CONTRACT DOCUMENTS AND SPECIFICATIONS

for

Commerce Way Reconstruction

Bid #66-15

State of New Hampshire

John P. Bohenko, City Manager

Prepared by:

City of Portsmouth
Engineering Division
Public Works Department

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City of Portsmouth
Portsmouth, New Hampshire
Department of Public Works

Commerce Way Reconstruction
Bid #66-15

INVITATION TO BID

Sealed bid proposals, **plainly marked, Commerce Way Reconstruction**, Bid Proposal #66-15 **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 May 14, 2015 at 2:00 p.m.; at which time all bids will be publicly opened and read aloud.

This project consists of the installation of water mains and services, granite curbing, asphalt pavement, drainage pipe & structures, concrete sidewalks, lighting, plantings and various other amenities.

Work may begin at any time on or after July 6, 2015. Final Completion of the project must occur by November 1, 2015. Liquidated damages shall be assessed at $300.00 per day. Hours of work will be 7AM to 5 PM weekdays.

The Contractor will be required to keep roadways and sidewalks passable for the public and employees to the maximum degree possible**. The Contractor will also be responsible for ensuring that the public will be able to access the different businesses at all times.**

The General Contractor for this project must be Pre-qualified with NHDOT for Road Construction. All electrical work on this project, including conduit, will be installed under the supervision of a New Hampshire Licensed Electrician. An electrical permit is required prior to any project work being completed.

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

Specifications may be obtained at the City's website: http://www.cityofportsmouth.com/finance/purchasing.htm Addenda to this project, if any, including written answers to questions, will not be provided directly to vendors, but will be posted by 4:00 p.m., on May 11, 2015 on the City of Portsmouth Website under the project heading.

Electronic copies of the plans and specifications may be obtained off of the City's webpage. Documents are not available for pickup.

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. Also, the City reserves the right to approve or deny subcontractors for this project. An award of this project is contingent upon additional process and funding.

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.

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.

The bidders must submit a statement of bidder's qualifications, if requested, subsequent to bid opening but prior to award.

Addenda to this bid document, if any, including written answers to questions, will be posted by May 11, 2015 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.

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 rejected 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 conduct such investigations of the contractor's history, financial resources, and other qualifications as it deems necessary to determine whether bidder is qualified to do the work. Bidder may be asked to execute releases. Failure to execute a release upon request may result in disqualification.

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. An award of this project is contingent upon additional process and funding.

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.

At the time of project completion, the Owner may, in its sole discretion, permit the Contractor to substitute a maintenance bond in lieu of holding retainage for the entire guaranty period. If a bond is furnished it shall meet the following criteria:

- The bond shall be in an amount equal to 20 percent of the contract amount. Such bond shall guarantee the repair of all damage due to faulty materials or workmanship provided or done by the contractor. The guarantee shall remain in effect for a period of one year after the date of final acceptance of the job by the Owner.

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

Commerce Way Reconstruction

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 Director of Public Works. 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:

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
201.22	35	Ea	Remove Tree and Stump _____	$_____	$_____
202.3	420	Sy	Existing Sidewalk Removal (F) _____	$_____	$_____
202.41	300	Lf	Removal of misc. existing pipe as directed _____	$_____	$_____

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
202.6	1200	Lf	Remove all existing 4" x 12" curb and stockpile for reuse on adjacent lot (pieces 4'or longer get saved)	$_____	$_____
214	14,600	Sy	Fine Grading (F)	$_____	$_____
304.3	410	Cy	Crushed Gravel in place	$_____	$_____
306.108	14,600	Sy	8" Reclaimed Stabilized Base (Assume 2 mobilizations)	$_____	$_____
403.11A	2040	Tons	Machine Method Bituminous Paving (2 ½") (Binder ¾" 50Gyr. Fine Binder)	$_____	$_____
403.11 B	1214	Tons	Machine Method Bituminous Paving (1 ½") (Wearing Surface 3/8" 75 Gyr)	$_____	$_____
403.12	20	Tons	Hand Method Bituminous Paving	$_____	$_____
417	1	LS	Cold Planing Bituminous Surfaces (1-1/2") (Woodbury Avenue Intersection trench repair)	$_____	$_____
520	140	Cy	Class B Curb Backfill	$_____	$_____
592.12	800	Sf	Mechanically Stabilized Precast Units	$_____	$_____

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
603.82212	745	Lf	12” HDPE Drain Pipe	$_____	$_____
			_____		
604.0007	20	Ea	Polyethylene Liner for CB	$_____	$_____
			_____		
604.1	14	Ea	Eliminator© systems Oil/Water Separator Hood	$_____	$_____
			_____		
604.2	13	Ea	Core and boot existing drain structures	$_____	$_____
			_____		
604.12	14	Ea	New Catch Basins (Type B Complete)	$_____	$_____
			_____		
604.22	1	Ea	New Drop Inlet Basin (Type B Frame & Grate) (token)	$_____	$_____
			_____		
604.51	6	Lf	Reconstruct sewer structures as necessary (Frame and Cover covered under 604.61 below)	$_____	$_____
			_____		
604.52	18	Lf	Convert or reconstruct drainage structures (Frame and Cover covered under 604.62 or 604.72 below)	$_____	$_____
			_____		
604.61	6	EA	Provide and Install Sewer Manhole Covers	$_____	$_____
			_____		
604.62	12	EA	Provide and Install Drain Manhole Covers (32” or 24” as appropriate)	$_____	$_____
			_____		
604.72	6	EA	Provide and Install CB Frame & Grate (Existing Structures)	$_____	$_____
			_____		

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
605.504	2226	Lf	4" Corrugated Perforated HDPE Underdrain	$_____	$_____
606.12	340	Lf	Beam Guardrail Standard Section (Steel Post)	$_____	$_____
606.147	2	Ea	Beam Guardrail Terminal Unit G-2	$_____	$_____
608.24	1850	Sy	4” Concrete Sidewalk	$_____	$_____
608.26	100	Sy	6” Concrete Sidewalk in Ramp Areas	$_____	$_____
608.52	15	Ea	Detectable Warning Surface Panels Brand: Armor Tile®, Color: Red	$_____	$_____
609.01	6400	Lf	New Straight Vertical Granite Curb 5” Wide	$_____	$_____
609.02	450	Lf	New Curved Vertical Granite Curb 5” Wide	$_____	$_____
609.5A	10	Lf	Reset Existing 5” x 18” Curb (Indeterminate quantity)	$_____	$_____
609.5B	40	Lf	Reset Existing 4” x 12” Sloped Curb	$_____	$_____
611.05206	40	Lf	6” Cement Lined Ductile Iron Pipe Includes all misc. fittings	$_____	$_____

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
611.05212	1650	Lf	12” Cement Lined Ductile Iron Pipe Includes all misc. fittings	$_____	$_____
611.71006	1	Ea	6” Gate Valve and tapping Sleeve Assembly	$_____	$_____
611.71010	1	Ea	10” Gate Valve and tapping Sleeve Assembly	$_____	$_____
611.71012	1	Ea	12” Gate Valve and tapping Sleeve Assembly	$_____	$_____
611.71012	3	Ea	12” Gate Valve	$_____	$_____
611.81	1	Ea	New Hydrant Assembly Complete (Includes, tee, valve, 6” lateral & Hydrant)	$_____	$_____
611.811	1	Ea	Relocate Existing Hydrant Complete (Includes, tee, valve & 6” lateral piping)	$_____	$_____
611.90001	20	EA	Adjusting Existing Gate Valves and Stops to Finish Grade	$_____	$_____
614	10	Ea	Electrical Pull Boxes	$_____	$_____
614.321	240	Lf	2” Steel Conduit	$_____	$_____
614.72114	2000	Lf	2” Schedule 40 PVC Conduit	$_____	$_____

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
614.72118	850	Lf	2” Sch. 80 PVC Conduit	$_____	$_____
614.73114	130	Lf	3” Sch. 40 PVC Conduit (service to cabinet)	$_____	$_____
614.74118	20	Lf	4” Sch. 80 PVC Conduit (token)	$_____	$_____
615	8	Ea	Traffic Sign Relocation	$_____	$_____
615.02	31	Sf	Traffic Signs	$_____	$_____
616	1	U	Electrical Work for Project (This item includes the control cabinet)	$_____	$_____
616.650	2	Ea	Permanent Traffic Signal Detector Loop	$_____	$_____
618.6	600	Hr	Uniformed Flaggers seventeen dollars and no cents per hour (Only Exact Cost will be paid, estimated cost)	$17.00	$10,200.00
618.7	60	Hr	Portsmouth Police (Woodbury Avenue) fifty dollars and no cents per hour (Only Exact Cost will be paid, estimated cost)	$50.00	$3,000.00
619.1	1	U	Maintenance of Traffic	$_____	$_____
619.253	8	Week	Portable Message Board(s)	$_____	$_____
625.2	17	Ea	Light Pole Bases	$_____	$_____

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
625.52	17	Ea	Light Pole & Fixture	$_____	$_____
			_____		
628.2	1120	Ea	Saw Bituminous Pavement	$_____	$_____
			_____		
632.0104A	7900	Lf	4” Paint Striping (Chlorinated Rubber Paint)	$_____	$_____
			_____		
632.0104B	108	Lf	4” Paint Striping (Parking Stalls)	$_____	$_____
			_____		
632.3112	850	Lf	12” Thermoplastic Crosswalk	$_____	$_____
			_____		
632.3118	50	Lf	18” Thermoplastic Stop Bars	$_____	$_____
			_____		
632.32	65	Sf	Thermoplastic Symbol/Word	$_____	$_____
			_____		
645	20	Ea	Catch Basin Silt Sacks	$_____	$_____
			_____		
645.531	3640	Lf	Silt Fencing or silt log	$_____	$_____
			_____		
645.7	1	Ls	SWPPP	$_____	$_____
			_____		
645.71	24	Hr	SWPPP Inspections	$_____	$_____
			_____		

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
646.51	5000	Sy	Turf Establishment with Mulch, Tackifiers & 6” of Loam	$_____	$_____
			_____		
650.1	2500	Sy	Construct new planting beds with 12” of Loam And mulch	$_____	$_____
			_____		
650.2	1200	Sy	Planting beds amended with 3” of Compost And mulch	$_____	$_____
			_____		
651.1	4	ea	Pinus flexilis 'Vanderwolf's Pyramid'	$_____	$_____
			_____		
651.2	22	ea	Picea orientalis	$_____	$_____
			_____		
652.1	1	ea	Acer Saccharum 'Green Mountain'	$_____	$_____
			_____		
652.2	14	ea	Ulmus Americana ‘Princeton American Elm’	$_____	$_____
			_____		
652.55	6	ea	Platanus Acerifolia 'London Planetree'	$_____	$_____
			_____		
653.1	10	ea	Malus 'Spring Snow Crabapple'	$_____	$_____
			_____		
653.89	8	ea	Pyrus Calleryana 'Chanticleer Flowering Pear'	$_____	$_____
			_____		
654.1	18	ea	Juniperus Chinensis Pfitzeriana 'Compacta'	$_____	$_____
			_____		
654.2	22	ea	Taxus media 'Tauntonii'	$_____	$_____
			_____		

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
655.2	42	ea	Buxus 'Green Velvet'	$_____	$_____
			_____		
655.3	30	ea	Clethra alnifolia 'Hummingbird'	$_____	$_____
			_____		
655.4	47	ea	Comus alba 'Ivory Halo'	$_____	$_____
			_____		
655.5	52	ea	Forsythia 'Broxensis'	$_____	$_____
			_____		
655.6	8	ea	Fothergrilla gardenia	$_____	$_____
			_____		
655.7	25	ea	Hyrdrangea arborescens 'Annabelle'	$_____	$_____
			_____		
655.9	101	ea	Hydrangea quercifolia 'Sikes Dwarf'	$_____	$_____
			_____		
655.1	24	ea	Hydrangea macrophylla 'All Summer Beauty'	$_____	$_____
			_____		
655.11	63	ea	Ilex glabra 'Shamrock'	$_____	$_____
			_____		
655.12	37	ea	Ilex verticillata 'Red Sprite'	$_____	$_____
			_____		
655.13	3	ea	Juniperus squamata 'Blue Star'	$_____	$_____
			_____		
655.14	29	ea	Juniperus chinensis 'Sargenti'	$_____	$_____
			_____		

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
655.15	3	ea	Vibumum plicatum tomentosum 'Mariesii'	$_____	$_____
			_____		
655.16	11	ea	Microbiota decussate	$_____	$_____
			_____		
655.17	18	ea	Deutzia gracilis	$_____	$_____
			_____		
655.18	21	ea	Deutzia gracilis 'Nikko'	$_____	$_____
			_____		
656.2	6	ea	Rhododendron 'P.J.M.'	$_____	$_____
			_____		
656.3	9	ea	Rhododendron yakushimanum	$_____	$_____
			_____		
656.4	124	ea	Spirea Nipponica 'Snowmound'	$_____	$_____
			_____		
656.4	37	ea	Rosa 'Double Knockout'	$_____	$_____
			_____		
656.5	38	ea	Rosa 'Pink Double Knockout'	$_____	$_____
			_____		
656.6	31	ea	Spiraea x bumalda 'Anthony Waterer'	$_____	$_____
			_____		
656.7	125	ea	Spiraea x bumalda 'Goldmound'	$_____	$_____
			_____		
656.8	12	ea	Syringa 'Bloomerang'	$_____	$_____
			_____		

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
656.9	6	ea	Syringa vulgaris 'Charles Joy'	$_____	$_____
			_____		
656.1	8	ea	Thuja occidentalis 'Nigra'	$_____	$_____
			_____		
656.11	14	ea	Rhus aromatica 'Grow-Low'	$_____	$_____
			_____		
657.1	36	ea	Miscanthus Virgatum 'Shenandoah'	$_____	$_____
			_____		
657.2	184	ea	Hemerocallis 'Big Time Happy'	$_____	$_____
			_____		
657.5	170	ea	Anemone 'September Charm'	$_____	$_____
			_____		
657.7	6	ea	Baptisia australis	$_____	$_____
			_____		
657.8	11	ea	Calamagrostis acutifolia 'Karl Foster'	$_____	$_____
			_____		
657.12	13	ea	Hosta 'Frances Williams'	$_____	$_____
			_____		
657.13	12	ea	Hosta 'Guacamole'	$_____	$_____
			_____		
657.17	36	ea	Vinca minor 'Bowles'	$_____	$_____
			_____		
658	8	ea	Transplanted Crabapple	$_____	$_____
			_____		

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	UNITS	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
658	25	ea	Transplanted Rhododendron	$_____	$_____
			_____		
661.1	5	ea	Bench w/ Concrete Pad	$_____	$_____
			_____		
661.2	2	ea	Bus Shelter w/ Concrete Pad	$_____	$_____
			_____		
692	1	U	Mobilization	$_____	$_____
			_____		
1010.2	2000	$	Asphalt Cement Adjustment	$2,000.00	$2,000.00

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 and/or easements and agreements from one or more impacted property owners are not received.

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.

TOTAL FOR PROJECT AND BASIS OF AWARD

In Figures $_____

In Words **$**_____

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:

_____ By:_____
Company Signature

_____ Title:_____
Business Address

_____
City, State, Zip Code Telephone:_____

We certify that the Company is currently pre-qualified with the State of New Hampshire for Road Construction.

By: _____ _____
Signature & Title Date

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.

In order to follow the City's sustainability practices, future bid invitations/specifications may be sent electronically. Please provide an email address as to where I could email future bid invitations/specifications of this type. Thank you in advance for your cooperation.

Email
Address:_____

BID SECURITY BOND

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

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned

_____, as Principal, and

_____, as Surety, are hereby

held and firmly bound unto _____

IN THE SUM OF _____

as liquidated damages for payment of which, well and truly to be made we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

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

NOW THEREFORE,

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

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

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

BID SECURITY BOND (continued)

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

IN WITNESS WHEREOF, the parties hereto have duly executed

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

_____L.S.
(Name of Principal)

(SEAL)

BY _____

_____
(Name of Surety)

BY _____

STATEMENT OF BIDDER'S QUALIFICATIONS

Supply with Bid

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

1. Name of Bidder

2. Permanent Main Office Address

3. Form of Entity

4. When Organized

5. Where Organized

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

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

8. General character of work performed by your company.

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

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

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

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

13. List your major equipment available for this contract.

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

15. List subcontractors for the following categories whom you will use for the following (unless this work is to be done by your own organization, in which case please state).

    a. Paving _____

    b. Concrete Flatwork _____

    c. Landscaping _____

    d. Curbing _____

STATEMENT OF BIDDERS QUALIFICATIONS (continued)

e. Electrical _____

f. Paint Striping _____

The City reserves the right to disallow any subcontractor including work proposed to be completed by the General Contractor.

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

Commerce Way Reconstruction 66-15

THIS AGREEMENT made as of the xxx day of xxxx in the year **2015,** 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 Director of Public Works 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. **All work shall be substantially completed no later than November 1, 2015.**

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 **three hundred dollars ($300)** for each calendar day beyond the specified completion date for each section of work. Liquidated damages shall be deducted from the Contract Price prior to final payment of the Contractor.

CONTRACT AGREEMENT (continued)

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
General Requirements, Control of Work, Temporary Facilities, Measurement and Payment, Standard Specifications
8.5 Insurance Requirements
8.6 Special Conditions
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 other 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 entitled:

Commerce Way Reconstruction
Bid #66-15

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:

Commerce Way Reconstruction
Bid #66-15

TO:

YOU ARE HEREBY NOTIFIED TO COMMENCE WORK IN ACCORDANCE

WITH THE AGREEMENT DATED AND ALL

WORK SHALL BE COMPLETED BY _____.

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: November 1, 2015
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

PERFORMANCE BOND (continued)

(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.

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 MATERIAL PAYMENT BOND

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

Bond Number _____

KNOW ALL MEN BY THESE PRESENTS:

that _____

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

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

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

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

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

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

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

(2) The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such a claimant, may sue on this bond for the use of such claimant, prosecute the suit by final judgment for such sum or sums as may be

LABOR AND MATERIAL PAYMENT BOND (continued)

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:

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

_____
(Surety Company)

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

LABOR AND MATERIAL PAYMENT BOND (continued)

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.

MAINTENANCE BOND

At the Owner's election, a maintenance bond may be substituted for retainage at the completion of the project. If the Owner permits a maintenance bond, it shall be in the amount of **Twenty Percent (20%)** of the contract price with a corporate surety approved by the Owner. Such bond shall be provided at the time of Contract completion and shall guarantee the repair of all damage due to faulty materials or workmanship provided or done by the Contractor. This guarantee shall remain in effect for a period of one year after the date of final acceptance of the job by the Owner.

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: **Commerce Way Improvements**

_____

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

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

_____

CONTRACTOR'S RELEASE

KNOW ALL MEN BY THESE PRESENTS that _____

(Contractor) of _____, County of _____and State of

_____ does hereby acknowledge

that_____(Contractor)

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

payment for the Construction of:

Commerce Way Improvements

NOW THEREFORE, the said _____

(Contractor)

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

IN WITNESS WHEREOF,

Contractor:

_____ By:_____

print name of witness:_____ Its Duly Authorized _____

Dated: _____

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. Signs
e. Mobilization/Demobilization (unless otherwise paid for)
f. Restoration of property
g. Cooperation with other contractors, abutters and utilities.
h. Utility crossings, (unless otherwise paid for)
i. Minor items - such as replacement of fences, guardrails, rock wall, etc.
j. Steel and/or wood sheeting as required.
k. 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. Standard Specifications for Road & Bridge Construction will govern General Requirements.

2. Technical Specifications will govern Standard Specifications.

3. Plans will govern Technical Specifications, and General Requirements.

CONTROL OF WORK

1. AUTHORITY OF ENGINEER

(a) All work shall be done under supervision of the Engineer and to his satisfaction. The 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 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 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.

CONTROL OF WORK (continued)

3. MAINTENANCE DURING CONSTRUCTION

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

4. SAFETY PRECAUTIONS

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

5. PERMITS

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

6. BARRICADES, WARNING SIGNS AND TRAFFIC OFFICERS

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

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

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

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

TEMPORARY FACILITIES

1. STORAGE FACILITIES

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

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

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

2. SANITARY FACILITIES

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

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

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

3. TEMPORARY WATER

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

4. TEMPORARY ELECTRICITY

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

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

INSURANCE REQUIREMENTS

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

AMOUNT OF INSURANCE

A) 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.

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

MEASUREMENT AND PAYMENT

1. MEASUREMENT OF QUANTITIES

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

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

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

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

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

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

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

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

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

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

MEASUREMENT AND PAYMENT (continued)

(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.

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.

MEASUREMENT AND PAYMENT (continued)

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 until such time as the work receives final acceptance.

5. FINAL ACCEPTANCE

Upon due notice from the Contractor of presumptive completion of the entire project, the 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 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 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 Engineer will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

MEASUREMENT AND PAYMENT (continued)

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 ten percent (10%) of the whole will be deducted and retained by the Owner for the guaranty period. This retainage may be waived, at the discretion of the City, provided the required Maintenance Bond has been posted. After approval of the final estimate by the Owner, the Contractor will be paid the entire sum found to be due after deducting all previous payments and all amounts to be retained or deducted under the provisions of the contract.

(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.

MEASUREMENT AND PAYMENT (continued)

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.

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 Section 100 "General Conditions" of those Standard Specifications and without regard to any of those NHDOT provisions that allow for an adjustment for changing fuel and asphalt prices.

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

REQUIRED:

The City has made certain representations to the business owners and stakeholders of this project. A very important part of this project will be maintaining access to all buildings and businesses at all times.

The following items are crucial to the success of this project:

The project may begin on July 6, 2015.

Work will commence no earlier than 7am and will stop no later than 4:30 pm weekdays unless allowed by the Engineer with the exception of work in Woodbury Avenue as described below.

For work in the traffic lanes of Woodbury Avenue:

All work must be completed at night from 7PM to 6:30AM unless allowed by the Engineer. No water will be shut off to the main on Woodbury Avenue except after 10PM. Any main shut offs will be coordinated with the Portsmouth Water Department.

Portsmouth Police will be required for all work.

Proper Sign packages and/or traffic detours (if approved) as depicted in the MUTCD will be required.

Traffic Signal detection loops will not be compromised for more than 4 consecutive days.

There will be at least one lane in each direction open at all times. This may require work on consecutive nights.

The road will be brought up to grade with a minimum of crushed gravel at the end of each work shift. The road must be paved with a minimum of 1 ½" of asphalt if the work carries over the weekend.

Work in Woodbury Avenue will last no more than 4 consecutive nights.

After the water main is installed, a patch 1 ½" thick will be constructed across the road. This patch will be maintained as necessary and as ordered by the Engineer. After a period of time as determined by the City, the patch will be removed and repaired with full depth pavement. Cold planing of the adjacent paving will be required by the City prior to a final overlay of 3/8" 75 gyration paving. Separation and reuse of the existing gravels in the road will be required.

Installation of temporary traffic loops if necessary as determined by the City will be subsidiary to the Maintenance of Traffic Item. All construction signs and traffic control plans ordered by the Engineer will also be subsidiary to this item. Message boards will be required if major detours due to utility or road reconstruction work is required.

TECHNICAL SPECIFICATIONS

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

Additional Technical Specifications and Special Provisions for this project are attached.

Included Technical Specifications:

306.108	**Reclaimed Stabilized Base**
401	**Asphalt Pavement Supplemental Specification**
592.12	**Mechanically Stabilized Precast Units**
604	**Catch basin and manhole frames and covers**
608.24	**Concrete Sidewalks**
608.52	**Armortile Handicapped truncated dome panels**
609	**Curbing Source**
611	**Water Main Installations**
616	**City owned Lighting and Electrical Work**
618 & 619	**Traffic Control and Maintenance of Traffic**
646	**Loaming with Turf Establishment**
65X	**Landscape Plantings**
661.1	**Bench with pad**
661.2	**Bus shelter**

SPECIAL PROVISION

AMENDMENT TO SECTION 306 – Reclaimed Stabilized Base

Item 306.208 8" Asphalt Stabilized Base Remove & Rehandle

This item is amended as follows:

Amend 2.1.1 to the following gradation:

Sieve designation	% passing by weight
2"	100
1 ½"	70-100
¾"	55-90
#4	40-75
#40	10-30
#200	3-10

Construction Requirements:

Add

3.13 Excavation & removal of excess materials to finish base elevation and compaction are all inclusive to this item. The road will be reclaimed, finish graded and compacted to a finish grade that will be approved by the Engineer.

SUPPLEMENTAL SPECIFICATION

BITUMINOUS CONCRETE PAVING (NH[RD1])

PART 1 - GENERAL

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**[RD2] 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** [RD3]inches in 25 feet shall corrected.

PART 2 - PRODUCTS

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[RD4]% 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[RD5]-E for all high strength bituminous pavements. NHDOT QC/QA Specifications shall be followed for high strength mixes.
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[RD6]	75
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 not allowed 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).**

PART 3 - EXECUTION

3.1 INSTALLATION

A. 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 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 0.02 and 0.05 gal/$yd^{2.}$
   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.

END OF SECTION

SPECIAL PROVISION – Not a Standard NHDOT Specification

SECTION 592.12

SEGMENTAL RETAINING WALL SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Segmental retaining wall system

1.2 REFERENCES

A. National Concrete Masonry Association Design Manual for Segmental Retaining Walls – Latest Edition.

1.3 SUBMITTALS

A. Submit a list of at least five successful projects of similar or greater size and complexity installed in the last five years by the Contractor using the same wall system proposed for this project. Project references shall include the following minimum information:

1. Project name and location

2. Owner contact information

3. Wall plans and specifications

B. Submit wall manufacturer product information for wall system proposed including a statement indicating project experience within the last five years of similar or greater size and complexity. Project references shall include the following minimum information:

1. Project name and location

2. Product brochures

3. Photographs of completed wall systems

4. Owner reference

C. Final design, which shall include detailed design computations and all details, dimensions, quantities and cross sections necessary to construct the wall. Along with the requirements of the Contract, the design shall conform to the latest edition of the National Concrete Masonry Association Design Manual for Segmental Retaining Walls. The fully detailed plans shall be 24" x 36" prints with Project

Name, Number and Design Firm. The plans to be submitted shall include, but not be limited to, the following items:

1. A plan and elevation sheet or sheets for each wall, containing the following:
    a. An elevation view of the wall which shall indicate the elevation at the top of the wall, at all horizontal and vertical break points and at least every twenty-five (25) feet along the wall, elevations at the top of leveling pads, elevations of reinforcement (if any), the designation as to the type of unit, and the location of the original and final ground line.
    b. A plan view of the wall, which shall indicate: the offset from the construction centerline or baseline to the face of the wall at all changes in horizontal alignment and the limit of the widest unit.
    c. Any general notes required for design and construction of the wall.
    d. All horizontal and vertical curve data affecting wall construction.
2. All details for leveling pads, as well as allowable and calculated maximum bearing pressures.
3. Backfill gradation, placement, and compaction requirements.
4. Detailed design computations, including global stability calculations.
5. The plans and calculations shall be prepared, stamped and signed by a Registered Professional Engineer in the State of New Hampshire
6. The computations shall include all detailed explanation of any symbols and computer programs used in the wall design.

1.4 QUALITY ASSURANCE

A. Certifications

1. The wall designer shall inspect the wall construction and provide a stamped Certification to the Engineer that it has been constructed in accordance with their design.

PART 2 PRODUCTS

2.1 MATERIALS

A. All backfill material used in the wall construction shall be as specified by the wall designer on the approved wall plans. Backfill material requirements shown on the Drawings indicate the maximum particle size and maximum percentage of fines acceptable for use in the wall design. On-site material is not expected to be suitable as wall backfill.

B. Retaining wall systems to be used on this Project shall be the product of one of these manufacturers:

1. Stone Strong

2. Redi-Rock

PART 3 EXECUTION

3.1 PREPARATION

A. Foundation Preparation

1. The foundation for the structure shall be graded level for a width as shown on the submitted wall plans. Prior to wall construction, the foundation, if not on sound, intact, bedrock, shall be compacted as indicated on the submitted wall plans. Any foundation soils found to be unsuitable shall be removed and replaced as directed by the Engineer.

3.2 WALL ERECTION

A. The wall system, including but not limited to, blocks, reinforcement, and backfill materials, shall be constructed in accordance with the manufacturer's recommendations and the latest edition of the National Concrete Masonry Association Design Manual for Segmental Retaining Walls, unless superseded by these Specifications or the submitted wall plans.

B. Backfill placement shall closely follow erection of each course of wall units. Backfill shall be placed in such a manner as to avoid any damage to the wall materials or misalignment of the units. Any wall components, which become damaged or disturbed during backfill placement, shall be either removed and replaced or corrected at the Contractor's expense, as directed by the Engineer.

3.3 BASIS OF PAY

A. Pay Item and Units:

Pay Item		Pay Unit
592.12	Segmental Block Retaining Wall System	Sf

END OF SECTION

SPECIAL PROVISION

AMENDMENT TO SECTION 604 – Catch Basins, Drop Inlets, and Manholes

Frames, grates and covers either new or to be replaced will be fabricated in the USA.

SPECIAL PROVISION
To Section 608 (NHDOT Standard Specifications) Sidewalks

SECTION 608.24 & 608.26
CONCRETE SIDEWALK CONSTRUCTION

Amend sections of section 608 to read:

Materials:

2.2 Portland cement concrete shall be Class AA conforming to 520.

2.3.1 Handicapped ramps (at street intersections) shall be 6" deep, class AA 4000 psi synthetic fiber reinforced with 6" x 6" x 10ga welded wire mesh sheets.

2.3.2 4" Sidewalks shall be reinforced with synthetic fibers.

Construction Requirements:
3.2.6 Joints: Construct crack control joints at 5' intervals. Construct expansion joints at 25' intervals.

Methods of Measurement:
4.1 This work shall be measured by the square yard of concrete sidewalk successfully & completely installed and approved by the Engineer.

Basis of Payment:
5.1 This work shall be paid for at the Contract Unit Price as listed in Item #608.24 & 608.26 in the Bid.

Pay Items and units:

608.24	4" Concrete sidewalk	Square yard
608.26	6" Concrete sidewalk (HC Ramps)	Square yard

This price shall include all equipment, material and labor incidental hereto.

SPECIAL PROVISION
To Section 608 (NHDOT Standard Specifications) Sidewalks
Item 608.52 – ADA Compliant Handicap Ramp Panels

This special provision provides for the installation of handicap accessible ramp surfaces (Detectable Warning Pavers) to be in compliance with the Americans with Disabilities Act (ADA). This Special Provision provides for Item 608.52 and neither modifies nor amends any other provisions of this section unless specifically noted.

Description

1.1 This work shall consist of furnishing and installing a detectable warning surface and accessories on sidewalk ramps at locations shown on the plans, as specified herein, or as ordered including any and all required surface preparation. Detectable warnings shall be installed at sidewalk ramps where a sidewalk crosses a vehicular way, excluding unsignalized driveway crossings. The edge nearest the curbline shall be located 150 to 200 mm (6 to 8 in) from the back of the curbline. The paver shall be centered on the ramp.

Materials

2.1 Detectable Warning Device:

2.1.1 Material. The detectable warning surface shall consist of Engineered Plastic units. The units will be pressed into Portland cement or other Owner approved material. **The paver units shall be Armor Tile as manufactured and supplied by Engineered Plastic, Inc., 300 International Dr Suite 100, Williamsville, NY 14221, 1-800-769-4463, www.armor-tile.com**

2.1.2 Color. The color of the tile used shall be **brick red**, and would be installed in a concrete ramp as described above (608.26).

2.1.3 Paver Dimensions. Nominal paver dimensions shall be **2' deep x 3' wide**.

2.1.4 Detectable Warning Truncated Dome Geometry:

2.1.4.1 Detectable warnings shall be in full compliance with ADAAG guidelines (Title 49 DFR Transportation, Part 37.9 Standard for Accessible Transportation Facilities, Appendix A, Section 4.29.2- Detectable Warning on Walking Surfaces).

2.1.4.2 Size and spacing for truncated domes shall be as follows: base diameter of nominal 0.9 inch, top diameter of nominal 0.4 inch, height of nominal 0.2 inch, with a center to center spacing of nominal 2.35 inches.

2.1.4.3 The truncated dome pattern shall align properly from paver to paver if more than 1 paver is required.

2.2 Setting Bed Material

2.2.1 Material. Pavers shall be set into fresh concrete before it sets. See ramp specification above (608.26). Also see manufacturer instructions.

Construction Requirements

3.1 The Contractor shall submit manufacturer's installation instructions and descriptive literature for materials specified herein.

3.2 Transport, storage, and handling of products shall be in accordance with manufacturer's instructions.
3.2.1 All sealants/adhesives shall be protected from freezing conditions.
3.3 The air and surface temperatures during construction shall be in accordance with manufacturer's recommendations.
3.4 Concrete foundation shall be installed in accordance with the specifications included within Section 608 to depths indicated in the section shown on the plans.
3.5 Install detectable warning pavers in accordance with manufacturer's instructions directly in the setting bed and the allowing the top surface of the paver units to be at or just below the required finish grade.
3.6 Care shall be taken to ensure the safety of pedestrians when sidewalks must remain in service during construction.

Method of Measurement

4.1 These are measured by each panel installed successfully.

Basis of Payment

Pay Item and Unit		
608.52	Detectable Warning Surface Panels	Each

SPECIAL PROVISION

AMENDMENT TO SECTION 609 – Curbing Installation

Item 609.01, 609.02

Materials:

Add to 2.1: Curbing will be manufactured by Swenson Granite Works, Concord NH.

Basis of Payment:

Amend 5.3: Class A Concrete backfill will be used for curb installation and will be paid for under item 520 by the cubic yard installed.

SPECIAL PROVISION
To Section 611 (NHDOT Standard Specifications) Drinking Water Mains

SECTION 02610

PIPE & PIPE FITTINGS - GENERAL

PART 1 - GENERAL

1.1 DESCRIPTION
- A. Work Included: Furnish, install, support and test pipe and pipe fittings of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.

1.2 SUBMITTALS TO THE ENGINEER
- A. Submit shop drawings in accordance with the General Conditions of the Construction Contract.
- B. If requested by the Engineer, submit manufacturer's "Certification of Conformance" that pipe and pipe fittings meet or exceed the requirements of these Specifications.
- C. Submit other documents as specified in the appropriate Sections of this Division.

1.3 DELIVERY, STORAGE AND HANDLING
- A. Exercise care during loading, transporting, unloading, and handling to prevent damage of any nature to interior and exterior surfaces of pipe and fittings.
- B. Do not drop pipe and fittings.
- C. Store materials on the project site in enclosures or under protective coverings in accordance with manufacturer's recommendations and as directed by the Engineer.
- D. Assure that materials are kept clean and dry.
- E. Do not store materials directly on the ground.
- F. Follow manufacturer's specific instructions, recommendations and requirements.

PART 2 - PRODUCTS

2.1 MATERIALS
- A. Marking Tape
  1. Shall be coded in accordance with the NPWA Standards.
  2. Shall be indelibly marked indicating the type of utility it is placed over.
  3. Shall be three (3) inches wide Terra Tape Sentry Line 1350 (Detachable) by Reef Industries, Houston, TX, or approved equal.
- B. Pipe Lubricant or glue
  1. Use only lubricants or glues suitable for the type of pipe and application.
  2. For potable water pipe use only lubricants or glues clearly marked “For Use with Potable Water”.

PART 3 - EXECUTION

3.1 EXAMINATION
- A. Provide all labor and equipment necessary to assist the Engineer to observe pipe, fittings, gaskets, and other materials.
  1. This shall include all air quality testing equipment, harnesses and manlifts necessary to comply with the appropriate OSHA regulation.
  2. The Engineer shall comply with the Contractor’s regulations and policies regarding below grade or confined space entry.

B. Carefully inspect all materials at the time of delivery and just prior to installation.
C. Carefully inspect all pipe and fittings for:
   1. Defects and damage.
   2. Deviations beyond allowable tolerances for joint dimensions.
   3. Removal of debris and foreign matter.
D. Examine areas and structures to receive piping for:
   1. Defects, such as weak structural components that adversely affect the execution and quality of work.
   2. Deviations beyond allowable tolerances for pipe clearances.
E. All materials and methods not meeting the requirements of these Specifications shall be rejected.
F. Immediately remove all rejected materials from the project site.
G. Start work only when conditions are corrected to the satisfaction of the Engineer.

3.2 INSTALLATION

A. General:
   1. Install all pipe and fittings in strict accordance with the manufacturer's instructions and recommendations and as instructed by the Engineer.
   2. Install all pipes and fittings in accordance with the lines and grades shown on the Drawings and as required for a complete installation.
   3. Install adapters, approved by the Engineer, when connecting pipes constructed from different materials.
   4. When applicable, support all piping not being installed in trenches in accordance with the "Pipe Hangers & Supports" Section of these Specifications.
B. Installation and Trenches:
   1. Firmly support the pipe and fittings on bedding material as shown on the Drawings and as specified in the appropriate Sections of these Specifications.
      a. Where, in the opinion of the Engineers, the subgrade material is unsuitable to support the pipe, over-excavate the unsuitable material and replace the same with suitable gravel or granular borrow.
      b. If the subgrade material encountered consists of saturated clays or silts, the Engineer may direct the installation of the bedding material and pipe inside a construction fabric wrap as shown on the Drawings.
   2. Do not permanently support the pipe or fittings on saddles, blocking stones, or any material which does not provide firm and uniform bearing along the outside length of the pipe.
   3. Thoroughly compact the material under the pipe to obtain a substantial unyielding bed shaped to fully support the pipe.
   4. Excavate suitable holes for the joints so that only the barrel of the pipe receives bearing pressure from the supporting material after placement.
   5. Lay each pipe length so it forms a close joint with the adjoining length and bring inverts to the required grade.
   6. Set the pipe true to line and grade. Use a transit for line. Use a laser beam aligner for grade.
   7. Do not drive the pipe down to grade by striking it with a shovel handle, timber, rammer or any other unyielding object.
   8. Make all pipe joints watertight and no sand, silt, clay or soil of any description entering the pipeline at the joints.
   9. Immediately after making a joint, fill the holes for the joint with bedding material, and compact.
   10. When each pipe length has been properly set, place and compact enough of the bedding material between the pipe and the sides of the trench to hold the pipe in correct alignment.
   11. After filling the sides of the trench, place and lightly tamp bedding material to complete the bedding as shown on the Drawings.
   12. Take all necessary precautions to prevent flotation of the pipe in the trench.

13. Where there is evidence of water or soil entering the pipeline, repair the defects to the satisfaction of the Engineer.

C. Temporary Plugs:
1. When pipe installation work in trenches is not in progress, close open ends of the pipe with temporary watertight plugs.
2. If water is in the trench when work is resumed, do not remove plugs until all danger of water entering the pipe is eliminated.
3. Do not use the pipe lines as conductors for trench drainage during construction.

D. Protection of Water Supplies:
1. There shall be no physical connection between a public or private potable water supply system and a sewer.
2. Sewer shall be a minimum of ten feet horizontally unless shown otherwise on the drawings.
3. Whenever sewers must cross water mains, the sewer shall be constructed as follows (unless shown otherwise on the Drawings):
   a. Sewer pipe shall be class 52 ductile iron or PVC pressure rated pipe (DR-25 min. or SDR-32.5 min.) for a minimum distance of 9 feet each side of the crossing.
   b. Joints shall be mechanical type water pressure rated with zero leakage when tested at 25 pounds per square inch for gravity sewers and 1-1/2 times working pressure for force mains, and joints shall not be located within 9 feet of the crossing.
   c. Vertical separation of sewer and water main shall not be less than 18".

3.3 CLEANING AND TESTING

A. Cleaning and Testing Piping - General:
1. Thoroughly clean all piping prior to testing. Remove all dirt, dust, oil, grease and other foreign material. Exercise care while cleaning to avoid damage to linings and coatings.
2. When the installation is complete, test all pipelines, including service laterals, in the presence of the Engineer and the plumbing or building inspector in accordance with the requirements of the local and state plumbing codes and the appropriate Sections of these Specifications, at no additional cost to the Owner.
3. Equipment: Supply all labor, equipment, materials, gages, and pumps required to conduct the tests.
4. Retesting: Perform all retesting required due to failure at no additional cost to the Owner and to the complete satisfaction of the Engineer.

B. Outside Potable Water Piping:
1. Pressure Test:
   a. Perform testing in accordance with Section 5 of AWWA Standard C600.
   b. Pressure and leakage tests are required.
2. Chlorination of Pipelines:
   a. Chlorinate all new potable water lines in accordance with the procedure outlined in AWWA C600, latest revision.
   b. Locate chlorination and sampling points as approved by the Engineer.
   c. Use a dosage which will produce not less that 10.0 ppm chlorine residual after a contact period of not less than 24 hours.
   d. During the chlorination period, exercise care to prevent the contamination of water in existing water mains.
   e. After chlorination, flush the piping with clean potable water until there is only background chlorine residual.
   f. Chlorinated effluent shall be dechlorinated prior to release to surface waters.
3. Bacteriological Testing:
   a. Test all new potable water lines for total Coliform bacteria at no additional cost to the Owner. The Contractor shall coordinate all testing with the City. Bacteriological testing services of new water mains will be provided by the City of

Portsmouth Water Department, at no cost to the Contractor. However, the Contractor will remain responsible for coordination and sampling in advance.

b. The length of pipe to be tested and the time of the test shall be as approved by the Engineer.

c. The Engineer will observe the taking of samples.

d. Have all samples tested by a laboratory approved by the State and submit test results to the Engineer.

e. Any segment of a potable water line shall be considered unsuitable for service if a Coliform bacteria count is obtained from that sample.

f. Re-disinfect all segments of piping considered unsuitable and retest. Continue to disinfect and test until no Coliform bacteria are present.

g. Place piping into service when it has been successfully tested for pressure, leakage and total Coliform bacteria.

4. Services:

a. After a new main has been energized and the new service has been completed, it shall be the responsibility of the Contractor to confirm with the property owner that all water systems in the building are working properly. This will include removing any air from the water service and confirmation with the property owner that interior plumbing is functioning properly.

C. Building Interior Water Lines (When Applicable):

1. Clean and test in accordance with the "Plumbing General" Section in these Specifications.

D. Sewer Lines:

1. Outside Sewer Lines: Test with a low pressure air test, a visual inspection, and for PVC or other flexible piping, test with a deflectometer after suitable settling time has elapsed..

2. Building Interior Sewer System: Clean and test in accordance with the "Plumbing General" Section in these Specifications.

E. All Other Piping Systems:

1. Pressure Test:

a. Perform a pressure test for all other piping systems at 1-1/2 times maximum system pressure, or at the maximum working pressure of the piping system, or at a pressure indicated in the appropriate Sections of this Specification.

b. Tests shall be hydrostatic water, or air pressure as specified or as approved by the Engineer.

2. Cleaning: Perform all specialized cleaning as specified or required by system.

SECTION 02611

DUCTILE IRON PIPE & FITTINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Furnish and install ductile iron pipe and ductile iron fittings of the type(s) and size(s) in the location(s) shown on the Drawings and as specified herein.

1.2 QUALITY ASSURANCE

A. Standards:

1. Cement-mortar lining for water: ANSI A21.4/AWWA C104.

2. Rubber gasket joints: ANSI A21.11/AWWA C111.

3. Ductile iron pipe thickness: ANSI A21.50/AWWA C150.

4. Ductile iron pipe, centrifugally cast: ANSI A21.51/AWWA C151.

5. Threaded flanges: ANSI A21.15/AWWA C115.
6. Ductile iron fittings: ANSI 21.53/AWWA C153.
7. Pipe flanges and fittings: ANSI B16-1, ANSI A-21.12.
8. Bolts: COR-TEN ASTM A588.
9. Polyethylene encasement: ANSI/A21.5/AWWA C105

1.3 SUBMITTALS TO THE ENGINEER

A. Submit shop drawings in accordance with the General Conditions of the Construction Contract.
B. If requested by the Engineer, submit manufacturer's "Certification of Conformance" that pipe and fittings meet or exceed the requirements of these Specifications.
C. If joint restraints are to be used in place of thrust blocks, submit restraint calculations for review by the Engineer. Restraint calculation shall be in accordance with DIPRA and AWWA standards.

1.4 DELIVERY, STORAGE AND HANDLING

A. Exercise extra care when handling pipe and fittings.
B. Exercise extra care when handling cement lined pipe and fittings because damage to the lining will render it unfit for use.
C. Protect the spherical spigot ends and the plain ends of all pipe during shipment by wood lagging securely fastened in place.

1.5 OBSERVATION

A. Provide all labor necessary for the Engineer to observe pipe, fittings, gaskets, and other materials.
B. Carefully observe all materials at the time of delivery and just prior to installation.
C. Carefully observe all pipe and fittings for:
   1. Defects and damage.
   2. Deviations beyond allowable tolerances for joint dimensions.
   3. Removal of debris and foreign matter.
D. Examine areas and structures to receive piping for:
   1. Defects, such as weak structural components that adversely affect the execution and quality of work.
   2. Deviations beyond allowable tolerances for pipe clearances.
E. All materials and methods not meeting the requirements of the Contract Documents will be rejected.
F. Immediately remove all rejected materials from the project site.
G. Start work only when conditions are corrected to the satisfaction of the Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe:
   1. All pipes shall conform to the latest AWWA specification C151. Unless otherwise shown on the Drawings, the minimum thickness of ductile iron pipe shall be:
      a. All ductile iron pipe shall be Class 52, double cement lined.
      b. Pipe with flanges: Class 53 (formerly Class 3).
      c. All ductile iron pipe shall have cement lining of double thickness.
   2. Pipe for use with sleeve type couplings shall have plain ends (without bells or beads) cast or machined at right angles to the axis.
   3. Pipe for use with split type couplings shall have ends with cast or machined shoulders or grooves that meet the requirements of the manufacturer of the couplings.
   4. Factory applied bituminous coatings, as approved by the Engineer, shall be furnished for all underground piping.
   5. Each ductile iron pipe shall have conspicuously marked on the exterior the pressure, class, and weight of the pipe.

6. All ductile iron pipe furnished to the project shall be one uniform length, either 18 feet or 20 feet.

B. Joints (as shown on the Drawings, specified and applicable):

1. General: All joints shall be the same pressure class as the pipe unless otherwise shown on the Drawings.
2. Flanged:
   a. Provide specially drilled flanges when required for connection to existing piping or special equipment.
   b. Flanges shall be long-hub screwed tightly on pipe by machine at the foundry prior to facing and drilling.
   c. Gaskets:
      (1) Ring type of rubber with cloth insertion.
      (2) Thickness of gaskets 12 inches in diameter and smaller: 1/16 inch.
      (3) Thickness of gaskets larger than 12 inches in diameter: 3/32 inch.

   d. Fasteners:
      (1) Make joints with bolt, stubs with a nut on each end, or one tapped flanged with a stud and nut.
      (2) The number and size of bolts shall meet the requirements of the same American National Standard as the flanges.
      (3) Nuts, bolts and studs shall be Grade B meeting the requirements of ASTM A307.
      (4) After jointing, coat entire joint with bituminous material compatible with pipe coating.
   e. When applicable, provide and install flange clamps as shown on the Drawings.
   f. Uniflange type connection shall be positively restrained by use of threaded rods (2) or other approved restraint device.
3. Push-on and Mechanical Joint:
   a. The plain ends of push-on pipes shall be factory machined to a true circle and chamfered to facilitate fitting the gasket.
   b. Provide gaskets manufactured from a composition material suitable for exposure to the liquid to be contained within the pipe.
4. Grooved split ring couplings, sleeve couplings, flexible joints and couplings: As specified and shown on the Drawings.
5. Joint Bracing:
   a. Provide joint bracing to prevent the piping from pulling apart under pressure as required.
   b. Types of bracing:
      (1) Field Lok 350™ Gasket by US Pipe for Ductile Iron Pipe.
      (2) Thrust blocks of sufficient size in accordance with DIPRA and AWWA standards for thrust restraint.
      (3) Mechanical joint ductile iron pipe shall have "Mega-lug Type" restrained ductile iron glands.
      (4) Pipe and fittings with approved lugs or hooks cast integrally for use with socket pipe clamps, tie rods, or bridles. Bridles and tie rods shall be a minimum of 3/4 inch diameter except where they replace flange bolts of a smaller size, in which case they shall be fitted with a nut on each side of the pair of flanges. The clamps, tie rods, and bridles shall be coated with an approved bituminous paint after assembly or, if necessary, prior to assembly.

      (5) Other types of bracing as shown on the Drawings.

C. Standard Fittings:
   1. All joints shall conform to the latest AWWA specification C-153.
   2. Class 350, Ductile Iron, Cement Lined except as shown on the Drawings or as specified.
   3. Joints the same as the pipe with which they are used or as shown on the Drawings.
   4. Provide fittings with standard bases where shown on the Drawings.
   5. Provide retainer glands on all fittings.
   6. Outside surface coated to specifications applicable to pipe.

D. Non-Standard Fittings:
   1. Fittings having non-standard dimensions shall be subject to the Engineer's approval.
   2. Non-standard fittings shall have the same diameter and thickness as standard fittings and shall meet the specification requirements for standard fittings.
   3. The laying lengths and types of joints shall be determined by the particular piping to which they connect.
   4. Flanged fittings not meeting the requirements of ANSI A21.10 (i.e., laterals or reducing elbows) shall meet the requirements of ANSI B16.1 in Class 125.

E. Polyethylene encasement shall be 8 mil thick.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Install all pipe and fittings in strict accordance with the manufacturer's instructions and recommendations.
   2. Install all pipes and fittings in accordance with the lines and grades shown on the Drawings and as required for a complete installation.
   3. Install adapters, approved by the Engineer, when connecting pipes constructed from different materials.

B. Installation in Trenches:
   1. Firmly support the pipe and fittings on bedding material as shown on the Drawings and as specified in the appropriate Sections of these Specifications.
   2. Do not permanently support the pipe or fittings on saddles, blocking stones, or any material which does not provide firm and uniform bearing along the outside length of the pipe.
   3. Thoroughly compact the material under the pipe to obtain a substantial unyielding bed shaped to fully support the pipe.
   4. Excavate suitable holes for the joints so that only the barrel of the pipe receives bearing pressure from the supporting material after placement.
   5. Lay each pipe length so it forms a close joint with the adjoining length and bring the inverts up to the required grade.
   6. Set the pipe true to line and grade. Use a transit and level or a laser beam aligner as appropriate to the pipe application.
   7. Do not drive the pipe down to grade by striking it with a shovel handle, timber, rammer, or any other unyielding object.
   8. Make all pipe joints watertight with no visible leakage and no sand, silt, clay or soil of any description entering the pipeline at the joints.
   9. Immediately after making a joint, fill the holes for the joints with bedding material and compact.
   10. When each pipe length has been properly set, place and compact enough of the bedding material between the pipe and the sides of the trench to hold the pipe in correct alignment.
   11. After filling the sides of the trench, place and lightly tamp bedding material to complete the bedding as shown on the Drawings.
   12. Take all necessary precautions to prevent flotation of the pipe in the trench.
   13. Where there is evidence of water or soil entering the pipeline, repair the defects.

C. Temporary Plugs:

1. When pipe installation work in trenches is not in progress, close the open ends of the pipe with temporary watertight plugs.
2. If water is in the trench when work is resumed, do not remove plugs until all danger of water entering the pipe is eliminated.
3. Do not use the pipelines as conductors for trench drainage during construction.

D. Assembling Joints:

1. Push-on Joints:
   a. Insert the gasket into the groove of the bell.
   b. Uniformly apply a thin film of special lubricant over the inner surface of the gasket that will contact the spigot end of the pipe.
   c. Insert the chamfered end of the plain pipe into the gasket and push until it seats against the bottom of the socket.
   d. Where electromagnetic type pipe locators are used or as directed, insert serrated brass wedges at all joints to assure continuity. Use two wedges per joint for 2" through 12" diameter pipe and four wedges for pipes greater than 12" diameter. Each wedge shall be driven into the opening between the plain end and the bell end. Wedges may be omitted with use of Field Lok 350 ™ gaskets.
2. Bolted Joints:
   a. Remove rust preventive coatings from machined surfaces prior to assembly.
   b. Thoroughly clean and carefully smooth all burrs and other defects from pipe ends, sockets, sleeves, housings and gaskets.
3. Flanged Joints:
   a. Insert the nuts and bolts (or studs), finger tighten, and progressively tighten diametrically opposite bolts uniformly around the flange to the proper tension.
   b. Execute care when tightening joints to prevent undue strain upon valves, pumps, and other equipment.
4. Mechanical Joints:
   a. Thoroughly clean, with a wire brush, surfaces that will be in contact with the gaskets.
   b. Lubricate the gasket, bell, and spigot.
   c. Slip the gland and gasket, in that order, over the spigot and insert the spigot into the bell until properly seated.
   d. Evenly seat the gasket in the bell at all points, center the spigot, and firmly press the gland against the gasket.
   e. Insert the bolts, install the nuts finger tight, and progressively tighten diametrically opposite nuts uniformly around the joint to the proper tension with a torque wrench.
   f. The correct range of torque (as indicated by a torque wrench) and the length of wrench (if not a torque wrench) shall not exceed:
      (1) Range of Torque: 60-90 Ft.-lbs.
      (2) Length of Wrench: 10 inches.
   g. If effective joint sealing is not attained at the maximum torque specified above, disassemble, thoroughly clean, and reassemble the joint. Do not overstress the bolts to tighten a leaking joint.
5. Bell and Spigot Joints:
   a. Thoroughly clean the bell and spigots and remove excess tar and other obstructions.
   b. Apply a liberal coat of manufacturer supplied lubricant to both the gasket and the spigot end. Lubricant shall be appropriate for the pipe application.
   c. Insert the spigot firmly into place and hold securely until the joint has been properly completed.

E. Fabrication:

1. Tapped Connections:
   a. Make all tapped connections where shown on the Drawings or where directed by the Engineer.

b. Make all connections watertight and of adequate strength to prevent pullout.
c. Drill and tap normal to the longitudinal axis of the pipe.
d. The maximum sizes of taps in pipes and fittings without busses shall not exceed the sizes listed in the appendix of ANSI A21.51 based on 3 full threads for cast iron and 2 full threads for ductile iron.

2. Cutting:
a. Perform all cutting with machines having rolling wheel cutters or knives designed to cut cast or ductile iron. Do not use a hammer and chisel to cut pipe.
b. After cutting, examine all cut ends for possible cracks.
c. Carefully chamfer all cut ends to be used with push-on joints to prevent damage to gaskets when pipe is installed.

F. Polyethylene encasement shall be installed in agreement with ANSI/AWWA C105/A21.5 and per manufacturers recommendations. Tube end shall be overlapped and secured with adhesive tape or plastic string. Repair any rips or deflects prior to backfilling.

G. Pipe Deflection:
1. Push-on and Mechanical Joints:
a. The maximum permissible deflection of alignment at joints, in inches for 18 foot lengths:

Size of Pipe	Push-On	Mechanical
6	19	27
8	19	20
10	19	20
12	11	20
14	11	13.5
16	11	13.5
18	11	11
20	11	11
24	11	9

b. The maximum permissible deflection for other lengths shall be in proportion of such lengths to 18 feet.
2. Flexible Joints: The maximum deflection in any direction shall not exceed the manufacturer's instructions and recommendations.

H. Testing to be performed in accordance with the appropriate section of Section 02610 – Pipe and Pipe Fittings – General.

SECTION 02626

COPPER SERVICE PIPE

PART 1 - GENERAL

1.1 DESCRIPTION
A. Work Included: Furnish and install copper service pipe of the type and size and in the locations shown on the Drawings and as specified herein.

1.2 QUALITY ASSURANCE
A. Seamless copper water tube, ASTM B88.

PART 2 - PRODUCTS

2.1 MATERIALS
- A. Type K, soft annealed, 3/4" (minimum) through 1".
- B. Type K, hard tempered, 1-1/4 inches and larger.

PART 3 - EXECUTION
- A. Jointing:
  - 1. Compression Joints
    - a. Ream or file the pipe to remove burrs.
    - b. Slip compression nut over pipe and slide pipe into corporation.
    - c. Tighten compression nut.
    - d. Inspect for cracks, splits or other damages and replace if necessary.
  - 2. Adapters: Use as required to connect to existing services.
- B. Bending Pipe:
  - 1. Bend pipe with suitable tools and provide smooth bend free of any cracks or buckles.

SECTION 02630

COUPLINGS, CONNECTORS, CAPS & PLUGS

PART 1 - GENERAL

1.1 DESCRIPTION
- A. Work Included: Furnish and install couplings and connectors of the type(s) and size(s) in the location(s) shown on the Drawings and as specified herein.
- B. Related Work Specified Elsewhere: "Pipe & Pipe Fittings - General" is specified in this Division.

1.2 QUALITY ASSURANCE
- A. Minimum pressure rating equal to that of the pipeline in which they are to be installed.
- B. Couplings and connectors, other than those specified herein, are subject to the Engineer's approval.
- C. Cap and plug shop drawing submissions must be accompanied by a manufacturer's written certification that the cap or plug will effectively and permanently seal the inactivated or abandoned utility.

PART 2 - PRODUCTS

2.1 MATERIALS
- A. All couplings and Connectors:
  - 1. Gasket Materials: Composition suitable for exposure to the liquids to be contained within the pipes.
  - 2. Diameters to properly fit the specific types of pipes on which couplings and connectors are to be installed.
- B. Sleeve Type Couplings (When Applicable):
  - 1. Exposed Couplings (When Applicable):
    - a. Steel middle ring,
    - b. Two steel follower rings,
    - c. Two wedge-section gaskets,
    - d. Sufficient steel bolts to properly compress the gaskets,
    - e. Acceptable Manufacturers:
      - (1) Dresser Manufacturing Co. - Style 38,
      - (2) Smith-Blair Inc. - Style 411,
      - (3) Or approved equal.
  - 2. Buried Couplings (When Applicable):

a. Cast or ductile iron middle rings with pipe stops removed,
b. Two malleable iron follower rings with ribbed construction,
c. Two wedge-section gaskets,
d. Sufficient galvanized steel bolts to properly compress the gaskets,
e. Acceptable Manufacturers:
(1) Dresser Manufacturing Co.
(2) Smith-Blair Inc. - Style 411,
(3) Or approved equal.

C. Split Type Couplings (When Applicable):
1. Constructed from malleable or ductile iron.
2. For use with grooved or shouldered end pipe with minimum wall thickness as required so as not to weaken pipe.
3. Cast in two sections for 3/4 inch through 14 inch pipe sizes, four segments for 15 inch through 24 inch pipe sizes, and six segments for pipe sizes over 24 inch.
4. Coating: Enamel.
5. Bolts: Carbon steel.
6. Acceptable Manufacturers:
a. Victaulic Company of America, Style 77,
b. Gustin-Bacon Co.,
c. Or approved equal.

D. Flanged Adapters (When Applicable):
1. For joining plain end or grooved end pipe to flanged pipes and fittings.
2. Adapters shall conform in size and bolt hole placement to ANSI standards for steel and/or cast iron flanges 125 or 150 pound standard unless otherwise required for connections.
3. Exposed Sleeve Type:
a. Constructed from steel.
b. Coating: Enamel.
c. Bolts: Carbon steel.
d. Acceptable Manufacturers:
(1) Dresser Manufacturing Co. - Style 128 for cast iron, ductile iron and steel pipes with diameters of 2 inches through 96 inches.
(2) Or approved equal.
4. Buried Sleeve Type:
a. Constructed from cast iron.
b. Bolts: Galvanized steel.
c. Acceptable Manufacturers:
(1) Dresser Manufacturing Co. - Style 127 locking type for cast iron, ductile iron, asbestos cement and steel pipes with diameters of 3 inches through 12 inches.
(2) Or approved equal.
5. Split Type:
a. Constructed from malleable or ductile iron.
b. For use with grooved or shouldered end pipe.
c. Coating: Enamel.
d. Acceptable Manufacturers:
(1) Victaulic Company of America - Style 741 for pipe diameters of 2 inches through 12 inches,
(2) Victaulic Company of America - Style 742 for pipe diameters of 14 inches through 16 inches,
(3) Or approved equal.

E. Flexible Joints:
1. Expansion Joints:
a. Materials shall be capable of withstanding the temperature, pressure and type of material in the pipeline.

b. Shall be the filled arch type that will prevent sediment build up for all sludge, sewage, and other lines with similar service.
c. Supplied with control rods to restrict elongation and compression.
d. Metal retaining rings shall be split and beveled galvanized steel for placement against the flange of the expansion joint.

2. Deflection Joints:
a. Joints designed to permit a nominal maximum deflection of 15 degrees in all directions from the axis of the adjacent pipe length, will prevent pulling apart, and will remain watertight at any angle of deflection under 15 degrees.
b. Material to be manufactured from a composition material suitable for exposure to the liquid, pressure and temperature to be contained within the pipe.
c. Supplied with control rods as required.

F. Caps and Plugs
1. Cap and plug material shall be as indicated on the Drawings and shall be adaptable to the inactive or abandoned utility to be capped or plugged.

PART 3 - EXECUTION

3.1 INSTALLATION
A. Sleeve Type Couplings (When Applicable):
1. Thoroughly clean pipe ends for a distance of 8 inches from the ends prior to installing couplings, and use soapy water as a gasket lubricant.
2. Slip a follower ring and gasket (in that order) over each pipe and place the middle ring centered over the joint.
3. Insert the other pipe length into the middle ring the proper distance.
4. Press the gaskets and followers evenly and firmly into the middle ring flares.
5. Insert the bolts, finger tighten and progressively tighten diametrically opposite bolts uniformly around the flange to the torque recommended by the manufacturer.

B. Split Type Flange Adapters (When Applicable): Install in the same manner as Split Type Couplings.
C. Buried Couplings, Adapters and Connectors (When Applicable): Thoroughly coat all exterior surfaces, including nuts and bolts, after assembly and inspection by the Engineer with a heavy-bodied bituminous mastic as approved by the Engineer.
D. Install thrust rods, supports and other provisions to properly support pipe weight and axial equipment loads.
E. Install caps and plugs in accordance with manufacturer's recommendations to ensure a permanent seal of the inactive or abandoned utility.

SECTION 02641

RESILIENT-SEATED GATE VALVES & TAPPING SLEEVE AND VALVES

PART 1 - GENERAL

1.1 DESCRIPTION
A. Work Included: Furnish and install gate valves of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.

1.2 QUALITY ASSURANCE
A. All gate valves of the same type and style shall be manufactured by one manufacturer.
B. Meet or exceed AWWA 509 Resilient-Seated Gate Valves for Water and Sewerage Systems.

C. Acceptable Manufacturers shall be specified by the local authority in their standards. If local standards do not exist, the following manufacturers shall be acceptable:
1. Mueller
2. Dresser
3. Darling
4. Clow
5. Smith
6. Or Equivalent

1.3 VALVE LOCATION AND USE
A. As shown on the Drawings.
B. Accessories: As shown and required for proper operation.

PART 2 - PRODUCTS

2.1 RESILIENT-SEATED GATE VALVES
A. Waterworks type NRS valves (AWWA C509, with mechanical joints and all accessories including retainer gland.
1. Iron body bronze mounted (IBBM), coated inside and out with fusion bonded epoxy (AWWA C550).
2. Non rising stem (NRS).
3. Resilient seat gate.
4. End Connections: As shown on the Drawings and as required for pipe.
5. Working pressure:
a. All sizes: 200 psi water.
b. Unless otherwise shown on the Drawings.
6. Stem Sealing:
a. Rust-proofed bolting.
b. "O" ring design.
c. Capable of replacing under pressure with valve open.
7. Buried Valves:
a. Gate box required.
b. Sufficient quantity of tee-handle valve wrenches for operating valves of various depths.
c. 2 inch square operating nut, securely fastened to shaft.
8. Valve operation: Open by turning right-clockwise.
9. Arrow showing direction of opening plainly cast on valve bonnet.

2.2 TAPPING SLEEVE AND VALVE ASSEMBLY
A. Tapping Sleeve
1. Body and Outlet: Type 304 or better stainless steel fully passivated welds to restore stainless characteristics.
2. Flange: Type 304 or better stainless steel with recess to accept standard tapping valves. Flange shall conform to AWWA C207 Class D ANSI 150 lb. drilling.
3. Bolts and Nuts: Type 304 stainless steel or better, coated to prevent galling.
4. Lifter Bar: Type 304 or better stainless steel to provide a heavy bearing surface for nuts.
5. Gaskets: Gridded virgin SBR or Buna-N compounded for water service ASTM D2000. Full gasket to give 360° pipe coverage.
6. Rating: Tapping sleeve shall be rated for pressures equal to or greater than the pipe to which it is connected.
B. Tapping Valve

1. Tapping valves shall be resilient seated gate valves meeting the requirements of Paragraph 2.1 above and shall have the following additional features.

2. The valve shall be furnished with a flange-end connection on one end and a mechanical joint end on the opposite end. The flange shall be furnished with an alignment ring to help ensure true alignment of the valve and tapping sleeve. The mechanical joint end shall be furnished in accordance with ANSI/AWWA C153/A21.53.

3. All tapping valves shall include a minimum 3/8" NPT pipe plug on the bonnet of the valve body to aid in the field testing of the valve.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Buried Valves:

1. Stem vertical
2. Box vertical and centered over operating nut.
3. Thrust blocks installed as shown on the Drawings.
4. Gate box supported during backfilling and maintained.
5. Gate box shall not transmit shock load or stress to valve.

B. Tapping Sleeves and Valves:

1. Tapping sleeves and valves shall be installed by an experienced crew trained to safely and properly install a tapping sleeve and valve on a live main.

SECTION 02642

CORPORATION STOPS

GENERAL

DESCRIPTION

Work Included: Furnish and install corporation stops of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.

Work Specified Elsewhere. This Section is not a stand-alone Section. Other requirements which relate to this Section are noted elsewhere in these documents. The Contractor and all Subcontractors are required to review this entire document along with the Drawings in an effort to identify all requirements.

reference standards

ANSI/AWWA C800.

submittals

Submit manufacturer's literature, test reports, and certificates in accordance with the General Conditions and submittals.

DELIVERY, STORAGE & HANDLING

Store to prevent damage and in accordance with manufacturer's instructions.

PRODUCTS

MATERIALS

Ball valve-type corporation with 300 psi rating.

Shall conform to ANSI/AWWA C800, latest revision**.**
Constructed of brass. Brass alloys not listed in ANSI/AWWA C800 Paragraph 4.1.2 are not approved.
Shall be "lead free" as defined in the Safe Drinking Water Act, amended January 4, 2011. Specifically, fittings shall contain not more than a weighted average of 0.25% lead when used with respect to their wetted surfaces.
Outlet shall have a compression pack joint (CPPJ) for Copper Tubing Size (CTS) O.D.
Stainless steel insert stiffeners shall be used where CTS plastic tubing is specified
Inlet shall have AWWA (cc) Tapered Pipe Threads.
Acceptable Manufacturers:
Mueller
A. Y. McDonald
Or equivalent

substitutions

A. Products of equal or better quality, function and performance may be proposed for substitution by following the procedures in Section 01630 – Substitution and Product Options.

EXECUTION

INSTALLATION

Install at locations shown on the Drawings and as specified in accordance with manufacturer's instructions.
Service saddles shall be required as noted on the drawings, on all PVC and AC mains, as required below, and as specified by the pipe and saddle manufacturers.

Pipe Size	Class 50 Ductile Iron Pipe	Class 51 Ductile Iron Pipe	Class 52 Ductile Iron Pipe
6"	All Taps	All Taps	Taps > 3/4"
8"	All Taps	Taps > 3/4"	Taps > 3/4"
10"	Taps > 3/4"	Taps > 3/4"	Taps > 1"
12"	Taps > 3/4"	Taps > 1"	Taps > 1-1/4"
16"	Taps > 1-1/4"	Taps > 1-1/2"	Taps > 2"

Spiral-wrap completely the thread area with Teflon tape prior to insertion.
Install corporation stops at the 2 and 10 o'clock positions on the pipe.
A minimum of one and a maximum of three threads of the installed corporation stop must be showing outside the water main. Care shall be taken not to over-tighten the stops.
Check and adjust all corporation stops for smooth operation.

testing

All corporation stops must be installed prior to leakage testing of the water main.

SECTION 02643

CURB STOPS ASSEMBLY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Furnish and install curb stops of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.

1.2 QUALITY ASSURANCE

A. All curb stops shall be manufactured by one manufacturer.
B. All curb boxes shall be from one manufacturer.
C. Qualifications of Manufacturer: Products shall have proven reliable in similar installations over a reasonable number of years.
D. Meet or exceed ANSI/AWWA C800.
E. Acceptable Curb Stop Manufacturers:
   1. A.Y. McDonald Mfg. Co.
   1. Mueller Co.
   2. or equivalent.

PART 2 - PRODUCTS

A. Curb Stop
   1. Curb ball valve, quarter turn check.
   2. Construction shall be in accordance with AWWA C800 latest revision.
   3. Shall be "lead free" as defined in the Safe Drinking Water Act, amended January 4, 2011. Specifically, fittings shall contain not more than a weighted average of 0.25% lead when used with respect to their wetted surfaces.
   4. Inlet and outlet shall have compression type connections (CPPJ).
   5. Working pressure shall be 300 psi.
   6. Stainless steel insert stiffeners shall be used where plastic tubing (CTS) is specified.
   7. Inverted key and plug type curb stops are not acceptable.
B. Service Boxes
   1. Erie style
   2. 5½' - 6½' bury (unless shown otherwise)
   3. Plug cover with rope thread
   4. 36" x ½" stainless steel Box Rod
   5. For services over 1", provide heavy duty foot piece.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install at locations shown on the Drawings and in accordance with manufacturer's instructions.
B. Install 2" x 8" x 8" concrete tile under curb stop.

3.2 ADJUSTMENTS

A. Check and adjust all curb stops for smooth operation.
B. The curb box shall be adjusted to final grade.
   1. In paved areas or in sidewalks, the adjustment shall be approximately 1/8" below finish grade.
   2. In lawn or grass area, the adjustment shall be approximately ½" below finish grade or at such a level as not to interfere with lawn maintenance.

SECTION 02644

HYDRANT ASSEMBLIES

PART 1 - GENERAL

1.1. DESCRIPTION

A. Work Included: Furnish and install hydrant assemblies of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.
B. Hydrant Assemblies consist of:

1. Hydrant tee.
2. 6 inch gate valve and valve box.
3. 6 inch hydrant branch piping.
4. Hydrant.
5. Thrust blocking and retainer glands.

1.2 QUALITY ASSURANCE

A. Hydrants shall conform to AWWA C502 and all hydrants shall be from one manufacturer.

B. Hydrants shall comply with Factory Mutual Research Corporation and Underwriters' Laboratories UL246 Standard.

C. Gate valves shall conform to AWWA C500.

D. Acceptable Manufacturer:

1. Kennedy Model K-81A or as approved by the City of Portsmouth Water Department.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fire Hydrants:

1. Dry barrel type with a 5-1/4 inch minimum valve opening.
2. Two (2) 2-1/2 inch hose connections and one (1) 4-1/2 inch pumper connection.
   a. 2-1/2 inch outlets: 60 degree V threads, 7-1/2 threads to the inch, external threads 3-1/16 inches, O.D. National Standard threads.
   b. 4-1/2 inch outlet: 4 threads to the inch, external threads 5-3/4 inches, O.D. National Standard threads.
3. 200 pounds working pressure and 400 pounds hydrostatic test pressure.
4. Working parts shall be bronze and open RIGHT (clockwise). Operating nut shall open by turning to the RIGHT and be five-sided, 1 1/2 inch point to flat.
5. Designed with standpipe breaking ring or breakable sections.
6. Supply one (1) collision repair kit for every twenty-five (25) hydrants installed.
7. Caps shall be attached to hydrant body by chains.

B. Gate Valves: Waterworks type non-rising stem AWWA valve as specified in Section 02646-Gate Valves.

C. Valve Boxes:

1. Cast or ductile iron, with the word "WATER" cast in covers.
2. Be of such length as required without full extensions. Minimum lap 12 inches.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install hydrants as shown in the details and using manufacturer's written instructions.

B. No hydrant assembly shall be backfilled until approved by the Engineer.

C. Provide thrust blocks as shown.

D. Provide barrel extensions as required for hydrant to be installed at proper grade at no additional cost to the Owner.

E. Plug all drain openings with brass plugs.

F. Provide finish paint on all exposed surfaces. Color must meet Owner's requirements.

3.2. CLEANING

A. Clean all hydrants of concrete, etc. and repaint as necessary to the satisfaction of the Engineer and Owner.

SECTION 02646

VALVE BOXES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Furnish and install valve boxes of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.

1.2 QUALITY ASSURANCE

A. All valve boxes shall be manufactured by one manufacturer.

B. Qualifications of Manufacturer: Products to have been proven reliable in similar installations over a reasonable number of years.

PART 2 - PRODUCTS

2.1 MATERIALS

A. For valves 10 inches and smaller the valve box shall be cast iron, slip type two-piece integral base, with a top flange, 5-1/4 inch shaft.

B. For valves 12 inches and larger the valve box shall be cast iron, slip type, three piece (separate base), with a top flange, 5-1/4 inch shaft.

C. Cast or ductile iron, with the word "WATER" cast in covers.

D. Acceptable Manufacturers:

1. Mueller Co.
2. Central Foundry Co.
3. Clow.
4. Or equivalent.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation as shown on the Drawings and/or as specified herein:

1. When installation is complete, no pressure shall be exerted by valve box on the water main or on the valve.
2. Be of such length as required without full extension. Minimum lap 12 inches.
3. Install so cover is exactly level to 1/4 inch lower than pavement.

SECTION 02649

SERVICE SADDLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Furnish and install service saddles of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.

1.2 QUALITY ASSURANCE

A. All service saddles shall be manufactured by one manufacturer.

B. Qualifications of Manufacturer: Products to have been proven reliable in similar installations over a reasonable number of years.

1.3 SUBMITTALS TO THE ENGINEER

A. Submit shop drawings in accordance with the General Conditions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. For cast iron, ductile iron, and C900 PVC pipe
   1. Body - ductile iron.
      a. Fusion bonded epoxy coated (10 mils min.)
   2. Gasket - NBR compound.
   3. Bolts, Washers and nuts - heavy hex constructed of type 304 (18-8) stainless steel.
   4. Threads-American Tapered Pipe Threads.

B. Straps:
   1. 304 Stainless Steel single or double strap for 6" or smaller.
   2. 304 Stainless Steel double strap for 8" and larger.

C. Acceptable Manufacturers:
   1. Smith-Blair
   2. Dresser
   3. Or equivalent

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation as shown on the Drawings and/or as specified herein:
   1. Install at locations with 1 1/2 inch or larger services on ductile iron pipe, or at any size service on A.C. pipe, or as specified by the pipe and saddle manufacturers.
   2. Check for leaks prior to backfilling as appropriate.
   3. Tap pipe with tools and methods specifically furnished by pipe manufacturer.

END OF SECTION

SPECIAL PROVISION – Not a Standard NHDOT Specification

SECTION 616

CITY OWNED LIGHTING

PART I – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings also apply to work of this section.

B. The Contractor must be familiar will all other Sections of this specifications and the associated Drawings, which affect the scope of work. Where paragraphs of this Section conflict with similar paragraphs elsewhere, the more stringent requirements shall prevail.

1.02 DESCRIPTION OF WORK

A. The Contractor shall furnish a complete finished product, which meets all applicable codes and standards, and the intent and specific requirements of the Drawings and specifications for this project. It is the intent of these specifications that the electrical system shall be suitable in every way for the service (and use) required. All materials and all work, which may be reasonably implied as being incidental to the work of this Section, shall be furnished at no extra cost to the Owner.

B. As used in this Section, "*provide*" means "furnish and install", "*furnish*" means "to purchase and deliver to the project site complete with every necessary appurtenance and support", and "*install*" means "to unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project".

C. Perform work and provide (furnish and install) material and equipment as shown on Drawings and as specified, or indicated, in this Section of the specifications. Completely coordinate work of this Section with work of other trades and provide a complete and fully functional installation. Drawings and specifications form complimentary requirements; provide work specified and not shown, and work shown and not specified as though explicitly required by both. Although work is not specifically shown or specified, provide supplementary or miscellaneous items, appurtenances, devices and materials obviously necessary for a sound, secure and complete installation.

D. Remove all debris caused by Contractors' work.

E. Provide demolition and relocation of existing electrical items as shown on the drawings.

F. The work under this section shall require that the Contractor provide all labor, materials, equipment, tools, supplies and transportation involved in the installation of electrical equipment as specified.

G. The work to be done under this contract generally includes, but is not limited to the following:

Electrical System

1. Provide new conduit and handhole system for outdoor electrical work, in locations as shown on Drawing. Provide precast 14”x14”x24”concrete electric handholes in locations as shown and “Electric” logo on grey iron cover rated for H-20 loading.

2. Provide new light poles and concrete bases for new proposed lighting poles in locations and quantities as shown on Drawing. Foundations to be reinforced with conduits and bolt patterns as shown on Contract Drawings, to match City-standard light poles and parking lot poles.

3. Install new light poles, fixtures, along with necessary accessories in quantities and locations as shown on Contract Drawings. Provide bulbs (if necessary) in each fixture for a complete system.

4. Provide new NEMA 3R Electrical Cabinet for outdoor power on new cast-in-place concrete foundation. Foundation to include reinforcement, conduit stubs and grounding, per local and NEC requirements. Provide cabinet with service entrance rated distribution panelboard (min. 20 space), 6 pole lighting contactor with H/O/A switch, photocell(s), circuit breakers (as needed), outlet (one GFCI duplex inside), and other accessories as shown on Contract Drawings. Cabinet to be black M-style. Panel board to be Square-D QO.

5. Provide electrical feed for new outdoor Electrical Cabinet from existing utility as shown on Drawings, per Local Utility standard requirements. Service to be 100A, 120/240V single-phase, 3-wire. Routing as shown, or as required by NEC or local authorities. Obtain necessary electrical permits prior to starting conduit work. Provide new 100A utility service including all PSNH hook up fees.

6. Provide conduit and cabling for outdoor lighting between fixtures, handholes, Electrical Cabinet, and utility service. Cabling per panel schedules and as shown on Contract Drawings.

7. Conduits outside below grade to be PVC Schedule 40 or 80 and conduit into and out of light pole bases to be RGS. Conduit sizes as indicated on Drawing. Provide all necessary grounding, including ground rods at electrical cabinet location and at each light pole foundation as shown or if required by NEC or local authorities.

8. Provide startup services for new lighting system.

9. Provide other associated electrical equipment necessary for a complete system, shown, or implied in these Specifications and on Contract Drawings.

10. Coordinate with the City and local utility staff for new underground service to site, installation of new conduit, service and electrical requirements.

1.03 SITE VISIT

A. Contractor shall visit the site of the proposed work and fully acquaint himself with the conditions there relating to construction and labor, and should fully inform himself as to the facilities involved, and the difficulties and restrictions attending the performance of the Contract. The Contractor should thoroughly examine and familiarize himself with Drawing, Technical Specifications and all other Bid and Contract Documents. The Contractor, by the execution of the Contract, shall in no way be relieved of any obligation under it due to his failure to receive or examine any form or legal document or to visit the site and acquaint himself with the conditions there existing and the Owner will be justified in rejecting any claim thereof.

1.04 AS-BUILT DRAWINGS:

A. After completion of the electrical installation, the Contractor shall furnish an "as-built" drawings showing all conduits, cables, cabinets, transformers, light poles, etc. to scale with dimensions where required. Instruction sheets and parts lists covering all operating equipment will be bound into a folder and furnished to the Owner in duplicate.

1.05 INSTRUCTIONS:

A. Within 10 days, after completion and testing of the system, the Contractor will instruct the Owner's personnel in the proper operations and maintenance of the system, in a 1/2 hour training session.

1.06 GUARANTEE

A. Guarantee work of this Section in writing for one year from date of Owner's acceptance. Repair or replace defective materials, equipment, workmanship and installation that develop within this period, promptly and to Owner's satisfaction and correct damage caused in making necessary repairs or replacements under guarantee with no extra cost to Owner. Contractor shall transfer all equipment warrantees for all systems to Owner.

1.07 REFERENCE STANDARDS AND SPECIFICATIONS

A. Perform work strictly as required by rules, regulations, standards, codes, ordinances, and laws of local, state, and federal government, and other authorities that have lawful jurisdiction.

B. All materials and installations shall be in accordance with the latest edition of the National Code, and all applicable local codes and ordinances. Materials and equipment shall be listed by Underwriters Laboratories (UL). Special Attention shall be paid to the latest edition of the following standards:

American National Standards Institute	ANSI
American Society for Testing & Materials	ASTM
Illuminating Engineering Society	IES
Institute of Electrical & Electronics Engineers	IEEE
Insulated Cable Engineers' Association	ICEA
National Electrical Code	NEC
National Electrical Manufacturer's Association	NEMA
National Electrical Safety Code	NESC
InterNational Electrical Testing Association	NETA
National Fire Protection Association	NFPA
Occupational Safety & Health Administration	OSHA
Underwriter's Laboratories, Inc.	UL

C. The above listed codes and standards are referenced to establish minimum requirements and wherever this Section requires higher grades of materials and workmanship than required by the listed codes and standards, this Section shall apply. In the event a conflict occurs between the above listed codes and standards and this Section, the more stringent requirement shall govern.

1.08 SUBMITTALS

A. Within 10 days after Award of Contract, submit shop drawings and product data on below listed items for approval by the City. Submit copies as requested.

B. Check, stamp and mark with project name shop drawings and product data before submitting for approval. Specifically indicate on shop drawing transmittal form, or by separate letter any deviations from Contract Documents because of standard shop practice or other reason. Rectify with no extra cost to Owner, deviations which escape Engineer's scrutiny and have not been indicated on shop drawings.

C. List of materials and equipment requiring shop drawings shall include:

1. Conduits and Wiring
2. Service Cabinet and Equipment
3. Circuit Breakers
4. Concrete Products and Light Bases
5. Handholes & Manholes
6. Lighting Contactors
7. Receptacles and covers
8. