made. Items not appearing on both the Field Report and Monthly Progress Summation will not be included for payment. Items appearing on forms not properly signed by the Contractor will not be included for payment.

Samples of the above referenced forms are included at the end of this section of the Specifications.

13. SAMPLE DOCUMENTS

The following sample documents are attached to this specification as described below:

- Daily Field Report
- Submittal Certification Form
- Resident Complaint Form

SPECIAL PROVISION

SECTION 201 – INVASIVE SPECIES CONTROL

Description

1.1 The work consists of cutting, removing and/or implementing control measures during clearing and grubbing operations for Type I & Type II invasive species that are encountered on the project site during construction within the locations identified in the Contract Drawings and/or as directed by the Owner.

1.2 Invasive Species known to be present within the wetland areas on site are listed below (other species may also be present):

1.2.1 Outfall #1 Type I Species: Autumn Olive (*Elaeagnus umbellate*) Common Buckthorn (*Rhamnus cathartica*), Glossy Buckthorn (*Frangula alnus*), Multiflora Rose (*Rosa multiflora*); Type II Species: Purple Loosestrife (*Lythrum salicaria*)

1.2.2 Outfall #2 Type I Species: Autumn Olive (*Elaeagnus umbellate*), Glossy Buckthorn (*Frangula alnus*), Multiflora Rose (*Rosa multiflora*); Type II Species: Common Reed (*Phragmites australis*), Purple Loosestrife (*Lythrum salicaria*)

1.2.3 Outfall #3 Type I Species: Glossy Buckthorn (*Frangula alnus*); Type II Species; Common Reed (*Phragmites australis*), Purple Loosestrife (*Lythrum salicaria*)

Materials

2.1 Materials shall conform to the requirements of the NHDOT standard specifications.

Construction Requirements

3.1 Construction requirements shall conform to the applicable construction requirements of Section 201 of the NHDOT Standard Specifications for the type of work required and the NHDOT publication on Best Management Practices for the Control of Invasive and Noxious Plant Species, 2018 (Appendix D).

Method of Measurement

4.1 Invasive Species Control will be measured by the Square Yard.

Basis of Payment

5.1 Invasive Species Control will be paid for at the Contract Unit Price, complete.

5.1.1 The Square Yard Price for the Invasive Species Control includes all labor, (including, but not limited to, handling, cutting, stockpiling and spraying), materials, services, equipment and supplies required for removal and proper disposal of Type I and Type II invasive species in accordance with the approved Invasive Species Control and Management Plan.

5.1.2 The intent of this item is to compensate the Contractor for all additional costs incurred due to the handling of invasive species during construction excavations. This item will be paid in addition to the appropriate pay items for the class excavation and/or embankment work being performed.

5.1.3 Said Unit price shall also include cleaning of equipment and tools used in areas where invasive plants exist, prior to moving tools and equipment from the invasive species area.

Pay Items and Units:

201.8822	Type I and/or II Invasive Species Control – Mechanical	SY

SPECIAL PROVISION

SECTION 585– STONE FILL, CLASS C1, C2, C3

Description

1.1 The work consists of providing stone fill for the various types at the locations identified in the project drawings.

1.2 The applicable sections of the NHDOT standard specifications shall apply to the work including but not limited to Section 105, Section 503, Section 585, and Section 603.

Materials

2.1 Materials shall conform to the requirements of the NHDOT standard specifications with the additional requirements that gradation for stone sizes C1, C2 and C3 shall be as indicated in the table provided in the Contract Drawings.

Construction Requirements

3.1 Construction requirements shall conform to the applicable construction requirements of Sections 585 of the NHDOT Standard Specifications for the type of work required.

Method of Measurement

4.1 Stone Fill, Class C1 under this project shall be measured by the cubic yard of Stone Fill, Class C1 installed.

4.2 Stone Fill, Class C2 under this project shall be measured by the cubic yard of Stone Fill, Class C2 installed.

4.3 Stone Fill, Class C3 under this project shall be measured by the cubic yard of Stone Fill, Class C3 installed.

Basis of Payment

5.1 Payment will be made for Stone Fill, Class C1 provided under this contract on a cubic yard basis and includes all materials and equipment necessary for or incidental to the completion of the work to the satisfaction of the Engineer.

5.2 Payment will be made for Stone Fill, Class C2 provided under this contract on a cubic yard basis and includes all materials and equipment necessary for or incidental to the completion of the work to the satisfaction of the Engineer.

5.3 Payment will be made for Stone Fill, Class C3 provided under this contract on a cubic yard basis and includes all materials and equipment necessary for or incidental to the completion of the work to the satisfaction of the Engineer.

Pay Items and Units

585.31	Stone Fill, Class C1	SY
585.32	Stone Fill, Class C2	SY
585.33	Stone Fill, Class C3	SY

SPECIAL PROVISION

SECTION 697 – INVASIVE SPECIES CONTROL AND MANAGEMENT PLAN

Description

1.1 The work consists of developing a plan outlining proposed control measures for Type I & Type II invasive species that may be encountered during clearing and grubbing.

1.2 The Invasive Species Control & Management Plan must identify the locations of invasive species and the Best Management Practices (BMPs) for preventing their spread, controlling them where necessary, and disposing/transporting them off site if necessary, as described in NHDOT Best Management Practices for the Control of Invasive and Noxious Plant Species – 2018 (Appendix D).

Materials

2.1 Not Used.

Construction Requirements

3.1 The Contractor shall engage the services of a qualified environmental consultant to identify and locate the invasive species within the limits of work and prepare the Invasive Species Control and Management Plan for review and approval by the Engineer and Owner.

3.2 Prior to excavation work, the Contractor shall coordinate an onsite meeting with the Owner and Engineer present to review the approved Invasive Species Control and Management Plan.

Method of Measurement

4.1 The Invasive Species Control and Management Plan will be measured as a unit, complete and approved.

Basis of Payment

5.1 The Invasive Species Control and Management Plan will be paid for at the unit final pay quantity.

Pay Items and Units

697.11	Invasive Species Control and Management Plan	UNIT

SPECIAL PROVISION

SECTION 900 – HEADWALLS

Description

1.1 The work consists of installing precast concrete or mortar rubble masonry headwalls as indicated in the contract drawings or where directed by the Engineer.

1.2 The applicable sections of the NHDOT standard specifications shall apply to the work including but not limited to Section 203, Section 520, Section 544 and Section 570

Materials

2.1 Materials for Precast Concrete Headwalls shall conform to the requirements of the NHDOT standard specifications, Sections 520 and 544. Provide Shop Drawings in advance for review and approval.

2.2 Mortar Rubble Masonry Headwalls and Retaining Walls may be constructed from materials recovered during the removal of existing stone box culverts, or other sources, in accordance with NHDOT standard specifications, Sections 570.

Construction Requirements

3.1 Construction requirements shall conform to the applicable construction requirements of the NHDOT Standard Specifications for the type of work required. When the specific type of headwall is not specified, the headwalls may be pre-cast reinforced concrete or mortar rubble masonry (Contractor's choice). The headwalls shall be constructed as shown on NHDOT standard plans, where shown on the drawings or to the dimensions approved by the Engineer.

Method of Measurement

4.1 NHDOT Standard PC Headwalls will be measured per each for each headwall unit, complete and in place.

4.2 Mortar Rubble Headwalls and Retaining Walls will be measured by the cubic yard in neat lines of the size and dimensions shown on the plan, or where directed.

Basis of Payment

5.1 Payment for NHDOT Standard PC Headwalls will be made for each unit, complete and in place. Payment will include all excavation, backfill, labor, materials, and equipment necessary for or incidental to the completion of the work to the satisfaction of the Engineer. Any materials damaged by the Contractor shall be replaced at no expense to the Owner.

5.2 Mortar Rubble Masonry Headwalls and Retaining Walls will be paid by the cubic yard, complete and in place. Payment will include all excavation, backfill, labor, materials, and equipment necessary for or incidental to the completion of the work to the satisfaction of the Engineer. Any materials damaged by the Contractor shall be replaced at no expense to the Owner.

Pay Items and Units

900.15	Concrete or Mortar Rubble Masonry (PC-1 or PC-2 Headwall) 12" to 15" dia. Pipe	UNIT
900.24	Concrete or Mortar Rubble Masonry (PC-1 or PC-2 Headwall) 18" to 24" dia. Pipe	UNIT
900.30	Concrete or Mortar Rubble Masonry (PC-5, PC-6, PC-7 or PC-8 Headwall) 24" to 30" dia. Pipe	UNIT
900.42	Concrete or Mortar Rubble Masonry (PC-5, PC-6, PC-7 or PC-8 Headwall) 30" to 42" dia. Pipe	UNIT
900.5	Mortar Rubble Masonry Headwalls and Retaining Walls (Where shown or directed)	CY

S P E C I A L P R O V I S I O N

SECTION 1008 -- ALTERATIONS AND ADDITIONS AS NEEDED

ITEM 1008.2 - Alterations and additions as Needed - Soils Testing Allowance

This section is intended to provide and pay for certain soils testing measures which may be required during construction. Engineering judgment indicates that a reasonable estimated dollar allowance is in order in setting up the contract.

Description

1.1 The Contractor may be required to conduct tests for compaction and material gradation to demonstrate the work installed complies with the specifications.

Materials

2.1 Materials required for testing soil properties shall be those accepted by standard industry practices and may include such equipment necessary to perform Standard or Modified Proctor tests, in place density testing, sieve analysis, etc.

Construction Requirements

3.1 Earth materials which have been disturbed and backfilled shall be compacted to a minimum of 95% of the maximum density. The maximum density determination shall be made as specified in AASHTO T 99 (Standard Proctor Test). The in-place density determination shall be made by AASHTO T 191 (Sand-Cone Method), AASHTO T 204 (Drive Cylinder Method) or by AASHTO T 310 (Nuclear Methods). If the required density cannot be achieved with the equipment at hand, the contractor shall obtain whatever equipment is necessary to achieve the specified density. Manipulation of tills, silts, and clays, or any combination thereof, (including aeration where necessary) will be required to produce a stable fill of the required density.

Method of Measurement

4.1 Work authorized under this section shall be based on the actual invoices submitted for soils testing procedures.

Basis of Payment

5.1 Payment for work authorized under this section will be made on a dollar basis for each man-hour on-site plus laboratory testing costs and will be based on actual invoices with no mark-up. The dollar limit set in the Bid will not limit the Engineer in the value of work performed under this item.

5.1.1 Payment of the amount set in the proposal will not be on a lump sum basis, but only the amount determined for the value of the work ordered will be paid.

5.2 The Bidder's attention is called to the dollar amount inserted in the Bid under these items, which dollar amount is the allowance the Owner has set up for soils testing procedures. This figure must not be altered by the Bidder on the Bid, and must be included to obtain the grand total of the Bid.

Pay items and units:

1008.2	Soils Testing	Allowance*

*Dollar allowance for Item 1008.2 on this project has been set at $2,000.00.

S P E C I A L A T T E N T I O N

FUEL ADJUSTMENT

(a) The shortage of all products in relation to the national and worldwide energy situation has made future costs of fuel unpredictable. For this reason, a price adjustment clause is being inserted in this contract to provide for either additional compensation to the Contractor or payment to the State, depending upon an increase or decrease in the price of fuel.

(b) The fuel usage factors, which will be applied to the several items of the Contract shall be those set forth in Table 1.

(c) Price adjustment will be based upon the quantity of fuel incorporated in the work as determined by the factors in Table 1.

- When the monthly sales price determined per paragraph (f) is more than 110% of the fixed base price set forth in paragraph (e), a contract adjustment will be made under Item 1010.15 based on: [monthly sales price less 110% of the fixed base price] multiplied by [item quantity eligible for payment during month] multiplied by [fuel factor].

- When the monthly sales price determined per paragraph (f) is less than 90% of the fixed base price set forth in paragraph (e), a contract adjustment will be made under Item 1010.15 based on: [monthly sales price less 90% of the fixed base price] multiplied by [item quantity eligible for payment during month] multiplied by [fuel factor].

(d) The Contractor warrants that its bid prices for this Contract include no allowances for any contingency to cover increased costs for which adjustment is provided herein.

(e) The fixed base price of fuel will be $ 4.3175 per gallon.

- This price is used solely to compute price adjustments. The fuel price will be the lower bulk retail price of **ultra low sulfur diesel fuel** for Boston as published by OPIS (Oil Price Information Service) in the Oil Price Daily, formerly known as the Journal of Commerce, and will include current Federal and State taxes.

(f) The monthly sales price of fuel will be determined by the Department based on the following schedule:

2022					
Month	**Publication Date**	**Month**	**Publication Date**	**Month**	**Publication Date**
January	December 27, 2021	May	April 25, 2022	September	August 22, 2022
February	January 24, 2022	June	May 23, 2022	October	September 26, 2022
March	February 21, 2022	July	June 27, 2022	November	October 24, 2022
April	March 21, 2022	August	July 25, 2022	December	November 21, 2022

Monthly sales prices will be set in the same manner as indicated in paragraph (e).

(g) When an adjustment is called for as provided in paragraph (c), the monthly sales price determined in paragraph (f) will be used for work accomplished in the following month.

(h) No price adjustment will be allowed beyond the Project completion date unless there is a Department-approved extension of time. Price adjustments will be made on quantities adjusted as a result of the final audit.

(i) The Department will not be responsible for computing or otherwise indicating price adjustments except to the prime contractor, which must make its own arrangements with its subcontractors.

(j) When no item for Fuel Adjustment is included in the Contract no adjustments will be made.

Pay item and unit:

1010.15 Fuel Adjustment [1] $

[1] Not a bid item.

Table 1 - FUEL FACTORS

Item of Work	Item No.	Units	Fuel
Excavation:			
Earth	203.1_,.4_ 203.50_,.51_,.52_ 203.6_,.7_ 206.1_ 207.1_ 504.1_	gal/c.y.	0.26
Rock	203.2_ 206.2_ 207.2_ 504.2_	gal/c.y.	0.34
Other	203.3_ 206.3_ 207.3_ 583._ 585._ 586._ 587._	gal/c.y.	0.31
Bases:			
Unprocessed	209._ 304.1_,.2_	gal/c.y.	0.46
Processed [4]	304.3_ 304.4_,.5_,.6_ 508._	gal/c.y.	0.82
Bituminous Concrete			
Pavement [2]	403._ 411._	gal/ton	1.90
All Other Items:		gal/$1,000 of work	13.0

Excluded Items: [3]

210._	510.41_	550.2_	565.7_	692._
211._	510.61_	560._	568._	693._
306.31_	510.65_	561._	592._	697._
306.32_	521.2_	563.1_	603.0001	698._
306.33_	528._	563.2_	618._	699._
410._	544._	563.3_	619._	8_ _._
419.3	548._	563.7_	624._	10_ _._
510.31_	550.1_	565.2_	645.7_	

[2] Item 403.4, 403.16, & 403.26 shall be calculated using the "All Other Items" category rate.
[3] Also excluded are all supplementary agreements, extra work and per specification items.
[4] Item 304.32 shall be calculated using the "All Other Items" category rate.

APPENDICES

APPENDIX A

NHDES Wetlands and Non-Site Specific Permit

WETLANDS AND NON-SITE SPECIFIC PERMIT 2021-03770 PAGE 1 OF 3

NOTE CONDITIONS

PERMITTEE: **PEASE DEVELOPMENT AUTHORITY**
C/O PAUL BREAN
55 INTERNATIONAL DR
PORTSMOUTH NH 03801

PROJECT LOCATION: **231, 249 & 273 CORPORATE DR, PORTSMOUTH TAX MAP 314 LOT 2**

WATERBODY: **UNNAMED WETLANDS**

APPROVAL DATE: **FEBRUARY 11, 2022** **EXPIRATION DATE: FEBRUARY 11, 2027**

Based upon review of permit application 2021-03770 in accordance with RSA 482-A and RSA 485-A:17, the New Hampshire Department of Environmental Services (NHDES) hereby issues this Wetlands and Non-Site Specific Permit. To validate this Permit, signatures of the Permittee and the Principal Contractor are required.

PERMIT DESCRIPTION:
Impact a total of 30,200 square feet of jurisdictional area to include 7,050 square feet of scrub-shrub wetland and 23,150 square feet of emergent wetland for access and maintenance dredging to restore stormwater drainage flow at four (4) drainage outlet locations.

THIS PERMIT IS SUBJECT TO THE FOLLOWING PROJECT-SPECIFIC CONDITIONS:
1. In accordance with Env-Wt 307.16, all work shall be done in accordance with the plans by Underwood Engineers, Inc. dated December 14, 2021 as received by the NH Department of Environmental Services (NHDES) on December 23, 2021.
2. In accordance with Env-Wt 307.03(b), all work, including management of soil stockpiles, shall be conducted so as to minimize erosion, minimize sediment transfer to surface waters or wetlands, and minimize turbidity in surface waters and wetlands using the techniques described in Env-Wq 1505.02, Env-Wq 1505.04, Env-Wq 1506, and Env-Wq 1508; the applicable BMP manual; or a combination thereof, if the BMP manual provides less protection to jurisdictional areas than the provisions of Env-Wq 1500.
3. Restoration of all temporary impacts shall meet all of the conditions listed in Rule Env-Wt 307.12(a) through (i).
4. In accordance with Env-Wt 307.15(a), heavy equipment shall not be operated in any jurisdictional area unless specifically authorized by this permit.
5. In accordance with Env-Wt 307.15(b), mobile heavy equipment working in wetlands shall not be stored, maintained, or repaired in wetlands, except that repairing or refueling in a wetland is allowed if equipment cannot practicably be removed and secondary containment is provided.
6. In accordance with Env-Wt 307.03(g)(1), the person in charge of construction equipment shall inspect such equipment for leaking fuel, oil, and hydraulic fluid each day prior to entering surface waters or wetlands or operating in an area where such fluids could reach groundwater, surface waters, or wetlands.
7. In accordance with Env-Wt 307.03(g)(3) and (4), the person in charge of construction equipment shall maintain oil spill kits and diesel fuel spill kits, as applicable to the type(s) and amount(s) of oil and diesel fuel used, on site so as to be readily accessible at all times during construction; and train each equipment operator in the use of the spill kits.
8. In accordance with Env-Wt 307.03(g)(2), the person in charge of construction equipment shall repair any leaks prior to using the equipment in an area where such fluids could reach groundwater, surface waters, or wetlands.

9. In accordance with Env-Wt 307.03(h), equipment shall be staged and refueled outside of jurisdictional areas (unless allowed) and in accordance with Env-Wt 307.15.
10. In accordance with Env-Wt 307.03(c)(3), water quality control measures shall be installed prior to start of work and in accordance with the manufacturer's recommended specifications or, if none, the applicable requirements of Env-Wq 1506 or Env-Wq 1508.
11. In accordance with Env-Wt 307.10(b), work shall be done during low flow or in the dry unless a dredge dewatering, diversion, or cofferdam plan has been approved as part of the project, the project has specific approval based on water depth to operate from a barge; or the work will be conducted in a lake or pond and turbidity containment can be achieved using turbidity controls.
12. In accordance with Env-Wt 307.03(f)(1), a cofferdam or other turbidity control shall be used to enclose a dredging project conducted in the permitted dredge areas, provided that a coffer dam shall not be installed during periods of high flow.
13. In accordance with Env-Wt 307.10(f), dredged materials to be stockpiled in uplands shall be dewatered in sedimentation basins that are contained within turbidity controls that prevent turbid water from leaving the basins; and located outside of any jurisdictional area.
14. In accordance with Env-Wt 307.10(d), dredged materials shall be disposed of out of jurisdictional areas, unless other disposition is specifically permitted pursuant to Env-Wt 307.10(e).
15. In accordance with Env-Wt 307.03(c)(5), water quality control measures shall be maintained so as to ensure continued effectiveness in minimizing erosion and retaining sediment on-site during and after construction.
16. In accordance with Env-Wt 307.03(d), any sediment collected by water quality control measures shall be removed with sufficient frequency to prevent the discharge of sediment; and placed in an upland location in a manner that prevents its erosion into a surface water or wetland.
17. In accordance with Env-Wt 307.03(c)(6), water quality control measures shall remain in place until all disturbed surfaces are stabilized to a condition in which soils on the site will not experience accelerated or unnatural erosion by achieving and maintaining a minimum of 85% vegetative cover using an erosion control seed mix, whether applied in a blanket or otherwise, that is certified by its manufacturer as not containing any invasive species; or placing and maintaining a minimum of 3 inches of non-erosive material such as stone.
18. In accordance with Env-Wt 307.03(f)(2), a coffer dam or other turbidity control shall be removed after work within the coffer dam or other turbidity control is completed, the contained water has returned to background clarity, and when removing the structure will not cause or contribute to a violation of Env-Wt 307.03(c)(6).
19. In accordance with Env-Wt 307.03(c)(7), temporary water quality control methods shall be removed upon completion of work when compliance with Env-Wt 307.03(c)(6) is achieved.
20. In accordance with Env-Wt 307.11(a), fill shall be clean sand, gravel, rock, or other material that meets the project's specifications for its use; and does not contain any material that could contaminate surface or groundwater or otherwise adversely affect the ecosystem in which it is used.
21. In accordance with Env-Wt 307.11(c), slopes shall be immediately stabilized by a method specified in Env-Wq 1506 or Env-Wq 1508, as applicable, to prevent erosion into adjacent wetlands or surface waters.
22. In accordance with Env-Wt 307.12(h), any trees cut in an area of authorized temporary impacts shall be cut at ground level with the shrub and tree roots left intact, to prevent disruption to the wetland soil structure and to allow stump sprouts to revegetate the work area.
23. In accordance with Env-Wt 307.18(b), a construction monitoring plan with inspection reports, water quality reports, and a wetland planting plan prepared by a certified professional erosion and sediment control specialist (CPESC) or certified wetland scientist shall be submitted to the department.

