

CONTRACT DOCUMENTS AND SPECIFICATIONS

for

**INTERSECTION IMPROVEMENT PROJECT
U.S. ROUTE 1 at ANDREW JARVIS DRIVE**

Bid Proposal #35-18

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City of Portsmouth

State of New Hampshire

Prepared by:

City of Portsmouth
Engineering Division
Public Works Department

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City of Portsmouth
Portsmouth, New Hampshire
Department of Public Works

**INTERSECTION IMPROVEMENT PROJECT – U.S. ROUTE 1 at
ANDREW JARVIS DRIVE**

INVITATION TO BID

Sealed bid proposals, **plainly marked**, **Intersection Improvement Project – U.S. Route 1 at Andrew Jarvis Drive**, Bid Proposal #35-18 **on the outside of the mailing envelope as well as the sealed bid envelope**, addressed to the Finance/Purchasing Department, City Hall, 1 Junkins Avenue, Portsmouth, New Hampshire, 03801, will be accepted until **February 15, 2018 at 3:00 PM EST**; at which time all bids will be publicly opened and read aloud.

This project consists of the installation of a fully actuated traffic signal, roadway widening, pavement reclamation, drainage improvements, sidewalk installation and other ancillary tasks. Work may begin at any time on or after **April 15, 2018**. However, work shall be limited to traffic signal installation activities. The remainder of work will not be allowed until after the conclusion of the 2017-2018 High School academic calendar year (tentatively set for June 14, 2018). Substantial completion of all work shall be **August 24, 2018**, which shall include all work except for final stabilization and erosion control removal. Final completion shall be **September 28, 2018**. Liquidated damages shall be assessed at \$500.00 per day for completion dates not met.

There will be a mandatory pre-bid meeting on Wednesday, **February 7, 2018** at 10:00 AM EST at the Portsmouth Public Works Building located at 680 Peverly Hill Road in Portsmouth, NH.

The General Contractor for this project must be Pre-qualified with NHDOT for Road Construction prior to bid submission. The contractor must also be licensed with the City of Portsmouth for laying drains.

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

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. The City reserves the right to approve or deny subcontractors for this project.

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 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.

The Contractor will be required to keep roadways and sidewalks passable for the public to the maximum degree possible. The Contractor will also be responsible for ensuring that the public will be able to access the residences at all times or with reasonable accommodations.

Questions may be directed to and specifications may be obtained from the Finance/Purchasing Department on the third floor at the above address, or by calling the Purchasing Coordinator at 603-610-7227. Specifications may also be obtained from the City's website <http://www.cityofportsmouth.com/finance/purchasing.htm>.

Addenda to this bid document, if any, including written answers to questions, will be posted by close of business on **February 13, 2018** on the City of Portsmouth website <http://www.cityofportsmouth.com/finance/purchasing.htm> under the project heading.

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.

Addenda to this bid document, if any, including written answers to questions, will be posted by February 13, 2018 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 bid 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 Road Construction;
- 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.

AWARD AND EXECUTION OF CONTRACT

1. Consideration of Proposals

After the proposals are opened and read, they will be compared on the basis of the total price for all sections of 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.

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, mailed 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.

3. Reservation of Rights

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. The Owner further reserves the right to modify the scope of work in the event that bids exceed budgeted amounts.

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.

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.

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.

5. Contract Bonds

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

- A performance bond in the amount of 100 percent of the contract amount.
- Labor and materials payment bond in the sum equal to 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 10 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 to provide acceptable bonds and proof of insurance within 10 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 City may exercise its reserved rights including the rejection of all bids or re-advertisement.

PROPOSAL FORM

INTERSECTION IMPROVEMENT PROJECT U.S. ROUTE 1 at ANDREW JARVIS DRIVE

CITY OF PORTSMOUTH, N.H.

To the City of Portsmouth, New Hampshire, herein called the Owner.

The undersigned, as Bidder, herein referred to as singular and masculine declares as follows:

1. All interested in the Bid as Principals are named herein.
2. This bid is not made jointly, or in conjunction, cooperation or collusion with any other person, firm, corporation, or other legal entity;
3. No officer, agent or employee of the Owner is directly or indirectly interested in this Bid.
4. The bidder has carefully examined the sites of the proposed work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this Bid, and the bidder has carefully read and examined the Drawings, Agreement, Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof;
5. The bidder understands that the quantities of work calculated in the Bid or indicated on the Drawings or in the Specifications or other Contract Documents are approximate and are subject to increase or decrease or deletion as deemed necessary by the Portsmouth City Engineer. Any such changes will not result in or be justification for any penalty or increase in contract prices; and agrees that, if the Bid is accepted the bidder will contract with the Owner, as provided in the Contract Documents, this Bid Form being part of said Contract Documents, and that the bidder will supply or perform all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other activities required by the Contract Documents in the manner and within the time therein set forth, and that the bidder will take in full payment therefore the following item prices, to wit:

BID FORM

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
201.1	0.2	CLEARING AND GRUBBING (F) at: Dollars and Cents per acre		
201.21	1	REMOVING SMALL TREES at: Dollars and Cents per each		
202.5	1	REMOVAL OF CATCH BASINS, DROP INLETS, OR MANHOLES at: Dollars and Cents per each		
203.1	1,100	COMMON EXCAVATION at: Dollars and Cents per cubic yard		
203.2	15	ROCK EXCAVATION at: Dollars and Cents per cubic yard		
203.61	30	EMBANKMENT-IN-PLACE SURPLUS at: Dollars and Cents per cubic yard		
206.19	50	COMMON STRUCTURE EXCAVATION <u>EXPLORATORY</u> at: Dollars and Cents per cubic yard		
206.2	20	ROCK STRUCTURE EXCAVATION at: Dollars and Cents per cubic yard		

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
304.2	300	GRAVEL (F) at: Dollars and Cents per cubic yard		
304.301	600	CRUSHED GRAVEL at: Dollars and Cents per cubic yard		
304.4	25	CRUSHED STONE (FINE GRADATION) (F) at: Dollars and Cents per cubic yard		
306.110	2,550	RECLAIMED STABILIZED BASE REMOVED AND REHANDLED, 8" DEEP (F) at: Dollars and Cents per square yard		
306.36	200	STONE FOR RECLAIMED STABILIZED BASE at: Dollars and Cents per ton		
403.11	1,175	HOT BITUMINOUS PAVEMENT, MACHINE METHOD at: Dollars and Cents per ton		
403.119	350	HOT BITUMINOUS PAVEMENT, MACHINE METHOD, HIGH STRENGTH at: Dollars and Cents per ton		
403.12	100	HOT BITUMINOUS PAVEMENT, HAND METHOD at: Dollars and Cents per ton		

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
403.6	2350	PAVEMENT JOINT ADHESIVE at: Dollars and Cents per linear foot		
403.99	20	TEMPORARY BITUMINOUS PAVEMENT at: Dollars and Cents per ton		
410.22	500	ASPHALT EMULSION FOR TACK COAT at: Dollars and Cents per gallon		
417	3,200	COLD PLANING BITUMINOUS SURFACES at: Dollars and Cents per square yard		
520.2	110	CONCRETE CLASS B at: Dollars and Cents per cubic yard		
570.31	7	STONE MASONRY WALL (F) at: Dollars and Cents per cubic yard		
593.221	20	GEOTEXTILE; SEPARATION CL.2, NON-WOVEN at: Dollars and Cents per square yard		
603.00212	10	12" R.C. PIPE, 2000D at: Dollars and Cents per linear foot		

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
603.82212	350	12" PE PIPE (TYPE S) at: Dollars and Cents per linear foot		
603.82215	1,450	15" PE PIPE (TYPE S) at: Dollars and Cents per linear foot		
603.83312	5	12" POLYPROPYLENE PIPE (TYPE S) at: Dollars and Cents per linear foot		
604.0007	13	POLYETHYLENE LINER at: Dollars and Cents per each		
604.124	11	CATCH BASINS TYPE B, 4-FOOT DIAMETER at: Dollars and Cents per unit		
604.242	2	DROP INLETS TYPE D-B at: Dollars and Cents per unit		
604.324	7	DRAINAGE MANHOLES, 4-FOOT DIAMETER at: Dollars and Cents per unit		
604.325	1	DRAINAGE MANHOLES, 5-FOOT DIAMETER at: Dollars and Cents per unit		

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
604.4	1	RECONSTRUCTING/ADJUSTING CATCH BASIN & DROP INLET at: Dollars and Cents per linear foot		
604.5	1	RECONSTRUCTING/ADJUSTING MANHOLES at: Dollars and Cents per linear foot		
604.51	4	RECONSTRUCTING/ADJUSTING SEWER MANHOLES at: Dollars and Cents per linear foot		
604.62	8	DRAINAGE MANHOLE COVERS AND FRAMES at: Dollars and Cents per each		
607.5106	190	WOOD STOCKADE FENCE, 6' HIGH at: Dollars and Cents per linear foot		
607.5346	100	WOOD RAILING FENCE, 4'6" HIGH at: Dollars and Cents per linear foot		
607.92	225	RESET CHAIN LINK FENCE WITH ALUMINUM COATED STEEL FABRIC at: Dollars and Cents per linear foot		
607.9804	100	RESETTING SPLIT RAIL WOOD FENCE at: Dollars and Cents per linear foot		

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
608.24	825	4" CONCRETE SIDEWALK at: Dollars and Cents per square yard		
608.26	50	6" CONCRETE SIDEWALK at: Dollars and Cents per square yard		
608.29	10	BRICK WALKWAY at: Dollars and Cents per square yard		
608.54	7.5	DETECTABLE WARNING DEVICES, CAST IRON at: Dollars and Cents per square yard		
609.01	1,800	STRAIGHT GRANITE CURB at: Dollars and Cents per linear foot		
609.02	50	CURVED GRANITE CURB at: Dollars and Cents per linear foot		
609.5	850	RESET GRANITE CURB at: Dollars and Cents per linear foot		
611.81100	1	ADJUSTING/RELOCATING HYDRANTS at: Dollars and Cents per each		
611.90001	5	ADJUSTING WATER GATES AND SHUTOFFS SET BY OTHERS at: Dollars and Cents per each		

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
611.710061	1	REPLACE WATER GATE BOX at: Dollars and Cents per each		
612.302	4	REPLACE SEWER MANHOLE FRAME & COVER at: Eight Hundred Seventy Five Dollars and Zero Cents per each (These get purchased at cost from the City)	\$875.00	\$3,500.00
614.511	3	CONCRETE PULL BOX 14" at: Dollars and Cents per each		
614.72118	150	2" PVC CONDUIT, SCHEDULE 80 at: Dollars and Cents per linear foot		
614.73118	300	3" PVC CONDUIT, SCHEDULE 80 at: Dollars and Cents per linear foot		
615.016	1	INSTALL HIGH SCHOOL SIGN AND FOUNDATION at: Dollars and Cents per lump sum		
615.0301	80	TRAFFIC SIGN TYPE C at: Dollars and Cents per square foot		
615.033	12	REMOVING TRAFFIC SIGN, TYPE C at: Dollars and Cents per unit		

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
615.034	7	RELOCATING TRAFFIC SIGN, TYPE C at: Dollars and Cents per unit		
615.03401	1	RESETTING FLASHING ILLUMINATED SIGN POST & FOUNDATION at: Dollars and Cents per unit		
615.0601	15	TRAFFIC SIGN TYPE CC at: Dollars and Cents per square foot		
616.101	1	TRAFFIC SIGNALS at: Dollars and Cents per unit		
618.61	1	UNIFORMED OFFICERS WITH VEHICLE at: Twenty Thousand Dollars Zero Cents Allowance for exact cost with no markup allowed	\$20,000.00	\$20,000.00
618.7	1	FLAGGERS at: Eighteen Thousand Dollars Zero Cents Allowance for exact cost with no markup allowed	\$18,000.00	\$18,000.00
619.1	1	MAINTENANCE OF TRAFFIC at: Dollars and Cents per unit		
619.253	22	PORTABLE CHANGEABLE MESSAGE SIGN(s) (UNIT WEEK) at: Dollars and Cents per unit week		

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
628.2	1,200	SAWED BITUMINOUS PAVEMENT at: Dollars and Cents per linear foot		
632.0104	6,150	RETROREFLECTIVE PAINT PAVE. MARKING, 4" LINE at: Dollars and Cents per linear foot		
632.3112	1,025	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 12" LINE at: Dollars and Cents per linear foot		
632.3118	100	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 18" LINE at: Dollars and Cents per linear foot		
632.32	825	RETROREFLECT. THERMOPLAS. PAVEMENT MARKING, SYMBOL OR WORD at: Dollars and Cents per square foot		
632.321	375	RETROREFLECTIVE PREFORMED THERMOPLASTIC PAVEMENT MARKINGS at: Dollars and Cents per square foot		
637.3	1	RESET GRANITE POST at: Dollars and Cents per each		

ITEM NO.	EST. QTY.	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
641	150	LOAM at: Dollars and Cents per cubic yard		
645.6	14	SILT SACKS at: Dollars and Cents per each		
645.7	1	STORM WATER POLLUTION PREVENTION PLAN at: Dollars and Cents per unit		
645.71	24	MONITORING SWPPP AND EROSION AND SEDIMENT CONTROLS at: Dollars and Cents per hour		
646.312	900	TURF ESTABLISHMENT WITH MULCH AND TACKIFIERS (F) at: Dollars and Cents per square yard		
692	1	MOBILIZATION at: Dollars and Cents per unit		

Total Base Bid Price (sum of all items above and basis of award)

.

Total Bid Price (Words): _____

ADD ALTERNATE BID 1

(Extend Milling, Paving and restriping on Lafayette Rd up to Station 16+70 +/- which is approximately 100' from the crosswalk at the South and Lafayette Intersection).

Add the following approximate quantities:

ITEM NO.	EST. QUANTITY	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
403.11	360	HOT BITUMINOUS PAVEMENT, MACHINE METHOD at: Dollars and Cents per ton		
403.6	860	Pavement Joint Adhesive at: Dollars and Cents per linear foot		
410.22	200	ASPHALT EMULSION FOR TACK COAT at: Dollars and Cents per gallon		
417	4,000	COLD PLANING BITUMINOUS SURFACES at: Dollars and Cents per square yard		
612.302	2	REPLACE SEWER MANHOLE FRAME & COVER at: Eight Hundred Seventy Five Dollars Zero Cents per each	\$875.00	\$1,750.00

ITEM NO.	EST. QUANTITY	ITEM DESCRIPTION WITH BID PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
632.0104	3,340	RETROREFLECTIVE PAINT PAVE. MARKING, 4" LINE at: Dollars and Cents per linear foot		
632.3112	12	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 12" LINE at: Dollars and Cents per linear foot		
632.32	18	RETROREFLECT. THERMOPLAS. PAVEMENT MARKING, SYMBOL OR WORD at: Dollars and Cents per square foot		
619.1	1	MAINTENANCE OF TRAFFIC at: Dollars and Cents per unit		

Total Add/Alt Bid Price (sum of all items above)

_____.

Add Alt Bid Price
(Words): _____

- To Bidder:

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.

It is the intention of this contract that the items listed above describe completely and thoroughly the entirety of the work as shown on the plans and as described in the specifications. All other items required to accomplish the above items are considered to be subsidiary work, unless shown as a pay item.

The undersigned agrees that for extra work, if any, performed in accordance with the terms and provisions of the Contract Documents, the bidder will accept compensation as stipulated therein.

Date

Company:

By: _____
Signature

Business Address

Title: _____

City, State, Zip Code

Telephone: _____

<p>We certify that the Company is currently pre-qualified with the State of New Hampshire for Road Construction.</p> <p>_____</p> <p>Signature</p> <p>_____</p> <p>Printed Name & Title</p>
--

The Bidder has received and acknowledged Addenda No. _____ through _____.
All Bids are to be submitted on this form and in a sealed envelope, plainly marked on the outside with the Bidder's name and address and the Project name as it appears at the top of the Proposal Form.

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__.

(Name of Principal) L.S.

(SEAL)

BY _____

(Name of Surety)

BY _____

SUPPLY WITH BID

COMPLETE ALL SECTIONS

STATEMENT OF BIDDER'S QUALIFICATIONS

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.

STATEMENT OF BIDDERS QUALIFICATIONS (continued)

15. List any subcontractors whom you would expect to use for the following (unless this work is to be done by your own organization).

Paving _____XX

The City reserves the right to disallow any subcontractor.

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 Statements 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 AGREEMENT

**INTERSECTION IMPROVEMENT PROJECT – U.S. ROUTE 1 at
ANDREW JARVIS DRIVE**

THIS AGREEMENT made as of the ____ day of _____ in the year 2018, by and between the City of Portsmouth, New Hampshire (hereinafter call 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 the 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 City Engineer or his authorized representative will act as engineer in connection with completion of the Project in accordance with the Contract Documents.

ARTICLE III - CONTRACT TIME - The work will commence in accordance with the Notice to Proceed. Substantial completion shall be by August 24, 2018. Final completion shall take place prior to September 28, 2018.

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.

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 Contract Price as specified in the Contract Documents.

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 **five hundred dollars (\$500)** for each calendar day beyond the specified completion dates for each section of work. 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 Award, Notice to Proceed
- 8.4 Instruction to Bidders
- 8.5 General Requirements: Scope of Work, Control of Work, Insurance Requirements, Temporary Facilities, and Measurement and Payment,
- 8.6 Supplemental Requirements: Prosecution of Work, Summary of Work, Coordination, Additional Measurement and Payment.
- 8.7 Standard and Technical Specifications
- 8.8 Drawings
- 8.9 Special Provisions
- 8.10 Any modifications, including 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 will indemnify Owner against all suits, claims, judgments, awards, loss, cost or expense (including without limitation attorneys' fees) arising in any way out of the Contractor's negligent performance of its obligations under this Contract. Contractor will 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 will secure at its own expense, all permits and consents required by law as necessary to perform the work and will 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: _____

John P. Bohenko

TITLE: City Manager

NOTICE OF INTENT TO AWARD

Date:

TO:

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

INTERSECTION IMPROVEMENT PROJECT U.S. ROUTE 1 at ANDREW JARVIS DRIVE

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 ten (10) calendar days from the date of this Notice.

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: _____

**INTERSECTION IMPROVEMENT PROJECT
U.S. ROUTE 1 at ANDREW JARVIS DRIVE**

TO: _____

YOU ARE HEREBY NOTIFIED TO COMMENCE WORK IN ACCORDANCE

WITH THE AGREEMENT DATED _____, ON OR AFTER _____, AND
THE FOLLOWING COMPLETION DATES WILL BE MET:

SUBSTANTIAL COMPLETION OF THE ROADWAY & SIGNAL WORK, **August 24, 2018**

FINAL COMPLETION OF ALL WORK, **September 28, 2018**

CITY OF PORTSMOUTH, N.H.

BY: Peter H. Rice, PE

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: _____

CHANGE ORDER

Change Order Number: _____ Date of Issuance: _____

Owner: CITY OF PORTSMOUTH, N.H

Contractor: _____

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

Description:

Purpose of Change Order:

Attachments:

CHANGE IN CONTRACT PRICE

CHANGE IN CONTRACT TIME

Original Contract Price:

Original Completion Date:

Contract Price prior to this Change Order:
\$

Contract date prior to this Change Order:

Net Increase or Decrease of this Change Order:
\$

Net Increase or Decrease of this Change Order:

Contract Price with all approved Change Orders:
\$

Contract Due date with all approved Change Orders:

RECOMMENDED:

APPROVED:

APPROVED:

by _____

by _____

by _____

by _____

PW Director

City Finance

City Manager

Contractor

PERFORMANCE BOND

(This format provided for convenience, actual Performance 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 as surety, hereinafter called Surety, are held and firmly bound unto the City of Portsmouth, N.H. Obligee, hereinafter called Owner, in the amount of _____ Dollars (\$ _____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents. WHEREAS, Contractor 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 if the Contractor shall well and faithfully do and perform the things agreed by him to be done and performed, according to the terms of said Contract and such alterations as may be made in said Contract during progress work, and shall further indemnify and save harmless the said Owner in accordance with the Contract and shall remedy without cost to the Owner any defect which may develop within one year from the time of completion and acceptance of the work.

The Surety hereby waives notice of any alteration in work or extension of time made by the Owner or any of its agents or representatives.

Whenever Contractor shall be, and declared by Owner to be, in default under the Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- (1) Complete the Contract in accordance with its terms and conditions, or
- (2) Obtain a bid or bids for submission to the Owner for completing the Contract in accordance with its terms and conditions, and upon determination by Owner and Surety of the lowest responsible bidder, arrange for a contract between such bidder and Owner and make available as work progresses (even though there should be a default or a succession of defaults under the contract of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by the Owner to Contractor under the Contract and any amendments thereto, less the amount paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of (2) years from the date on which final payment under the contract falls due.

PERFORMANCE BOND (continued)

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of Owner.

Signed and sealed this _____ day of _____

A.D., 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.

LABOR AND MATERIALS 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 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:

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

(Surety Company)

(Witness) BY: _____
(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: **Intersection Improvement Project – U.S. Route 1 at Andrew Jarvis Drive**

(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:

Intersection Improvement Project – U.S. Route 1 at Andrew Jarvis Drive

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:

print name of witness: _____

By: _____
Its Duly Authorized _____

Dated: _____

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. Plugging existing sewers and manholes
- d. Restoration of property
- e. Cooperation with other contractors, abutters and utilities.
- f. Utility crossings, (unless otherwise paid for)
- g. Minor items - such as replacement of fences, guardrails, rock wall, etc.
- h. Steel and/or wood sheeting as required.
- i. 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. Supplemental Requirements shall govern General Requirements.
2. Standard Specifications for Road & Bridge Construction without regard to Section 100 "General Conditions" of those Standard Specifications will govern General Requirements.
3. Technical Specifications will govern Standard Specifications.
4. Special Provisions will govern Technical Specifications, Standard Specifications and General Requirements.

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.

3. MAINTENANCE DURING CONSTRUCTION

The Contractor shall maintain the area of 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 area 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. The City will not charge fees for any City issued permits.

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.

GENERAL REQUIREMENTS - 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. It is anticipated that a portion of the northeast parking lot for the High School will be available as a potential staging area both during and after the school year. When the High School is out for summer break, it is anticipated that approximately 12 parking spaces will be available in the school parking lot immediately adjacent to Andrew Jarvis Drive. These potential storage locations shall be approved by the City.

(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 Eversource 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.

GENERAL REQUIREMENTS - 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) Comprehensive 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

Coverage amounts may be met with excess policies

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

- A) Full Workers Comprehensive Insurance coverage for all people employed by the Contractor to perform work on this project. This insurance shall at a minimum meet the requirements of the most current laws of the State of New Hampshire.
- 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.
- D) Installation Floater in an amount sufficient to cover the cost of the pipe work.

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 Insureds.

- 1) The contractor's insurance shall be primary in the event of a loss.
- 2) City of Portsmouth shall be listed as a Certificate Holder. The City shall be identified as follows:

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

GENERAL REQUIREMENTS - 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 prismatic 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.

(q) When an item of work is designated as a final pay quantity in the Method of Measurement, or Basis of Payment, or Bid Schedule as (F), the estimated bid quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion or the quantity of that item are revised by the Engineer, or the item or any portion of the item is eliminated. If the dimensions of any portion or the quantity of the item are revised, and the revision results in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions or the quantity. If a final pay item is eliminated, the estimated quantity for the item will be eliminated. If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

The estimated quantity for each item of work designated as a final pay quantity in the Method of Measurement or Basis of Payment or Bid Schedule shall be considered as approximate only, and no guarantee is made that the quantity that can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No adjustment will be made in the event that the actual quantity based on measurements / computations does not equal the estimated quantity.

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 will be made on a monthly basis during the contract period. From the total amount ascertained as payable, an amount equivalent to ten percent (10%) of the whole will be deducted and retained by the Owner up until fifty percent (50%) completion of the work. Five Percent (5%) of the whole will be deducted and retained by the Owner up until substantial completion. At which point the Contractor can request a reduction down to two percent (2%) in accordance with Final Payment.

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.

(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 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 three (3) sets of drawings to the 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 Engineer with two sets of the revised detail working drawings.
6. The 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.

STANDARD SPECIFICATIONS

The Standard Specifications for Road and Bridge Construction of the State of New Hampshire Department of Transportation and any Addenda shall apply but without regard to Division 100 “General Provisions” of those Standard Specifications (unless specifically referenced in a contract bid item) and without regard to any of those NHDOT provisions that allow for an adjustment for changing fuel and asphalt prices. Additional Technical Specifications and Special Provisions for this project follow.

SUPPLEMENTAL REQUIREMENTS - PROSECUTION OF WORK

The Prosecution of Work is intended to provide the Contractor a summary of project requirements for easy reference. It is not intended to provide all requirements. Refer to Technical Specifications and Drawings for details.

1. DESCRIPTION OF WORK

Generally, work will be conducted at the following locations:

- Lafayette Rd (758 LF)
- Andrew Jarvis: (835 LF)

Work to be completed for this project includes the following:

- **New Storm Sewer Drains**
 - 12” up to 24”, all depths with manholes
 - Maintain drainage until completion of new systems
- **Water Distribution Improvements**
 - Reset existing hydrant to allow for sidewalk
 - Maintenance of water system without interruption to service to users
- **Roadway & Property Restoration**
 - Roadway gravel replacement & fine grading to elevations shown on the plans or as directed
 - Pavement & Curb Installations
 - Concrete sidewalk installation
 - Complete Restoration of all properties, public and private
 - Perform testing of systems prior to paving
- **Traffic Signal Installation**
 - Install new signal equipment as shown on drawings
- **Coordination and Protection of Utilities**
 - Coordinate utility relocation work (by others) with utility companies
 - Coordinate protection of existing gas mains with Unitil. Contact for Unitil is Phil Johnson (603-294-5157)
 - Coordinate water main work with Portsmouth Water Department (427-1552)
 - Coordinate with Eversource regarding the shoring up of poles during excavation if necessary.

- **Protection of Public, Workers and Site Personnel**

Site safety shall be the Contractor's responsibility.

2. PROJECT TIME

This Contract includes two separate completion dates:

1. **Substantial completion** of work includes traffic signals, drainage pavement, striping, curb installation, driveway aprons and sidewalks.
August 24, 2018 for **Substantial Completion**
2. **Final completion for loam and seed, punch list items.**
September 28, 2018 for **Total Project Completion**

3. SPECIAL SEQUENCEING OF WORK

Prior to the start of any work, the Contractor shall submit for approval a proposed work schedule. Schedule updates or alterations should be presented at regular progress meetings but no less than every 30 days. Schedule to be in the form of a Gantt chart or other form acceptable to Engineer. The Contractor will need to consider the following items pertaining to general sequencing of the work:

3.1 Road Reconstruction

Reclaim roadway in Andrew Jarvis to reclaimed stabilized road base for use as a surface during pipe installation. Once the pavement is ground or removed, the contractor must maintain a passable travel way surface. *The Contractor will be responsible for maintaining traveled way in a stable condition (free of rutting) for the duration of the project.*

Use of the Temporary Pavement item will be limited to areas in the Lafayette Road traveled way that need to be paved but will be re-excavated again for the project. It is expected that Lafayette Road will have a paved surface by the end of every workweek. During the week, trenches may remain gravel but must be maintained by the Contractor including dust control.

Upon completion of all pipe installation and testing begin roadway reconstruction/restoration including any additional excavation, placement of gravel and bituminous pavement. Raise all structures/castings to final elevation, unless otherwise directed.

All major road work and construction activity will take place while school is out of session. In the event that work gets extended beyond the Substantial Completion Date, work on this project will be limited to hours that will need to be approved by the City and High School Personnel.

3.2 Testing

Coordinate all testing and acceptance of new utilities with Engineer and Owner, prior to paving.

4. TRAFFIC CONTROL

A Traffic Control Plan (TCP) shall be submitted to the Engineer, for review and will require the approval by the City of Portsmouth. Road detours are not anticipated. Construction warning signs must conform to MUTCD standards, as applicable. Trenches will be backfilled nightly and

roads and sidewalks shall be open and safe for vehicular and pedestrian traffic at the end of each working day. The Plan shall also include the anticipated number of flaggers to be used for a given work area. Police details shall only be used when stopping traffic on Lafayette Road for signal erection or during milling or paving operations. The Engineer reserves the right to request more or fewer flaggers as work progresses and conditions change. Variations to the TCP will be dependent on the Contractors schedule and operations. All temporary detours require approval from the Portsmouth DPW. The Contractor shall coordinate implementation of detours with the DPW. However, the Contractor shall maintain access to properties and driveways throughout construction, to the extent that is possible.

In the event work gets extended beyond the Substantial Completion Date, an alternate traffic control plan will need to be generated by the Contractor for review and approval by the City. This TCP will likely mandate that no work would proceed daily until the High School population is in session within the building and that work would stop during the PM exit from the site.

Equipment - Provide necessary barricades, signs and traffic control devices in accordance with approved TCP. Contractor shall provide all portable message signs required for traffic control.

5. CONSTRUCTION LAYOUT

Work is to be generally constructed as shown on the drawings. The Contractor will be responsible for all construction layouts. An AutoCAD drawing containing horizontal control points (and coordinates) and TBM's will be provided by the Engineer and confirmed by the Contractor, for reference throughout the project. The Engineer and/or Owner's Representative, together with the Project Superintendent will review utility corridors, giving consideration to dig-safe markings and Contractor's work plan. The Contractor will advise the Engineer, in advance, of potential conflicts concerning execution of his work. It will be the responsibility of the Contractor to protect and maintain TBM's, layout and control points provided by the Engineer. The Engineer will provide an electronic copy of plans and coordinates to the Contractor upon request to facilitate the Contractor's layout, providing the Contractor executes a release concerning the information transmitted.

6. REUSE OF MATERIALS

Re-use of reclaimed pavement can be used for sidewalk base or driveway restoration, but will only be allowed if it meets the specified gradation for crushed gravel and does not include silt, clay, loam, humus, woody or other non-granular or material considered unsuitable by the engineer.

7. CONFLICTS AND COORDINATION WITH EXISTING UTILITIES

It will be the Contractor's responsibility to coordinate with the utility companies for identification and re-location, if necessary, of any utilities that are interfering or conflicting with the work shown on the drawings. Loss of production or crew downtime relating to utility work by others will not be considered for additional payment.

8. OTHER BURIED UTILITIES AND SERVICE PIPES

Service pipes for gas, sewer and water utilities are not necessarily shown on the drawings but are to be expected for each building. Where buildings have multiple units, multiple services can be expected. The Contractor is expected to coordinate utility markings through Dig Safe, Utilil and the City of Portsmouth, Water and Sewer Department before proceeding with this work. Utility Markings for sewer and water are based on information on file and should be considered approximate. Repairs to damaged utilities either shown on the plans or through markings on the ground will not be measured for payment. Direct conflicts with utilities resulting in the need for relocation of utilities will be measured for payment, utilizing contract unit items, as deemed appropriate by the Engineer. Additional compensation beyond unit items for loss of production, delays or downtime will not be considered.

9. MEETINGS

Public Information Meeting:

The Contractor, together with City Officials and the Engineer, shall schedule and attend one public information meeting with residents and business owners prior to the start of construction and at the beginning of construction following any temporary disruptions of the work (i.e., winter shutdown).

Project Meetings:

It is anticipated that regular scheduled meetings will be held with Owner's Representatives, Contractor, sub-contractors and High School and will be held at a maximum frequency of twice monthly, unless weekly meetings is considered necessary by the Contractor, Owner or Engineer.

Coordination Meetings

Informal weekly meetings are anticipated between the Contractor's Superintendent, Owner, and Resident Project Representative to review progress/schedule, sequence and other day to day issues.

10. TEMPORARY EROSION CONTROL

The Contractor's attention is directed to the provisions of the Project Manual regarding erosion control. The Contractor shall exercise caution to minimize the intrusion of any spillage, sediment, turbidity, or pollution into the waterways or adjacent properties around the project area. Sediment and erosion controls shall be operational prior to commencing trench de-watering operations.

11. CONSTRUCTION DEWATERING (Also, refer to Section 02402)

Trench dewatering may be required to complete the work. The Contractor shall comply with the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Dewatering before proceeding with the work.

Appropriate sediment and erosion controls shall be operational prior to commencing trench dewatering operations. Construction dewatering is incidental.

12. SIDEWALKS

The project includes the construction of new sidewalks; however, all sidewalks will not be replaced. The Contractor shall protect from damages sidewalks designated to remain, to the extent that is possible. Sidewalks damaged as a result of the Contractor's operations or

equipment will be repaired at the Contractor's own cost. Cross sections are provided for grading of sidewalks. Sidewalks will slope towards the curb line, unless otherwise shown or directed. Careful grading around doorways and steps is required to prevent puddling. Sidewalk grading shall be in accordance with ADA requirements. Review sidewalk grading with the Resident Project Representative before concrete is placed.

13. GRANITE CURBING

Granite curbing over 3.5' long shall be carefully removed, stockpiled offsite and reset. New curbing shall be installed as necessary to supplement. All granite curbing removed and not reset will remain property of the Owner and shall be delivered to a location as directed by the Owner.

14. RAISING STRUCTURE COVERS AND GRATES

The Contractor shall include one structure and casting (sewer and drainage) adjustment to be considered subsidiary to the bid items. Water and gas valves will be set to binder and final grade as a subsidiary item to the work.

15. GEOTECHNICAL INFORMATION (refer to Appendix A)

To assist the Contractor in preparing a bid, borings logs are included in Appendix A of the Project Manual.

16. MANAGEMENT & DISPOSAL OF SOILS and MATERIALS

The contractor is responsible for management and disposal of all surplus soils and materials.

17. DUST CONTROL

Due to the close proximity of businesses and homes to the work zone, the Contractor is required to use a mechanically enclosed street sweeper on paved surfaces when necessary to control dust. Water and/or Calcium Chloride are required on unpaved surfaces to control dust. The City will enforce a strict dust control policy for this project.

18. PEDESTRIAN TRAFFIC

The work areas are in residential neighborhoods and pedestrian traffic corridors need to be maintained on a daily basis. The Contractor will need to separate work zones from pedestrian corridors.

19. WORK HOURS

It is anticipated that the Work will be completed Monday through Friday during daylight hours (7 AM to 5 PM) unless specifically noted otherwise. Requests to perform nighttime or weekend operations must be approved by the City at least 3 days prior to the anticipated construction operations. Additional costs associated with nighttime or weekend operations will be at the Contractor's expense. Holiday work will not be allowed unless permission is granted from the Department.

20. STAGING AREA

The Contractor is required to locate and secure all staging and material storage areas. All staging areas to be secured by the Contractor must be approved in advance by the City. Contractor shall provide a Hold Harmless Release to the City prior to start of use of the staging

area. At the completion of work, the Contractor shall receive a release from the property owners of the staging area(s) and a copy of each release shall be provided to the City prior to final acceptance of the project.

With City approval, the Contractor may use the side of the roadway for staging of pipe and structures (CB's and manholes) providing the following conditions are met (unless approved otherwise by the City).

- A. That structures are placed no sooner than one (1) week preceding installation.
- B. Sidewalks and driveways are unimpeded.
- C. That the Contractor will relocate structures upon notification by the City, if deemed necessary to maintain public relations and/or public safety.
- D. The contractor shall not park in individual driveways or parking areas not owed by the City. Any damage to private areas will be paid for entirely by the contractor.

21. PAVEMENT MARKINGS

Permanent pavement markings are to be reviewed with the Owner's Representative prior to placement. Markings not approved shall be removed at the Contractor's own expense, if requested by the Owner.

22. SALVAGE OF MATERIALS

Existing drainage catch basin grates and frames, granite curb inlets, shall be salvaged to the City of Portsmouth if determine appropriate by the Engineer. All items selected by the City for salvage shall be delivered to a location specified by the City. The City has the right to salvage additional materials as requested. Contractor is to coordinate delivery of materials within the City.

23. ABANDONMENT OF EXISTING PIPE

All pipes to be abandoned (water, sewer, drain, etc.) 12-inch diameter or smaller shall be cut and capped, unless shown otherwise on the Drawings. Existing pipe larger than 12-inches or structures, outside normal excavation limits, to be abandoned, shall be filled with flowable fill or removed. All pipes and structures within the excavation limits shall be removed and disposed of by the Contractor at his own cost.

24. VIBRATION MONITORING

Vibration Monitoring in addition to the vibration monitoring for blasting, required by state and local ordinances, will be provided by the Contractor upon request, if deemed necessary to monitor vibration resulting from the Contractor's equipment, compaction efforts or operations. Vibration monitoring for blasting operations is provided at the Contractors own expense.

25. ARCHEOLOGICAL SENSITIVITY

No archeologically sensitive areas are identified within the project area. However, in the event that archaeological resources are discovered, then the Contractor will stop work immediately and notify Owner's Representatives who will meet to discuss protocols to be employed by the Contractor.

26. WORK ON PRIVATE PROPERTY

The City will obtain homeowner authorization for work on private property. The Contractor will review all sewer and/or drain connection work, pipe locations and grades with the City in advance. Work on private property will need to be scheduled in advance, and the homeowner shall be notified of the Contractor's schedule a week in advance. The City reserves the right to request additional sanitary sewer or storm sewer work, with homeowner's approval, if the work is considered necessary to re-route flows from sewers that will be abandoned by the City. Property restoration, excluding any approved tree removal that may be necessary, is subsidiary to the work and will not be measured for payment. Property restoration will be completed by the Contractor to the existing or better condition.

Work requiring access to buildings will need to be coordinated with the Owner of the property, the Engineer and/or the Portsmouth Sewer Department. Plumbing modifications at building interior, pipe penetration and materials through foundation, and connection outside the foundation, will need to be inspected by the City's Plumbing Inspector. Materials and workmanship shall meet all local ordinances.

27. TREE REMOVAL

The Contractor will remove them during the completion of the work. No trees will be removed without prior approval from the Mayor's Trees and Public Greenery Committee (City of Portsmouth). This approval will be obtained by the City.

28. TRIMMING OF TREES

Tree trimming shall be completed by the City. Prior to the start of the project, or a particular phase of the project, the Contractor shall walk the site and mark all the limbs that will require trimming in order to complete the work and minimize further damage to the tree. Upon approval for all the limbs to be cut by the Engineer and the Owner, the Contractor shall then coordinate with the City to have the required limbs cut. This work shall be incidental and shall not be measured for payment.

29. PROTECTION OF TREES

The Contractor will endeavor to prevent damage to all trees that are designated to remain. Tree limbs that impede normal construction operations will be removed as described in Paragraph 28 above. Trees to be removed are shown on the drawings. Additional limb or tree removal is subject to Owner approval. A penalty will be assessed to the Contractor for damage to trees as follows:

- Limbs damaged following trimming (Paragraph 28): \$100/limb (in addition limbs will require further trimming by Contractor as directed)
- Tree bark or surface scarring: \$10/sq. in. of impact area (\$100 MIN. and \$1000 MAX.)
In addition, Contractor shall remove trees that are, in the opinion of the Owner, significantly altered or cosmetically impaired or terminally damaged.

SUPPLEMENTAL REQUIREMENTS - SUMMARY OF WORK

PART 1 - GENERAL

1.1 WORK UNDER THIS CONTRACT

- A. The work to be completed under this Contract includes all work as shown on the drawings or identified in the contract documents, including but not limited to:
1. Construction of new traffic signal system
 2. Construction of new Storm Sewers
 3. Construct new Water Distribution mains.
 4. Traffic control planning and maintenance of roadways, driveways and trenches.
 5. Piping and structure modifications necessary to tie into existing systems.
 6. Roadway and sidewalk reconstruction.
 7. Complete restoration of all properties both public and private. Restoration shall be performed continuously as the work progresses.

1.2 CONTRACTORS RESPONSIBILITIES

- A. The General Contractor shall have the following responsibilities:
1. Prosecution of Work – The Contractor will perform work in accordance with the Prosecution of Work section of these specifications.
 2. Traffic Control – Coordinate with and submit to the City of Portsmouth Department of Public Works, a Traffic Control Plan for review and approval.
 3. Furnish all labor, materials, equipment and incidentals required to complete all work in accordance with the bid documents within the allotted time schedule and maintain required warranties.
 4. Protect against vandalism. All losses incurred through vandalism are to be reimbursed by the Contractor or Contractor's insurance company.
 5. Coordinate with the City of Portsmouth Department of Public Works, including securing any required permits (i.e., excavation and flagging permits) on all work accomplished within City roadway rights-of-way.
 6. Perform all work within City right-of-way or limits of easements as shown on the drawings unless written authorization is provided for further occupation of private properties.
 7. Coordinate activities involving other utilities with the respective utility companies.
 8. The work also includes but is not limited to furnishing all materials, labor and equipment to perform the following activities:
 - a. Preparation and submittal of contract specified submittals.
 - b. Testing of materials as specified herein.
 9. Contractor shall maintain sanitary and storm flow during construction.
 10. The work zone is located in residential neighborhoods with high volumes of pedestrian traffic. The Contractor shall conduct work in a professional manner. Any unprofessional conduct (i.e., foul language and use of excessive speed) will not be tolerated.

11. Contractor shall maintain access to all homes and businesses while completing the work.

PART 2 - PRODUCTS

2.1 STANDARDS

- A. The contractor shall meet the requirements of the following:
 1. City of Portsmouth standards for construction
 2. NHDES standards for construction

PART 3 - EXECUTION

3.1 WORK SEQUENCE

- A. No work may commence until a Traffic Control Plan has been approved in writing by the Public Works Department.
- B. It is the intention that the work required to be completed under this Contract be performed in an organized and workmanlike manner. Construction areas shall be restored as soon as practical in an effort to minimize disturbance to private and public property. The contractor is responsible for scheduling work to meet these objectives.
- C. Proposed test pits, as shown on the Drawings or as directed by the Engineer, shall be excavated in the presence of the Engineer. Test pits shall be excavated prior to the start of drainage work so that adequate time is allowed to address any required field changes and to allow for sufficient material lead time.
- D. The work will be constructed from the lowest elevations to the highest elevations for each street or as otherwise approved by the Engineer.

3.2 SPECIAL REQUIREMENTS

- A. Contractor shall maintain existing utilities to all existing users at all times. Exceptions will be considered; however, the service interruptions to water and sewers shall not exceed 2 hours.
- B. Where possible the Contractor shall maintain access to all properties during construction. Advance notification shall be provided otherwise.
- C. The Contractor shall schedule and construct pipe installations in such a manner that will minimize the need for temporary pavement repairs. Temporary pavement will be installed only where directed.
- D. Contractor shall maintain repair parts on-site for emergency repair of water system, sewer system, drain lines, etc.
- E. Contractor to receive approval from the City prior to initiating any traffic restrictions or detours, if any.
- F. Asbestos cement sewer pipe if encountered in areas requiring sewer replacement will require special handling. The Contractor shall comply with all local, state and federal requirements governing the handling, removal, transport and disposal of this material.

- G. The Contractor shall maintain one-lane traffic unless road closures are approved by the Public Works Department or noted in the Contract Documents, and all necessary detour signs are in place in accordance with the Traffic Control Plan.
- H. Contractor shall determine the location of existing water and sewer service connections in the field.
- I. If requested by the Owner, the Contractor shall provide a video inspection of all completed storm drain lines installed or rehabilitated in this project.

SUPPLEMENTAL REQUIREMENTS - COORDINATION

PART 1 – GENERAL

- 1.1 **DESCRIPTION** All damage to existing structures, utilities, or pipelines, as a result of digging test pits, shall be paid by the Contractor. All materials shall be the responsibility of the Contractor. Coordinate operation of utilities with the owner of the utility. Do not interrupt utility services to businesses or homeowners without the Owner's prior approval. The Contractor, by nature of this project, will be working in close proximity to residents, businesses and traveled ways. Portions of the service work will extend onto private property. The Contractor, under this Contract, will be responsible for coordinating construction activities with the City of Portsmouth, where traffic control is involved, and with property owners in a manner that will lessen impacts, to the extent possible, and to ensure that residents, business services, facilities, and safe working conditions are maintained.
- A. Any damage to existing structures, equipment and property as a result of the Contractor's or their subcontractor's operations shall repaired/restored by the Contractor at no additional cost to the Owner.
 - B. The Contractor will be responsible for developing a Traffic Control Plan and for coordinating its implementation with the City, local businesses and residents. The Contractor shall coordinate the relocation of Traffic Control measures and devices as needed to move traffic through and/or around the Work Zone or as directed by the Public Works Departments.
 - C. The contractor shall be responsible for the maintenance of sanitary and storm flows during construction
 - D. The Owner will be responsible for the operation of all existing facilities and any new facilities accepted during the construction period.
 - E. The Contractor shall notify the Engineer in writing when, in his opinion, a portion of the construction is ready to be accepted by the Owner. After inspection of the work the Engineer will either recommend that the Owner accept the portion of construction or shall identify remedial work needed to be performed by the Contractor.
 - F. All damage to existing or accepted equipment or structures, as a result of the Contractor's or his Subcontractor's operations shall be paid by the Contractor at no additional cost to the Owner.

1.2 COORDINATION WITH OTHERS:

- A. **It will be the responsibility of the Contractor to complete all coordination required with all other utilities, the High School, homeowners and City sub-contractors to complete the work.** The City may be available upon request to provide limited support for homeowner coordination.
- B. City of Portsmouth:
1. Contractor shall coordinate access, egress, detours and traffic control, if required, with the City of Portsmouth's Police Department. The Contractor shall notify the Portsmouth Police, Fire Department and Rescue Squad at least 24 hours in advance of any street closings or detours. All fees for police traffic control details shall be paid by the Contractor.
 2. The Contractor shall be responsible for coordinating and maintaining public services to all public and private properties.
- C. City of Portsmouth: **Department of Public Works (DPW)**
1. The Contractor shall be responsible for obtaining all opening and utility location permits.
 2. The Contractor shall be responsible for coordinating access, egress, detours and traffic control on all City roadways with the City DPW.
 3. The Contractor shall be responsible for coordinating the operation of valves and work in the vicinity of water lines with the DPW.

Portsmouth Water/Sewer Division

600 Peverly Hill Road

Portsmouth, NH 03801

(603) 427-1552 (Primary contact, DPW Dispatch)

Dispatch (City Emergency Services)

(603) 427-1530

John Adams (Sewer and Water)

(603) 766-1430

D. Power, Cable, and Phone

1. The Contractor shall be responsible for coordinating all work in and around existing utility facilities (aerial and below ground) and bear all costs of inspection requirements, temporary facilities relocation and all other requirements.
2. The following is a list of contacts for utilities in the project area:

Eversource (PSNH)

Mark Collins 332-4227 ext 5555325

mark.collins@eversource.com

Fairpoint

Joe Considine

1575 Greenland Road

Greenland, NH

(603) 427-5525 (phone)

(603) 427-2090 (fax)

Comcast (Cable)
Mike Collins
334B Calef Highway
Epping, NH 03042
(603) 679-5695 X 1037

E. Public Services to Private Properties

The Contractor shall be responsible for coordinating and maintaining public services to all properties. The Contractor shall notify police and fire departments and rescue squad at least 24 hours in advance of any street closings and detours.

F. Gas

1. The Contractor shall be responsible to coordinate protection of all existing gas mains in close proximity to the proposed work.

Unitil (Gas Division)
Phil Johnson
325 West Road
Portsmouth, NH 03801
(603) 294-5157

- G. The Contractor shall sequence daily operations to accommodate school bus schedules and weekly trash and recycling pickup. The day and time of pick-up may vary based on location of work.

SUPPLEMENTAL REQUIREMENTS - ADDITIONAL MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. For all items other than those to be paid for by lump sum amounts, after the work is completed and before final payment is made therefore, the Owner's Representative shall make final measurements to determine the quantities of various items of work accepted as the basis for final settlement. The Contractor, in the case of unit price items, will be paid for the actual amount of work accepted and for the actual amount of materials in place, as shown by the final measurements.
- B. All units of measurement shall be standard United States convention as applied to the specific items of work by tradition and as interpreted by the Engineer.
- C. At the end of each day's work, the Contractor's Superintendent or other authorized representative of the Contractor shall meet with the Owner's Representative and determine and agree upon the quantities of unit price work accomplished and/or completed during the work day.
- D. The Representative will then prepare a "Field Report" which shall be signed by both the Representative and Contractor's Representative indicating complete agreement and approval of the quantities listed.
- E. Once each month the Representative will prepare a "Monthly Progress Summation" form from the month's accumulation of "Field Report" which shall also be signed by both the Representative and Contractor's Representative indicating complete agreement and approval of quantities listed.
- F. 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 may not be included for payment. Items appearing on forms not properly signed by the Contractor may not be included for payment.
- G. The Contractor will prepare and submit the Pay Application for approved work completed in the payment period to the Owner's Representative. Upon recommendation from the Representative, the Owner will complete a final review and, if satisfactory, approve the Pay Application for payment.
- H. Samples of the above referenced forms are included at the end of this section of the Specifications.
- I. The Contractor shall submit a cost breakdown of all lump sum items for payment purposes. This cost breakdown shall be submitted prior to Contract signing and shall be approved by the Engineer.
- J. Payment Application will only be prepared in a form acceptable to the Owner and approved by the Engineer. The form shall be in a computer spreadsheet format and exportable to MS EXCEL. (Sample Forms attached).

1.2 SCOPE OF PAYMENT

- A. Payments to the Contractor will be made for the actual quantities of Contract items performed and accepted in accordance with the plans and specifications. Upon

completion of the construction, if these actual quantities show either an increase or decrease from the quantities given in the Bid (form), the Contract unit prices will still prevail, except as provided hereinafter.

- B. The Contractor shall accept compensation, as herein provided, in full payment for furnishing all materials, labor, tools, equipment and incidentals necessary to complete the work and for performing all work included in the Contract; for all loss or damage arising from the nature of the work, or from the action of the elements; or from any unforeseen difficulties which may be encountered during the prosecution of the work and until its final acceptance by the Engineer; and for all risks of every description connected with the prosecution of the work, except as provided herein, also for all expenses incurred in consequence of the suspension of the work as herein authorized.
- C. The payment of any partial estimate or of any retained percentage except by and under the approved final invoice, in no way shall affect the obligation of the Contractor to repair or replace any defective parts of the construction or to be responsible for damage due to such defects.

1.3 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

- A. When alterations in the quantities of work not requiring supplemental agreements are ordered and performed, the Contractor shall accept payment in full at the Contract price for the actual quantities of work done. No allowance will be made for anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as stipulated in such agreements.

1.4 ELIMINATED ITEMS

- A. Should any items contained in the Bid (form) be found unnecessary for the proper completion of the work contracted, the Engineer may eliminate such items from the Contract, and such action shall in no way invalidate the Contract, and no allowance will be made for items so eliminated in making final payment to the Contractor.

1.5 PARTIAL PAYMENTS

- A. Partial payments shall be made monthly as the work progresses. All partial payments shall be subject to correction in the final quantity invoice and payment.
- B. No monthly payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the Contract, or when, in his judgment, the total value of the work done since the last payment amounts to less than \$1,000.00.
- C. The partial payments will be based upon invoices prepared by the Engineer of the value of the work performed, and materials complete in place in accordance with the Contract. Retainage shall be as specified in the General Requirements – Measurement and Payment Section. The Owner shall pay the Contractor within 45 days of receipt of the Engineer approved invoiced amount.

1.6 PAYMENT FOR MATERIAL DELIVERED ON LUMP-SUM PROJECTS

- A. At the discretion of the Owner, the Engineer may act upon the request of the Contractor, prepare an invoice, accompanied by receipted bills for payment of all or part of the value of acceptable, nonperishable materials and equipment which are to be

incorporated into lump sum type contracts, and which have been delivered to the site of the work or in acceptable storage places, and not used at the time of such invoice. Materials, when so paid for by the Owner, shall become the property of the Owner, and in the event of default on the part of the Contractor, the Owner may use, or cause to be used, these materials in the construction of the work provided for in the Contract. The Contractor shall be responsible for any damage to, or loss of, these materials in accordance with Contract insurance requirements. The amount thus paid by the Owner shall go to reduce estimated amounts due the Contractor as the material is used in the work.

- B. No partial payment shall be made upon fuels, supplies, lumber, false work, or other materials, or on temporary structures of any kind which are not a permanent part of this Contract.

1.7 FINAL PAYMENT

- A. The Engineer shall make, as soon as practicable after the completion of the project, a final quantity invoice of the amount of work performed under the Contract and establish the value of such work.
- B. The Owner shall retain a sum determined in accordance with the General Requirements, Measurement and Payment Section of the final Contract cost for an one-year warranty period commencing on the date of substantial completion.
- C. The Owner shall then pay the entire sum found to be due, after deducting there from all previous payments and the aforementioned retainage. In addition, any amounts to be retained or deducted under the provisions of the Contract may be held by the Owner for a period of sixty (60) days after the completion of the final quantity invoice, or until such time as the Contractor submits satisfactory evidence that all bills for labor and materials used under this Contract have been paid and all required documents submitted to the Engineer.

1.8 INCIDENTAL OR SUBSIDIARY WORK

- A. Incidental work items for which separate payment is not measured includes the following items:
 - 1. Clearing, Grubbing and Stripping.
 - 2. Clean Up.
 - 3. Sod or Loam and Seeding unless paid for under other items.
 - 4. Restoration of property or repairs to any facilities that are impacted from construction performed by the Contractor unless otherwise paid for.
 - 5. Cooperation with utility companies, Owner's representatives, or other Contractors employed by the Owner.
 - 6. Utility crossings, unless otherwise paid for.
 - 7. Utility relocation unless otherwise paid for.
 - 8. Minor items - Such as replacement/relocation of mailboxes, guard rails, rock walls, etc.
 - 9. Dewatering, unless otherwise paid for.
 - 10. Steel and/or wood sheeting utilized by the Contractor other than sheeting left in place or removed when directed by the Engineer and paid for under a separate item.

11. Repair to utilities damaged as a result of Contractor operations
12. Maintenance of Sanitary/Storm Sewerage flows (by-pass pumping) is subsidiary to sewer construction, unless otherwise included in the bid schedule for payment.
13. Temporary roadway stabilization materials (crushed gravel or reclaimed asphalt product) unless paid for under separate items.
14. Prosecution of Work in accordance with project specifications.
15. Dust control is required on a daily basis.
16. Any work shown or described on the drawings or in the Contract Documents, for which no pay item exists, shall be considered subsidiary to the project and will not constitute additional payment.

SPECIAL PROVISIONS

Amendments to Standard Specifications:

304	Aggregate Base Course
306	Reclaimed Stabilized Base
401	Plant Mix Pavements – General
403	Hot Bituminous Pavement
570	Stone Masonry
603	Culvert and Storm Drains
604	Catch Basins, Drop Inlets and Manhole Covers
607	Fences
608	Sidewalks
615	Traffic Signs
616	Traffic Signals
618	Uniformed Officers and Flaggers
619	Maintenance of Traffic
632	Retroreflective Pavement Markings
645	Erosion Control

Supplemental Specifications:

611	Water Installation
612.302	Replace Sewer Manhole Frame & Cover
637.3	Reset Granite Post

SPECIAL PROVISION

AMENDMENT TO SECTION 304 – AGGREGATE BASE COURSE

ITEM 304.301

CRUSHED GRAVEL

CUBIC YARD

The work under these items shall conform to the relevant provisions of Section 304 of the Standard Specifications and the following.

Method of Measurement

Amend 4.1 to read:

Roadbed base course materials of crushed gravel shall be measured by the cubic yard using average lengths, widths and depths of the area to be filled as determined by the engineer.

Basis of Payment

Amend 5.1 to read:

Roadbed base course materials of crushed gravel will be paid for at the Contract unit price per cubic yard complete in place.

Add to Pay items and units:

304.301

Crushed Gravel

CUBIC YARD

SPECIAL PROVISION

AMENDMENT TO SECTION 306 – RECLAIMED STABILIZED BASE

<u>ITEM 306.208</u>	<u>RECLAIMED STABILIZED BASE REMOVED AND REHANDLED, 8” DEEP (F)</u>	<u>SQUARE YARD</u>
<u>ITEM 306.36</u>	<u>STONE FOR RECLAIMED STABILIZED BASE</u>	<u>TON</u>

The work under these items shall conform to the relevant provisions of Section 306 of the Standard Specifications and the following.

Add to Description:

- 1.2** The following work shall be included in the item:
 - 1.2.1** Lower existing utility structures to a depth below the material to be scarified.
 - 1.2.2** Prepare road surface in accordance with reclaimer manufacturer recommendations.
 - 1.2.3** Reclaim roadway to specifications listed below.
 - 1.2.4** Regrade stabilized base according to typical section.
 - 1.2.5** Provide additional material or remove excess material to achieve the required profile and cross-section.
 - 1.2.6** Raise existing utility structures as specified.
- 1.3** The following work shall not be included in the item:
 - 1.3.1** Reclamation of pavement beyond the limit of work for the convenience of the Contractor. Strict attention shall be made to minimize damage to pavement outside the limit of work.

Materials

Add to 2.1

- 2.1.4** Additional stone for reclaimed stabilized base shall be 1 ½” – 2” angular crushed stone.

Construction Requirements

Add to 3.1:

3.1.1 Use only a self-propelled or towed reclaiming machine specifically designed to process the existing asphalt surface and a specified amount of subsurface gravel to the tolerances specified herein.

3.1.2 Equipment Needed: Hammer Mill, Bomag type reclaimer or other approved equivalent, grader, water truck, vibratory roller, towing unit for reclaiming unit if not self-propelled.

Add to 3.5:

3.5.1 If required by the engineer, Contractor shall take samples of the existing pavement and base gravel to determine the need for additional gravel and bituminous asphalt. Samples shall be taken at an interval of not less than one every 200 linear feet of roadway to be reclaimed.

3.5.2 Testing shall be performed at an NHDOT approved laboratory in accordance with AASHTO T 164.

Add 3.13:

3.13.1 All utility structures shall be lowered to prevent damage by the processing.

3.13.2 Where applicable, cut pavement according to Section 02555 of the Specifications.

3.13.3 The road surface and an approximately equal thickness of gravel base shall be reclaimed.

3.13.4 Reclaiming:

3.13.4.1 Apply water to insure optimum water content.

3.13.4.2 The reclaimer shall process the material to the specified gradation.

3.13.4.3 The process shall be repeated until the "Stabilized Base" meets the required specification.

3.13.5 Placement of the Stabilized Base:

3.13.5.1 Where specified remove the stabilized base and perform the necessary regrading of the underlying roadbed in accordance with the plans and profiles, typical specifications or as directed by the Engineer.

3.13.5.2 The stabilized base shall be compacted in accordance with NHDOT Section 304, "Aggregate Base Course", current edition.

3.13.5.3 The finish grade shall not vary more than plus or minus a quarter inch (+/- 1/4") from a ten foot (10') straight line applied parallel to or perpendicular to the centerline.

3.13.5.3 Excess material becomes the property of the contractor unless otherwise specified on the contract drawings or in Section 01611 - Owner's Right to Materials, of this document.

3.14. Contractor shall sawcut existing drives in accordance with the standard details on the plans.

SPECIAL PROVISION
AMENDMENT TO SECTIONS 401 AND 403

(02551)

<u>ITEM 403.11</u>	<u>HOT BITUMINOUS PAVEMENT, MACHINE METHOD</u>	<u>TON</u>
<u>ITEM 403.119</u>	<u>HOT BITUMINOUS PAVEMENT, MACHINE METHOD, HIGH STRENGTH</u>	<u>TON</u>
<u>ITEM 403.12</u>	<u>HOT BITUMINOUS PAVEMENT, HAND METHOD</u>	<u>TON</u>
<u>ITEM 403.99</u>	<u>TEMPORARY BITUMINOUS PAVEMENT</u>	<u>TON</u>

The work under these items shall conform to the relevant provisions of Sections 401 and 403 of the Standard Specifications and the following.

Description

1.1 Description

- A. Work Included: Furnish and install bituminous concrete pavement courses in accordance with Sections 401 of the NHDOT Standard Specifications for Road and Bridge Construction (latest edition) and as specified in this section.
- B. All reference to NHDOT, NHDOT personnel or the Department may be construed as the Engineer, the City of Portsmouth, their agents and their representatives.

1.2 Quality Assurance

- A. Work shall conform to NHDOT Section 401, Tier 2 except as noted herein:
 - 1. Ride Smoothness: Section 401.3.17.3.4.1 shall apply except variations exceeding **3/8** inch in profile or cross slope shall be eliminated.
 - 2. Ride Smoothness: Section 401.3.17.3.4.4 shall apply except high points **0.5** inches in 25 feet shall corrected.

Materials

2.1 Materials

- A. Materials shall conform to NHDOT Section 401 except the following:
 - 1. **The maximum amount of Total Reused Binder (TRB) in the pavement mix design shall be .5% and the mix shall meet all volumetric mix design criteria.**
 - 2. Asphalt Cement shall not contain any form of used, recycled or refined oil. Suppliers of PG Binder shall certify that the PG Binder does not contain any used, recycled or refined oil.
 - 3. All 3/4 inch (19mm) and 1 inch (25mm) pavement mixes shall be designed using the 50 gyration N design, unless specified otherwise.
 - 4. Liquid asphalt cement binder shall have a Performance Grade (PG) of PG 64-28 for all standard bituminous and PG 64-E for all high strength bituminous pavements.
 - 5. All high strength asphalt, when specified, shall be 50 gyration unless otherwise directed.

2.2 Pavement Mix Designs

Pavement mix designs shall meet NHDOT Section 401.2.5.1 except the following:

A. Minimum asphalt binder content shall be as follows:

Minimum Asphalt Binder Content		
Mix Type	50 Gyration	75 Gyration*
3/8-in (9.5 mm)	6.3	5.9
1/2-inch (12.5 mm)	5.9	*
3/4-inch (19 mm)	5.3	*

The required minimum asphalt content is based on the use of aggregate with a specific gravity of 2.65 to 2.70. The minimum asphalt content requirement may be adjusted when aggregate with a higher specific gravity is used, or the minimum may be adjusted at the Engineer’s discretion if it is believed to be in the best interest of the Owner. All mix designs shall be submitted to the Engineer for verification and approval.

*75 Gyration mix is not allowed for these sizes without express written permission of the engineer.

B. Method Requirements NHDOT Section 401.2.6 shall apply including the following:

1. Coarse Aggregate: Stockpiled coarse aggregate shall meet the requirements of 2.6.1, Table 2.
2. Tolerances: All mixtures shall conform within the range of tolerances provided in NHDOT Section 401.2.6.2
3. When Non-Compliant test result, it shall be the Contractor’s responsibility to correct non-compliant pavement. The Contractor may be required to remove non-compliant material that is poorly graded or material exhibiting cracks, open joints or other imperfections (**no payment will be made for this material or its removal**).

Construction Requirements

Construction requirements shall be in accordance with Sections 401 of the NHDOT Standard Specifications for Road and Bridge Construction (latest edition) **and** as specified in this section.

1. Prior to placing any mix, a mix design shall be submitted for approval and pre-paving conference shall be held with the Owner, Contractor, and Engineer to discuss the proposed paving schedule, source of mix, type and amount of equipment to be used, sequence of paving pattern, rate of mix supply, traffic control, and general continuity of the operation. Special attention shall be made to the paving pattern sequence to minimize cold joints.
2. The Contractor shall notify the Engineer one week in advance of paving operations to allow sufficient time for scheduling personnel.
3. Any pavement course four inches (compacted depth) or greater shall be placed and compacted in two lifts.
4. Sweeping. Existing pavement or previously laid courses shall be thoroughly dry and free from all dust, dirt, and loose material. Sweeping with a power broom, supplemented by hand brooming, may be necessary.
5. Tack coat. Surfaces of any pavement course shall have a tack coat of emulsified asphalt applied in accordance with NHDOT Specifications. Application of emulsified asphalt shall be between 0.03 and 0.05 gal/yd².

6. Joint adhesive shall be used for all transverse and lateral seams when placing more than 100 tons of asphalt or more. This item is subsidiary unless a separate pay item is provided.
6. Utility covers, frames and grates, valves and other castings shall be set and raised. Contact surfaces of the drainage and utility castings shall be painted with a thin coating of suitable bituminous material. Surface pavement shall be removed from covers and castings immediately following pavement operations.
7. Method requirements NHDOT Section 401.3.1.2 shall apply.
8. In addition to 3.1.A.7 above, the following performance requirements shall apply:
 - a). Tier 2 QA/QC performance requirements shall apply.
 - b). Ride Smoothness: NHDOT Section 401.3.17.3.4.1 shall apply except variations exceeding **3/8** inch in profile or cross slope shall be eliminated.
 - c). Ride Smoothness: Section 401.3.17.3.4.4 shall apply except high points 0.5 inches in 25 feet shall corrected.

SPECIAL PROVISION
AMENDMENT TO SECTION 570 – STONE MASONRY

ITEM 570.31

STONE MASONRY WALL (F)

CUBIC YARD

The work under this item shall conform to the relevant provisions of Section 570 of the Standard Specifications, the detail on the plans and the following.

Add to Section 1.1:

1.2 Visual Reference. The following image is intended to serve as a visual reference for the construction of the stone masonry wall. Dimensions shall be 2' wide and 3' high (exposed).



Amend the Mortar Squared Stone information within Table 570-2 to consist of the following:

Class of Masonry	Type of Stone	Joint Material	Max. Thickness
Mortar Squared Stone	Squared	Cement mortared core with dry look from the exterior	1

Add to Section 3.2:

3.2.8 The cap of the wall shall be crowned or pitched to one side to direct water away from the core of the wall. Over the length of the wall there shall be 3 locations where stone will extend the entire width of the cap.

Pay item and units:

570.31	Stone Masonry Wall (F)	Cubic Yard
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SPECIAL PROVISION

AMENDMENT TO SECTION 603 – CULVERT AND STORM DRAINS

<u>ITEM 603.82212</u>	<u>12" PE PIPE (TYPE S)</u>	<u>LINEAR FOOT</u>
<u>ITEM 603.82215</u>	<u>15" PE PIPE (TYPE S)</u>	<u>LINEAR FOOT</u>
<u>ITEM 603.83312</u>	<u>12" POLYPROPYLENE PIPE (TYPE S)</u>	<u>LINEAR FOOT</u>

The work under these items shall conform to the relevant provisions of Section 603 of the Standard Specifications and the following.

Add to: 2.3:

2.3.6 Where the item description reads “Polypropylene Pipe”, ADS Sanitite pipe or approved equal shall be used. Polypropylene pipe shall be installed per manufactures specifications.

Replace 3.1.7 to read:

3.1.7 The width of trenches shall be held to a minimum consistent with the space required to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Trenching below the top of the pipe shall be kept to a maximum of the diameter plus three (3) feet. The width of the trench above the pipe may be at the Contractors option as shown in Figure 1-B.

Add to: 3.2:

3.2.3 Bedding material shall conform to Table 703-1 – Required Grading, Graded Coarse Aggregates, Standard Size #4. separated with geotextile fabric consistent with Section 593 as shown in the permanent and temporary trench details. Bedding for pipes located within 36” of the surface shall completely envelop the pipe. Bedding for all pipe lower than 36” from the surface shall include crushed stone bedding to the haunch line of the pipe with geotextile fabric sand backfill above the stone to 2” higher than the crown of pipe.

Replace 5.8 to read:

3.2.3 Backfill, including crushed stone bedding material, geotextile fabric for separation, concrete class F, flowable fill substituted for backfill material shall be subsidiary to the pipe item.

SPECIAL PROVISION

AMENDMENT TO SECTION 604 – CATCH BASINS, DROP INLETS AND MANHOLE COVERS

ITEM 604.62 DRAINAGE MANHOLE COVERS AND FRAMES EACH

The work under these items shall conform to the relevant provisions of Section 604 of the Standard Specifications and the following.

Materials

Add 2.11: Catch basin frames and grates either new or to be replaced shall NHDOT Type B and be fabricated in the USA.

Add 2.12: Drain manhole frames and covers shall dual hinged, Ergo XL from EJIW – 41421025L01. 32” Hinged and gasketed with locking cam and be fabricated in the USA.

Construction Requirements

Add 3.10: All test pits shall be conducted prior to ordering drainage materials. Test pits are required at all locations shown on plans and as directed by the engineer.

Method of Measurement

Amend 4.3: Frames with grates or manhole covers will be measured by the number of units installed except when they are a part of a structure measured under 4.1. A cover and frame will be a unit; and a grate and frame will be a unit. Installation of drain manhole frames and covers will not be measured for payment, they will be considered subsidiary to the drain manhole structure pay item.

Basis of Payment

Amend 5.3: The accepted quantities of frames and grates of manhole covers will be paid for at the Contract unit price per each unit, complete in place, including setting to final grade. Installation of the drain manhole frames and covers will be considered subsidiary to the drain manhole structure pay item.

SPECIAL PROVISION
AMENDMENT TO SECTION 607 - FENCES

ITEM 607.5106 **WOOD STOCKADE FENCE, 6'-0" HIGH** **LINEAR FOOT**

The work under these items shall conform to the relevant provisions of Section 607 of the Standard Specifications and the following.

Description

1.1 Work under this item shall include furnishing and installing a 6-foot timber stockade fence in the location indicated on the plans or directed by the Engineer.

Materials

2.1 Timber fence materials shall be new and without defect. All materials shall meet the approval of the Engineer. Wood fences shall be pressure-treated with chromated water-borne copper arsenate per AWPB LB-22 at the rate of 0.60 pounds per cubic foot. Prior to pressure treatment, posts shall be kiln-dried to a maximum 15 percent moisture content.

Construction Requirements

3.1 The posts shall be set true to the line and grade of the proposed fence. All fencing panels shall be 6 feet in height.

Basis of Payment

5.1 Payment for this work will be at the contract unit price per foot, and shall include all equipment, materials and labor costs for a complete installation as described herein.

Pay item and units:

607.5106	Wood Stockade Fence, 6'-0" High	Linear Foot
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SPECIAL PROVISION
AMENDMENT TO SECTION 607 - FENCES

ITEM 607.9804 RESETTING SPLIT RAIL WOOD FENCE LINEAR FOOT

The work under these items shall conform to the relevant provisions of Section 607 of the Standard Specifications and the following.

Basis of Payment

5.1 The accepted quantity of posts, railing or fencing reset will be paid for at the Contract unit price per linear foot complete in place. The cost of furnishing additional materials, removing old concrete embedment from the posts, and replacing damaged hardware, as directed by the Engineer, shall be subsidiary to the resetting item.

Pay item and units:

607.9804	Resetting Split Rail Wood Fence	Linear Foot
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SPECIAL PROVISION
AMENDMENT TO SECTION 608 -- SIDEWALKS

ITEM 608.29

BRICK WALKWAY

SQUARE YARD

The work under these items shall conform to the relevant provisions of Section 608 of the Standard Specifications and the following.

Description

1.1 The work shall consist removing and relaying an existing privately owned brick walkway as shown on the plans in order to transition the existing walkway to the proposed back of sidewalk elevation and as directed in the field by the Engineer.

Materials

2.1 The existing brick shall be reused where possible. If existing bricks are broken or if new units are necessary to reset the walkway, they shall be of the same color and texture as the existing. All existing units shall be thoroughly cleaned before being reset.

Construction Requirements

3.1 All labor and materials shall conform to the State of New Hampshire Standard Specifications for Road and Bridge Construction, Section 608.

3.2 The depth of excavation will depend on the final grades required. All unsuitable material shall be removed and disposed of off-site at the Contractor's own expense.

3.3 The base material for the walkway shall consist of 8" of Item 304.301 crushed gravel. If the existing base is of another material, that material may be used subject to the approval of the Engineer

3.4 The Contractor shall lay the bricks to match the existing pattern of the walkway that is not impacted by the grading.

3.5 The walkway shall have a 2% maximum cross slope to ensure drainage. The maximum running slope shall be 5% or as directed by the Engineer.

3.6 If necessary, the Contractor shall install edging to hold the bricks in place.

Method of Measurement

4.1 Brick Walkways shall be measured for payment by the square yard of Brick Walkway installed, complete in place.

Basis of Payment

5.1 Brick Walkways will be paid for at the Contract unit price per square yard of Brick Walkway installed, which price shall include all labor, materials, equipment and incidental costs required to complete the work. Crushed gravel, if needed, will be paid for separately under Item 304.301.

Pay item and units:

608.29	Brick Walkway	Square Yard
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SUPPLEMENTAL SPECIFICATION

SECTION 611 – WATER INSTALLATION

<u>ITEM 611.710061</u>	<u>REPLACE GATE VALVE BOX</u>	<u>EACH</u>
<u>ITEM 611.81100</u>	<u>ADJUSTING/RELOCATING HYDRANTS</u>	<u>EACH</u>
<u>ITEM 611.90001</u>	<u>ADJUSTING WATER GATES AND SHUTOFFS</u>	<u>EACH</u>
	<u>SET BY OTHERS</u>	

Description

PART 1 DESCRIPTION

1.01 SCOPE OF WORK

- A. The Contractor shall relocate all hydrants as shown on the Contract Drawings and specified herein.

1.02 SUBMITTALS

- A. Submit to the Engineer five (5) sets of shop drawings detailing the type and class of materials to be furnished. The Contractor shall not purchase the pipe prior to the Engineer's approval of the shop drawings.

Materials

PART 2 MATERIALS

2.01 DUCTILE IRON PIPE AND FITTINGS

- A. The Ductile Iron pipe shall designed in accordance with AWWA C150 and shall be manufactured in accordance with AWWA C151. The Ductile Iron pipe shall conform to the ANSI A21.50, A21.51 Specifications for Ductile Iron Pipe.

PIPE SIZE	Thickness (inches)	Thickness Class	Rated Working Pressure
6"	0.31	52	350
8"	0.33	52	350
10"	0.35	52	350
12"	0.37	52	350
16"	0.34	50	350
16"	0.40	52	350

- B. Pipe fittings shall be ductile iron and shall conform in all respects to ANSI 21.10 and 21.11 (AWWA C110 and C111) and shall be mechanical joint. Compact fittings 3 inches through 16 inches shall conform to ANSI/AWWA C152/A21.53

and shall be mechanical joint. Compact fittings larger than 16 inches shall not be used. All fittings shall be restrained with restrainer glands (Megalug or equal).

- C. Pipe shall be of the push-on type, unless specified, mechanical joint or flanged as shown on the Contract Drawings.
- D. All pipe and fittings shall be furnished with a cement lining on the inside of the pipe. The lining shall be twice the thickness as specified in ANSI A21.4 (AWWA C104). The cement lining shall be given a seal coat of asphalt material. Asphalt seal coat shall not impart taste or odor, or toxic or carcinogenic compounds to the water contained therein. Asphalt seal coat shall be a product acceptable to the U.S. E.P.A. for use in potable water and shall be so listed in the most current E.P.A. summary of approved products. The asphalt seal coat shall be applied and cured in strict conformance with the coating manufacturer's cautions and instructions. The seal coat shall be applied by the pipe manufacturer or supplier, under controlled factory conditions. Field application is strictly prohibited.
- E. All ductile iron pipe for buried service shall be furnished with a minimum of 1 mil thick bituminous coating on the outside of the pipe.
- F. All fittings shall be cement lined and coated inside and out, as specified hereinbefore for ductile iron pipe. Branch of tees for hydrants or stubs shall be mechanical joint anchoring tees.
- G. All fittings shall be Class 350 and all fittings shall conform to the weights and dimensions shown in the latest edition of the CIPRA Handbook of Ductile Iron Pipe and Cast Iron Pipe.
- H. Where required, flanged fittings shall be furnished and installed. Fittings shall be ductile iron as specified or as shown, and shall have Class 125 drilled flanges and shall conform in every respect to the applicable requirements of AWWA C115 and ANSI B16.1.
- I. Retainer glands with double heat treated set screws shall be furnished as required or as shown on the contract drawings for all fittings, caps and plugs subject to movement by line surge or internal pipe stresses.
- J. Joint accessories shall consist of high strength ductile iron glands, rubber gaskets, tee head or hex head bolts and nuts. Nuts and bolts shall be made of low alloy steel or stainless steel as required, where corrosive soils and/or saltwater conditions exist. Bolts and set screws shall be torqued in accordance with the manufacturer's recommendations.

2.02 PUSH-ON JOINTS

- A. Push-on joints shall meet all the requirements of ANSI A21.11 and shall consist of a single continuous, molded, rubber ring gasket; a bell socket cast integrally with the pipe or fitting; and a plain end. The configuration shall be such that when the plain end is inserted into the pipe fitting socket, the gasket shall be compressed radially to form a positive seal. The gasket and annular space shall be so designed and shaped that the gasket is locked in place after the plain end is inserted into the fitting socket.
- B. Push-on joints shall have the same pressure rating as the pipe or fitting of which they are a part.
- C. Gaskets for push-on joints shall be vulcanized natural or synthetic rubber. All gaskets shall be free of porous areas, foreign material and visible defects.
- D. All pipe and fittings shall be supplied with silicon bronze serrated wedges.

2.03 MECHANICAL JOINTS

- A. Mechanical joints shall meet all the requirements of ANSI A21.11 and consist of: a bell socket cast integrally with the pipe or fitting and provided with an exterior flange having bolt holes and a socket with annular recess; a plain end; a continuous molded, rubber ring gasket and; a follower with bolt holes, tee head bolts and hexagonal nuts.
- B. Mechanical joints shall have the same pressure rating as the pipe or fitting of which they are a part.
- C. Glands for mechanical joints shall be cast or ductile iron and be stamped with the manufacturer's identification, nominal size and material type. Glands shall receive a bituminous coating at the shop.
- D. Rubber gaskets for mechanical joints shall be natural or synthetic vulcanized rubber, free of porous areas, foreign materials and visible defects.

2.04 FLANGED JOINTS

- A. Flanged joints shall meet all the requirements of ANSI A21.15 and ANSI A21.10 and shall consist of two threaded flanges: flange gasket and bolts with square or hexagonal shaped heads and hexagonal nuts.
- B. Threaded flanges shall be individually fitted and machine tightened on the threaded pipe by manufacturer. Threaded flanges shall not be installed in the field. Flange faces shall be machined.
- C. Pipe furnished with flanges at each end shall have the bolt holes aligned.

- D. Flange gaskets shall be ring or full face rubber and be 1/8 inch thick.
- E. Flange fittings will not be used in buried applications.

2.05 PIPE MARKING

- A. The weight, class or nominal thickness and casting period shall be shown on each piece of pipe. The manufacturer's mark, year of fabrication and the letters "DI" or the word "Ductile" shall be cast or stamped on in letters and numerals not less than 1/2-inch in height.

2.06 GATE VALVES

- A. All gate valves shall be manufactured in full compliance with the content and intent of this specification. Gate valves shall be iron body, resilient wedge type with 8 mil epoxy coating inside and out, with two inch operating nut. Valves shall have mechanical joint hubs. Gate valves shall conform in every respect to AWWA C509. Valves shall be designed for 200 psi working and 300 psi test pressure. Valves shall open as those in use by the Owner.
- B. Valves shall also conform to the specifications of the AWWA as to size of stem, pitch of thread, etc. The gasket seating area shall be fully machined to fixed dimensions and tolerances as per AWWA specifications. All valves shall be provided with "O" rings. The design of the valve is under pressure in a fully open position. Cartridge O-ring type gate valves, if accepted, shall be furnished with a spare cartridge for each valve accepted.
- C. Exterior surfaces of all valves shall be coated with a minimum of three applications of an approved bituminous solution, on a rust-free casting, prior to shipment. Body ring shall be free of any bitumastic solution.
- D. Gate valves shall be manufactured by Clow Valve Co., Oskaloosa, IA; Mueller Co., Decatur, IL; American Valve and Hydrant, Birmingham, AL; Waterous Co., St. Paul, MN; or approved equal.

2.07 CONCRETE FOR THRUST BLOCKS

- A. Concrete for thrust blocks shall have a minimum compressive strength of 3,000 psi and shall conform to the contract drawings.

2.08 DRESSER COUPLING

- A. "Dressers" shall be mechanical joint with ductile iron glands.

- B. Ductile iron “Dressers” shall conform to AWWA Specification C110. Solid sleeves, plugs and caps shall also be ductile iron and conform to AWWA Specification C110.
- C. Coupling and bolts shall receive two coats of bituminous paint – Inertol No. 66 Special Heavy – after installation.

Construction Requirements

PART 3 CONSTRUCTION REQUIREMENTS

3.01 HANDLING AND CUTTING PIPE

- A. Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe or lining, scratching or marring machined surfaces and abrasion of the pipe coating or lining.
- B. Any fitting showing a crack and any fitting or pipe which has received a severe blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work.
- C. In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portion, if so approved, may be cut off by and at the expense of the Contractor before the pipe is laid so that the pipe used may be perfectly sound. The cut shall be made in the sound barrel at a point at least 12 inches from the visible limits of the crack.

3.02 INSTALLING PUSH-ON JOINT PIPE AND FITTINGS

- A. Prior to assembling, the bell and plain end shall be cleaned of all foreign matter. Push-on joints shall be made up by first inserting the gasket into the groove of the bell and applying a thin film of special non-toxic gasket lubricant, supplied by the pipe manufacturer, uniformly over the inner surface of the gasket which will be in contact with the spigot end of the pipe. The end of the plain pipe shall be chamfered to facilitate assembly. The end shall be inserted into the gasket and then forced passed it until it seats against the bottom of the socket. Bedding and backfill requirements shall be as shown on the Contract drawings.
- B. Where proper separation distance cannot be maintained between the ductile iron water main and an existing sewer or drain pipe crossing; the pipe shall be laid so the closest joint in the water main is a minimum of ten feet (10') from the crossing.

3.03 DEFLECTION OF PIPE

- A. When laying ductile iron pipe, the deflection at the joints shall not exceed 3 degrees or 12 inches for a 16 foot length of pipe.

3.04 INSTALLING MECHANICAL JOINT PIPE AND FITTINGS

- A. Prior to assembling mechanical joints the bell and plain end shall be cleaned of all foreign matter and then brushed with non-toxic gasket lubricant supplied by the pipe manufacturer. With the follower gland and gasket on the plain end, seat the plain end into the bell and press the gasket evenly and firmly into the bell. Move the follower gland into position for bolting and insert all nuts and bolts and make finger tight. The follower gland shall be tightened evenly using a torque wrench on opposite bolts until all are made up. Bedding and backfill requirements shall be as shown on the Contract drawings. All nuts and bolts shall be given a bituminous coating after bolts are tightened. All fittings shall be rodded to the other fittings or a restraining gland placed on the pipe.
- B. Where proper separation distance cannot be maintained between the ductile iron water main and an existing sewer or drain pipe crossing; the pipe shall be laid so the closest joint in the water main is a minimum of ten feet (10') from the crossing.

3.05 POLYETHELENE ENCASUREMENT

- A. Where indicated, piping to be encased shall be thoroughly cleaned of all soil and debris prior to installation of the polyethylene encasement. No soil or debris shall be allowed to enter the encasement during or after its installation.
- B. Polyethylene encasement shall be installed using Method A as described in AWWA C105, with the encasement joints coincident with pipe joints. Adhesive tape shall be used to secure the encasement.
- C. Minimum overlap of polyethylene encasement shall be 24 inches, 12 inches on each side of pipe joints.
- D. If required, two layers of polyethylene encasement shall be installed. The first layer shall be completely installed on and secured to the length of pipe before the second layer is installed.
- E. Tears, cuts and other damage shall be repaired with a piece of polyethylene covering secured with adhesive tape, when approved by the Engineer. Otherwise, the damaged length of polyethylene shall be replaced at the Contractor's expense.
- F. Care shall be taken when backfilling to avoid damage to the polyethylene encasement.
- G. Service and fitting connections shall be made by making an x-shaped cut in the polyethylene and folding back the cut film. Immediately following completion of the connection, the film shall be secured to the connection with adhesive tape and the cut area repaired. Service connections shall be wrapped with polyethylene

encasement for a minimum of 3 feet from the point of connection to the encased pipe.

- H. At the junctions between wrapped and unwrapped pipe the polyethylene encasement shall be extended a minimum of 3 feet beyond the end of the pipe scheduled to be encased and the ends of the encasement securely taped so that no soil can enter the encasement.

3.06 REMOVING AND RESETTING EXISTING HYDRANTS

- A. Where shown on the drawings and/or directed by the Engineer, remove existing hydrants and reinstall them at locations designated by the Engineer.
- B. Hydrants shall be set plumb. Earth fill shall be carefully tamped around the hydrants to a distance of 4 feet on all sides of the hydrant, or to the undisturbed trench face, if less than 4 feet. Hydrants and connecting pipe shall have at least the same depth of cover as the distributing main. Hydrants shall be set upon a layer of stone or a slab of concrete not less than 4-inches thick and 15-inches square. The side of the hydrant opposite the pipe connection shall be firmly wedged against the vertical face of the trench with a concrete thrust block, as indicated on the drawings
- C. Backfill around the hydrant shall be thoroughly compacted to the grade line in a satisfactory manner. Hydrants shall have the interiors cleaned of all foreign matter before installation, and shall be inspected in both the open and closed positions.
- D. The body of the hydrant shall be of sufficient length to allow the hydrant to be set at the proper elevation, as shown on the drawings. Extensions shall be furnished and installed at the Contractor's expense, when required for greater depths.

3.07 CONNECTION TO EXISTING WATER MAINS

- A. At least twenty-four (24) business hours prior to connecting to any existing water main, the Contractor shall notify the Water Department. At no time shall the Contractor operate any existing or new system valve or hydrant. All such operations shall be performed by Water Department Personnel. Prior to connecting or disconnecting any fire sprinkler service line, the Contractor shall notify the Fire Department, Water Department and a responsible party at the building(s) being serviced by the line.
- B. Make all cuts into the various water pipes, and install the required sleeves, tees, couplings, adaptors, reducers, pipe nipples, jointing materials, and other fittings which may be required and make all joints watertight, as shown on the drawings or as specified herein, and do whatever work is shown or intended to be done in order to make complete and effective connections to existing water mains.

- C. The cutting, removal, plugging, and bracing of parts of the existing water mains made necessary by this work, and the shutdown of the existing water system and subsequent pumping, hand excavating and whatever time that may be required by the Owner to notify customers of discontinuation of water service, time required to effect tight closures of existing valves, and any reasonable changes that may be required by the Engineer, or any other work done hereunder shall be considered as an obligation of the Contractor to complete the work. No additional compensation will be made for such work, other than that directly covered by the applicable bid items listed in the proposal.
- D. The work shall be coordinated with the Owner and such connections that may be required shall be made at such times and in such a manner as to cause as little interference in water service within the existing system as practicable.
- E. All new pipe and fittings cut into existing mains shall be swabbed with a minimum 5 ppm chlorine solution and rinsed with potable water prior to installation.

3.08 REMOVAL / ABANDONMENT OF EXISTING WATER MAINS

- A. All existing water mains and appurtenances to be replaced shall be physically removed and disposed of by the Contractor unless otherwise directed by the Engineer.
- B. Sections of existing water main that are permitted to be abandoned in-place by the Engineer shall have open ends plugged with concrete or brick and mortar to prevent the entrance of soil into the pipe after backfilling.

Method of Measurement

- 4.01 The actual number of hydrants relocated to be paid for under this item shall be the actual number removed and reset in accordance with the plans and ordered by the Engineer.

Basis of Payment

5.01 The unit price paid for hydrants shall include removing and resetting the existing hydrant, all 6" pipe required, coupling or solid sleeve, furnishing and placing sand bedding, testing the hydrant, all excavation and backfilling, furnishing and installing adequate thrust restraint and all other work for which there is no separate pay item.

Pay item and units:

611.710061	6" Gate Box	Each
611.81100	Adjusting/Relocating Hydrants	Each
611.90001	Adjusting Water Gates And Shutoffs by Others	Each

SUPPLEMENTAL SPECIFICATION

ITEM 612.302 REPLACE SEWER MANHOLE FRAME & COVER EACH

Description

1.1 Frame and covers **shall be purchased at cost from the Portsmouth Department of Public Works**. The covers shall have the City’s seal and are hinged type covers manufactured by E.J. Iron Works Product Number 41421053L01.

Materials

2.1 Sewer manhole frames and covers shall be dual hinged Ergo XL from EJIW – 32” Hinged and gasketed with locking cam and be fabricated in the USA. Covers shall have the City Logo and will be purchased from the City at cost. The Covers are available for pick up at the Public Works Building.

Method of Measurement

4.1 Sewer manhole frames and covers will be measured for payment by each installed, complete in place.

Basis of Payment

5.1 Sewer manhole frames and covers will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to obtain the materials and complete the frame and cover replacement. The removal and disposal of the existing frames and covers are considered incidental to this work.

Pay item and units:

612.302	Replace Sewer Manhole Frame & Cover	Each
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SPECIAL PROVISION
AMENDMENT TO SECTION 615 – TRAFFIC SIGNS

ITEM 615.016 **INSTALLING HIGH SCHOOL SIGN** **LUMP SUM**
AND FOUNDATION

The work under these items shall conform to the relevant provisions of Section 615 of the Standard Specifications and the following.

Description

1.1 The work to be performed under this item shall include the installation of the existing high school sign which is currently being stored on the High School property. The work includes construction of the foundations, transporting the sign and all work necessary for the installation as detail on the Contract Plans.

Construction Requirements

3.1 The existing location of the sign is on the high school property and shall be provided by the Engineer. In order to prevent damage, the existing sign shall not be transported until it is ready for installation. The Contractor shall be responsible for protecting the sign from damage during transport and the installation process.

Prior to installing the high school sign in its new location, the footings shall be installed per the details provided in the Contract Plans.

Method of Measurement

4.1 The work of this item shall be paid by the Lump Sum for the “Installing High School Sign and Foundation” transported and installed, complete in place.

Basis of Payment

5.1 The contract lump sum price shall include full compensation for installing the High School Sign, and all labor, tools, materials, storage, transportation, equipment and all incidentals necessary for installing the High School Sign and Foundation to the satisfaction of the Engineer.

5.2 The work under this section shall be paid for at the contract unit price for Item 615.016.

Pay item and units:

615.016	Installing High School Sign and Foundation	Lump Sum
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SPECIAL PROVISION

AMENDMENT TO SECTION 615 – TRAFFIC SIGNS

<u>ITEM 615.0301</u>	<u>TRAFFIC SIGN TYPE C</u>	<u>SQUARE FOOT</u>
<u>ITEM 615.0601</u>	<u>TRAFFIC SIGN TYPE CC</u>	<u>SQUARE FOOT</u>

The work under these items shall conform to the relevant provisions of Section 615 of the Standard Specifications and the following.

Amend 2.9.1.1, 2.9.1.2, and 2.9.1.3 to read:

2.9.1.1 The design, arrangement, color, and spacing of copy shall be in accordance with, the NHDOT Standard Plans for Road Construction, or the MUTCD and the FHWA “Standard Highway Signs”.

2.9.1.2 All sign sheeting and copy materials shall be fabricated from components of compatible systems warrantied by the same manufacturer in accordance with the NHDOT Qualified Products List Product Qualification Criteria/Acceptance Criteria.

2.9.1.3 Blank.

Amend 4.2 and 4.3 to read:

4.2 Traffic sign Type A, B, C will be measured by the square foot, including all necessary posts, footings, bases, and mounting hardware.

4.3 Traffic sign Type AA, BB or CC will be measured by the square foot, including all necessary mounting hardware.

Replace 5.2 to read:

5.2 Traffic sign Type A, B, C will be paid for at the Contract Price per square foot complete and in place.

SPECIAL PROVISION

AMENDMENT TO SECTION 615 – TRAFFIC SIGNS

ITEM 615.03401 RESETTING FLASHING ILLUMINATED SIGN POST & FOUNDATION EACH

The work under these items shall conform to the relevant provisions of Section 615 of the Standard Specifications and the following.

Description

1.1 The work under this item shall include the resetting of an existing flashing illuminated sign and foundation as shown on the plans or as ordered.

Construction Requirements

3.1 Excavate around the existing foundation to allow pole and foundation to be reset plumb. The reset location will be in the same location as the existing. The foundation and pole shall be set plumb and backfilled with gravel borrow. Gravel shall be properly compacted in 6” lifts in order to provide a firm support for the existing foundation. The illuminated sign shall be replaced at the Contractor cost if damaged during construction. Caution shall be taken to locate the existing power source. Electrical modifications are not anticipated.

Method of Measurement

4.1 The work of this item shall be paid per unit for each “Reset Flashing Illuminated Sign Post & Foundation” installed, complete in place.

Basis of Payment

4.1 The contract price per unit shall include full compensation for all labor, tools, materials, equipment and all incidentals necessary for resetting the Flashing Illuminated Sign Post & Foundation to the satisfaction of the Engineer.

4.2 The work under this section shall be paid for at the contract unit price for Item 615.03401.

SPECIAL PROVISION

AMENDMENT TO SECTION 616 - TRAFFIC SIGNALS

ITEM 616.101

TRAFFIC SIGNALS

UNIT

The work under these items shall conform to the relevant provisions of Section 616 of the Standard Specifications and the following.

Amend Section 1.1 to read as follows:

The work to be done related to traffic signal installation consists of furnishing and installing new traffic signals at the intersection of Lafayette Road (U.S. Route 1) at Andrew Jarvis Drive complete with vehicle detectors, controller/cabinet, signal posts, signal heads, mast arm assemblies, foundations, pull boxes, conduit and all necessary fittings, wire and cable, an electrical service connection and all other equipment, materials and incidental costs necessary to furnish, install and program a complete and functioning traffic control system as specified and as shown in the contract documents.

There is an existing flashing beacon at the intersection which shall be removed and stacked under Item 616.101. The beacon, and all associated equipment, shall be maintained in operation as long as feasible throughout the construction. The existing beacon, and all associated equipment, will be stacked at the Portsmouth DPW unless the equipment is refused by the DPW, in which case the beacon (and associated equipment) shall become the property of the Contractor and disposed of properly.

All work under these items shall conform to the relevant provisions of Section 616 of the Standard Specifications, the 2009 Manual on Uniform Traffic Control Devices (MUTCD), the 2010 Standard Plans for Road Construction and the following technical provisions.

The traffic signal must be inspected and approved by the City of Portsmouth Department of Public Works (603-427-1530) prior to placing in operation. The Contractor shall contact Public Works one week prior to turning the signals on flash. If the Contractor does not speak directly with David Desfosses they must leave a detailed message with the Administrative Assistant and expect a call back. Leaving a message does not constitute an approval.

The electrical service modifications and new hook-up shall be paid for by the Contractor. The monthly power costs will continue to be paid for by the City of Portsmouth during the construction contract.

Add to 2.1:

2.1.3 List of Major Materials:

- 1 – The traffic signal equipment shall be housed in a “P” Type cabinet that is on the NHDOT approved products list and assembled by the equipment manufacturer with a 12-inch extension base. The exterior of the controller cabinet shall be painted black and the interior shall be white as per City of Portsmouth standards. The cabinet shall be equipped with a pull out keyboard tray, an interior light, heat control with heat source to control

moisture and twin cooling fans. The cabinet shall be equipped with a newly installed ground rod array and lightning arresting connections on all external cables leads. The cabinet shall be provided with a portland cement concrete foundation.

1 – 16-Phase programmable traffic actuated signal controller of current NEMA specifications (TS2-Type 1) with internal time-based coordination and internal fire preemption with associated MMU to be operated in conflict monitor mode. The controller shall be a Siemens model m60 NEMA controller with compatible MMU (i.e., EDI brand MMU accepted where applicable). The controller and MMU/conflict monitor, plus any additional hardware shall be capable of initiating the flashing yellow arrow sequence. The controller shall include an integrated Ethernet port.

1 – 16-channel Ethernet equipped enhanced malfunction management unit, set-up to operate in conflict monitor mode. The MMU shall be compatible with the Siemens NEMA controller and shall include an integrated Ethernet port, or approved equal.

1 – Service Connection (from relocated utility pole)

1 – Optical Fire Preemptor Phase Selector, GTT Opticom Model 764 with a Model 760 Card Rack.

3 – Optical Fire Preemptor receivers, GTT Opticom Model 711 Detector.

1 – Confirmation strobe light, 120 VAC, with red Lexan optic lens. Whelan Model, IAC 12 RP.

1 – 4-Channel Video Detection System - Grid Smart omni-directional, Video Camera with manufacturer cables and rack cards, including hardware mounted on the mast arms or approved equal with integral counting capability.

1 – 9” Color flat screen portable monitor or approved equal, compatible with installed video detection system, with capabilities to view video detection

5 – One-way, three-section, 12-inch black polycarbonate signal heads with LED modules type, mounted on mast arms or signal posts, with 5-inch louvered backplates. The outside perimeter of the backplate shall be lined with a fluorescent-yellow 2-inch strip of Type IX or XI retroreflective sheeting to highlight the three-section signal head.

2 – One-way, five-section, 12-inch black polycarbonate signal heads with LED modules type, mounted on mast arms, with 5-inch louvered backplates. The outside perimeter of the backplate shall be lined with a fluorescent-yellow 2-inch strip of Type IX or XI retroreflective sheeting to highlight the five-section signal head.

1 – One-way, four-section, 12-inch black polycarbonate signal heads with LED modules type, mounted on mast arms, with 5-inch louvered backplates. The outside perimeter of the backplate shall be lined with a fluorescent-yellow 2-inch strip of Type IX or XI retroreflective sheeting to highlight the four-section signal head.

2 – Black powder-coated galvanized steel signal posts, with pedestal and foundation. The signal post shall be 8 ft.

1 – Black powder-coated galvanized steel signal post, with pedestal and foundation. The signal post shall be 10 ft.

4 – One-way, 16-inch polycarbonate pedestrian signal head, black, with LED countdown module, type (Leotek, G.E. Lighting or Dialight/Trastar) side-mounted on mast arms with brackets, or on signal posts. The pedestrian signal indications shall have a solid hand symbol, solid man symbol and provide countdown indications.

3 – Pedestrian push button assemblies, mounted on traffic signal poles or posts. The push button assemblies shall provide Accessible Pedestrian signal (APS) capabilities; including vibratory warning and audio/audible warning. Push buttons shall be mounted perpendicular to the path of travel and detectable arrow parallel to the path of travel. Push button assemblies shall include a R10-3e sign, mounted with the push button, with arrow facing the corresponding crossing path.

1 – Black powder-coated galvanized steel 40-foot mast arm assembly

1 – Black powder-coated galvanized steel 30-foot mast arm assembly

Amend Section 2.2, Traffic Signal Heads, to include the following:

Signal heads shall be rigid mounted on mast arms, with the bottom of all signals at the same height. All traffic signal lenses shall be 12” in diameter unless otherwise noted on the plans. Solid backplates shall be 5” provided on all signal heads. Backplate shall have a to 2-inch yellow micro-prismatic retroreflective sheeting along the outer edge. All signal heads shall be equipped with light emitting diode (L.E.D.) 12” modules as noted on the plans.

Signal heads shall be made of polycarbonate and conform to Materials Section 2.2 of Section 616 of the NHDOT Standard Specifications.

Revise Section 2.4.1.2, revise in its entirety to read as follows:

2.4.1.2 Concrete foundation shall be concrete Class B meeting the requirements of 520. Reinforcing steel shall meet the requirements of 544. All of the mast arm footings shall be cored pier footings. The cored pier for the 40’ mast arm shall have a 3’-0” diameter and a depth of 10’-0”. The cored pier for the 30’ mast arm shall have a 3’-0” diameter and a depth of 8’-0”. Loose fill must be excavated and replaced with compacted fill within 3’ clear of the piers. Foundations must conform with the appropriate NHDOT 2010 Traffic Signal Standard Plans.

Revise Section 2.5.2.12, to read as follows:

2.5.2.12 Video Detection system shall consist of the following:

- a. Mounting brackets
- b. Traffic sensor and detection module
- c. Communications cable

The detection system also, at a minimum, shall be:

- Able to provide stop bar detection; and;
- Be NEMA TS 2 compatibility

Grid Smart omni-directional detection system with manufacturer cables and rack cards, including hardware mounted on the mast arm shaft (vertical support) or approved equal with integral counting capability. Components of the detection system shall all be the same make and model. Riser and mounting straps shall be painted black.

The video detection system shall be capable of providing all detection zones shown on the plans, without incurring inclusion from adjacent lane traffic. The Contractor shall be responsible setting the vehicle detection zones as shown on the plans. The Contractor may be required to adjust and readjust the location of proposed vehicle detection zones in the presence of the Engineer, at no additional cost, to properly set the detection areas.

The manufacturer shall provide 3 complete sets of maintenance manuals for the installed equipment. These manuals shall have complete set-up, maintenance and troubleshooting procedures presented in an organized format. These sets shall be delivered to the City of Portsmouth Department of Public Works.

The vehicle detection communications cable shall be supplied and installed per the manufacturer's recommendations.

The Contractor shall provide and install a management system designed to allow for remote monitoring, data collection and control. The management system shall be compatible with the detection system supplied as part of this project.

Detector Rack Assemblies shall conform to Paragraph 5.3.4 of the NEMA TS 2 Standard. The detector rack assembly shall be supplied in a Type 2 configuration as defined in Table 5-9 of the NEMA TS 2 Standard. All vehicle detection and preemption cards shall be mounted in single, stand-alone detector rack; installing detector or preemption cards directly into the traffic controller chassis is not allowed.

Cabinet Power Supply shall be supplied and installed in the TS 2 cabinets. As a minimum, the power supplies shall meet all requirements of Paragraph 5.3.5 of the NEMA TS 2 Standard. The units shall be AC line powered and provide regulated DC power, unregulated

AC power, a line frequency reference for the load switches and other auxiliary cabinet equipment as required.

The power supplies shall be either shelf or rack mounted.

The units shall contain four LED indicators on the front panel to indicate the four outputs;

1. + 12 VDC +/- 1 VDC @ 2.0 amps,
2. + 24 VDC +/- 2 VDC @ 2.0 amps,
3. 12 VAC @ 250 milliamps, and
4. 60 Hz line frequency reference.

A test point terminal shall also be located on the unit front panel for + 24VDC and logic ground testing.

Add to 3.14

3.14.4 The contractor shall be responsible to ensure that no false calls are placed as result of the video detection camera placement.

3.14.5 The manufacturer of the vehicle detection system, or their representative, shall design sensor layout, placement and lens size, and supervise the installation and testing of the equipment. A factory certified representative from the supplier shall be on-site for a minimum of one day.

Add to 3.15

3.15.2 Contractor shall be responsible for maintaining operations of the traffic signal during construction. The labor and equipment necessary to complete this application will be included in the cost.

Add the following subsections to 3.1

3.1.3 No work shall be commenced by the Contractor until approval of the shop drawings and the manufacturer's data has been received in writing from the Engineer. Approval of these drawings shall be general in character and shall not relieve the Contractor from the responsibility of, or the necessity of, furnishing materials and workmanship conforming to the plans and specifications.

3.1.4 The Contractor shall deliver to the Engineer a certificate of compliance with the manufacturer for all materials purchased from the manufacturer.

3.1.5 The Contractor shall obtain an electrical permit from the City of Portsmouth prior to construction. The Contractor shall notify the City of Portsmouth 15 days prior to start of work.

3.1.6 Any Electrical Contractor performing work on signals must be approved to do signal work from the NHDOT.

Amend Section 3.12 to read as follows:

Painting. All paint shall conform to Section 708 of the Standard Specifications and the following:

Controller cabinet	(Exterior)	-	Black (Federal Color No. 17038)
	(Interior)	-	White
Posts and Bases		-	Black (Federal Color No. 17038)
Mast arms & mast arm poles		-	Black (Federal Color No. 17038)
Signal housings		-	Black (Federal Color No. 17038)
Signal housing supports		-	Black (Federal Color No. 17038)
Visors of signal housing		-	Black (Federal Color No. 17038)
Louvers		-	Black (Federal Color No. 17038)
Meter socket		-	Black (Federal Color No. 17038)

After the signal have been completely installed, two coats of enamel shall be applied to all unpainted or scratched surfaces after the surface has been lightly sanded to remove gloss.

Add Section 3.17 to read as follows:

3.17.1 Each programmable local hardware component installed by the contractor (i.e. video detection system, emergency vehicle preemption phase selector) shall be initially programmed by the Contractor based on information contained on the plans. **Note: Three bound sets of hard copy programming per device shall be supplied to the City of Portsmouth by the CONTRACTOR.**

3.17.2 The CONTRACTOR shall supply an 8½”x11” laminated copy of the traffic signal design plan and sequence and timing chart to be left in the cabinet documentation envelope mounted on the inside of the cabinet door.

3.17.3 Drawings, manufacturer’s specifications, and applicable catalog cuts for all materials and components shall be submitted in accordance with Section 105.02 of NHDOT Standard Specifications within 21 days after award of the contract. An additional set of final approved documents, to total 6 sets, shall be supplied to the Engineer.

Add Section 3.18 to read as follows:

3.18 The Contractor shall be responsible for the dismantling, removing and stacking at the Portsmouth DPW the existing flashing beacon components, including, but not necessarily limited to, the existing signal heads, existing electrical service, and controller cabinet. All other components of the existing beacon shall be removed and disposed of by the Contractor, including but not necessarily be limited to: the removal and disposal of the electrical system; removing and disposing or abandoning existing hand holes and signal conduit; disconnecting the power source; removing the riser on the utility pole. Old cable and all unusable material shall be disposed of by the Contractor. Any existing equipment refused by the DPW will become the property of the Contractor.

Add Section 5.4 to read as follows:

5.4 Payment for dismantling, loading, transporting, and stacking of the existing flashing beacon as designated above, shall be included in the unit price for Item 616.101.

SPECIAL PROVISION

AMENDMENT TO SECTION 618 – UNIFORMED OFFICERS AND FLAGGERS

<u>ITEM 618.61</u>	<u>UNIFORMED OFFICERS WITH VEHICLE</u>	<u>ALLOWANCE</u>
<u>ITEM 618.7</u>	<u>FLAGGERS</u>	<u>ALLOWANCE</u>

The work under these items shall conform to the relevant provisions of Section 618 of the Standard Specifications and the following.

Add to Description:

1.2 Daily traffic control personnel will be required to facilitate traffic through the work zone quickly and safely. The use of, type of, and number of personnel will be reviewed and approved with the Engineer.

The cost of traffic control will be passed onto the City with no markup by the Contractor.

SPECIAL PROVISION

AMENDMENT TO SECTION 619 – MAINTENANCE OF TRAFFIC

ITEM 619.1

MAINTENANCE OF TRAFFIC

UNIT

The work under these items shall conform to the relevant provisions of Section 619 of the Standard Specifications and the following.

Add to Construction Requirements:

3.4 All work shall be prosecuted so pedestrian and traffic flow can be maintained whenever possible. No travel lane or sidewalk closures will be allowed without prior approval from the Engineer. If lane closures are required, a traffic flagging and/or detour plan will be generated and will need to be approved by the City prior to its implementation. It should be expected that detours will not be typically allowed for day to day work except for non-preventable road closures caused by the installation of certain structures or systems that would make one-way reversible traffic impossible or unsafe.

3.5 The Contractor will develop a construction staging plan for this project. The plan shall be submitted to be approved by the Engineer.

3.6 Access shall be maintained to the abutting driveways and entrances at all times during construction. Open lanes of the road shall be graded safely for traffic at all times. A 24 hour contact will be required in case of emergency or safety concerns or in case the road surface needs attention.

3.7 Pedestrian walkways etc. may be ordered by the Engineer if the need arises. The Contractor is responsible for the safety of pedestrians at all times, including non-working hours.

3.8 All costs associated with the application of these measures or other measures directed by the Engineer shall be paid for under these items and will not be further chargeable to the project, except as stipulated and specified under Contract Items.

Amend 5.1.4 to read:

5.1.4 The material cost of permanent construction signs is subsidiary to the Pay Item.

Add to 5.1:

5.1.10 The following items are incidental to the 619.1 Pay Item: Traffic control, construction signs (permanent and temporary), nightly dust control and roadway repair, traffic control plans, and traffic cones and barrels.

SPECIAL PROVISION

AMENDMENT TO SECTION 632 – RETROREFLECTIVE PAVEMENT MARKINGS

<u>ITEM 632.321</u>	<u>RETROREFLECTIVE PREFORMED THERMOPLASTIC PAVEMENT MARKINGS</u>	<u>SQUARE FOOT</u>
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The work under these items shall conform to the relevant provisions of Section 632 of the Standard Specifications and the following.

Add to 1.1:

1.2 This work consists of furnishing and installing retroreflective preformed thermoplastic pavement markings which will be used to delineate the bicycle box along the southbound approach of Lafayette Road to its intersection with Andrew Jarvis Drive. This includes green markings for the limits of the bicycle box as well as a white bicycle symbol within the middle of the approach as shown on the plans or as directed by the Engineer. The work includes furnishing and installing the markings as well as all materials that will be part of the work needed to complete the installation.

Add to 2.1:

2.5.4 The retroreflective preformed thermoplastic pavement markings to be used for the bicycle box shall consist of the PreMark Product with ViziGrip, or approved equal. The limits of the bicycle box shall be green in color while the bicycle symbol shall be white.

Add to 3.1:

3.1.9 Retroreflective preformed thermoplastic pavement markings to be used for the bicycle box shall be applied to the pavement surface per manufacturer's application instructions taking into account all aspects such as surface preparation, weather, traffic control and cleanup. The Contractor shall submit Shop Drawings for the bicycle box markings and manufacturer's literature in conformance with the standard General Conditions of the construction contract. Approval of this submittal shall be general in character and shall not relieve the Contractor from the responsibility of, or the necessity of, furnishing materials and workmanship conforming to the plans and specifications.

Add to 4.1:

4.8 Retroreflective preformed thermoplastic pavement markings for the bicycle box will be measured by the square foot, to the nearest 0.1 of a square foot of area applied.

Add to 5.1:

5.6 The accepted quantity of retroreflective preformed thermoplastic pavement markings for the bicycle box will be paid for at the Contract Unit Price per square foot complete in place. The price bid under this item shall be considered as fair compensation for all labor, equipment, tools, supervision, and materials necessary to complete the work associated with construction and installation of retroreflective preformed thermoplastic pavement markings.

Add to Pay item and units:

632.321 Retroreflective Preformed Thermoplastic Pavement Markings Square Foot

SUPPLEMENTAL SPECIFICATION

ITEM 637.3

RESET GRANITE POST

EACH

Description

1.1 The work under this item shall include the removal and resetting of an existing granite post as shown on the plans or as ordered.

Construction Requirements

3.1 Excavate around the existing granite post so that the post can be removed along with its foundation (if present). The reset location of the post shall be as shown on Construction Plans and coordinated with the Engineer. The granite post shall be set plumb and backfilled with gravel borrow. Gravel shall be properly compacted in 6" lifts in order to provide a firm support. The granite post shall be replaced by the Contractor if damaged during construction.

Method of Measurement

4.1 The work of this item shall be paid per unit for each "Reset Granite Post" installed, complete in place.

Basis of Payment

4.1 The contract price per unit shall include full compensation for all labor, tools, materials, storage, transportation, equipment and all incidentals necessary for relocating and resetting the Granite Post to the satisfaction of the Engineer.

4.2 The work under this section shall be paid for at the contract unit price for Item 637.3.

SPECIAL PROVISION

AMENDMENT TO SECTION 645 – EROSION CONTROL

ITEM 645.6

SILT SACKS

EACH

The work under these items shall conform to the relevant provisions of Section 645 of the Standard Specifications and the following.

Description

1.1 The work under this item includes the furnishing, installation, maintenance and removal of a reusable fabric sack to be installed in drainage structures for the protection of wetlands and other resource areas and the prevention of silt and sediment from the construction site from entering the storm water collection system at the locations specified in the contract plans or as directed by the Engineer.

Materials

2.1 The silt sack shall consist of a pre-manufactured non-woven geotextile intended for use as inlet protection; manufactured items include SiltSack, and approved equals.

Construction Requirements

3.1 Contractor shall install per manufacturer’s recommendation. Silt sacks shall be maintained weekly or after every storm event. The Contractor shall remove and dispose of the silt sack following construction, and shall remove any accumulated debris inside the Catch Basin.

Method of Measurement

4.1 Silt sacks will be measured for payment by each installed, complete in place.

Basis of Payment

5.1 Silt sacks will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work. Payment will be made once per construction season and shall be full compensation for the maintenance, replacement if necessary, removal following construction, and Catch Basin vacuuming of any debris resulting from failed silt sacks.

5.1.1 No separate payment will be made for removal and disposal of the sediment from the insert, but all costs in connection therewith shall be included in the Contract unit price bid.

Pay item and units:

645.6	Silt Sack	Each
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APPENDIX A: GEOTECHNICAL REPORT



MILLER ENGINEERING & TESTING INC.

GEOTECHNICAL / SOIL BORINGS / ENVIRONMENTAL / SOILS / CONCRETE / MASONRY / STEEL / ROOFING / ASPHALT INSPECTION

Mail all correspondence to: 100 SHEFFIELD ROAD · PO BOX 4776 · MANCHESTER, NH 03108-4776 · TELEPHONE (603)668-6016 · Fax (603)668-8641

November 25, 2016

Mr. Joseph Johnson, P.E.
21 Daniel Street, 2nd Floor
Portsmouth, NH 03801-3868

RE: Geotechnical Engineering Evaluation
Traffic Signal Improvements
Andrew Jarvis Drive Portsmouth, NH

Project No. 16.264.NH

Dear Mr. Johnson:

This report presents the results of a geotechnical engineering evaluation completed for proposed traffic signal mast arms planned at the intersection of Andrew Jarvis Drive and Lafayette Road (U.S. Route 1) in Portsmouth, New Hampshire. This evaluation was completed in accordance with our proposal Ref. File 331-16 Revision 1, and consisted of:

1. Performing a subsurface exploration program consisting of three (3) test borings at the locations of the proposed support structures for the traffic signal mast arms;
2. Evaluation of the subsurface conditions and performing geotechnical engineering analyses to develop foundation design recommendations for the proposed traffic signal mast arms; and
3. Summarizing the exploration program and engineering analyses in this Project Geotechnical Report.

Presented herein is a description of the proposed project, subsurface conditions encountered, and the geotechnical engineering implications of subsurface conditions on recommended design specification for the supporting structure of the traffic signal mast arms. The contents of this report are subject to the limitations presented as Attachment A.

SITE AND PROJECT DESCRIPTION

The proposed traffic signal mast arms have been planned on U.S. Route 1 at the intersection of Andrew Jarvis Drive in Portsmouth, New Hampshire.

For this evaluation, we reviewed the following documents:

- Google Earth recent aerial photographs depicting existing conditions at the site and surrounds;

- The test boring layout depicted on the plan titled “Boring Plan”, dated 11-01-2016, prepared by GPI.
- The traffic signal layout depicted on the plan, dated 2-19-2016, titled “Traffic Signal Plan U.S. Route 1 at Andrew Jarvis Drive Portsmouth”, prepared by GPI.

Existing Conditions

The Route 1 and Jarvis Drive intersection slopes gradually downward from south (vicinity of test boring SB-1) towards the north (vicinity of test boring SB-2), and west to east towards test boring SB-3. Subsurface and overhead utilities exist in close proximity to the mast arms at SB-1 and SB-2; thus, test borings had to be offset from the mast arm locations.

Project Description

MET has reviewed a plan titled “Traffic Signal Plan U.S. Route 1 at Andrew Jarvis Drive Portsmouth”, prepared by Greenman-Pedersen, Inc. Based upon our review of this plan, three (3) mast arms are proposed as follows:

SW Corner of Andrew Jarvis Drive & Route 1 (STA 4+22, 33’ LT):

The mast arm is 30-feet in length, and supports three (3) traffic signals and no luminaire. One additional signal is mounted on the pole. The base plate reactions were not available at the time of preparing this report.

NW Corner of Andrew Jarvis Drive & Route 1 (STA 4+68, 33’ LT):

The mast arm is 20-feet in length, and supports two (2) traffic signals and no luminaire. The base plate reactions were not available at the time of preparing this report.

NE Corner of Andrew Jarvis Drive & Route 1 (STA 4+85, 28.5’ RT):

The mast arm is 25-feet in length, and supports two (2) traffic signals and no luminaire. The base plate reactions were not available at the time of preparing this report.

SUBSURFACE EXPLORATION PROGRAM

Subsurface conditions at the site were characterized by advancing three test borings (SB-1 through SB-3) at the proposed traffic signal mast arm locations. In addition, test probes (TP-1 through TP-10) were also advanced as requested by GPI. A Subsurface Exploration Location Plan is provided as Figure 1.

The purpose of the subsurface exploration program was to:

1. Characterize the nature and consistency of the soil units at the site and provide samples for visual classification;
2. Perform Standard Penetration Tests (SPTs) to estimate relative density and cohesive consistency of the in-situ soil units;
3. Estimate the engineering properties of the subsurface strata for geotechnical engineering analyses; and

4. Determine the depths to competent soil and/or auger refusal, and the depth to the groundwater table.

The test boring was drilled as near as possible to the surveyed locations of the proposed traffic signal mast arm foundations. However, SB-1 and SB-2 were moved 4 to 8 feet to avoid active subsurface and overhead utilities.

Split-spoon soil samples were obtained continuously from the ground surface through a fill layer at the location of test boring B-1 using a 1-3/8 inch inside-diameter split-spoon sampler during the Standard Penetration Tests (SPTs). The SPTs were performed with a 140-pound hammer dropping 30 inches, in general accordance with ASTM D1586. The number of hammer blows required to drive the sampler between the 6- and 18-inch depth intervals (the “N” value) for each sample was used to assess the relative density and elastic properties of the soil units. No split-spoon soil samples were collected during the advancement of test probes.

A Miller Engineering & Testing, Inc. engineer monitored the advancement of the test borings, classified soil samples, measured groundwater levels, and observed the performance of the Standard Penetration Tests. The test boring locations were located/surveyed by others.

SUBSURFACE CONDITIONS ENCOUNTERED

The test borings indicate that subsurface conditions consist of the following generalized profile from the ground surface downward. Detailed descriptions of the subsurface conditions are provided on the Test Boring Logs presented as Attachment B.

Test Boring SB-1:

1. Topsoil Layer
2. Auger Refusal

Topsoil Layer

A 6-inch thick topsoil layer was observed at test boring SB-1. The topsoil layer consists of dark brown to grey, dry, loose, silt and very fine sand with abundant roots.

Auger Refusal

Auger refusal on presumed bedrock was encountered at SB-1 directly below the topsoil layer. Bedrock core sampling was not performed to verify that refusal was caused by solid bedrock; however, outcropping in close proximity SB-1 was indicative of shallow bedrock in this area.

Test Borings SB-2 and SB-3:

1. Topsoil and Pavement Layer
2. Fill Layer
3. Sand and Silt Layer

Topsoil and Pavement Layer

A 7.5-inch layer of pavement and 24-inch thick topsoil layer was observed at test borings SB-2 and SB-3, respectively. The topsoil layer consists of dark brown to grey, dry, loose, silt and very fine sand with abundant roots.

Fill Layer

A fill layer associated with the roadway embankment construction was encountered at the locations of Test Borings SB-2 and SB-3. The thickness of the fill layer was determined to be approximately 6 to 8 feet. The fill layer consisted of brown, loose to medium dense, fine sand, some silt, and trace to little gravel material. The fill material contained wood, wire, and plastic at the location of SB-2.

Fine Sand and Silt Layer

Beneath the fill layer at 6 to 8 feet below the surface, naturally occurring, medium dense, brown, fine sand and silt material was encountered. Auger refusals were encountered at test borings SB-1 and SB-2 at 13.0 feet below ground surface. The auger refusals are interpreted to be on the bedrock surface.

Groundwater Conditions

Groundwater was encountered 9.0 feet below the surface at the location of test boring SB-3. It should be noted, however, that groundwater fluctuates with season and precipitation; therefore, groundwater might be present at other times of the year.

GEOTECHNICAL ENGINEERING EVALUATION AND RECOMMENDATIONS

The organic topsoil, loose to medium dense fill, and buried wood, wire and plastic materials are inadequate for support of the signal mast arm foundations. These unsuitable soils were found at test boring SB-2 to a depth of 8 feet below the existing surface elevation. Directly beneath the fill layer, SB-2 and SB-3 encountered a medium dense, fine sand and silt layer. Presumed bedrock was encountered 6-inches below the surface at SB-1.

Based upon results of the subsurface exploration program, the traffic signal mast arm may be supported by a drilled pier or a spread footing type foundation system. The loose fill and organic layers within 6 to 8 feet of the surface are unsuitable for support of either type of foundation; therefore, these materials should be excavated within 3-feet clear of the drilled pier and replaced with compacted structural fill material.

According to the General Notes on Drawings TS-01_Rev2016 of the NHDOT Standard Plans, the minimum design soil pressure is 1.5 tons per square foot (tsf) both horizontally and vertically for a spread footing; and according to Note 3, Sheet No. TS-04_Rev2016 of the NHDOT Standard Plans, the soil's minimum angle of internal friction is 32 degrees for a drilled pier foundation.

The engineering properties of the naturally occurring soil layer encountered at SB-2 and SB-3 below 6.0 to 8.0 feet indicate that the sand and silt layer has medium dense relative density; and therefore, is adequate for support of a spread footing or drilled pier type foundation. The fill and organic layers, however, must be excavated and replaced with structural fill material. Backfill material around the spread footing/pedestal type foundations should consist of NHDOT Item

304.3 (Crushed Gravel) as detailed in the 2010 Edition of the NHDOT Standard Specifications for Road and Bridge Construction. This material should be placed in 8-inch maximum loose lifts and be compacted to at least 95 percent of the materials maximum dry density as determined by ASTM Designation D-1557. Backfilling around the foundation with granular fill material would require that the excavation be sufficiently sloped to conform to OSHA Guidelines Title 29 CFR Subpart P 1926.650. Considering the site constraints, a shoring system may be required where an open excavation is impractical.

Bedrock excavation will be necessary at the location of SB-1; thus, blasting and/or mechanical hoe-ramming should be anticipated at this location. Any loose rock should be removed from the excavation prior to placing structural fill and casting the mast arm foundation.

The following Table summarizes the required mast arm foundation sizes according to NHDOT Standard Plans for spread footing and drilled pier foundation alternatives:

Recommended Foundations Types			
Test Boring No.	Location	Spread Footing Foundation Alternative	Drilled Pier Foundation Alternative
SB-1	STA 4+22, 33'LT	Type 1B Spread Footing (8'-0"x7'-0") 2'-0" thick and 6'-10" deep	Type 2 drilled pier (3'-0" diameter) and (10'-0" deep)
SB-2	STA 4+68, 33'LT	Type 1B Spread Footing (8'-6"x7'-0") 2'-0" thick and 6'-4" deep	Type 2 drilled pier (3'-0" diameter) and (8'-0" deep)
SB-3	STA 4+85, 28.5'RT	Type 1B Spread Footing (8'-6"x7'-0") 2'-0" thick and 6'-4" deep	Type 2 drilled pier (3'-0" diameter) and (8'-0" deep)

The foundation base soils should consist of firm and stable, naturally occurring dense Sand and gravel deposits that are free of standing water. A Geotechnical Engineer from MET should inspect the foundation base soils prior to the placement of steel reinforcement steel rebar to verify these conditions are satisfied.

FINAL DESIGN CONSTRUCTION MONITORING

It is recommended that a qualified geotechnical engineer or his/her representative be retained to provide engineering services during the excavation and foundation construction phases of the project. This will become particularly important relative to the inspection and testing of backfill

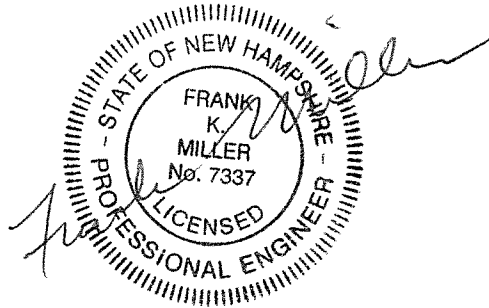
materials and concrete used in construction of the foundation elements. This would allow for design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction. The adequacy of compaction of all backfill material should be verified by field density testing.

In the event that any changes in the nature, the design, or the location of the mast arms are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of the report modified or verified in writing by Miller Engineering & Testing, Inc.

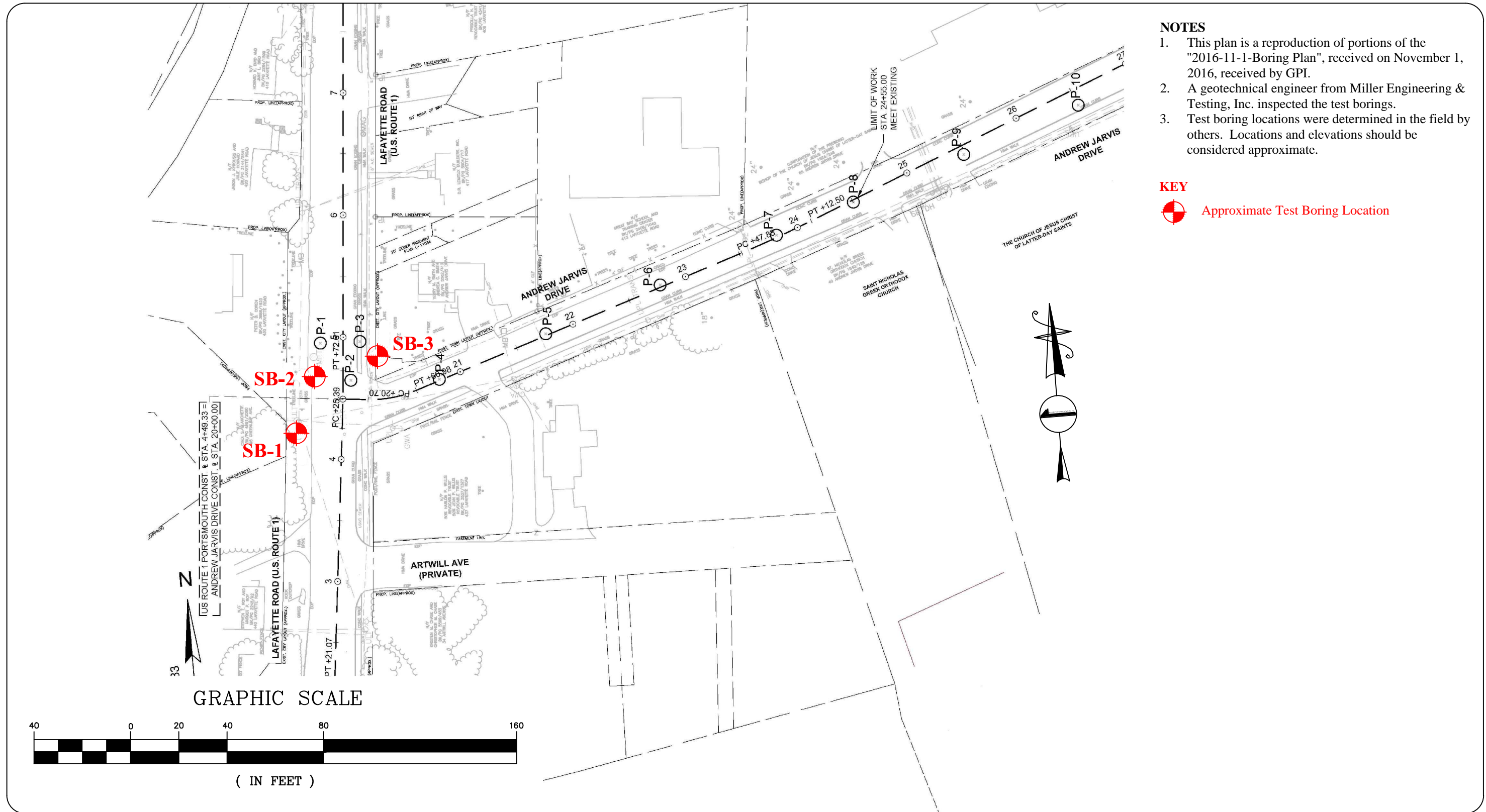
Thank you for this opportunity to be of service on this project. Please call us if you have questions or require additional information.

Sincerely,
MILLER ENGINEERING & TESTING, INC.

Frank Miller
Frank K. Miller, P.E.
Executive Vice President



Figure




NOTES

1. This plan is a reproduction of portions of the "2016-11-1-Boring Plan", received on November 1, 2016, received by GPI.
2. A geotechnical engineer from Miller Engineering & Testing, Inc. inspected the test borings.
3. Test boring locations were determined in the field by others. Locations and elevations should be considered approximate.

KEY

 Approximate Test Boring Location



MILLER ENGINEERING & TESTING, INC.

100 SHEFFIELD ROAD - PO BOX 4776
 MANCHESTER, NEW HAMPSHIRE 03108
 TEL (603) 668-6016 // FAX (603) 668-8641

Andrew Jarvis Drive
 Portsmouth, NH
 November 2016
 Project No. 16.070.NH

SUBSURFACE
 EXPLORATION
 LOCATION PLAN

FIGURE No.
 1

Attachment A

LIMITATIONS

Explorations

1. The analyses, recommendations and designs submitted in this report are based in part upon the data obtained from subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.
2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and have been developed by interpretation of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the boring logs.
3. Water level readings have been made in the drill holes at times and under conditions stated on the boring logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors differing from the time measurements were made.

Review

4. It is recommended that this firm be retained to review final design plans and specifications. In the event that any changes in the nature, design, or location of the structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of the report modified or verified in writing by Miller Engineering & Testing, Inc.

Construction


5. It is recommended that this firm be retained to provide soils engineering services during the excavations and foundation construction phases of the work. This is to observe compliance with the design concepts, specifications, or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Use of Report

6. This report has been prepared for the exclusive use of the **Greenman-Pedersen, Inc.** for the proposed **Lafayette Road & Andrew Jarvis Drive Traffic Signal Mast Arms** located in **Portsmouth, NH** in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.
7. This soil and foundation engineering report has been prepared for this project by Miller Engineering & Testing, Inc. This report was completed for design purposes and may be limited in its scope to prepare an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to design considerations only.

Attachment B

TEST BORING LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: Andrew Jarvis Drive Portsmouth, NH	Sheet 1 of 1 Boring No: SB-1 Location: See Plan Approx. Surface Elev: _____
	Project No: 16.264.NH Date Start: 11-09-16 Date End: 11-09-16	

GROUNDWATER OBSERVATIONS						
	CASING	SAMPLER	Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	11-09-16	None	6"	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				


Depth/ Elev.	Cas bl/ft	SAMPLE				BLOWS				Strata Change	Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.	0-6"	6-12"	12-18"	18-24"			
0		S-1	0.0-0.3	4	4						S-1: Topsoil	(1)
3											Auger Refusal at 6" BORING TERMINATED AT 0.5 ft	
6												
9												
12												
15												
18												

Driller: B. Marcoux Helper: J. Buxton Inspector: T. Young	COHESIVE CONSISTENCY (Blows/Foot) 0-2 VERY SOFT 2-4 SOFT 4-8 MEDIUM STIFF 8-15 STIFF 15-30 HARD	COHESIONLESS (Blows/Foot) 0-4 VERY LOOSE 4-10 LOOSE 10-30 MEDIUM DENSE 30-50 DENSE 50+ VERY DENSE	PROPORTIONS USED TRACE: 0-10% LITTLE: 10-20% SOME: 20-35% AND: 35-50%
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NOTES: (1) Bedrock outcroppings in the area of this boring. Used a shovel to clear off the topsoil on the bedrock and had the auger grind on the bedrock.

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: Andrew Jarvis Drive Portsmouth, NH	Sheet 1 of 1 Boring No: SB-2 Location: See Plan Approx. Surface Elev: _____
	Project No: 16.264.NH Date Start: 11-09-16 Date End: 11-09-16	

GROUNDWATER OBSERVATIONS						
	CASING	SAMPLER	Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	11-09-16	None	13'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				


Depth/ Elev.	Cas bl/ft	SAMPLE				BLOWS				Strata Change	Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.	0-6"	6-12"	12-18"	18-24"			
0		-	0.0-0.6	7.5							-: 7.5" Asphalt	
		S-1	0.6-2.0	17	6		22	17	24		S-1: Brown, fine to coarse sand, some gravel, little silt (FILL)	(1)
3		S-2	2.0-4.0	24	5	5	3	4	5		S-2: Wet, brown, fine sand, some silt, little gravel, trace clay (FILL)	
		S-3	4.0-6.0	24	7	1	22	37	19		S-3: Wet, brown, fine sand, some silt, little gravel, trace clay (wood fibers in sample) (wire and plastic in sample) (FILL)	
6		S-4	7.0-8.0	12	11	4	9				S-4: Wet, brown, fine sand, some silt, little gravel, trace clay (FILL)	(2)
9		S-4A	8.0-9.0	12	6			15	10		S-4A: Brown, fine sand, little medium sand, trace silt Auger Refusal at 13'	
12												
15											BORING TERMINATED AT 13 ft	
18												

Driller: B. Marcoux Helper: J. Buxton Inspector: T. Young	COHESIVE CONSISTENCY (Blows/Foot) 0-2 VERY SOFT 2-4 SOFT 4-8 MEDIUM STIFF 8-15 STIFF 15-30 HARD	COHESIONLESS (Blows/Foot) 0-4 VERY LOOSE 4-10 LOOSE 10-30 MEDIUM DENSE 30-50 DENSE 50+ VERY DENSE	PROPORTIONS USED TRACE: 0-10% LITTLE: 10-20% SOME: 20-35% AND: 35-50%
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NOTES: (1) Rock in tip of split-spoon.
 (2) Wood fibers came up with the clippings from the auger flights.

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: Andrew Jarvis Drive Portsmouth, NH	Sheet 1 of 1 Boring No: SB-3 Location: See Plan Approx. Surface Elev: _____
	Project No: 16.264.NH Date Start: 11-09-16 Date End: 11-09-16	

GROUNDWATER OBSERVATIONS						
	CASING	SAMPLER	Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	11-09-16	9'	13'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer	140 lbs.					
Fall	30"					


Depth/ Elev.	Cas bl/ft	SAMPLE				BLOWS				Strata Change	Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.	0-6"	6-12"	12-18"	18-24"			
0		S-1	0.0-2.0	24	6	2	4	8	5		S-1: Topsoil	
3		S-2	2.0-4.0	24	12	4	3	3	8		S-2: Brown, fine to medium sand, some silt, little gravel and coarse sand (FILL)	
		S-3	4.0-6.0	24	11	6	8	6	5		S-3: Brown, fine to coarse sand, some gravel, some silt (FILL)	
6		S-4	6.0-8.0	24	13	3	5	4	13		S-4: Olive/Orange (mottled), fine sand and silt, trace gravel	
9		S-5	9.0-11.0	24	17	12	15	15	16		S-5: Wet, olive, fine sand, some silt, little gravel Auger Refusal at 13'	
12												
15											BORING TERMINATED AT 13 ft	
18												

Driller: B. Marcoux		COHESIVE CONSISTENCY (Blows/Foot)	COHESIONLESS (Blows/Foot)	PROPORTIONS USED
Helper: J. Buxton		0-2 VERY SOFT	0-4 VERY LOOSE	TRACE: 0-10%
Inspector: T. Young		2-4 SOFT	4-10 LOOSE	LITTLE: 10-20%
		4-8 MEDIUM STIFF	10-30 MEDIUM DENSE	SOME: 20-35%
		8-15 STIFF	30-50 DENSE	AND: 35-50%
		15-30 HARD	50+ VERY DENSE	

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 <p>MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641</p>	Project: Andrew Jarvis Drive Portsmouth, NH	Sheet <u>1</u> of <u>1</u> Probe No: TP-1 Location: See Plan Approx. Surface Elev: _____
	Project No: 16.264.NH Date Start: 11-14-16 Date End: 11-14-16	

EQUIPMENT	GROUNDWATER OBSERVATIONS			
Contractor Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator R. Marcoux	11-14-16	10'		Upon Completion
ME&T Rep.				
Drill Make/Model				
Probe Diameter 2.25" Weather				


Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		
0		-	0.0-0.4	5		-: 5" Asphalt	
		S-1	0.4-12.0	139		S-1: Sand and gravel, little silt	
3							
6							
9							
12						TEST PROBE TERMINATED AT 12 ft	
15							
18							

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: <u>Andrew Jarvis Drive</u> <u>Portsmouth, NH</u>	Sheet <u>1</u> of <u>1</u> Probe No: <u>TP-2</u>
	Project No: <u>16.264.NH</u> Date Start: <u>11-14-16</u> Date End: <u>11-14-16</u>	Location: <u>See Plan</u> Approx. Surface Elev: _____

EQUIPMENT		GROUNDWATER OBSERVATIONS			
Contractor	Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator	R. Marcoux	11-14-16	10'		Upon Completion
ME&T Rep.					
Drill Make/Model					
Probe Diameter	2.25"	Weather			


Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES: Not able to do a test probe in this area due to 14" force sewer main not located by utility.

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: <u>Andrew Jarvis Drive</u> <u>Portsmouth, NH</u>	Sheet <u>1</u> of <u>1</u> Probe No: <u>TP-3</u>
	Project No: <u>16.264.NH</u> Date Start: <u>11-14-16</u> Date End: <u>11-14-16</u>	Location: <u>See Plan</u> Approx. Surface Elev: _____

EQUIPMENT		GROUNDWATER OBSERVATIONS			
Contractor	Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator	R. Marcoux	11-14-16	10'		Upon Completion
ME&T Rep.					
Drill Make/Model					
Probe Diameter	2.25"	Weather			


Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES: Not able to complete the test probe in this area due to 14" force sewer main not located by utility. Probe stopped at 5.5'

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 <p>MILLER ENGINEERING & TESTING, INC.</p> <p>100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641</p>	Project: <u>Andrew Jarvis Drive</u> <u>Portsmouth, NH</u>	Sheet <u>1</u> of <u>1</u> Probe No: <u>TP-4</u> Location: <u>See Plan</u> Approx. Surface Elev: _____
	Project No: <u>16.264.NH</u> Date Start: <u>11-14-16</u> Date End: <u>11-14-16</u>	

EQUIPMENT	GROUNDWATER OBSERVATIONS			
Contractor Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator R. Marcoux	11-14-16	10'		Upon Completion
ME&T Rep.				
Drill Make/Model				
Probe Diameter 2.25" Weather				


Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		
0		-	0.0-0.3	3		0-3' Asphalt	
		S-1	0.3-12.0	141		S-1: Sand and gravel, some silt	
3							
6							
9							
12						TEST PROBE TERMINATED AT 12 ft	
15							
18							

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES: -

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 <p>MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641</p>	Project: <u>Andrew Jarvis Drive</u> <u>Portsmouth, NH</u>	Sheet <u>1</u> of <u>1</u> Probe No: <u>TP-5</u> Location: <u>See Plan</u> Approx. Surface Elev: _____
	Project No: <u>16.264.NH</u> Date Start: <u>11-14-16</u> Date End: <u>11-14-16</u>	

EQUIPMENT		GROUNDWATER OBSERVATIONS			
Contractor	Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator	R. Marcoux	11-14-16	10'		Upon Completion
ME&T Rep.					
Drill Make/Model					
Probe Diameter	2.25"	Weather			


Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		
0		-	0.0-0.3	3		3" Asphalt	
		S-1	0.3-12.0	141		S-1: Sand and gravel, some silt	
3							
6							
9							
12						TEST PROBE TERMINATED AT 12 ft	
15							
18							

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES: -

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: <u>Andrew Jarvis Drive</u> <u>Portsmouth, NH</u>	Sheet <u>1</u> of <u>1</u> Probe No: <u>TP-6</u>
	Project No: <u>16.264.NH</u> Date Start: <u>11-14-16</u> Date End: <u>11-14-16</u>	Location: <u>See Plan</u> Approx. Surface Elev: _____

EQUIPMENT	GROUNDWATER OBSERVATIONS			
Contractor: Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator: R. Marcoux	11-14-16	10'		Upon Completion
ME&T Rep.				
Drill Make/Model				
Probe Diameter: 2.25" Weather				


Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		
0		-	0.0-0.3	3		3" Asphalt	
		S-1	0.3-12.0	141		S-1: Sand and gravel to clayey silt	
3							
6							
9							
12						TEST PROBE TERMINATED AT 12 ft	
15							
18							

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES: -

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: <u>Andrew Jarvis Drive</u> <u>Portsmouth, NH</u>	Sheet <u>1</u> of <u>1</u> Probe No: <u>TP-7</u>
	Project No: <u>16.264.NH</u> Date Start: <u>11-14-16</u> Date End: <u>11-14-16</u>	Location: <u>See Plan</u> Approx. Surface Elev: _____

EQUIPMENT	GROUNDWATER OBSERVATIONS			
Contractor: Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator: R. Marcoux	11-14-16	8'		Upon Completion
ME&T Rep.				
Drill Make/Model				
Probe Diameter: 2.25" Weather				


Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		
0		-	0.0-0.3	3		3" Asphalt	
		S-1	0.3-12.0	141		S-1: Sand and gravel to clayey silt	
3							
6							
9							
12						TEST PROBE TERMINATED AT 12 ft	
15							
18							

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES: -

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: <u>Andrew Jarvis Drive</u> <u>Portsmouth, NH</u>	Sheet <u>1</u> of <u>1</u> Probe No: <u>TP-8</u>
	Project No: <u>16.264.NH</u> Date Start: <u>11-14-16</u> Date End: <u>11-14-16</u>	Location: <u>See Plan</u> Approx. Surface Elev: _____

EQUIPMENT	GROUNDWATER OBSERVATIONS			
Contractor: Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator: R. Marcoux	11-14-16	8'		Upon Completion
ME&T Rep.				
Drill Make/Model				
Probe Diameter: 2.25" Weather				


Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		
0		-	0.0-0.3	3		3" Asphalt	
		S-1	0.3-12.0	141		S-1: Sand and gravel to gray clay	
3							
6							
9							
12						TEST PROBE TERMINATED AT 12 ft	
15							
18							

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES: -

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: <u>Andrew Jarvis Drive</u> <u>Portsmouth, NH</u>	Sheet <u>1</u> of <u>1</u> Probe No: <u>TP-9</u>
	Project No: <u>16.264.NH</u>	Location: <u>See Plan</u>
Date Start: <u>11-14-16</u>	Date End: <u>11-14-16</u>	Approx. Surface Elev: _____

EQUIPMENT	GROUNDWATER OBSERVATIONS			
Contractor Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator R. Marcoux	11-14-16	8'		Upon Completion
ME&T Rep.				
Drill Make/Model				
Probe Diameter 2.25" Weather				


Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		
0		-	0.0-0.3	3		3" Asphalt	
		S-1	0.3-12.0	141		S-1: Sand and gravel to gray clay	
3							
6							
9							
12						TEST PROBE TERMINATED AT 12 ft	
15							
18							

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES: -

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST PROBE LOG

 MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641	Project: <u>Andrew Jarvis Drive</u> <u>Portsmouth, NH</u>	Sheet <u>1</u> of <u>1</u> Probe No: <u>TP-10</u>
	Project No: <u>16.264.NH</u> Date Start: <u>11-14-16</u> Date End: <u>11-14-16</u>	Location: <u>See Plan</u> Approx. Surface Elev: _____

EQUIPMENT	GROUNDWATER OBSERVATIONS			
Contractor Miller Engineering & Testing Inc.	Date	Depth	Casing At	Stabilization Period
Operator R. Marcoux	11-14-16	8'		Upon Completion
ME&T Rep.				
Drill Make/Model				
Probe Diameter 2.25" Weather				

Depth/ Elev.	Cas bl/ft	SAMPLE				Sample Description	Notes
		Sample No.	Depth Range	Pen.	Rec.		
0		-	0.0-0.3	3		3" Asphalt	
		S-1	0.3-12.0	141		S-1: Brown, fine to coarse sand, gravel to gray clay	
3							
6							
9							
12						TEST PROBE TERMINATED AT 12 ft	
15							
18							

PROPORTIONS USED
 TRACE: 0-10%
 LITTLE: 10-20%
 SOME: 20-35%
 AND: 35-50%

NOTES: -

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.