THIS PERMIT IS SUBJECT TO THE FOLLOWING GENERAL CONDITIONS:

1. Pursuant to RSA 482-A:12, a copy of this permit shall be posted in a secure manner in a prominent place at the site of the approved project.
2. In accordance with Env-Wt 313.01(a)(5), and as required by RSA 482-A:11, II, work shall not infringe on the property rights or unreasonably affect the value or enjoyment of property of abutting owners.
3. In accordance with Env-Wt 314.01, a standard permit shall be signed by the permittee, and the principal contractor who will build or install the project prior to start of construction, and will not be valid until signed.
4. In accordance with Env-Wt 314.03(a), the permittee shall notify the department in writing at least one week prior to commencing any work under this permit.
5. In accordance with Env-Wt 314.08(a), the permittee shall file a completed notice of completion of work and certificate of compliance with the department within 10 working days of completing the work authorized by this permit.
6. In accordance with Env-Wt 314.06, transfer of this permit to a new owner shall require notification to, and approval of, the NHDES.
7. The permit holder shall ensure that work is done in a way that protects water quality per Env-Wt 307.03; protects fisheries and breeding areas per Env-Wt 307.04; protects against invasive species per Env-Wt 307.05; meets dredging activity conditions in Env-Wt 307.10; and meets filling activity conditions in Env-Wt 307.11.
8. This project has been screened for potential impact to known occurrences of protected species and exemplary natural communities in the immediate area. Since many areas have never been surveyed, or only cursory surveys have been performed, unidentified sensitive species or communities may be present. This permit does not absolve the permittee from due diligence in regard to state, local or federal laws regarding such communities or species. This permit does not authorize in any way the take of threatened or endangered species, as defined by RSA 212-A:2, or of any protected species or exemplary natural communities, as defined in RSA 217-A:3.
9. In accordance with Env-Wt 307.06(a) through (c), no activity shall jeopardize the continued existence of a threatened or endangered species, a species proposed for listing as threatened or endangered, or a designated or proposed critical habitat under the Federal Endangered Species Act, 16 U.S.C. §1531 et seq.; State Endangered Species Conservation Act, RSA 212-A; or New Hampshire Native Plant Protection Act, RSA 217-A.
10. In accordance with Env-Wt 307.02, and in accordance with federal requirements, all work in areas under the jurisdiction of the U.S. Army Corps of Engineers (USACE) shall comply with all conditions of the applicable state general permit.

APPROVED:

Eben M. Lewis
Southeast Region Supervisor, Wetlands Bureau
Land Resources Management, Water Division

THE SIGNATURES BELOW ARE REQUIRED TO VALIDATE THIS PERMIT (Env-Wt 314.01).

_____ PERMITTEE SIGNATURE (required)

_____ PRINCIPAL CONTRACTOR SIGNATURE (required)

APPENDIX B

Army Corps of Engineers Dredge and Fill Permit

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

REPLY TO
ATTENTION OF

March 14, 2022

Regulatory Division
CENAE-R-PEC
Permit Number: NAE-2022-00190

Paul Brean
Pease Development Authority
55 International Drive
Portsmouth, NH 03801

Dear Applicant:

This is to inform you that we have reviewed your application to conduct activities as described on the attached NH Permit No. 2021-03770, dated February 11, 2022.

Based on our review of the information you provided to the New Hampshire Department of Environmental Services Wetlands Bureau, we have determined that your project, which may include a discharge of dredged or fill material into waters or wetlands, will have only minimal individual or cumulative environmental impacts on waters of the United States, including wetlands. Therefore, this work is conditionally authorized under General Permit No. 02 of the attached Federal permit known as the Department of the Army General Permits for the State of New Hampshire (GPs), pending final concurrence with the Wetlands Bureau approval by the Governor & Executive Council (G&C). This work must be performed in accordance with the terms and conditions of the GP.

You are responsible for complying with all of the GP's requirements. Please review the attached GPs carefully to familiarize yourself with its contents. You should ensure that whoever does the work fully understands the requirements and that a copy of the permit document is at the project site throughout the time the work is underway. Also, see a copy of the GPs at: http://www.nae.usace.army.mil/Missions/Regulatory/StateGeneralPermits/NewHampshireGeneralPermit.aspx

This authorization expires August 18, 2022, unless the GPs are modified, suspended, or revoked before that. You must complete the work authorized herein by that date. If you do not, you must contact this office to determine the need for further authorization before continuing the activity. We recommend that you contact us *before* this authorization expires to discuss a time extension or reissuance of the authorization.

If you change the plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

This authorization requires you to complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.

Please note that if your proposal is vetoed or modified by the G&C, making it different from that which the NH DES Wetlands Bureau approved on the date stated in the first paragraph of this letter, you must re-submit a complete application to this office for review and processing in accordance with the terms and conditions of the then-current NHSPGP

This authorization presumes that the work as described above and as shown on your plans noted above is in waters of the U.S. Should you desire to appeal our jurisdiction, please submit a request for an approved jurisdictional determination in writing to this office.

This permit does not obviate the need to obtain other Federal, state or local authorizations required by law, including those listed in the GPs. Performing work not specifically authorized by this determination or failing to comply with all the terms and conditions of the GPs may subject you to the enforcement provisions of Corps regulations.

We continually strive to improve our customer service. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://www.nae.usace.army.mil/reg/Customer_Service_Survey.pdf.

If you have questions concerning this, please contact Lindsey Lefebvre of my staff at (978) 318-8295, (978) 318-8335/8338, (800) 343-4789, or, if calling from within Massachusetts, (800) 362-4367.

Sincerely,

Frank J. DelGiudice
Chief, Permits & Enforcement Branch
Regulatory Division

Enclosures

Copies Furnished:

Maryann Tilton, NHDES; maryann.tilton@des.nh.gov
Benjamin Dreyer, Underwood Engineers INC; bdreyer@underwoodengineers.com
Paul Brean, Pease Development Authority; p.brean@peasedev.org

WETLANDS AND NON-SITE SPECIFIC PERMIT 2021-03770 PAGE 1 OF 3

NOTE CONDITIONS

PERMITTEE: **PEASE DEVELOPMENT AUTHORITY**
C/O PAUL BREAN
55 INTERNATIONAL DR
PORTSMOUTH NH 03801

PROJECT LOCATION: **231, 249 & 273 CORPORATE DR, PORTSMOUTH TAX MAP 314 LOT 2**

WATERBODY: **UNNAMED WETLANDS**

APPROVAL DATE: **FEBRUARY 11, 2022** **EXPIRATION DATE: FEBRUARY 11, 2027**

Based upon review of permit application 2021-03770 in accordance with RSA 482-A and RSA 485-A:17, the New Hampshire Department of Environmental Services (NHDES) hereby issues this Wetlands and Non-Site Specific Permit. To validate this Permit, signatures of the Permittee and the Principal Contractor are required.

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THIS PERMIT IS SUBJECT TO THE FOLLOWING PROJECT-SPECIFIC CONDITIONS:
1. In accordance with Env-Wt 307.16, all work shall be done in accordance with the plans by Underwood Engineers, Inc. dated December 14, 2021 as received by the NH Department of Environmental Services (NHDES) on December 23, 2021.
2. In accordance with Env-Wt 307.03(b), all work, including management of soil stockpiles, shall be conducted so as to minimize erosion, minimize sediment transfer to surface waters or wetlands, and minimize turbidity in surface waters and wetlands using the techniques described in Env-Wq 1505.02, Env-Wq 1505.04, Env-Wq 1506, and Env-Wq 1508; the applicable BMP manual; or a combination thereof, if the BMP manual provides less protection to jurisdictional areas than the provisions of Env-Wq 1500.
3. Restoration of all temporary impacts shall meet all of the conditions listed in Rule Env-Wt 307.12(a) through (i).
4. In accordance with Env-Wt 307.15(a), heavy equipment shall not be operated in any jurisdictional area unless specifically authorized by this permit.
5. In accordance with Env-Wt 307.15(b), mobile heavy equipment working in wetlands shall not be stored, maintained, or repaired in wetlands, except that repairing or refueling in a wetland is allowed if equipment cannot practicably be removed and secondary containment is provided.
6. In accordance with Env-Wt 307.03(g)(1), the person in charge of construction equipment shall inspect such equipment for leaking fuel, oil, and hydraulic fluid each day prior to entering surface waters or wetlands or operating in an area where such fluids could reach groundwater, surface waters, or wetlands.
7. In accordance with Env-Wt 307.03(g)(3) and (4), the person in charge of construction equipment shall maintain oil spill kits and diesel fuel spill kits, as applicable to the type(s) and amount(s) of oil and diesel fuel used, on site so as to be readily accessible at all times during construction; and train each equipment operator in the use of the spill kits.
8. In accordance with Env-Wt 307.03(g)(2), the person in charge of construction equipment shall repair any leaks prior to using the equipment in an area where such fluids could reach groundwater, surface waters, or wetlands.

9. In accordance with Env-Wt 307.03(h), equipment shall be staged and refueled outside of jurisdictional areas (unless allowed) and in accordance with Env-Wt 307.15.
10. In accordance with Env-Wt 307.03(c)(3), water quality control measures shall be installed prior to start of work and in accordance with the manufacturer's recommended specifications or, if none, the applicable requirements of Env-Wq 1506 or Env-Wq 1508.
11. In accordance with Env-Wt 307.10(b), work shall be done during low flow or in the dry unless a dredge dewatering, diversion, or cofferdam plan has been approved as part of the project, the project has specific approval based on water depth to operate from a barge; or the work will be conducted in a lake or pond and turbidity containment can be achieved using turbidity controls.
12. In accordance with Env-Wt 307.03(f)(1), a cofferdam or other turbidity control shall be used to enclose a dredging project conducted in the permitted dredge areas, provided that a coffer dam shall not be installed during periods of high flow.
13. In accordance with Env-Wt 307.10(f), dredged materials to be stockpiled in uplands shall be dewatered in sedimentation basins that are contained within turbidity controls that prevent turbid water from leaving the basins; and located outside of any jurisdictional area.
14. In accordance with Env-Wt 307.10(d), dredged materials shall be disposed of out of jurisdictional areas, unless other disposition is specifically permitted pursuant to Env-Wt 307.10(e).
15. In accordance with Env-Wt 307.03(c)(5), water quality control measures shall be maintained so as to ensure continued effectiveness in minimizing erosion and retaining sediment on-site during and after construction.
16. In accordance with Env-Wt 307.03(d), any sediment collected by water quality control measures shall be removed with sufficient frequency to prevent the discharge of sediment; and placed in an upland location in a manner that prevents its erosion into a surface water or wetland.
17. In accordance with Env-Wt 307.03(c)(6), water quality control measures shall remain in place until all disturbed surfaces are stabilized to a condition in which soils on the site will not experience accelerated or unnatural erosion by achieving and maintaining a minimum of 85% vegetative cover using an erosion control seed mix, whether applied in a blanket or otherwise, that is certified by its manufacturer as not containing any invasive species; or placing and maintaining a minimum of 3 inches of non-erosive material such as stone.
18. In accordance with Env-Wt 307.03(f)(2), a coffer dam or other turbidity control shall be removed after work within the coffer dam or other turbidity control is completed, the contained water has returned to background clarity, and when removing the structure will not cause or contribute to a violation of Env-Wt 307.03(c)(6).
19. In accordance with Env-Wt 307.03(c)(7), temporary water quality control methods shall be removed upon completion of work when compliance with Env-Wt 307.03(c)(6) is achieved.
20. In accordance with Env-Wt 307.11(a), fill shall be clean sand, gravel, rock, or other material that meets the project's specifications for its use; and does not contain any material that could contaminate surface or groundwater or otherwise adversely affect the ecosystem in which it is used.
21. In accordance with Env-Wt 307.11(c), slopes shall be immediately stabilized by a method specified in Env-Wq 1506 or Env-Wq 1508, as applicable, to prevent erosion into adjacent wetlands or surface waters.
22. In accordance with Env-Wt 307.12(h), any trees cut in an area of authorized temporary impacts shall be cut at ground level with the shrub and tree roots left intact, to prevent disruption to the wetland soil structure and to allow stump sprouts to revegetate the work area.
23. In accordance with Env-Wt 307.18(b), a construction monitoring plan with inspection reports, water quality reports, and a wetland planting plan prepared by a certified professional erosion and sediment control specialist (CPESC) or certified wetland scientist shall be submitted to the department.

THIS PERMIT IS SUBJECT TO THE FOLLOWING GENERAL CONDITIONS:

1. Pursuant to RSA 482-A:12, a copy of this permit shall be posted in a secure manner in a prominent place at the site of the approved project.
2. In accordance with Env-Wt 313.01(a)(5), and as required by RSA 482-A:11, II, work shall not infringe on the property rights or unreasonably affect the value or enjoyment of property of abutting owners.
3. In accordance with Env-Wt 314.01, a standard permit shall be signed by the permittee, and the principal contractor who will build or install the project prior to start of construction, and will not be valid until signed.
4. In accordance with Env-Wt 314.03(a), the permittee shall notify the department in writing at least one week prior to commencing any work under this permit.
5. In accordance with Env-Wt 314.08(a), the permittee shall file a completed notice of completion of work and certificate of compliance with the department within 10 working days of completing the work authorized by this permit.
6. In accordance with Env-Wt 314.06, transfer of this permit to a new owner shall require notification to, and approval of, the NHDES.
7. The permit holder shall ensure that work is done in a way that protects water quality per Env-Wt 307.03; protects fisheries and breeding areas per Env-Wt 307.04; protects against invasive species per Env-Wt 307.05; meets dredging activity conditions in Env-Wt 307.10; and meets filling activity conditions in Env-Wt 307.11.
8. This project has been screened for potential impact to known occurrences of protected species and exemplary natural communities in the immediate area. Since many areas have never been surveyed, or only cursory surveys have been performed, unidentified sensitive species or communities may be present. This permit does not absolve the permittee from due diligence in regard to state, local or federal laws regarding such communities or species. This permit does not authorize in any way the take of threatened or endangered species, as defined by RSA 212-A:2, or of any protected species or exemplary natural communities, as defined in RSA 217-A:3.
9. In accordance with Env-Wt 307.06(a) through (c), no activity shall jeopardize the continued existence of a threatened or endangered species, a species proposed for listing as threatened or endangered, or a designated or proposed critical habitat under the Federal Endangered Species Act, 16 U.S.C. §1531 et seq.; State Endangered Species Conservation Act, RSA 212-A; or New Hampshire Native Plant Protection Act, RSA 217-A.
10. In accordance with Env-Wt 307.02, and in accordance with federal requirements, all work in areas under the jurisdiction of the U.S. Army Corps of Engineers (USACE) shall comply with all conditions of the applicable state general permit.

APPROVED:

Eben M. Lewis
Southeast Region Supervisor, Wetlands Bureau
Land Resources Management, Water Division

THE SIGNATURES BELOW ARE REQUIRED TO VALIDATE THIS PERMIT (Env-Wt 314.01).

_____ PERMITTEE SIGNATURE (required)

_____ PRINCIPAL CONTRACTOR SIGNATURE (required)

US Army Corps of Engineers ®
New England District

COMPLIANCE CERTIFICATION FORM

(Minimum Notice: Permittee must sign and return notification within one month of the completion of work.)

Permit Number: NAE-2022-00190

Project Manager: Stephanie Morrison

Name of Permittee: Pease Development Authority

Permit Issuance Date: March 14, 2022

Please sign this certification and return it to our office upon completion of the activity and any mitigation required by the permit. You must submit this after the mitigation is complete, but not the mitigation monitoring, which requires separate submittals.

****
E-MAIL TO:cenae-r@usace.army.mil; or stephanieann.prokopmorrison@usace.army.mil
*
*MAIL TO: Permits and Enforcement Branch C
* U.S. Army Corps of Engineers, New England District
* Regulatory Division
* 696 Virginia Road
* Concord, Massachusetts 01742-2751
****

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

_____ _____
Signature of Permittee Date

_____ _____
Printed Name Date of Work Completion

(____) _____ (____) _____
Telephone Number Telephone Number

APPENDIX C

PEASE DEVELOPMENT AUTHORITY
EXCAVATION PERMIT

PEASE DEVELOPMENT AUTHORITY
DIG PERMIT

A. PROJECT INFORMATION	PDA USE ONLY
Street Address: Outfall Areas 1,2,& 3 along Corporate Dr.	Serial No.:
City/Town: City of Portsmouth	Date Submitted:
Description of Work: Wetland dredging in Outfall areas	Date/Time approved for Work:
to improve drainage flow.	
Depth of Excavation: 1.5 feet	Date Terminated:

Is Work on the Airfield? __Yes X No

Field marking will be completed by (no later than date submitted):

Scheduled start date (no earlier than 5 work days following date submitted):

B. APPLICANT INFORMATION

Company Name: Contact:

Address:

Phone: Email:

C. INSTRUCTIONS

Any organization conducting excavation of soils, drilling, probing or any other work disturbing below grade material must first obtain a signed permit authorizing the work. This application form must be completed and submitted to the PDA Director of Engineering. The application must include a plan of the work area either sketched in the space provided or attached separately. If a separate sheet is attached, duplicate copies must be submitted. The applicant must also stake out or otherwise mark the work area. When all required clearances have been obtained, the PDA will notify the applicant. The applicant is responsible for compliance with any remarks listed in the clearance review section. This approved form must be in the possession of the operator performing the excavation If work has not commenced by the specified termination date, the permit will become void and the applicant shall re-apply. If work extends past the date then applicant must call Dig Safe at 1-888-Dig Safe to renew the number.

D. CLEARANCE REVIEW (PDA USE)

Area of Special Notice ☐ *

Dig Safe #	ORGANIZATION	INITIALS & DATE
PDA - Electric		
Water		
Sewer		
Drains		
Communications		
Air Force		
COP - Water		
NHANG		

*Subject to approval by Air Force, EPA, and NHDES.

E. SKETCH OF WORK AREA SHOWING LOCATION OF STAKES, FLAGGING, ETC. SHOW NEAREST STREETS.

F. Applicant Signature: _____ Date: _____

G. Approval:

Approved by: _____ Date: _____

APPENDIX D

Best Management Practices for the Control of Invasive and Noxious Plant Species

New Hampshire DOT
Department of Transportation

ENV 1, MANUAL 1

Best Management Practices

for the Control of Invasive and Noxious Plant Species





2018

Date Adopted: 2018
The 2018 Edition Replaces Previous Versions

Approved by: Deputy Commissioner

9/18/2018
Date

Acknowledgements:

This manual was prepared by a NHDOT Task Force that included the following:

Arlene Allen, Office of Stewardship and Compliance
Mary Fox, Bureau of Bridge Maintenance
Kathryn Holtgrewe, Bureau of Turnpikes
Marc Laurin, Bureau of Environment
Laurel Pushee, Bureau of Highway Maintenance
Barbara Rollins, Bureau of Highway Design

Doug Cygan, Invasive Species Coordinator, NH Department of Agriculture, Markets and Food contributed valuable technical expertise, narrative, and photographs.

New Hampshire Department of Transportation
BEST MANAGEMENT PRACTICES
FOR CONTROL OF INVASIVE AND NOXIOUS PLANT SPECIES

Table of Contents

BEST MANAGEMENT PRACTICES FOR CONTROL OF INVASIVE AND NOXIOUS PLANT SPECIES 2018

PURPOSE AND OVERVIEW

PURPOSE

This manual provides information about invasive plant species and the methods to control or eradicate them that comply with federal and state laws and regulations. Implementing management practices will help reduce the likelihood that invasive plants will spread to other areas. It is meant to bring awareness about invasive plants to New Hampshire Department of Transportation (NHDOT) employees and contractors and the role the Department can play in limiting the spread of these species on NHDOT and nearby properties.

AUTHORITY

NHDOT Deputy Commissioner, Christopher Waszczuk

SCOPE

The information in this manual is for the management of invasive and noxious plant species for NHDOT Operations personnel, construction personnel, and contractors working for the Department.

REFERENCES

NHDOT Environmental Policy, ENV 1

GENERAL COMMENTS AND BACKGROUND

The intention of New Hampshire Statute Title XL, Chapter 430, Section 430.51-57 and its rules is to minimize the effects of invasive species on the environment and the state's economy. The NH Department of Agriculture, Markets & Food, Division of Plant Industry (NHDAMF) is the lead agency for administering the invasive species rules. These rules are effectively summed up by one central rule, Chapter Agr. 3800, which states, "**No person must collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1, New Hampshire prohibited invasive species list**."

Other federal and state laws and regulations that apply to invasive species:

- Federal Executive Order 13112 on Invasive Species (February 3, 1999)
- Federal Executive Order 13751 on Safeguarding the Nation from Impacts of Invasive Species (December 8, 2016)
- Federal Highway Administration Guidance on Invasive Species (August 18, 1999)
- Public Law 108–412—OCT. 30, 2004, Noxious Weed Control and Eradication Act of 2004.
- U.S. Army Corps of Engineers State Programmatic General Permit (August 2017)
- NH Department of Agriculture Code of Administrative Rules, Invasive Species, Chapter Agr 3800; RSA 430:55 (2004)
- NH Department of Environmental Services Code of Administrative Rules, Invasive Aquatic Species, Chapter Env-Wq 1303.02; RSA 487:16-a (1998)

TRAINING - NOT APPLICABLE

OVERVIEW

Invasive plants can affect transportation corridors in many ways. They can reduce sight distance, block signs, increase the risk of fire, and invade travel lanes. One species, Japanese knotweed, is particularly aggressive and can push up through pavement causing damage to the shoulders and edges of roads. Likewise, many species are capable of plugging ditch lines and blocking culverts. Noxious species can cause impacts to employee health.

NHDOT must manage properties, construction sites, and linear areas of right-of-way that can serve as pathways for the spread of invasive plants into new regions and onto adjacent lands. Proper management of vegetation on NHDOT properties is needed to ensure that roads and their related structures are not damaged or impaired.

USING THIS MANUAL

This manual has two chapters.

The first chapter discusses invasive plants and their characteristics. It covers the plant species that are on the NHDAMF "prohibited list," NHDOT's Priority Plants, how to identify them, how they are spread, and how to control them. There is also a section on noxious plants, such as poison ivy, and a section on resources and contacts. A glossary and illustrations of the plant terms used is included at the end of Chapter 1.

Chapter 1 is divided into six sections.

SECTION I includes general information about the characteristics of invasive plants, an overview of NHDOT invasive plant species control types, and Best Management Practices (BMPs) that are generally applicable to all species listed on the Invasive Species Control List (page 3). When followed, these BMPs will reduce the likelihood of introducing invasive plants into new areas via maintenance and construction activities.

SECTION II contains information on NHDOT Type I invasive plant species.

SECTION III is a discussion of NHDOT's Type II Priority Plants. This section includes species-specific BMPs and their Preferred Control Methods.

SECTION IV contains information about *noxious* plants such as poison ivy and poison sumac.

SECTION V provides guidelines for using the statewide contractor for herbicide application.

SECTION VI lists contacts and resources for more information about invasive plant identification. The websites listed in this section provide detailed identification characteristics and photographs of invasive plants. A glossary is also included to define terms used throughout the manual.

The second chapter is currently in progress. It will cover, in detail, the use of pesticides to control invasive plant species.

CHAPTER 1

SECTION I

General Information on the Characteristics of Invasive Plants and (BMPs) for Controlling Them

Invasive plants multiply in many ways. They can be spread naturally by birds, wind, and water, or by human activities such as gardening, mowing, and transporting nursery stock. The routine activities that NHDOT must perform to build and maintain the roadway network can also inadvertently spread invasive plants. For instance, seeds or viable pieces of root and stem fragments can adhere to equipment during mowing or construction and even stick to shoes and clothing. As the equipment and material moves, it may carry seeds or plant parts from one area to another. Construction activities that remove vegetation leave the soil exposed and offer invasive plants the perfect opportunity to colonize the area. Further, using fill that might have invasive plant seeds or fragments can establish new colonies.

Eliminating or reducing the spread and establishment of invasive plants requires a proactive approach in which there are two key elements. First, new introductions, especially those that occur due to human activities, must be avoided to the maximum extent possible. Second, there must be an emphasis on **Early Detection and Rapid Response (EDRR)** for new populations. Control measures are more effective and less expensive when used on small young populations of plants rather than on larger more established populations, as shown in Figure 1.

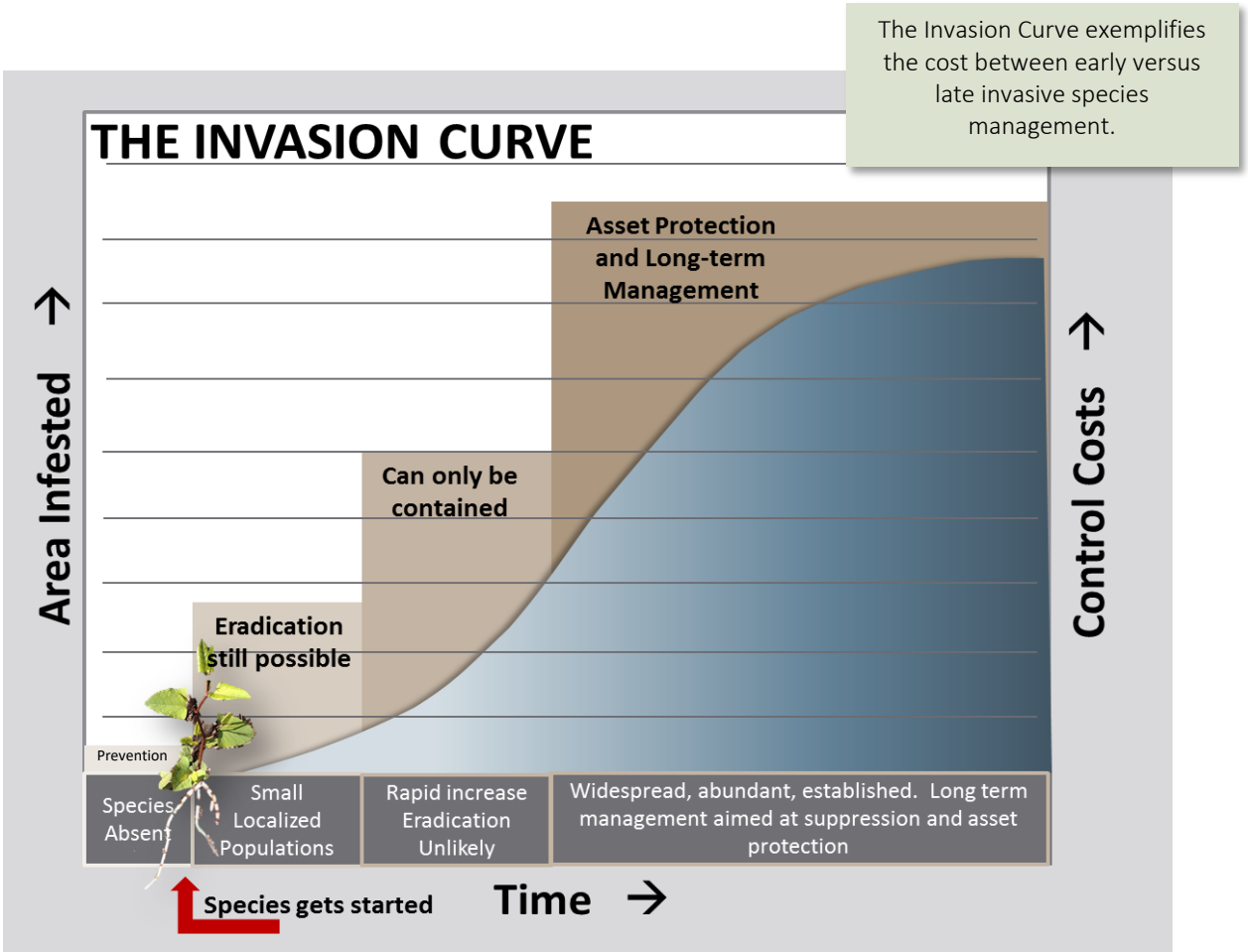

Figure 1
Chart adapted from a graphic by the US Army Corps of Engineers

NHDOT INVASIVE SPECIES CONTROL TYPES

Both NHDAMF and the New Hampshire Department of Environmental Services (NHDES) have made rules to prohibit specific invasive plants. NHDOT classifies these prohibited invasive plants into two separate categories based on the difficulty and limitation of management options. As categorized by NHDOT:

- Invasive Species Type I are those plants that are readily spread by seeds but do not reproduce by vegetative means (root fragments or pieces of stem).

- Invasive Species Type II are plants which have the ability to reproduce by seeds *and* vegetative means making them easier to spread. These **are priority species for NHDOT.**

  Type II species have at least two of the following characteristics:

  - ✓ They are **easily spread** by construction and maintenance activities.
  - ✓ They have **significant negative impacts** on transportation infrastructure.
  - ✓ They are very **difficult to eradicate.**

  The Type II species are of special concern to NHDOT because they can be found in wet or moderately wet conditions and are often encountered during roadway construction, maintenance activities, and on mitigation sites.

Type II
Priority Species
Difficult to eradicate
Easily spread
✧
Examples:
Japanese Knotweed
Giant Knotweed
Bohemian Knotweed
Purple Loosestrife
Common Reed

CONSTRUCTION CONTRACTS AND INVASIVE PLANTS MANAGEMENT PLANS

When construction activities cannot avoid impacting areas containing invasive plant species, appropriate containment measures and disposal methods must be in place.

For areas with invasive species, as identified by NHDOT on *Construction General Plans*, the contractor must mitigate these areas prior to clearing and grubbing. The mitigation must be in accordance with the Special Provision for Item 201.88X – Invasive Species Control Type X.

NHDOT may require an *Invasive Species Control and Management Plan* (Item 697.11), the (Plan). This plan should detail the specific method(s) for controlling the spread of the identified invasive plant species located within the construction limits and their proper disposal. The Plan must be submitted to NHDOT for review and approval prior to the start of construction. The Contractor shall perform the work necessary to control, remove and dispose of the invasive plant species found on the site according to the approved Plan throughout the life of the project.

The lists below include species from the NHDAMF's *Prohibited Invasive Plant Species List*, Agr 3800, and two species from the NHDES prohibited species (Env-Wq 1303.02).

NHDOT INVASIVE SPECIES TYPE I	
Common Name	**Scientific Name**
Autumn Olive	*Elaeagnus umbellata*
Barberry, European	*Berberis vulgaris*
Barberry, Japanese	*Berberis thunbergii*
Blunt-Leaved Privet	*Ligustrum obtusifolium*
Buckthorn, Common	*Rhamnus cathartica*
Buckthorn, Glossy	*Frangula alnus*
Burning Bush	*Euonymus alatus*
Common Privet	*Ligustrum vulgare*
Dames Rocket	*Hesperis matronalis*
European Black Alder	*Alnus glutinosa*
Garlic Mustard	*Alliaria petiolata*
Giant Hogweed	*Heracleum mantegazzianum*
Honeysuckle, Amur	*Lonicera maackii*
Honeysuckle, Bella	*Lonicera x bella*
Honeysuckle, Japanese	*Lonicera japonica*
Honeysuckle, Morrow's	*Lonicera morrowii*
Honeysuckle, Tatarian	*Lonicera tatarica*
Japanese Stilt Grass	*Microstegium vimineum*
Kudzu	*Pueraria montana*
Mile-a-Minute Vine	*Persicaria perfoliata*
Moneywort	*Lysimachia nummularia*
Multiflora Rose	*Rosa multiflora*
Norway Maple	*Acer platanoides*
Oriental Bittersweet	*Celastrus orbiculatus*
Ornamental Jewelweed	*Impatiens glandulifera*
Swallow-Work, Black	*Cynanchum louiseae*
Swallow-Wort, Pale	*Cynanchum rossicum*
Perennial Pepperweed	*Lepidium latifolium*
Reed Sweet Grass	*Glyceria maxima*
Spotted Knapweed	*Centaurea stroebe*
Tree of Heaven	*Ailanthus altissima*
Water-Flag	*Iris pseudacorus*

NHDOT INVASIVE SPECIES TYPE II - **PRIORITY**	
Common Name	**Scientific Name**
Knotweed, Japanese	*Reynoutria japonica*
Knotweed, Giant	*Reynoutria sachalinensis*
Knotweed, Bohemian	*Reynoutria* x *bohemica*
Common Reed*	*Phragmites australis*
Purple Loosestrife*	*Lythrum salicaria*
**Indicates a species that is not listed on NHDAMF's Prohibited Species list but is on the New Hampshire Environmental Services Exotic Aquatic Weeds Prohibited List.*	

<u>Type II - Purple Loosestrife</u>

Lovely, but lethal to native wetland species.

Each plant can produce millions of seeds and reproduce from tiny root fragments.

Note the **square stems.**

PREVENTION

SOIL DISTURBANCE AND STABILIZATION

Invasive plants readily colonize areas of disturbed soil. It is important to **minimize soil disturbance** whenever possible. For EDRR purposes, recently disturbed sites should be monitored and managed for invasive species. The sooner invasive species are managed the greater the control and eradication success rate. Established populations are more difficult to manage and control.

1. **Stabilize disturbed soils** as soon as possible by seeding and mulching with straw, rip-rap, or gravel that is free of invasive plant material.
2. Visually inspect mulch, gravel or other earthen materials before using them to ensure that they are free of invasive species.
3. Use seeds of native species whenever possible.
4. Never plant Type I or Type II species.
5. Never bring materials such as fill, loam, mulch, straw, rip-rap or gravel into project areas from sites where invasive plants are known to occur.
6. Monitor work sites for the emergence of invasive plants, if the absence of invasive plant parts in introduced materials, such as in #5 above, cannot be guaranteed.

NHDOT

Chris Schnepf, University of Idaho, Bugwood.org

Photo from PlayCleanGo.org

MOVEMENT AND MAINTENANCE OF EQUIPMENT

1. Locate and use staging areas that are free of invasive plants to avoid spreading seeds and other viable plant parts.
2. Move maintenance and construction equipment from areas free of invasive plants to areas infested by invasive plants whenever possible. This is especially important during ditch cleaning and shoulder scraping activities.
3. <u>If equipment must be used in areas containing Type II Invasive Species</u> (the priority species):
   a. Cut and properly dispose of all aboveground plant material (see page 5 & 6).
   b. Cover the cut area with geotextile and one foot of gravel or soil where the equipment is expected to travel. This is not necessary if the infested area was excavated and the infestation was removed. Refer to the Excavated Material Section.
   c. Clean all equipment, machinery, and hand tools cleaned of all visible soil and plant material before leaving the project site. Equipment should be cleaned at the site of infestation.

Invasive plant seeds and fragments can hitch a ride on equipment and clothing. Avoid unintentionally transporting them by cleaning equipment and clothing before leaving a site.

Acceptable methods of cleaning include, but are not limited to:

1. Brush, broom, or other hand tools (used without water)
2. High- pressure air
3. Portable wash station that contains runoff from washing that comply with wastewater discharge regulations

CONTROL

MECHANICAL – MOWING/CUTTING

Type II plants have the ability to sprout from stem and root fragments.

1. Avoid mowing Type II plants. Mowing for safety/sight distance concerns should be considered an interim measure as these plants will thrive from cutting alone and increase the site's population size and density.
2. Consider additional management such as herbicide application for eradication purposes. If these plants are cut, all plant material must be rendered nonviable and extra care should be taken to avoid spreading plant fragments.

In areas where there are no Type II invasive plants (Purple loosestrife, common reed, and Japanese knotweed):

1. Attempt to mow the area prior to seed maturation (approximately July 1st).
2. Identifying specific roads that are either heavily infested with invasive plants or roads that are in sensitive habitat areas.
    a. Make those roads a priority in the mowing schedule.
3. Clean mowing equipment daily, as well as prior to transport. This is particularly important if mowing occurs after seed maturation (after July 1st).

Rendering Plants Nonviable

Drying
Bagging
Burning

SMOTHERING

Smothering is a method of control that inhibits plant growth by depriving the plant of light and air and heating up the soil.

1. Remove above ground vegetation.
2. Lay down a thick layer of black plastic or landscape fabric over the area. Overlap the target area by a foot or two.
3. Secure the edges in a manner that ensures that no light can reach under the covering and wind cannot displace it.
4. Monitor frequently for damage or displacement of the cover.

BIOLOGICAL

Biological agents such as insects, can attack invasive plant species to suppress and inhibit growth (See page 20).

HERBICIDE

Recommended for any invasive plant.

1. Herbicide applications must be carried out by a licensed applicator with a special permit from the NHDAMF.
2. Herbicide applications should be timed to be completed at least

two-years prior to the initiation of any other construction work or activities. This will minimize the potential to spread the invasive plant(s).

3. See Section V for use of the statewide herbicide contract.

DISPOSAL AND TRANSPORT OF ABOVEGROUND PLANT MATERIAL AND SOIL

When invasive plants are cut or removed for roadside maintenance, construction, or control of plants, the viable plant material must be rendered nonviable to avoid spreading it. Movement of invasive plant material and soil containing plant material requires it to be covered in a manner that prevents the release of any plant parts or soil during transport.

The following methods can be used to destroy plant material (render it non-viable). Additional methods for Type II plants are found in Section III.

DRYING

Drying is recommended for Japanese knotweed, Purple loosestrife, and Phragmites.

1. For large amounts of plant material or for plants with rigid stems:
   a. Place the material on asphalt, tarps, or heavy plastic,
   b. Cover with tarps or heavy plastic to prevent the material from blowing away.
2. For smaller amounts of plant material or for plants with pliable stems:
   a. Bag the material in heavy duty (7-mil or thicker) garbage bags.
   b. Keep plant material covered or bagged for at least one month.

The amount of time that it takes for drying is variable. The material is nonviable when it has turned brown, is partially decomposed, very slimy, or brittle. Once material is nonviable, it can be disposed in a landfill or brush pile.

BRUSH PILES

Brush piles are an option for woody shrubs, trees, vines, spotted knapweed, and large quantities of purple loosestrife, common reed, and knotweed. It is NOT recommended for any invasive plant with seeds or fruit attached, unless plants can be piled within the limits of the infestation.

1. Plant material from most invasive plants can be piled on site to dry out.
2. When piling purple loosestrife, common reed, and knotweed, care must be taken to pile stems and roots so that cut surfaces are not in contact with moist soil.

BURYING

Burying is an option for invasive plants as long as knotweed is buried at least FIVE feet below grade and within the area of infestation.

1. Bury Type I invasive plants three feet below grade and knotweed five feet below grade. This method is best used on a job site that already has disturbed soils.

CHIPPING FOR TRANSPORT is recommended for woody invasive species prior to July 1st, the common seed maturation date. Chipping and transportation may occur after July 1st if the chips are destined for burning. ***Chipping is not appropriate for Type II invasive plants, or for the noxious weeds*** such as poison ivy, poison sumac or giant hogweed.


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BURNING

Burning is an option for any invasive plant that does not contain hazardous chemicals (e.g., poison ivy, poison sumac and giant hogweed).

Plant material should be taken to a designated burn pile. (All necessary permits must be obtained before burning.)

Propagule

A vegetative structure that can become detached from a plant and give rise to a new plant, e.g. a bud, sucker, or spore. Examples of plants that can produce propagules are purple loosestrife, knotweed, and common reed.

STOCKPILING MATERIAL

Any excavated material that contains viable plant propagules and is not reused within the limits of the infestation must be stockpiled on an impervious surface until viable plant material is destroyed OR the material must be disposed of by burying to the appropriate depth.

Burying

5 feet below grade for knotweed
3 feet below grade for all other invasives.

Whenever possible, excavation should be avoided in areas containing Japanese knotweed, purple loosestrife, and phragmites. If excavation does occur in these areas, the BMPs described in Section II must be followed. Cover soil and plant material during transport.

Excavated material from a DOT detention pond. Material was stockpiled on site until plant materials became nonviable.


NHDOT

Note that the material is covered and contained.

CHAPTER 1

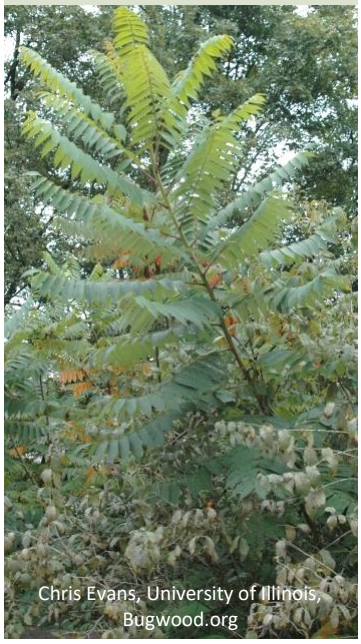
SECTION II

Type I Invasive Plants

TYPE I INVASIVE PLANT SPECIES

Type I plants are those plants that are spread by seeds. A complete list of the Type I invasive species is on page 3. The plant species on that list likely to be found on NHDOT properties are discussed in detail in this section on pages 9-15. The *Type I plants that are only occasionally encountered during NHDOT activities* are shown below for a quick reference. If these plants are found during activities, contact your environmental coordinator.

Tree of Heaven



Garlic Mustard

Garlic Mustard

Japanese Barberry

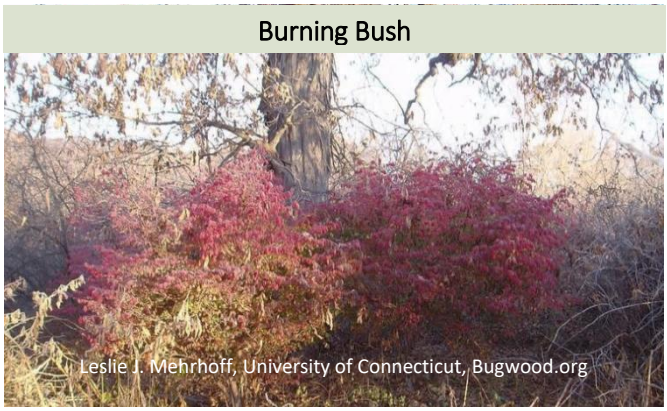
Mile-a-Minute

Blunt-leaved Privet

Tree of Heaven

Pepperweed

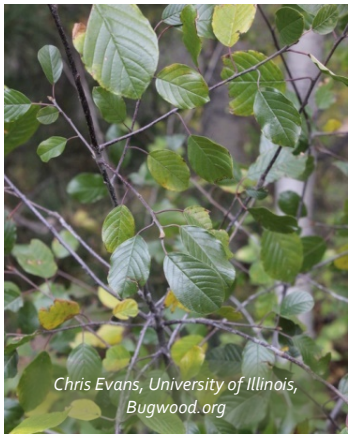
Burning Bush



Burning Bush

Burning Bush

Glossy Buckthorn, *Frangula alnus*

Appearance and Characteristics	Impact
A deciduous large shrub or small tree that grows up to 20'. **Stems:** Bark is gray to brown with white lenticels (openings in the bark that allow for gas exchange). **Leaves:** Simple, dark green, shiny with pronounced venation. **Flowers:** Clusters of small, pale green to creamy white, star shaped, in spring. **Fruit:** Starts as red in color and turns dark purple or black. **Habitat:** Moist woodlands and disturbed areas but tolerates a range of conditions. **Spread**: Wildlife eats the fruit and disperses the seeds.	Grows rapidly and produces many seeds. Can sprout from broken stems. Forms dense thickets.  *Chris Evans, University of Illinois, Bugwood.org*


Rob Routledge, Sault College, Bugwood.org

Small white flowers in clusters in June.


Leslie J. Mehrhoff, University of Connecticut, Bugwood.org


NHDOT

Black berries in the fall. The leaves can last longer on the stems than other plants in the fall.


Rob Routledge, Sault College, Bugwood.org


William Fountain, University of Kentucky, Bugwood.org

Honeysuckle, *Lonicera spp.*

There are several species of honeysuckle on the NHDOT Type I list. Each species has slightly different characteristics. The arrangement of leaves opposite each other along the stem is a characteristic that is common to all of the honeysuckles.

Japanese honeysuckle is shown here as an example.

Appearance and Characteristics

Stems: A deciduous vine that can grow up to 4" in diameter and over 50 feet long. Corky. Peels easily.

Leaves: Arranged opposite each other along the stem. Medium green, oval. Older leaves are smooth along their edges. Young leaves may be lobed. Either type of leaf may be on the same stem.

Flowers: Clusters of creamy white to white tubular in the axils of the leaves in spring.

Fruit: Begins green in color and gradually turns black.

Habitat: Old fields and disturbed sites, but it can adapt to various light and moisture conditions.

Spread: Wildlife, runners and roots.

Impact

Can girdle saplings and form dense mats in the canopies of trees.

Chris Evans, University of Illinois, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leaves that are arranged opposite each other along the stem are a characteristic of all honeysuckles.

Chris Evans, University of Illinois, Bugwood.org

Tom Heutte, USDA Forest Service, Bugwood.org

William M. Ciesla, Forest Health Management International, Bugwood.org

James H. Miller & Ted Bodner, Southern Weed Science Society, Bugwood.org

Spotted Knapweed, *Centaurea stoebe*

Appearance and Characteristics

Herbaceous perennial bush with a deep root.

Leaves: Arranged in a rosette, bluish green, somewhat hairy. The leaves get smaller toward the top of the stem.

Flowers: Pinkish purple flower heads composed of dozens of florets attached to a receptacle covered with fringed bracts with brown tips (creating a spotted appearance to the receptacle).

Fruit: Each floret produces one seed.

Habitat: Old fields, roadsides, sunny disturbed sites.

Spread: Wind and wildlife.


Steven Katovich, USDA Forest Service, Bugwood.org


Rob Routledge, Sault College, Bugwood.org


Leslie J. Mehrhoff, University of Connecticut, Bugwood.org


Rob Routledge, Sault College, Bugwood.org


Leslie J. Mehrhoff, University of Connecticut, Bugwood.org


Leslie J. Mehrhoff, University of Connecticut, Bugwood.org


Rob Routledge, Sault College, Bugwood.org

Multiflora Rose, *Rosa multiflora*

Appearance and Characteristics	Impact
A perennial shrub that grows up to 15' or more in height. **Stems:** Green to red (old stems are brownish) long, with curved thorns. Can be very thorny. Forms dense thickets. **Leaves:** Serrate**,** alternately arranged around stem, compound with 7-9 leaflets and having fringe at base. **Flowers:** Clusters of white or pink, June to July. **Fruit:** Small, rose hips turn red in fall and last through the winter. **Habitat:** Grows in a variety of conditions**,** prefers full sun. **Spread**: Wildlife eats the fruit and disperses the seeds.	Very aggressive, restricts movement.


Richard Gardner, UMES, Bugwood.org

Fringed petiole helps to distinguish this rose from other rose species. Note serrated leaves.


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

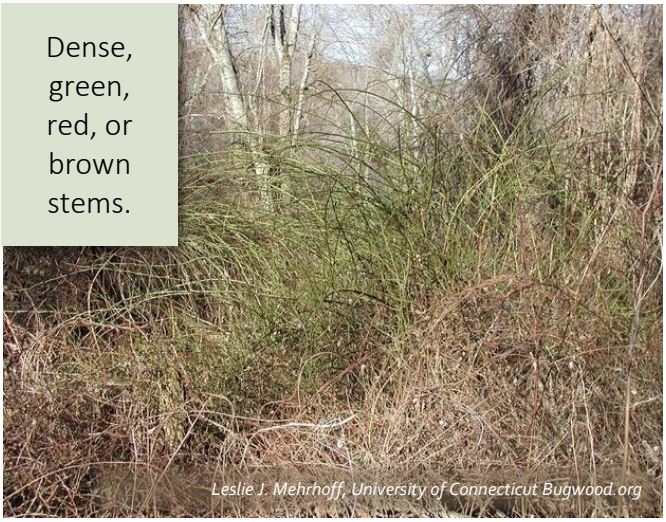

Leslie J. Mehrhoff, University of Connecticut Bugwood.org

Hips that look like berries persist through the winter.


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

Dense, green, red, or brown stems.


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

Oriental Bittersweet, *Celastrus orbiculatus*

Appearance and Characteristics	Impact
A perennial deciduous woody vine that grows up to 60'. **Stems and branches**: Woody, brown to gray, can grow up to 4" in diameter. **Leaves**: Alternately arranged on vine, light green, elliptical or circular. **Flowers**: Small, light green to white in the axils of the leaves. **Fruit**: Start small and greenish and ripen into round yellow balls that split revealing red berries that last through the winter. **Habitat**: Adapts to a variety of conditions. **Spread**: Wildlife eats the fruit and disperses the seeds.	Very aggressive, restricts movement, girdles trees.  *Chris Evans, University of Illinois, Bugwood.org*


Richard Gardner, UMES, Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

Autumn Olive, *Elaeagnus umbellata*

Appearance and Characteristics

A deciduous shrub that grows up to 20'.

Stems and branches: Have thorns.

Leaves: Alternately arranged on branch. Top of leaves are bright to grey green and silvery on the underside.

Flowers: Small, cream colored tubular flowers in clusters in late spring.

Fruit: Round, red, juicy with one seed in fall.

Habitat: Invades disturbed areas.

Spread: Wildlife eats the fruit and disperses the seeds.


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


James H. Miller, USDA Forest Service, Bugwood.org

Thorns on branches


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Chris Evans, University of Illinois, Bugwood.org

Leaves are silvery on underside

Black Swallowwort, *Cynanchum louiseae*

Appearance and Characteristics

Herbaceous perennial vine up to 6.5 feet.

Vine : Twining.

Leaves: Opposite, dark green, lanceolate, smooth edges.

Flowers: Small, dark maroon/purplish.

Fruit: Pods (like milkweed). Seeds tufted with white hairs.

Habitat: Uplands, tolerates wide range light and moisture.

Spread: Wind.

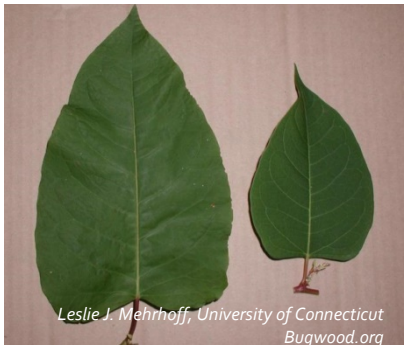
All photos on this page are by Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Chapter 1
Section III
NHDOT Type II Priority Invasive Plant Species

Knotweed, *Reynoutria spp.*

The three species of knotweed (Japanese, Bohemian, and Giant) are similar and control measures are applicable for all.

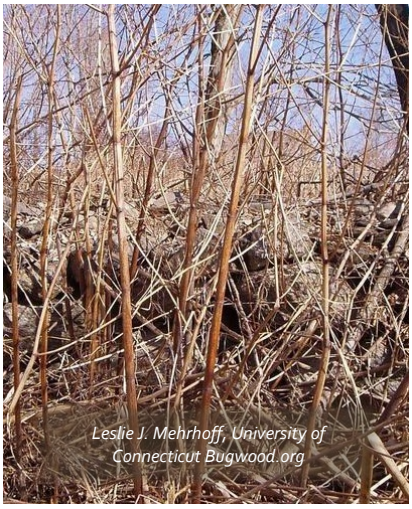
Appearance and Characteristics	Impact
Perennial herbaceous plant developing woody stem tissue. Upright growing to 10' – 15' tall. **Stems**: Green with purple splotching, have jointed segments about every 6-8", hollow (like bamboo). **Leaves:** Broadly ovate, 3-6" long by 2-4" wide and typically truncate at the base. **Flowers**: Small, whitish, forming panicles, August-September. **Seeds**: Brown, triangular. **Habitat**: Found in open spaces, ditches, roadsides, riverbanks woodland sites. Prefers moist, well-drained soils. **Spread**: Stem & root fragments, and by seed. **Comments**: Aggressive. Spreads quickly along surface waters and in right-of-ways.	Forms dense thickets along highway and roadway corridors. Releases allelopathic chemicals that displace native and/or desirable vegetation. Causes safety and sight distance issues, and structural damage to infrastructure.



Type II
Knotweed
Forms dense thickets along highway corridors.

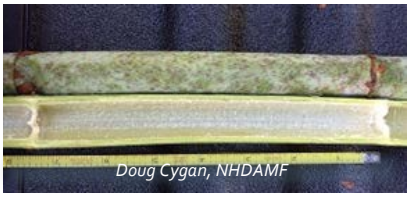
Knotweed

Three species of knotweed are problematic in New Hampshire: Japanese, Giant, and Bohemian. All three species have similar characteristics and the same methods are used for control and disposal. The three species are grouped together in this manual in a general category as “knotweed”.


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

Knotweed was introduced to North America in the early 1800s for ornamental purposes. It is now found in natural ecosystems throughout North America where it has escaped cultivation.

Knotweed produces tall stems that are greenish in color with subtle purple splotches and smooth with prominent nodes where each leaf joins the stem. The leaves are ovate, almost heart shaped, and have rough edges. They vary in size, but are mostly around six inches long by three to four inches wide. The small 1/4” greenish-white flowers occur in pendulous droops in the summer, which produce small whitish winged fruits. The seeds are triangular, shiny, and are very small, about 1/10” long. The rhizome system can become very extensive allowing it to store large amounts of carbohydrates for overwintering and spring development. Some have roots that grow down thirty feet into the soil and run horizontally up to sixty feet in length. The roots have been known to grow under and break through asphalt. All rhizome fragments have the ability to produce new plants. Stem fragments possessing nodes also have the ability to regenerate into new plants. In the fall when the first hard frost hits the plants, they immediately turn brown.


Doug Cygan, NHDAMF

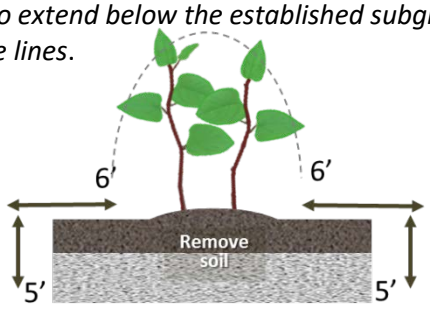

Doug Cygan, NHDAMF

CONTROL – MECHANICAL

EXCAVATION

If areas containing knotweed plants must be excavated, remove plant material and associated soil within a six-foot radius beyond the lateral limit of the plant surface growth and to a depth of five feet .

Note: Excavation is not required to extend below the established subgrade in proposed roadway sections nor extend beyond the proposed slope lines.



Knotweed

All excavated soil containing knotweed must conform to the following disposal methods:

1. Burial to a depth of at least five feet (5') below project finish ground surface, or
2. Transported to a designated disposal site in accordance with an Invasive Species Management Plan or approved work plan.

CUTTING

1. Avoid mowing knotweed.
2. Cut plants at ground level to avoid dispersal of plant fragments.
3. Render the plant material non-viable by bagging, burning, incineration, or other acceptable method until all of the matter is rendered non-viable.
4. Disposed of bagged material at a municipal landfill as allowed by municipality.
5. (See page 8 for additional information on bagging).

CONTROL - BIOLOGICAL

At this time, there are no biological treatments available

CONTROL - HERBICIDE TREATMENTS

This control method must be conducted by a NH licensed pesticide applicator in accordance with all state and federal rules and regulations.

For best results, cut the knotweed at the base of the stem around the first week of June. It is best, *but not essential*, to wait until September/October to apply the herbicide. This is because:

1. If the plants have been cut back in June, they are less likely to be flowering in the fall. Impacts to pollinators like honeybees, who like to forage on knotweed flowers, can be minimized when there are no flowers on the plant.
2. The waiting period between June and September allows the knotweed to re-sprout producing a shorter canopy. This improves accessibility for the applicator.
3. Autumn is the season when plants move nutrients stored in the leaves down into their roots for winter storage. If the herbicide is applied while the plant is moving nutrients, it will have a better chance of reaching the root where it can do maximum damage.
4. See Section V for use of the statewide herbicide contract.

Always consult the product label for use requirements and pollinator considerations.

Purple Loosestrife, *Lythrum salicaria*

Appearance and Characteristics	Impact
Herbaceous perennial growing to 7' tall with spikey magenta (pink purplish) flowers. A single plant can produce between 2-4 million seeds per year. Seeds can be viable up to 10-years. The plant can also reproduce through root fragments. It is commonly found in wet areas where it has the most potential to out compete native species. **Stems:** 4-6 sided (squarish) turning woody in summer. **Leaves:** Opposite to whorled, lanceolate, 2-4'' long. **Flowers:** Spiked raceme, purple to magenta, June to October. **Fruit:** Capsule. **Habitat:** Mostly found in wet area. Full to partial sun. Can also adapt to dryer areas. **Spread:** Each plant can produce millions of seeds. Seeds are dispersed by water, wildlife, and humans.	Fast growing enabling it to shade out and out compete native wetland plants. Clogs drainage ditches resulting in decreased flood capacity and storm water conveyance. Invades wetlands suppressing native species and destroying wildlife habitat.


Doug Cygan, NHDAMA


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

Type II
Purple Loosestrife

Generally found in wet areas.

Clogs drainage ditches.


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

Note the square stems and the way the leaves are opposite each other along the stem.


Rob Routledge, Sault College, Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

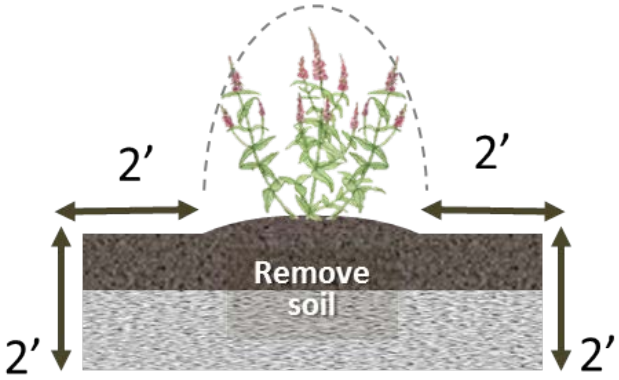

Richard Gardner, UMES, Bugwood.org

Purple Loosestrife, *Lythrum salicaria*

CONTROL - MECHANICAL

EXCAVATION

If areas containing purple loosestrife plants must be excavated, remove the plant material and associated soil within a two-foot (2') radius beyond the lateral limit of the plant surface growth and to a depth of two-feet (2').



Note: Excavation is not required to extend below the established subgrade in proposed ***roadway sections*** *nor extend beyond the proposed slope lines*.

For excavated soil containing purple loosestrife:

1. Bury it to a depth of at least 3' below project finish ground surface.
2. Transport it to a designated disposal site in accordance with an Invasive Species Management Plan or approved Work Plan.

CUTTING

1. Avoid mowing purple loosestrife.
2. Cut plants at ground level to avoid dispersal of plant fragments
3. Cut plants before flowering (before July 1) to avoid accidental dispersal of seeds.
4. Render plant matter non-viable by bagging, burning, incineration, or other acceptable method until all of the matter is non-viable.
5. Dispose of bagged plant material at a municipal landfill as allowed by the municipality.

Cutting
Purple Loosestrife

Bag
Burn or
Bury

CONTROL – BIOLOGICAL

NHDOT recommends using two beetles for biological control purple loosestrife: *Galerucella calmariensis* and *G. pussila*. These are leaf-eating beetles that have proven to be the most effective.

Purple Loosestrife, *Lythrum salicaria*

A beetle-release program was established in 1996 as a cooperative effort between NHDOT and NHDAMF. The effort resulted in beetle releases around the state making it likely that areas with purple loosestrife will have established beetle populations. Sites should be evaluated in the early stages of a project to determine if the beetles are present. The acquisition of *Galerucella sp.* beetles requires coordination with NHDAMF.

Note: Wetland permit conditions for mitigation sites may require long-term purple loosestrife management. Biological control is a highly feasible option but it requires long-term monitoring and management for success.

CONTROL - HERBICIDE TREATMENTS

This control method must be conducted by a NH licensed pesticide applicator in accordance with all state and federal rules and regulations.

1. Herbicide application must be done as a foliar treatment and can be conducted between the months of June through October.
2. Spraying should not be performed when the plants are in flower to avoid harming honeybees gathering nectar. Spraying may be resumed after the flowers have wilted, until the first hard frost has affected the vegetation.
3. Note that late applications, after August, do not affect seed production.

See Section V for use of the statewide herbicide contract.

Common Reed, *Phragmites australis*

Appearance and Characteristics	Impact
Tall erect perennial grass that can grow to 14’ in height. Spread by seed and rhizomes and stolons. A single inflorescence can produce up to 2,000 viable seeds. **Stems:** Called ‘culms’ are large, hollow and grow up to 1'' diameter. **Leaves:** Lanceolate, up to 24'' long, bluish-green in color. **Flowers:** Panicles with many spikelets having seven small reddish flowers. **Habitat:** Mostly found in marshlands, but also grows in freshwater wetlands and aquatic systems, full to partial sun. **Spread:** Spreads primarily by rhizomes. **Comments**: Forms dense colonies that suppress native species and alter wildlife habitat.	Very aggressive clonal grass that clogs surface water drainage systems/structures. Chokes out native plant species in wetland mitigation sites.


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

Common Reed, *Phragmites australis*

CONTROL - MECHANICAL

EXCAVATION

If areas containing common reed plants must be excavated, the removal of plant material and associated soil within a five-foot (5') radius beyond the lateral limit of the plant surface growth and to a depth of three feet (3') is required.

Note: Excavation is not required to extend below the established subgrade in proposed roadway sections nor extend beyond the proposed slope lines.

All excavated soils containing common reed must conform to the following disposal methods:

1. Burial to a depth of at least 3' below project finish ground surface.
2. Transported to a designated disposal site in accordance with the Invasives Management Plan or approved Work Plan.

CUTTING

1. Avoid mowing Phragmites.
2. Cut plants at ground level to avoid dispersal of plant fragments.
3. The plant matter must be rendered non-viable by bagging, burning, incineration, or other acceptable method until all of the matter is rendered non-viable.
4. Bagged matter may be disposed of at a municipal landfill as allowed by municipality.

CONTROL - HERBICIDE TREATMENTS

This control method must be conducted by a NH licensed pesticide applicator in accordance with all state and federal rules and regulations.

Herbicide application must be done as a foliar treatment and can be conducted between the months of June through September.

See Section V for use of the statewide herbicide contract.

CONTROL - BIOLOGICAL

At this time, there are no biological treatments available

Common Reed
Just getting started. Now is a good time to eradicate.

Chapter 1
Section IV
Noxious Plants

POISON IVY grows in many types of environments – from dry to wet, poor soil to rich soil, low light to high light. It grows as an erect low growing shrub or as a vine. Sometimes it appears as a ground cover. As a vine, it produces aerial roots that allow it to grow on trees and other structures. It can reach 160' long and its main stem can grow to 6" in diameter. Fibrous roots grow out from long, creeping rhizomes. It can out compete other plants, overgrow drainage structures, and cause varying degrees of allergic reaction.

Poison ivy has compound leaves divided into three pointed shiny leaflets that are arranged alternately along the stem. Leaflets vary in size, color, and shape – from green and reddish in spring – to yellow, orange, and red in fall. Its flowers are yellow or green with five petals that bunch together in an inflorescence. Berries (drupes) are small and round, light yellow, in clusters.

If skin is exposed to poison ivy or sumac, it can cause a mild to severe rash. The rash is a nasty business with red, raised skin lesions that ooze and itch (note: scratching a poison ivy or sumac rash just makes the itching worse). The allergic reaction is caused by urushiol (pronounced you-ROO-shee-all) which is found in both poison ivy and poison sumac. Urushiol is a resinous oil present in all parts of the plants in all seasons.

NEVER BURN POISON IVY or POISON SUMAC. Burning these plants can release the oil into the air which can be carried to people via the smoke. Inhaling urushiol can cause very serious health issues.

NEVER BURN POISON IVY!
Urushiol is present in all parts of the plant in all seasons.

Poison ivy can be a tricky plant to identify. Generally, poison ivy has leaves that are divided into three green, shiny, pointed leaflets. However:

- The leaves may not always be shiny.
- The leaves may be green or red depending on the age of the leaflet and the season.
- The leaflet edges are typically smooth but occasionally appear with uneven edges, or may have a mitten shape (the leaflet may have a small notch that makes it look like a mitten).


Ohio State Weed Lab Archive, The Ohio State University, Bugwood.org

- Even leaves on the same plant can look different!
- Poison ivy grows as a vine or shrub and can look like a ground cover. It can resemble other harmless plants.
- It attaches to vertical surfaces by producing many small reddish to brownish roots from its larger stems. These roots are visible in all seasons and are a visual sign to look for during the winter.

CONTROL – MECHANICAL

1. Small plants can be carefully **pulled** by putting a plastic bag over the plant (use a new bag for each plant) and pulling the plant out.
    a. If roots are visible in the ground, pick them out.
    b. If feasible, cover the area where the poison ivy was pulled with a heavy mulch to prevent any remaining plant parts from getting started.

2. **Digging** out the plant is an alternative to pulling.
    a. Put all plant parts into a heavy-duty plastic trash bag.
    b. Tie it securely, label it, and dispose with other solid waste.
    c. Check to make sure the solid waste contractor allows this type of waste. If not, plant parts can be buried.
    d. DO NOT BURN or COMPOST.

Always use PPE when working around poisonous plants!

✧

Do not let poisonous plants touch your skin or eyes.

✧

Dead poison ivy parts can still cause allergic reactions.

✧

Review Noxious Plants Sub-Section on Exposure – Prevention and Control

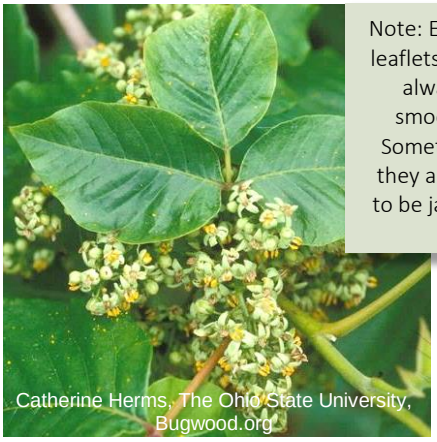
3. **Starving** the poison ivy plants by repeatedly cutting back to the ground and re-working the surrounding soil is also effective but labor intensive.
    a. Plant parts and dead material on the ground should be placed in a plastic bag and disposed. Remember that dead poison ivy can still cause an allergic reaction.
    b. Strong vinegar can be applied to the soil around cut plants as a secondary measure to kill any remaining roots.
4. Never use a weed-wacker to cut poison ivy as it can release the urshiol into the air.

CONTROL - HERBICIDE TREATMENTS

1. Apply chemical controls directly to the plant (e.g., painting) to avoid damaging the surrounding vegetation.
2. If **guardrail** is being treated for poison ivy, it is not necessary to paint the plants – the chemicals can be sprayed in accordance with NHDAMF rules
3. For **large vines** clinging to trees, cut a four-inch section out of the stem and paint the chemical directly on the cut.

Poison Ivy, *Toxicodendron radicans*


Ohio State Weed Lab, The Ohio State University, Bugwood.org


Catherine Herms, The Ohio State University, Bugwood.org

Note: Edge of leaflets are not always smooth. Sometimes they appear to be jagged.


USDA Forest Service - Ogden


Ohio State Weed Lab, The Ohio State University, Bugwood.org


Ohio State Weed Lab, The Ohio State University, Bugwood.org

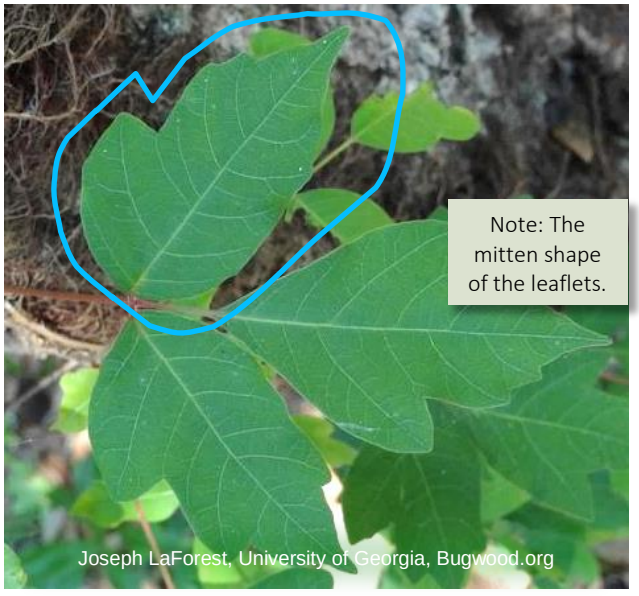

Rob Routledge, Sault College, Bugwood.org


Richard Gardner, UMES, Bugwood.org

Below: Poison ivy hiding in the grass....


Theodore Webster, USDA Agricultural Research Service, Bugwood.org

Note below: The poison ivy appears wilted. One of its many looks.


Joseph LaForest, University of Georgia, Bugwood.org

Note: The mitten shape of the leaflets.

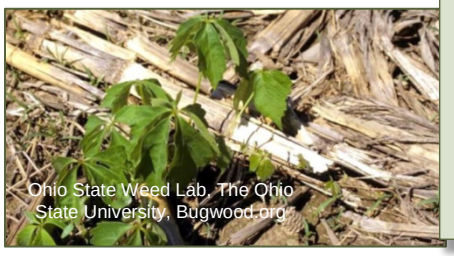

Chris Evans, University of Illinois, Bugwood.org

The many faces of poison ivy

(The wily ivy)

Plants That Look Like Poison Ivy

Are there more than three leaflets?
Not poison ivy



Virginia Creeper
Vine; compound palmate leaves with five saw-toothed leaflets

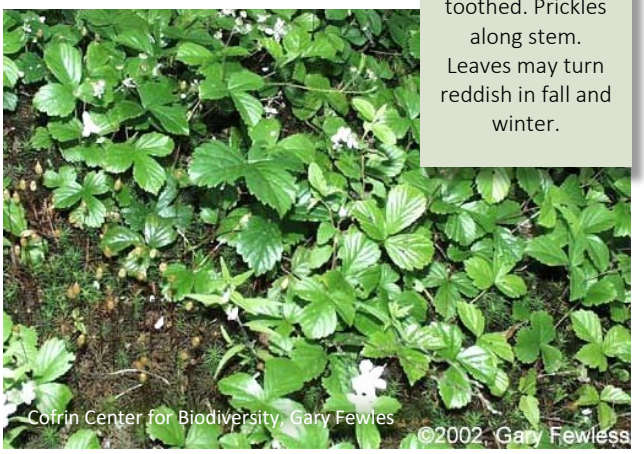
Hog Peanut
Three leaflets that are drop shaped. Purplish white flowers. Does not have a woody stem.

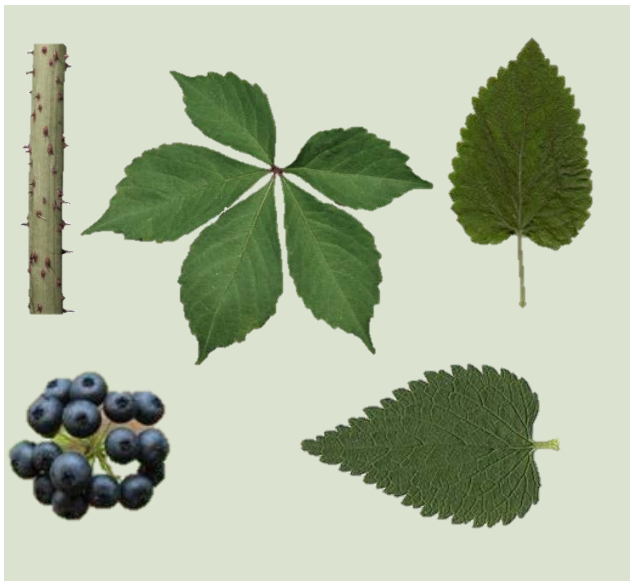
Wild Sarsaparilla
Compound leaves with 3-5 leaflets that are oval and pointed, not shiny.

Are there more than three leaflets? Not poison ivy.

Does the stem have prickles? Not poison ivy.
BUT, PI that is climbing may have aerial roots on the vine that look like prickles (see page 37).

Northern/Swamp Dewberry
Vine; edges of leaflets are sharply toothed. Prickles along stem. Leaves may turn reddish in fall and winter.





Not poison ivy.

Poison Sumac, *Toxicodendron vernix*

POISON SUMAC is rare in New Hampshire. Like poison ivy, it can be tricky to identify because it looks like other harmless plants. Here are some identifiers that will help:

- Poison sumac is a large shrub or small tree that grows in wetlands. It does not like dryer areas.
- Its leaves are separated into many leaflets that:
  - ✓ Are opposite each other (in pairs) along the stem. Each leaf has *up to* 13 leaflets.
  - ✓ Are smooth along their edges (not serrated)
  - ✓ Tend to fold up along the stem instead of folding down.
- The stems are generally reddish.
- The berries (drupes) are whitish/greyish/light greenish, not tightly compacted into one structure but hanging separately in a loose cluster.

CONTROL OF POISON SUMAC is best achieved by using an herbicide such as glyphosate.

1. Apply the herbicide while the plant is flowering.
2. The shrub should be cut back to roughly a foot above the ground and the herbicide applied to the cut. Repeated applications may be necessary to kill the plant.

<u>Poison Sumac</u>
Smooth leaves
Berries not held tightly in a cluster
Found in Wetlands

✦

<u>Staghorn Sumac</u> (shown left)

Not poisonous
Serrated leaves
Hairy/fuzzy stems
Red berries in a tight cluster

Giant Hogweed, *Heracleum mantegazzianum*

GIANT HOGWEED is rare in New Hampshire. It's a biennial that can grow up to 20 feet with very large leaves placed alternately along the stems. The stems are green with purplish splotches, hollow, and with bristles. The sap from this plant makes skin extremely sensitive to UV radiation and can cause blistering and burning. It can also cause blindness if the sap gets into the eyes. Hogweed is found in wooded or open spaces, roadside ditches, and along streams or rivers. **Do not handle this plant in any way.** If this plant is encountered, call your Environmental Coordinator who will contact NHDAMF.

Giant Hogweed

Roadside ditches and along streams and rivers. Large deeply incised leaves. Umbel shaped flowers can be up to 2.5' across.


Jan Samanek, Phytosanitary Administration, Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Leslie J. Mehrhoff, University of Connecticut Bugwood.org

Green and purplish/red stems with bristles


Leslie J. Mehrhoff, University of Connecticut Bugwood.org


Rob Routledge, Sault College, Bugwood.org

Plants That Look Like Hogweed

On first glance, cow parsnip looks a lot like giant hogweed. Rather than trying to distinguish the difference between the two, the advice is **stay away from anything that looks like giant hogweed.** *Cow parsnip is also phototoxic* but not as strongly as giant hogweed.

The flower of Queen Anne's Lace, also known as wild carrot, looks like the shape of the flower of hogweed but it is much smaller.

1. It is seen from early spring to fall, in upland fields, roadsides, and other open areas.
2. The flowers of Queen Anne's Lace have the same general shape of Hogweed, however, the flowers of Queen Anne's Lace are only 1-2 inches.
3. The plant only grows 1-2 feet tall
4. Leaves are finely divided and lacey.
5. Stems have fine hairs.

Cow parsnip looks like giant hogweed. Like hogweed, it is phototoxic. Personnel are advised to avoid any plant that looks like giant hogweed

Compare the lacey appearance of the small leaves on Queen Anne's Lace to the large incised leaves of Cow parsnip and Giant hogweed.

Queen Anne's Lace

EXPOSURE – PREVENTION AND CONTROL

The best defense against poisonous plants is to avoid them. If they cannot be avoided, wear long sleeves, thick *rubber* gloves (not latex), long pants that reach the foot, socks, and footwear. The idea is to cover up all areas of the skin. In addition, use a poison ivy preventative preparation prior to working in areas that contain poison ivy. Carrying soap or other cleaners that are specifically designed to remove urushiol is strongly advised. Understand that if urushiol gets on clothing, the clothing must be handled with care. Do not rub your eyes if you were exposed to urushiol. Anything that comes into contact with a poisonous plant is contaminated. The following protocol for exposure to urushiol is adapted from the American Academy of Dermatology's website:

Source: Adapted from American Academy of Dermatology, Inc. https://www.aad.org/public/diseases/itchy-skin/poison-ivy-oak-and-sumac#tips

1. *Immediately* rinse your skin with cool or lukewarm water. Do not use hot water as it can open skin pores, as can some soaps. Cleaners made for poison ivy are best. If you can rinse your skin immediately after touching poison ivy, poison oak, or poison sumac, you may be able to rinse off some of the oil. If not washed off, the oil can spread from person to person and to other areas of your body. If you do not have soap available within 20 minutes of exposure, use the water that is available as long as it is not hot water.
2. Wash your clothing. Thoroughly wash all of the clothes you were wearing (including boots) when you were exposed to the poisonous plant. The oil can stick to clothing, and if the clothing touches your skin, it can cause a rash.
3. Wash everything that may have the oil on its surface. Besides clothing, the oil from poison ivy, poison oak, and poison sumac can stick to many surfaces, including gardening tools, golf clubs, leashes and even a pet's fur. Be sure to rinse your pet's fur, and wash tools and other objects with warm, soapy water.
4. Do not scratch, as scratching can cause an infection.
5. Leave blisters alone. If blisters open, do not remove the overlying skin, as the skin can protect the raw wound underneath and prevent infection.
6. Take short, lukewarm baths. To ease the itch, take short, lukewarm baths in a colloidal oatmeal preparation, which you can buy at your local drugstore. You can also draw a bath and add one cup of baking soda to the running water. Taking short, cool showers may also help.
7. Consider calamine lotion or hydrocortisone cream. Apply calamine lotion to skin that itches. If you have a mild case, a hydrocortisone cream or lotion may also help.
8. Apply cool compresses to the itchy skin. You can make a cool compress by wetting a clean washcloth with cold water and wringing it out so that it does not drip. Then, apply the cool cloth to the itchy skin.
9. Consider taking antihistamine pills. These pills can help reduce itching, however use with caution. *You should not apply an antihistamine to your skin*, as doing so can worsen the rash and the itch.
10. If you have any of the following, seek medical attention:
    a. You have trouble breathing or swallowing
    b. The rash covers most of your body
    c. You have many rashes or blisters.
    d. You experience swelling, especially if an eyelid swells shut.
    e. The rash develops anywhere near your eyes or genitals.
11. If your rash is not improving after seven to 10 days, or you think your rash may be infected, see a physician. A dermatologist can treat your rash, any infection, and help relieve the itch.

Chapter 1
Section V
Use of the State Contractor for Herbicide Application

USING THE STATE CONTRACTOR FOR HERBICIDING

Statewide Contract
The National Institute of Governmental Purchasing (NIGP) Commodity Code 988-8900 - Weed and Vegetation Control (including Aquatic Weed Control) is found on the NHDAS Procurement Webpage.

Typically, the New Hampshire Department of Administrative Services (NHDAS) procures a statewide contract for herbicide application and treatment services. The contract generally includes spot application of herbicide to control invasive plants and poison ivy as needed. It also includes mechanical control.

When the statewide contract is used, **NHDOT is responsible for**:

1. Reviewing and having the contractor sign the *Contractor and Supplier Safety and Environmental Checklist* prior to contractor mobilization.
2. Obtaining and maintaining applicable the Safety Data Sheets (SDS) for any chemicals used.
3. Performing inspections to document the results of the treatment area. This must be done within 60 days of the treatment and in the growing season.
    a. NHDOT inspections should document, minimally, whether or not the work outlined in the contract was completed and whether or not the plants are dead or dying.
    b. If the treatment area does not meet the control requirements, the contractor must apply, at their own expense, a remedial treatment to all of the remaining living foliage.

The contractor is responsible for all required permitting and reporting as outlined in the projects scope of work.

Below is the information, documentation, and required forms that apply when using the state contract.

The items in bold are required and typically included in the special permit application package:

DAS state wide Herbicide Contract
DM-EMS-EIP-6-Form 6b Contractor Compliance Checklist (For use by the Operations Division. Due prior to contractor mobilization)

- NHDOT Environmental Policy 501.01
- **SDS Sheets provided by the contractor and maintained by NHDOT**
- Application Report Due within 30 days of the initial application
- **Date/Time of application**
- **Names and license numbers of all applicators**
- **NH Pesticide Permit Application Package and Special Permit**
- **Applied chemical mixture data (chemical names, and adjuvants or surfactants)**
- **Concentration and target rate**
- **Weather information (temperature, wind conditions, coordinates of target areas)**
- **Target Species**

Chapter 1
Section VI
Contacts and Resources

CONTACTS

NH Department of Transportation, Bureau of Environment,
Marc Laurin, Senior Environmental Manager
Marc.laurin@dot.nh.gov
271-4044
Contact for information on: plant identification, best management practices, and control methods

NH Department of Transportation, Bureau of Highway Design,Roadside Development,
Barbara Rollins, Landscape Specialist Supervisor
barbara.rollins@dot.nh.gov
271-1611
Contact for information on: herbicides

NH Department of Agriculture, Markets, & Food
Doug Cygan, Invasive Species Coordinator
Douglas.cygan@agr.nh.gov
271-2561
Contact for information on: plant identification, control methods, herbicides

David Rousseau, Director**,** Division of Pesticide Control
david.rousseau@agr.nh.gov
Telephone: (603) 271-3550
Contact for information on Pesticide Permitting

WEBSITES

Invasive Plant Atlas of New England—photographs and information on habitat
https://www.eddmaps.org/ipane/ipanespecies/species_list.htm

US Forest Service—fact sheets on invasive plants in the northeastern United States
https://www.fs.usda.gov/naspf/resources-and-publications

The Global Invasive Species Initiative—photographs, management information
https://www.invasive.org/gist/index.html

National Invasive Species Information Center—**species profiles** with links to other resources
http://www.invasivespeciesinfo.gov/plants/main.shtml

NH Department of Agriculture—Information and publications on invasive plants including**:**
Guide to Invasive Upland Plant Species in New Hampshire
https://www.agriculture.nh.gov/publications-forms/documents/upland-invasive-species.pdf

Preventing the Spread of Japanese Knotweed, Best Management Practices
https://www.agriculture.nh.gov/publications-forms/documents/japanese-knotweed-bmps.pdf

Federal Highway Administration—Guide to Roadside Invasives—photographs grouped by flower color; includes many weeds that are not considered invasive in NH.
http://www.fhwa.dot.gov/modiv/invasive.htm

Poison Ivy websites:

http://www.mortonarb.org/trees-plants/tree-and-plant-advice/horticulture-care/poison-ivy-control

https://www.extension.purdue.edu/extmedia/ho/ho-218-w.pdf

https://www.canada.ca/en/health-canada/services/home-garden-safety/poison-ivy.html

www.poison-ivy.org
A site for answers about poison ivy, oak, sumac and the skin rashes they cause. Good identification tips.

PUBLICATIONS

Vehicle Cleaning Technology for Controlling the Spread of Noxious Weeds and Invasive Plants
USDA Forest Service (2005)
www.fs.fed.us/eng/pubs/

NH Department of Agriculture—*Guide to Invasive Upland Plant Species in New Hampshire*
https://www.agriculture.nh.gov/publications-forms/documents/upland-invasive-species.pdf

NH Department of Agriculture – *Preventing the Spread of Japanese Knotweed, Best Management Practices*
https://www.agriculture.nh.gov/publications-forms/documents/japanese-knotweed-bmps.pdf

Control of Invasive Species: A Synthesis of Highway Practice National Cooperative Highway Research Program - Synthesis 363 (2006)
http://www.trb.org/main/blurbs/158498.aspx

Dangerous Travelers: Controlling Invasive Plants Along America's Roadways
USDA Forest Service (Training Video)
www.fs.fed.us/invasivespecies/prevention/dangeroustravelers.shtml
Copies are available to borrow from the NHDOT Bureau of Environment

Roadside Weed Management
US Department of Transportation, Federal Highway Administration
Contact the NHDOT Bureau of Environment for a hardcopy

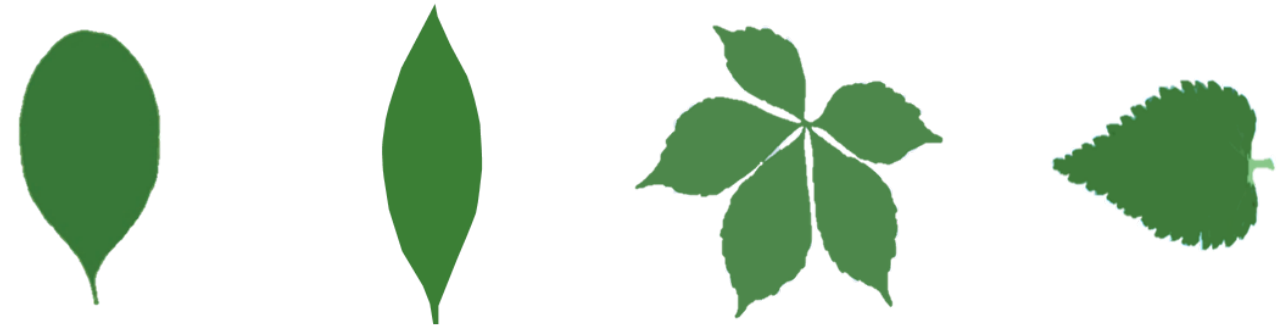
Glossary

Allelopathy	The chemical suppression of one plant (or other organism) by another, due to the release into the environment of substances acting as germination or growth inhibitors.
Annual	A plant that completes its life cycle in one year
Emergent	Having most vegetative growth above water
Eradication	Destroy completely, put an end to
Foliar	Of, relating to, or applied to leaves
Germination	Beginning of growth, as from a seed
Herb	A plant that does not produce woody, persistent tissue
Herbaceous	Having aboveground stems that are fleshy instead of woody
Infestation	The presence of an unusually large number of invasive plants in a place
Inflorescence	The complete flower head of a plant including stems, stalks, bracts, and flowers., the arrangement of the flowers on a plant
Invasive	Invasive plant species are species that are not native to a specific location (an introduced species), and that have a tendency to spread to a degree that excludes native plant species. These species can cause damage to the environment by disrupting native habitats and can also impact the economy.
Lanceolate	Shaped like the head of a lance, narrow, and tapering toward the apex or sometimes at the base. (See illustrations on page 36)
Lateral Limit	For the purposes of measuring the area of soil to be removed when excavating invasive plants, it is the edges of the foliar canopy.
Lenticel	A small opening (pore) in the bark of trees that allows the tree to exchange oxygen and carbon dioxide with the atmosphere
Native	Occurring naturally in a given range; not introduced by humans
Non-native	Introduced to areas outside of the species' natural geographic range.
Nonviable	Not capable of living or developing
Noxious	Harmful, poisonous, or very unpleasant.
Ovate	Having an oval outline or ovoid shape, like an egg. (See illustrations on page 36)
Panicle	A loose, branching cluster of flowers. (See illustrations on page 36)
Perennial	A plant that lives for two years or more
Petiole	The stalk that joins a leaf to a stem; leafstalk. (See illustrations on page 36)
Phototoxic	Rendering the skin susceptible to damage (such as burn or blisters) upon exposure to light and especially ultraviolet light
Prickle	A slender, sharp-pointed outgrowth on the bark or epidermis of a plant
Propagule	A structure with the capacity to create a new plant, for example a seed, a spore, or a part of the vegetative body capable of independent growth if detached from the parent.
Raceme	A flower cluster with the separate flowers attached by short equal stalks at equal distances along a central stem. The flowers at the base of the central stem develop first. (See illustrations on page 36)
Rhizome	A horizontal, underground stem that can produce roots and aboveground stems.
Serrated	Having a jagged edge, saw-like.
Stolon	A creeping horizontal plant stem or runner that takes root at points along its length to form new plants.
Twining	Capable of climbing to a greater or lesser height above the ground by twining their stems around a support
Vegetative Reproduction	Propagation by means other than seeds, including rhizomes, runners, stem cuttings, and root cuttings.
Viable	Capable of growing or developing

Inflorescence (Flower) Type Terms Used in this Manual

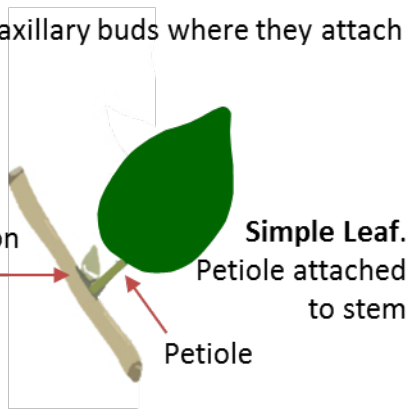
Spike | Raceme | Panicle | Umbel

Leaf Shape Terms Used in this Manual



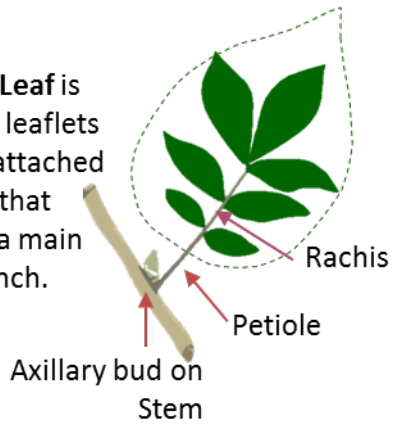
Oval Shaped Leaf | Lanceolate Shaped Leaf | Palmate Leaf | Serrated Leaf

Leaves have axillary buds where they attach to the stem.

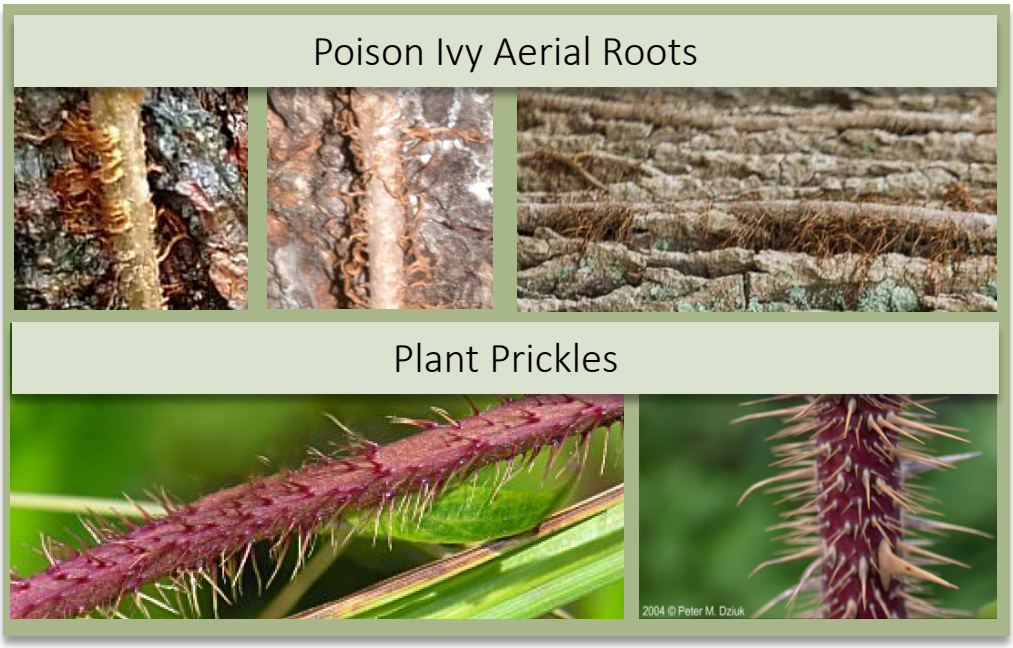


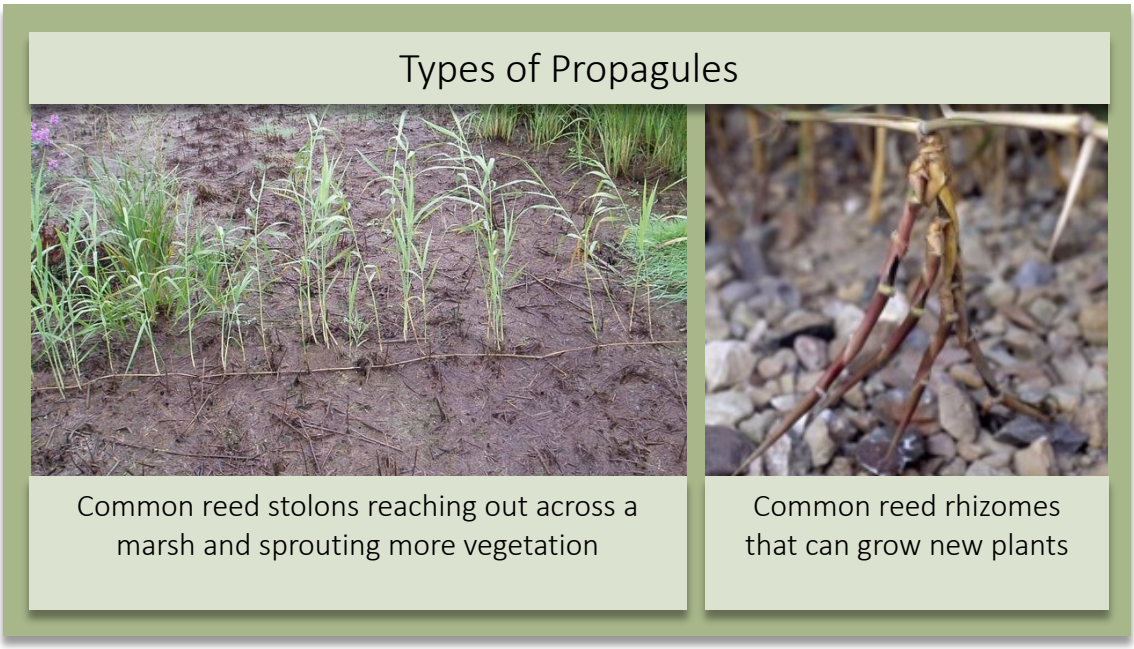
Leaflets do not have axillary buds on the rachis.

Compound Leaf is divided into leaflets on a rachis attached to a petiole that attaches to a main stem or branch.



Examples of plant aerial roots, prickles, and propagules:





Quick Reference
BMP's for Type I, Type II and Noxious Plants

Type I ↓

- Use native species for seeding and planting
- Limit earth disturbance and stabilize disturbed soils as soon as possible
- Inspect mulch and earth materials before use
- Monitor work sites
- Never use materials from areas of work sites where invasives are known to occur
- Stockpile excavated material that contains seeds/fruits on an impervious surface
- Use staging areas that are free of invasives
- Move equipment *from* areas **free of invasives** *to* areas that are already infested
- Cover soil and plant material during transport
- Clean equipment daily and before transport

Controls:

- **Cutting** - Mow areas prior to seed maturation. Combine with another approved control method.
- **Smothering**
- **Herbicide** - Pollinator considerations. Applicator Permit needed
- **Drying (impervious surface)**
- **Brush Piles** (within the limits of infestation or on impervious surface)
- **Burying** (3' below grade for plants with seed/fruit)
- **Chipping** (before seeds/fruit appear) After seeds/fruit appear, burn in incinerator.
- **Burning** (permits may be required)
- **Pulling -** Small plant and limited area
- **Bagging**

Type II Priority ↓

Knotweed, Common Reed (Phragmites), Purple Loosestrife

- Use native species for seeding and planting
- Limit earth disturbance and stabilize disturbed soils as soon as possible
- Inspect mulch and earthen materials before use
- Monitor work sites
- Never use materials from work sites where invasives are known to occur
- Stockpile excavated material that contains viable plant parts on an impervious surface
- Use staging areas that are free of invasives
- Move equipment *from* areas **free of invasives** *to* areas that are already infested
- Cover soil and plant material during transport
- Cut and properly dispose of all aboveground plant material. Transport to a designated disposal site in accordance with Invasives Management Plan.
- Cover infested areas not scheduled for excavation with Geotextile and one foot of earth material
- Clean all equipment and tools daily and before leaving the site (infested area)

Controls:

- **Biological** Beetles for purple loosestrife
- **Herbicide** - Pollinator considerations. Applicator Permit needed
- **Drying (impervious surface)**
- **Brush Piles** (within the limits of infestation or impervious surface)
- No contact with moist soil
- **Excavating-** For purple loosestrife excavate 2' beyond the lateral limit of the plant surface growth and 2' down.
- **Bury** 3' deep
- **Excavating -** For knotweed excavate 6' beyond the lateral limit of the plant surface growth and 5' down.
- **Bury** 5' deep
- **Excavation** of Phragmites must be 5' from lateral limit of vegetation and 3' down.
- **Bury** 3' Deep
- **Burning** – Dried plant material. Permit may be required.
- **Cutting -** Do not mow. Cut to ground level, bag plant materials to render non-viable. Combine with another approved method.

Noxious Plants

Poison Ivy, Poison Sumac, Giant Hogweed, Wild Parsnip ↓

- **Never Burn**
- **Can cause severe skin rash and burns**
- **Use PPE**
- Avoid Mowing

Controls:

- Smothering
- Herbicide
- Drying
- Pulling (Poison Ivy)
- Digging (Poison Ivy)
- Starving (Poison Ivy)
- Use appropriate PPE

APPENDIX E

Wetland Delineation and Function-Value Report

GOVE ENVIRONMENTAL SERVICES, INC.

September 7, 2021

Jack Kaiser, LLS
Doucet Survey
102 Kent Place
Newmarket, NH 03857

Subject: Wetland Delineation & Function-Value Report
PEASE Corporate Drive Drainage Study Project
Portsmouth, NH

Dear Mr.Kaiser:

This letter is to document the results of the wetland delineation and functional & value assessment performed by Gove Environmental Services, Inc., at five locations in the vicinity of Corporate Drive where drainage improvements are being contemplated. Excerpts of the existing conditions plans showing the surveyed wetland flags and a basic sketch showing the location and context of all the wetland areas have been included with this report. Photos of the wetlands and the individual function & value assessment forms have also been provided. A summary of the resources areas and a detailed functional assessment is provided in following sections.

WETLAND DELINEATION

The delineation work was performed on April 26, 2021 by Brendan Quigley, NHCWS #249. Wetland boundaries were evaluated utilizing the following standards:

1. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region,* (Version 2.0) January 2012, U.S. Army Corps of Engineers.
2. *Field Indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils*, Version 8.2. United States Department of Agriculture (2018).
3. *New England Hydric Soils Technical Committee. 2019 Version 4, Field Indicators for Identifying Hydric Soils in New England.* New England Interstate Water Pollution Control Commission, Lowell, MA.
4. *National Wetland Plant List*, Version 3.2 (2016).
5. *Classification of Wetlands and Deepwater Habitats of the United States.* USFW Manual FWS/OBS–79/31 (1979).

Wetland boundaries were demarcated with consecutively numbered pink "Wetland Delineation" flagging. The attached plan excerpts depict the surveyed wetland boundaries at each location. The color figure depicts these areas within the Corporate Drive area and provides a key to the following summary.

Wetland ID	Cowardin Class	Description/Notes
Area 1	PSS1B/PEM1E	The delineated boundary in this area represents the edge of a larger wetland extending north to the intersection of Rye Street and Corporate Drive and east to the Spalding Turnpike. This wetland includes a significant portion of Hodgson Brook which

8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz

		was channelized through this area during the early part of the site's history as an air force base. The larger wetland system contains a number of wetland classes but the dominant wetland type within the vicinity of the evaluation area is a patchwork of emergent and scrub shrub wetland. The overall character of the wetland is that of abandoned agricultural land, which is now densely vegetated by large shrubs and a few small trees. Multiflora Rose, Common Buckthorn, Glossy Buckthorn, and Autumn Olive make up a considerable portion of the vegetation in this area. Emergent wetland, including the drainage outfall ditch which is the subject of drainage planned work, is predominantly Cattail and purple loosestrife.
Area 2	PEM1F	This feature is an excavated drainage ditch extending from the intersection of Ashland Road and Corporate Drive into the larger wetland containing Area 1 and Hodgson Brook. The area to either side of the ditch is developed and its embankments are densely vegetated with invasive shrubs, principally Multiflora Rose, Autumn Olive, and Glossy Buckthorn. The channel itself does not fit neatly into the Cowardin Classification system but is primarily a semi-permanently flooded emergent wetland feature dominated by Purple Loosestrife, Cattail, Reed Canary Grass, and Jewelweed.
Areas 3&4	PEM1E	This boundary represents the edge of what may be called the *Harvey Lake* wetland complex. The wetland in this area is associated with what was historically Harvey Brook. This brook and the associated wetlands area has been substantially altered over decades of development in this area and now receive a significant portion of the stormwater runoff from the southern half of PEASE Tradeport. The flow out of this wetland system is controlled by an outlet control structure along its southern side and ultimately system flows into Hodgson Brook east of the Turnpike Several wetland classes are present in this wetland complex including shallow pond, marsh, scrub shrub wetland, and forested wetland. In the vicinity of the two outfalls where drainage work is being proposed (Areas 3 & 4) the wetland is predominantly emergent and dominated by Cattail, Woolgrass, Purple Loosestrife, and Reed-Canary-Grass. A narrow transition zone of shrubs including Speckled Alder, Arrowwood, Glossy Buckthorn, and Silky Dogwood exists at the edge of the marsh to the wetland boundary.
Area 5.1	PUB3Fh	Area 5.1 and 5.2 are located to either side of the Harvey Lake outlet control structure and associated access road. They have

		been separated into two areas for description and evaluation since two very different resource areas exist at this location. Area 5.1 is located on the upstream side of the control structure where a semi-permanent pond is maintained and vegetation is dominated by submerged and floating leaved vegetation such as pickerel weed and water lily.
Area 5.2	PFO1E	Area 5.2 is located directly below the outlet structure on the other side of the access road and consists of a rock lined channel which carries the flow from the pond. The wetland in the vicinity of the outfall is forested. While the access road and outlet structure appear to be regularly maintained, the area below the access road is severally overgrown with Multiflora Rose, Autumn Olive, and Buckthorn.

FUNCTION &VALUE ASSESSMENT

A wetland function and value assessment was conducted using the US Army Corps Highway Methodology guidelines. Functions are self-sustaining properties of wetlands, which exist in the absence of human involvement. Values refers to the benefits gained by human society from a given wetland or ecosystem and their inherit functions. Functions and values identified as "primary" have been determined to be significant features of the wetland being evaluated. An important distinction is that the primary functions and values of a particular wetland does not necessarily indicating the wetland supports them at a significant *level* in comparison to other wetlands in the region or even near the site.

The Highway Methodology considers 13 functions and values:

1. **Groundwater recharge/discharge:** This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge should relate to the potential for the wetland to serve as an area where ground water can be discharged to the surface.
2. **Floodflow Alteration:** This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.
3. **Fish and Shellfish Habitat:** This function considers the effectiveness of seasonal or permanent water bodies associated with the wetland in question for fish and shellfish habitat.
4. **Sediment/Toxicant/Pathogen Retention:** This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens.
5. **Nutrient Removal/Retention/Transformation:** This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.
6. **Production Export:** This function relates to the effectiveness of the wetland to produce food or usable products for human, or other living organisms.
7. **Sediment/Shoreline Stabilization:** This function relates to the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.
8. **Wildlife Habitat:** This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and or migrating species must be considered.

9. **Recreation:** This value considers the effectiveness of the wetland and associated watercourses to provide recreational opportunities such as canoeing, boating, fishing, hunting and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals or other resources that are intrinsic to the wetland, whereas non-consumptive opportunities do not.
10. **Educational/Scientific Value:** This value considers the effectiveness of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.
11. **Uniqueness/Heritage:** This value relates to the effectiveness of the wetland or its associated water bodies to produce certain special values. Special values may include such things as archeological sites, unusual aesthetic quality, historical events, or unique plants, animals, or geological features.
12. **Visual Quality/Aesthetics:** This value relates to the visual and aesthetic qualities of the wetland.
13. **Threatened or Endangered Species Habitat:** This value relates to the effectiveness of the wetland or associated water bodies to support threatened or endangered species.

The resource areas identified as part of this effort all belong to one of two larger wetland systems separated by Ashland Road and extending east to the highway. These areas are effectively surrounded by development or transportation infrastructure on all sides, which is a major factor in determining the Primary functions and values supported in the wetlands.

Foremost among these is the importance of water quality function. The two large blocks of wetland receive a significant portion of the stormwater from the PEASE Tradeport and drain directly to Hodgson Brook. This stream and the stormwater from its highly developed watershed have been the focus of investigations and improvement efforts for many years. This highlights the importance of water quality function for the associated wetlands and a major factor in identifying these as Primary functions of all the areas evaluated. This context also contributes to the importance of the Scientific, Educational, and Heritage value of the wetlands which are not typically attributed to wetlands in a highly developed and largely inaccessible setting. They are important here because of several other local concerns, include the overall health of the somewhat higher profile North Mill Pond in Portsmouth (the receiving water for Hodgson Brook) and legacy contamination issues associated with former operations at the PEASE facility. The development of the Hodgson Brook watershed, beginning as early as the 1800's, but particularly from the 1950's to present, presents a case study on the implications of urban development, drainage, and water quality.

Wildlife habitat is another function not normally attributed to isolated wetlands in developed areas. However, although the setting may preclude broader wildlife movement, the overall size and variability of habitat in the two larger areas clearly allows them to function as viable habitat islands in an otherwise intensely developed and segmented region. Wildlife habitat has therefore also been identified as a Primary function of all the areas evaluated.

The two larger wetland complexes discussed above support a wider set of functions and values as a whole than may be supported at the discrete outfall locations where work is proposed. The excavated drainage ditch described in Area 2 for instance, is quite different than the large marsh and scrub shrub complex surrounding Hodgson Brook. To capture the functions and values that would most likely be supported at any of these locations, and therefore potentially affected by proposed disturbance, each area described in Table 1 was evaluated separately. Table 2 below summarizes the results of the function and value assessment. The forms are included as an attachment.

Table 2—Function and Value Summary

Resources Evaluated	Primary Function(s)/Value(s)	Supported (not primary)	Rational
Area 1	Sediment Retention Nutrient Removal Shoreline Stabilization Wildlife Habitat	Groundwater R/D Flood Flow Alteration Production Export Edu/Sci Value Uniqueness/Heritage	The dense vegetation including emergent and scrub shrub growth provides excellent cover food sources for wildlife. Although the wetland is surrounded by development, its large size and variability make it a valuable habitat island. Dense vegetation is also effective at trapping and attenuating pollutants in runoff, made more important by the presence of a stormwater outfall in the vicinity and its proximity to Hodgson Brook. Dense Vegetation also serves to stabilize the drainage channel extending from the outfall pipe into the wetland.
Area 2	Sediment Retention Nutrient Removal Shoreline Stabilization Wildlife Habitat	Production Export Edu/Sci Value Uniqueness/Heritage	The evaluation area is a drainage ditch excavated in developed upland area. The primary functions of this wetland feature are related to water quality. These functions are supported to a much larger degree in the marsh and scrub shrub wetland to which it connects. The dense vegetation and berry producing shrubs also provide wildlife habitat and food sources, as well as serving to stabilize the channel.
Areas 3&4	Flood Flow Alteration Sediment Retention Nutrient Removal Wildlife Habitat	Groundwater R/D Production Export Shoreline Stabilization Edu/Sci Value Uniqueness/Heritage	Areas 3 and 4 lay at the edge of a large marsh and shallow pond with both forested and dense scrub shrub wetland nearby. Though still ultimately a habitat island, these characteristics support comparatively greater wildlife habitat making this a Primary function of the wetland. The other Primary functions of this area are related to the nature of the area which receives significant stormwater from the PEASE Tradeport. The restricted outlet control structure in conjunction with the dense vegetation and diffuse flow patterns make for ideal water quality renovation conditions. These characteristics also contribute to the Flood Flow Alteration function of the wetland by slowing and storing runoff during storm events.

8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz

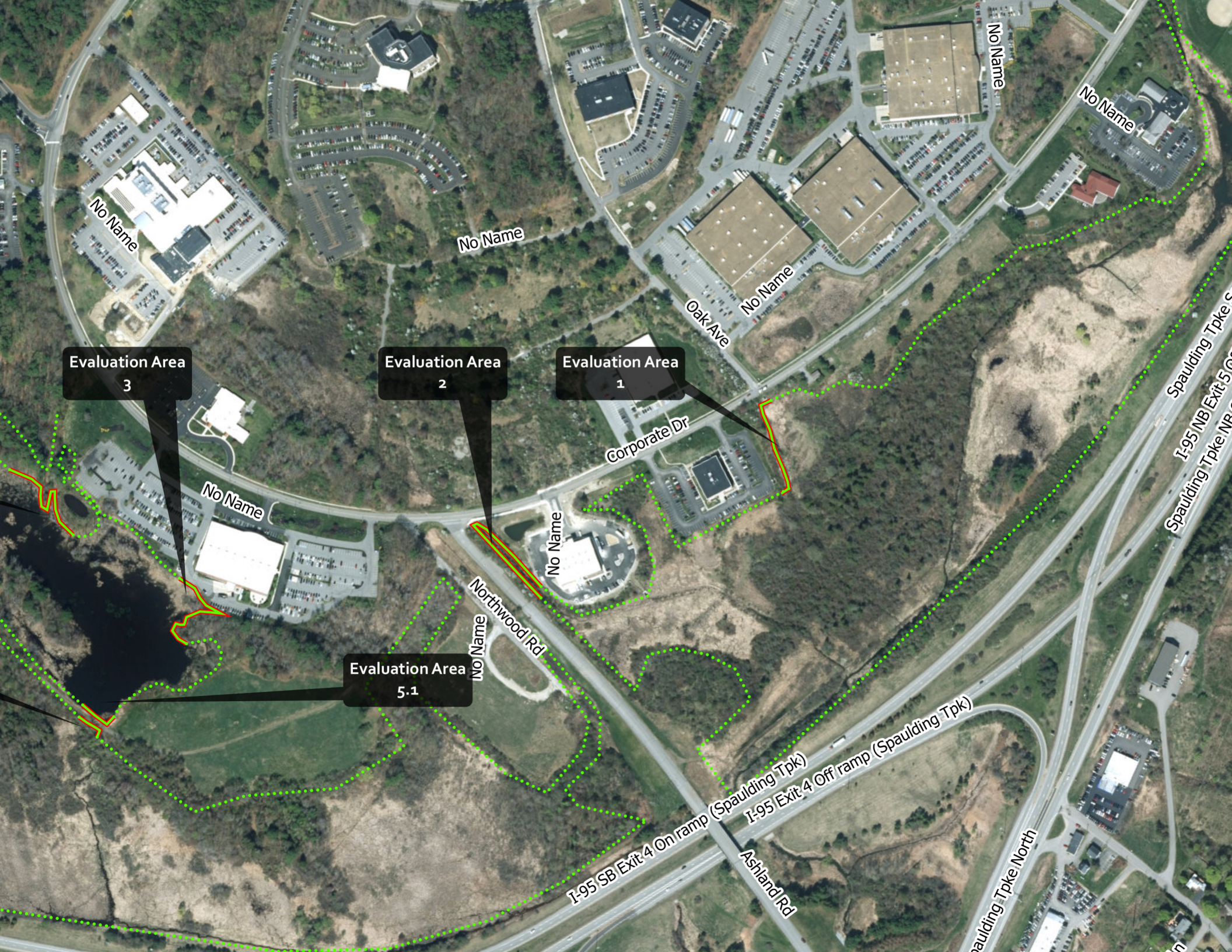
Area 5.1	Flood Flow Alteration Sediment Retention Nutrient Removal Wildlife Habitat	Groundwater R/D Production Export Sediment Retention Nutrient Removal	Area 5.1 is essentially the shallow pond portion of the wetland complex which also contains Areas 3 and 4. It serves the same Primary water quality and Flood Flow Alteration functions as those wetlands for the same reasons. Wildlife Habitat is also a Primary function of Area 5.1 though it differs from Areas 3 and 4 in that aquatic habitat is provided in this area.
Area 5.2	Shoreline Stabilization Wildlife Habitat Sediment Retention	Groundwater R/D Production Export Edu/Sci Value Uniqueness/Heritage	The Primary functions of the area immediately downstream of the pond outlet control structure are stabilization of the flow channel from the pond and additional water quality renovation through sediment trapping. The adjacent forested wetland also supports wildlife habitat value.

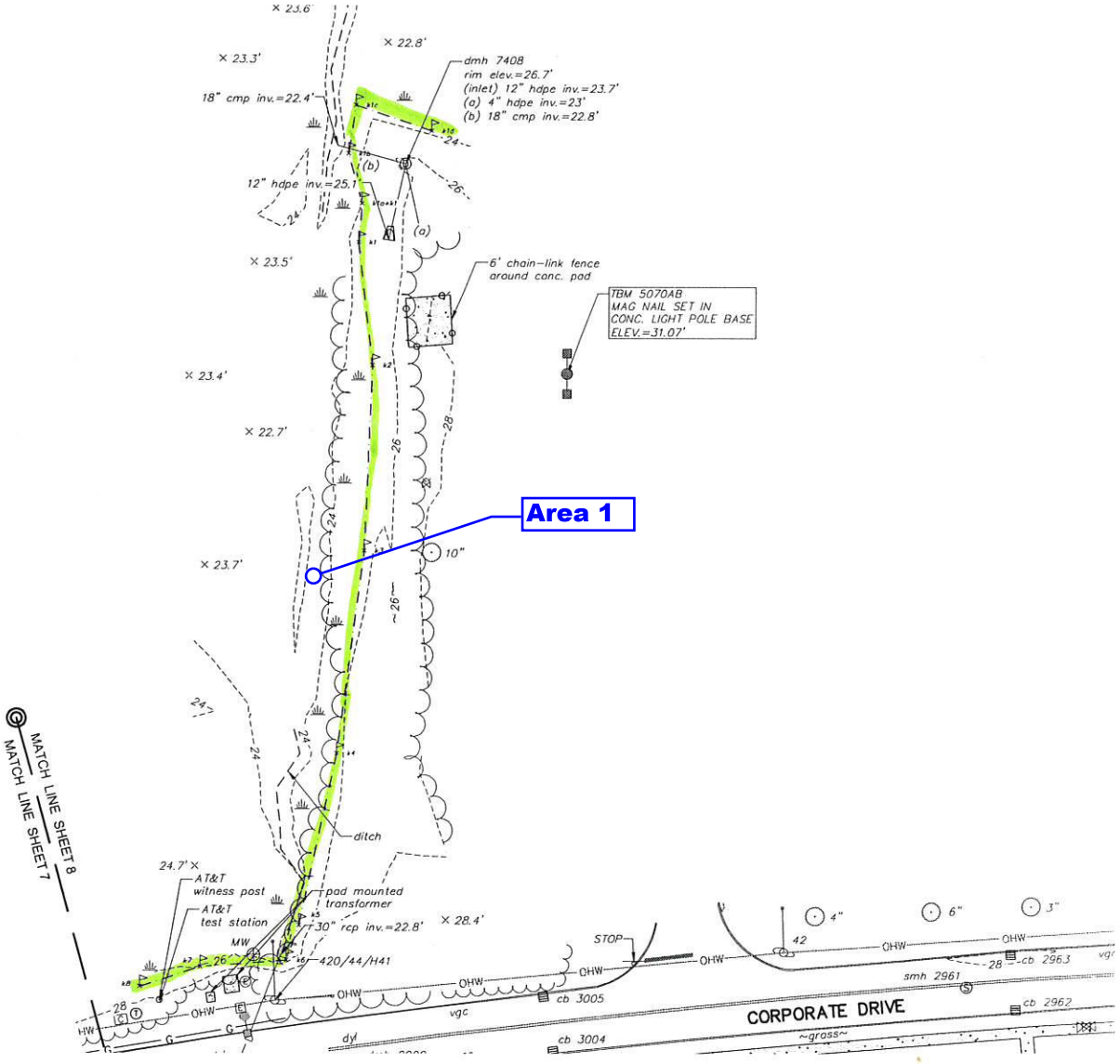
This concludes the wetland delineation and wetland functional assessment report. If I can be of further assistance, please feel free to contact me at (603) 778-0644.

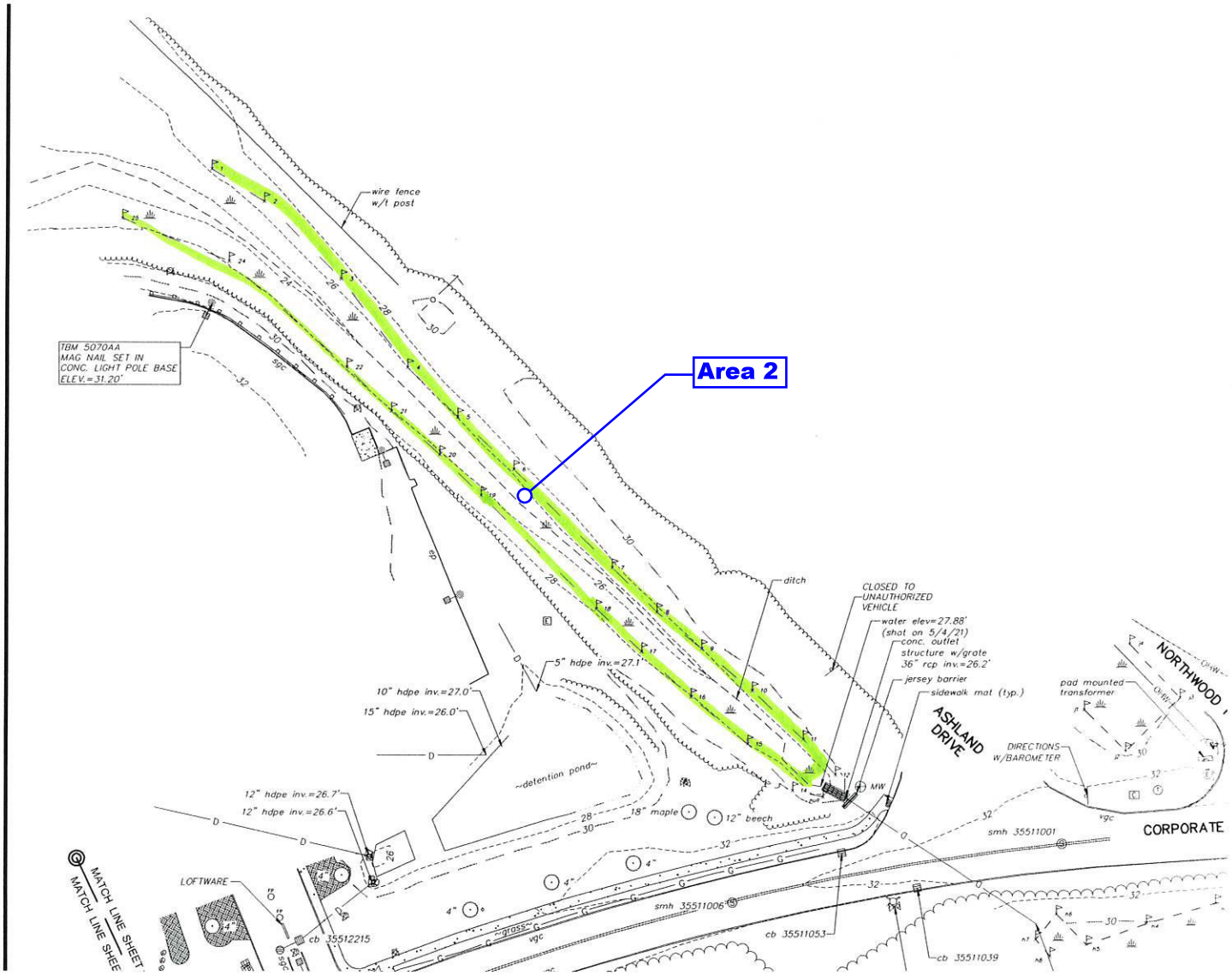
Sincerely,

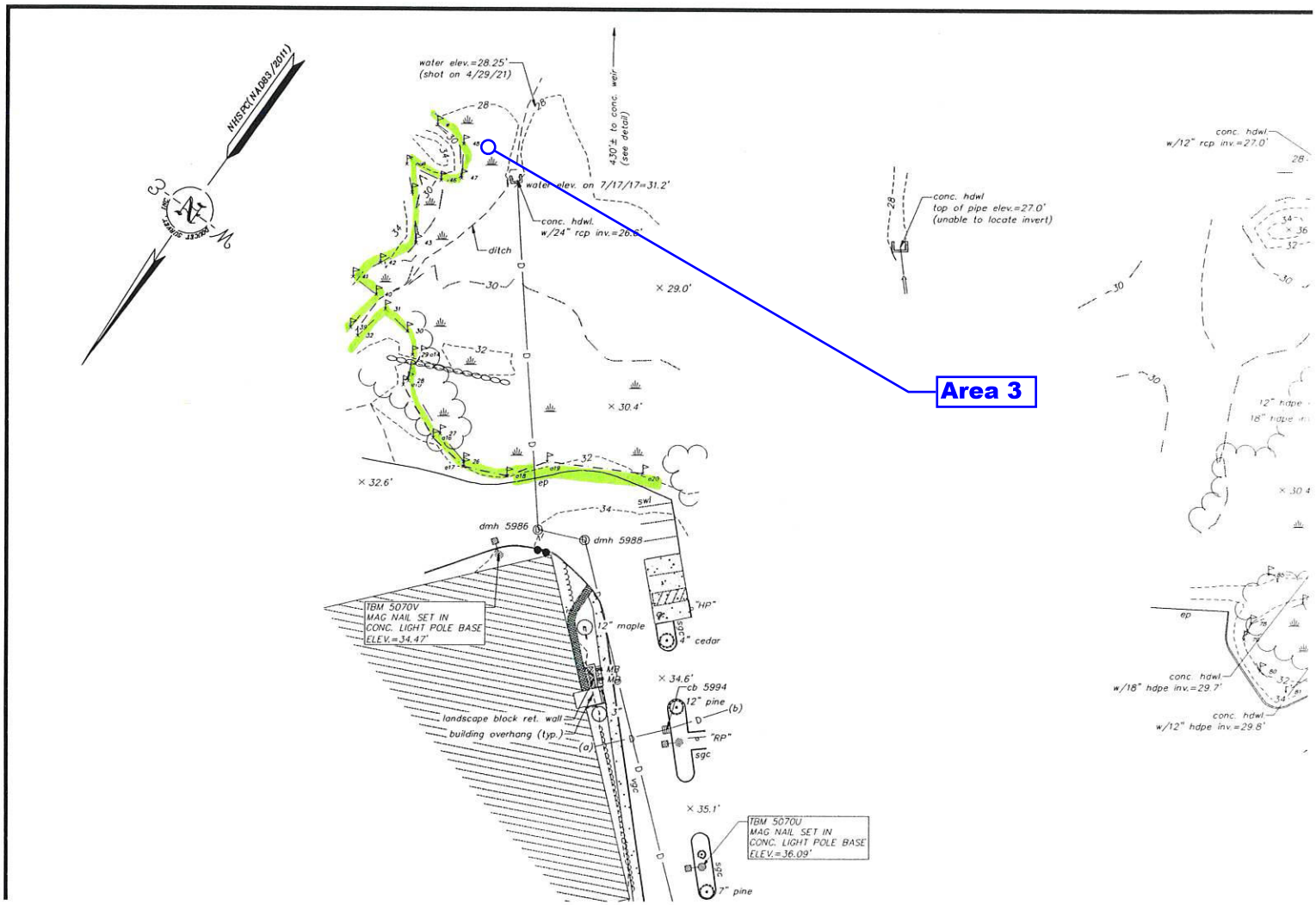
Brendan Quigley, NHCWS
Gove Environmental Services, Inc.

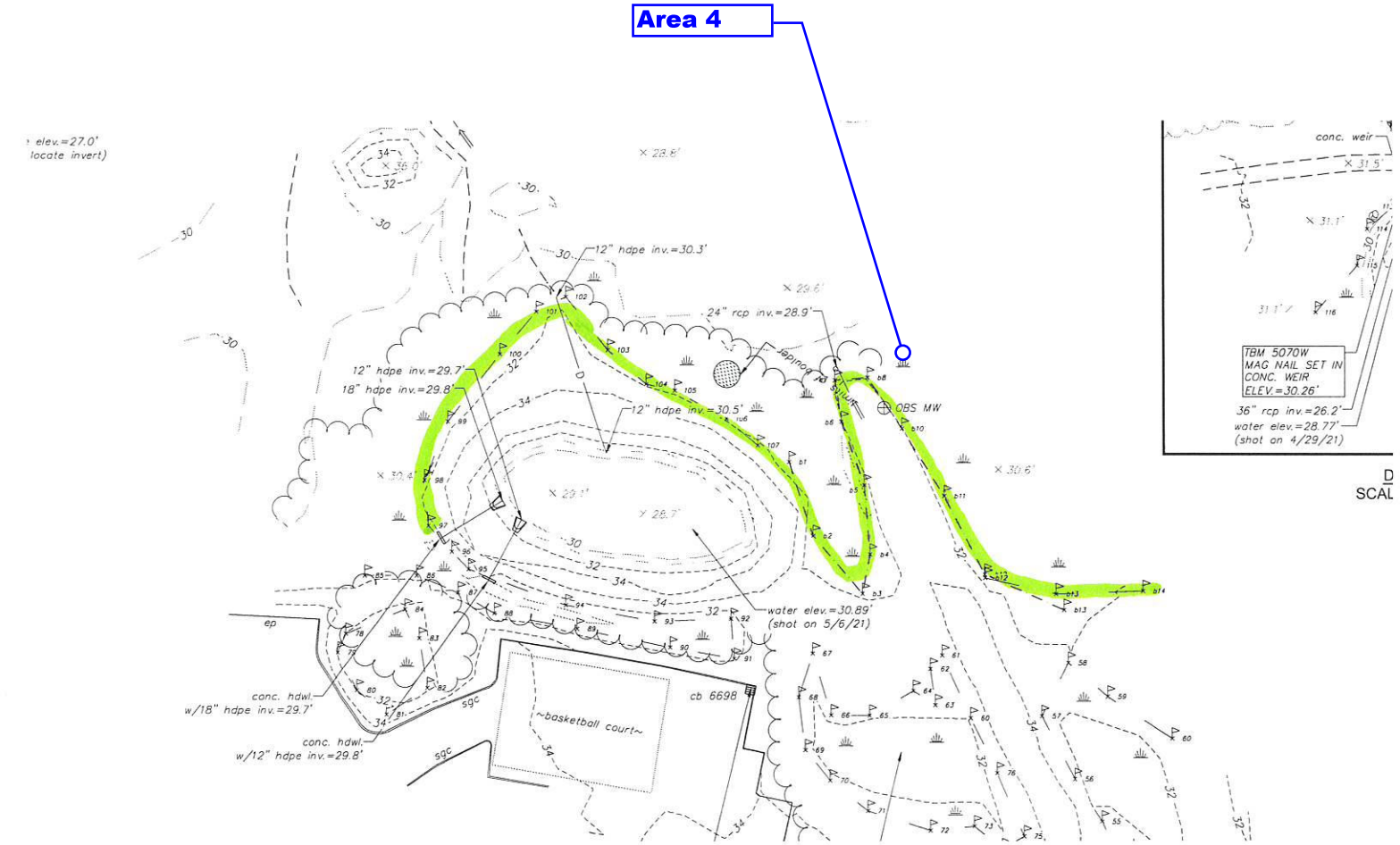
Enc. Wetland Delineation/Context Sketch
Existing conditions Plan excerpts
Photographs
Function & Value Assessment Forms

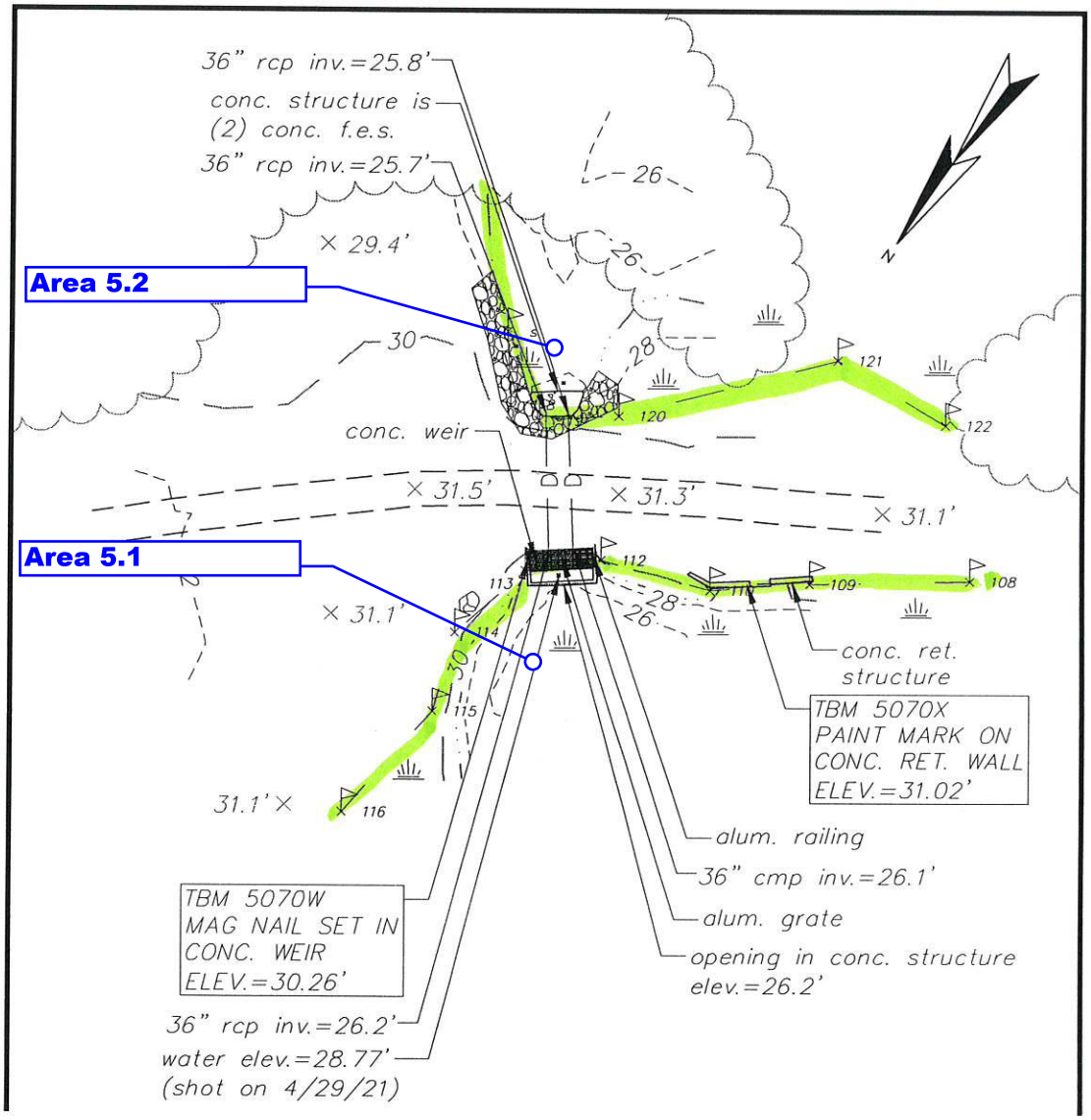

Evaluation Area 3
Evaluation Area 2
Evaluation Area 1
Evaluation Area 5.1
No Name
No Name
No Name
No Name
No Name
No Name
No Name
Oak Ave
Corporate Dr
Northwood Rd
Ashland Rd
I-95 SB Exit 4 On ramp (Spaulding Tpk)
I-95 Exit 4 Off ramp (Spaulding Tpk)
Spaulding Tpke North
I-95 NB Exit 5


× 23.6'
× 22.8'
× 23.3'
dmh 7408
rim elev.=26.7'
(inlet) 12" hdpe inv.=23.7'
(a) 4" hdpe inv.=23'
(b) 18" cmp inv.=22.8'
18" cmp inv.=22.4'
12" hdpe inv.=25.1'
(b)
(a)
× 23.5'
6' chain-link fence
around conc. pad
TBM 5070AB
MAG NAIL SET IN
CONC. LIGHT POLE BASE
ELEV.=31.07'
× 23.4'
× 22.7'
Area 1
10"
× 23.7'
ditch
24.7' ×
AT&T
witness post
AT&T
test station
pad mounted
transformer
30" rcp inv.=22.8'
× 28.4'
MW
420/44/H41
STOP
4"
6"
3"
42
OHW
cb 3005
cb 296.3
smh 2961
cb 2962
CORPORATE DRIVE
cb 3004
vgc
dyl
~gross~
MATCH LINE SHEET 8
MATCH LINE SHEET 7


Area 2
wire fence w/t post
TBM 5070AA
MAG NAIL SET IN
CONC. LIGHT POLE BASE
ELEV.=31.20'
ditch
CLOSED TO UNAUTHORIZED VEHICLE
water elev=27.88'
(shot on 5/4/21)
conc. outlet structure w/grate
36" rcp inv.=26.2'
jersey barrier
sidewalk mat (typ.)
5" hdpe inv.=27.1'
10" hdpe inv.=27.0'
15" hdpe inv.=26.0'
detention pond
12" hdpe inv.=26.7'
12" hdpe inv.=26.6'
18" maple
12" beech
MW
ASHLAND DRIVE
pad mounted transformer
DIRECTIONS W/BAROMETER
NORTHWOOD
CORPORATE
smh 35511001
smh 35511006
cb 35511053
cb 35511039
cb 35512215
LOFTWARE
MATCH LINE SHEET
MATCH LINE SHEET
grass
vgc


NHSPCS NAD83 (2011)
water elev.=28.25'
(shot on 4/29/21)
4.30'± to conc. weir
(see detail)
water elev. on 7/17/17=31.2'
conc. hdwl.
w/24" rcp inv.=26.6'
ditch
× 29.0'
× 30.4'
× 32.6'
ep
swl
dmh 5986
dmh 5988
TBM 5070V
MAG NAIL SET IN
CONC. LIGHT POLE BASE
ELEV.=34.47'
12" maple
"HP"
9" cedar
× 34.6'
cb 5994
12" pine
(b)
"RP"
sgc
landscape block ret. wall
building overhang (typ.)
(a)
× 35.1'
TBM 5070U
MAG NAIL SET IN
CONC. LIGHT POLE BASE
ELEV.=36.09'
7" pine
conc. hdwl
top of pipe elev.=27.0'
(unable to locate invert)
conc. hdwl
w/12" rcp inv.=27.0'
conc. hdwl
w/18" hdpe inv.=29.7'
conc. hdwl
w/12" hdpe inv.=29.8'
Area 3


Area 4
elev.=27.0'
locate invert)
12" hdpe inv.=30.3'
24" rcp inv.=28.9'
12" hdpe inv.=29.7'
18" hdpe inv.=29.8'
12" hdpe inv.=30.5'
OBS MW
water elev.=30.89'
(shot on 5/6/21)
ep
conc. hdwl.
w/18" hdpe inv.=29.7'
conc. hdwl.
w/12" hdpe inv.=29.8'
~basketball court~
cb 6698
sgc
conc. weir
TBM 5070W
MAG NAIL SET IN
CONC. WEIR
ELEV.=30.26'
36" rcp inv.=26.2'
water elev.=28.77'
(shot on 4/29/21)


36" rcp inv.=25.8'
conc. structure is
(2) conc. f.e.s.
36" rcp inv.=25.7'
× 29.4'
Area 5.2
30
26
26
28
121
120
122
conc. weir
× 31.5'
× 31.3'
× 31.1'
Area 5.1
112
113
111
109
108
× 31.1'
114
28
26
30
conc. ret.
structure
TBM 5070X
PAINT MARK ON
CONC. RET. WALL
ELEV.=31.02'
115
31.1'×
116
alum. railing
36" cmp inv.=26.1'
alum. grate
opening in conc. structure
elev.=26.2'
TBM 5070W
MAG NAIL SET IN
CONC. WEIR
ELEV.=30.26'
36" rcp inv.=26.2'
water elev.=28.77'
(shot on 4/29/21)
N

Evaluation Area 1 taking from the adjacent parking lot

Evaluation Area 2 taken from the beginning of the ditch

Evaluation Area 3 (Area 4 is nearly identical)

Evaluation Areas 3 & 4 taken from across the pond

Evaluation Area 5.1

Evaluation Area 5.2

Wetland Function-Value Evaluation Form

Total area of wetland ~46ac. Human made? modified Is wetland part of a wildlife corridor? no or a "habitat island"? yes

Adjacent land use Commercial Dev/Roadway Distance to nearest roadway or other development 25'

Dominant wetland systems present PSS1B/PEM1E Contiguous undeveloped buffer zone present no

Is the wetland a separate hydraulic system? no If not, where does the wetland lie in the drainage basin? low

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Evaluation Area 1

Latitude 43.0767209 Longitude 70.7926030

Prepared by: BJQ Date 8/26/21

Wetland Impact:
Type Temporary Area unknown

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	7,9		
Floodflow Alteration	Y	4,5,6,10,11,13,18		storage potential likely constrained by outfall being blocked
Fish and Shellfish Habitat	N			no permanent water
Sediment/Toxicant Retention	Y	1,2,3,4,7	X	function exists in larger wetland, outfall ditch facilitates
Nutrient Removal	Y	3,4,6,7,8,9,10,11	X	function exists in larger wetland, outfall ditch facilitates
Production Export	Y	1,4,7		wildlife food sources in larger wetland but minimal in outfall ditch, little export out of wetland
Sediment/Shoreline Stabilization	N			evaluation area is not adjacent to a waterway
Wildlife Habitat	Y	6,7,8,9,10,11,17,19,21	X	area functions as habitat island, dense vegetation provides excelent cover and food sources
Recreation	N			very poor access, lacks water features associated with rec
Educational/Scientific Value	Y	3,8,16		education/scientific potential of Hodgson Brook but very poor access at this location
Uniqueness/Heritage	Y	27,28,31		local significance for Hodgson Brook watershed, high degree of wetland loss and frag. in this area
Visual Quality/Aesthetics	N			as open space, aesthetics greatly diminished by invasive vegetation
ES Endangered Species Habitat				none identified
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~46ac. Human made? modified Is wetland part of a wildlife corridor? no or a "habitat island"? yes

Adjacent land use Commercial Dev/Roadway Distance to nearest roadway or other development <20'

Dominant wetland systems present PEM1F (excavated drainage ditch) Contiguous undeveloped buffer zone present no

Is the wetland a separate hydraulic system? no If not, where does the wetland lie in the drainage basin? low

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Evaluation Area 2

Latitude 43.0738908 Longitude 70.7926709

Prepared by: BJQ Date 8/26/21

Wetland Impact:
Type Temporary Area unknown

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			ditch designed to transmit storm water
Floodflow Alteration	N			exists in receiving wetland but ditch is designed for through-flow
Fish and Shellfish Habitat	N			no permanent water
Sediment/Toxicant Retention	Y	1,2,3,4,7	X	ditch functions as vegetated swale, greater WQ function in receiving wetland
Nutrient Removal	Y	3,4,7,8,9,10,11	X	ditch functions as vegetated swale, greater WQ function in receiving wetland
Production Export	Y	1,4,7		wildlife food sources in larger wetland but minimal in outfall ditch, little export out of wetland
Sediment/Shoreline Stabilization	N			evaluation area is a ditch
Wildlife Habitat	N	6,7,8,9,10,11,17,19,21		good cover and food sources but minimal in ditch itself, primarily in larger wetland
Recreation	N			drainage ditch
Educational/Scientific Value	Y	3,8,16		education/scientific potential of Hodgson Brook but very poor access at this location
Uniqueness/Heritage	Y	31		as it relates to development of PEASE and surrounding area, loss/fragmentation of wetland
Visual Quality/Aesthetics	N			drainage ditch
ES Endangered Species Habitat				none identified
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~46ac. Human made? modified Is wetland part of a wildlife corridor? no or a "habitat island"? yes

Adjacent land use Commercial Dev Distance to nearest roadway or other development 25'

Dominant wetland systems present PEM1E Contiguous undeveloped buffer zone present no

Is the wetland a separate hydraulic system? no If not, where does the wetland lie in the drainage basin? low

How many tributaries contribute to the wetland? 2 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Evaluation Areas 3 & 4

Latitude 43.0709662 Longitude 70.7936339

Prepared by: BJQ Date 8/26/21

Wetland Impact:
Type Temporary Area Unknown

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	1,7,9		
Floodflow Alteration	Y	4,5,6,7,9,10,11,13,15,18	X	receives significant runoff, impounded with outlet control, storage potential apparent
Fish and Shellfish Habitat	N			possible limited potential but depth and variable water levels are likely not suitable
Sediment/Toxicant Retention	Y	1,2,3,4,5,7,10,12,15,16	X	ideal conditions to perform this function; also likely the intent of the impoundment
Nutrient Removal	Y	2,3,4,5,6,7,8,9,10,11,12,13,14	X	ideal conditions to perform this function; also likely the intent of the impoundment
Production Export	Y	1,4,5,7,8,12		abundant wildlife food sources, physical export limited due to impoundment and controlled flow
Sediment/Shoreline Stabilization	Y	5,7,15		erosive forces at outfall ditches
Wildlife Habitat	Y	6,7,8,9,10,11,17,18,19,20,21	X	area functions as habitat island, dense,cover,food sources, varied wetland inc. shallow pond
Recreation	N			poor and/or controlled access
Educational/Scientific Value	Y	3,8,16		education/scientific potential for study of PEASE drainage and Hodgson Brook watershed
Uniqueness/Heritage	Y	27,28,31		local significance for Hodgson Brook watershed, high degree of wetland loss and frag. in this area
Visual Quality/Aesthetics	N			otherwise suitable but greatly diminished by invasive vegetation at potential viewing areas
ES Endangered Species Habitat				none identified
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~46ac. Human made? modified Is wetland part of a wildlife corridor? no or a "habitat island"? yes

Adjacent land use fallow land; maintained landfill cap Distance to nearest roadway or other development 25'

Dominant wetland systems present PUB3Fh Contiguous undeveloped buffer zone present no

Is the wetland a separate hydraulic system? no If not, where does the wetland lie in the drainage basin? low

How many tributaries contribute to the wetland? 2 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Evaluation Area 5.1

Latitude 43.0695150 Longitude 70.7929082

Prepared by: BJQ Date 8/26/21

Wetland Impact:
Type Temporary Area Unknown

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	1,7,9		
Floodflow Alteration	Y	4,5,6,7,9,10,11,13,15,18	X	receives significant runoff, impounded with outlet control, storage potential apparent
Fish and Shellfish Habitat	N			possible limited potential but depth and variable water levels are likely not suitable
Sediment/Toxicant Retention	Y	1,2,3,4,5,7,10,12,15,16	X	ideal conditions to perform this function; also likely the intent of the impoundment
Nutrient Removal	Y	2,3,4,5,6,7,8,9,10,11,12,13,14	X	ideal conditions to perform this function; also likely the intent of the impoundment
Production Export	Y	1,4,5,7,8,12		abundant wildlife food sources, physical export limited due to impoundment and controlled flow
Sediment/Shoreline Stabilization	N			pond has engineered banks in this location
Wildlife Habitat	Y	6,7,8,9,10,11,17,19,21	X	area functions as habitat island, deeper side of pond provides aquatic habitat
Recreation	N			controlled access
Educational/Scientific Value	Y	3,8,9,16		education/scientific potential for study of PEASE drainage and Hodgson Brook watershed, safety hazards
Uniqueness/Heritage	Y	27,28,31		local significance for Hodgson Brook watershed, high degree of wetland loss and frag. in this area
Visual Quality/Aesthetics	N			otherwise suitable but greatly diminished by invasive vegetation at potential viewing areas
ES Endangered Species Habitat				none identified
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~46ac. Human made? modified Is wetland part of a wildlife corridor? no or a "habitat island"? yes

Adjacent land use fallow land; maintained landfill Distance to nearest roadway or other development 25'

Dominant wetland systems present PFO1E Contiguous undeveloped buffer zone present no

Is the wetland a separate hydraulic system? no If not, where does the wetland lie in the drainage basin? low

How many tributaries contribute to the wetland? 2 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Evaluation Area 5.2

Latitude 43.0695150 Longitude 70.7929082

Prepared by: BJQ Date 8/26/21

Wetland Impact:
Type Temporary Area Unknown

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	1,7,9		
Floodflow Alteration	N			outflow area little storage in immediate vicinity
Fish and Shellfish Habitat	N			rock channel with little water depth
Sediment/Toxicant Retention	Y	1,2,3,4,6,10,17	X	sediment trapping in rock channel
Nutrient Removal	N			
Production Export	Y	1,4,7,10		abundant wildlife food sources, nutrient export from pond
Sediment/Shoreline Stabilization	Y	1, 2,6, 14	X	dense vegetation stabilizes outflow channel
Wildlife Habitat	Y	6,7,8,9,10,11,17,19,21	X	area functions as habitat island, forested wetland between pond and emergent wetland further east
Recreation	N			controlled access
Educational/Scientific Value	Y	3,8,9,16		education/scientific potential for study of PEASE drainage and Hodgson Brook watershed, safety hazards
Uniqueness/Heritage	Y	27,28,31		local significance for Hodgson Brook watershed, high degree of wetland loss and frag. in this area
Visual Quality/Aesthetics	N			greatly diminished by invasive vegetation at potential viewing areas
ES Endangered Species Habitat				none identified
Other				

Notes:

* Refer to backup list of numbered considerations.

APPENDIX F

New England Wetmix – Wetland Seed Mix

NEW ENGLAND WETLAND PLANTS, INC

820 WEST STREET, AMHERST, MA 01002

PHONE: 413-548-8000 FAX 413-549-4000

EMAIL: INFO@NEWP.COM WEB ADDRESS: WWW.NEWP.COM

New England Wetmix (Wetland Seed Mix)

Botanical Name	Common Name	Indicator
Carex vulpinoidea	Fox Sedge	OBL
Carex scoparia	Blunt Broom Sedge	FACW
Carex lurida	Lurid Sedge	OBL
Carex lupulina	Hop Sedge	OBL
Poa palustris	Fowl Bluegrass	FACW
Bidens frondosa	Beggar Ticks	FACW
Scirpus atrovirens	Green Bulrush	OBL
Asclepias incarnata	Swamp Milkweed	OBL
Carex crinita	Fringed Sedge	OBL
Vernonia noveboracensis	New York Ironweed	FACW+
Juncus effusus	Soft Rush	FACW+
Aster lateriflorus (Symphyotrichum lateriflorum)	Starved/Calico Aster	FACW
Iris versicolor	Blue Flag	OBL
Glyceria grandis	American Mannagrass	OBL
Mimulus ringens	Square Stemmed Monkey Flower	OBL
Eupatorium maculatum (Eutrochium maculatum)	Spotted Joe Pye Weed	OBL

PRICE PER LB. $135.00 MIN. QUANITY 1 LBS. **TOTAL:** $135.00 APPLY: 18 LBS/ACRE :2500 sq ft/lb

The New England Wetmix (Wetland Seed Mix) contains a wide variety of native seeds that are suitable for most wetland restoration sites that are not permanently flooded. All species are best suited to moist ground as found in most wet meadows, scrub shrub, or forested wetland restoration areas. The mix is well suited for detention basin borders and the bottom of detention basins not generally under standing water. The seeds will not germinate under inundated conditions. If planted during the fall months the seed mix will germinate the following spring. During the first season of growth several species will produce seeds while other species will produce seeds after the second growing season. Not all species will grow in all wetland situations. This mix is comprised of the wetland species most likely to grow in created/restored wetlands and should produce more than 75% ground cover in two full growing seasons.

The wetland seeds in this mix can be sown by hand, with a hand-held spreader, or hydro-seeded on large or hard to reach sites. Lightly rake to insure good seed-to-soil contact. Seeding can take place on frozen soil, as the freezing and thawing weather of late fall and late winter will work the seed into the soil. If spring conditions are drier than usual watering may be required. If sowing during the summer months supplemental watering will likely be required until germination. A light mulch of clean, weed free straw is recommended.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.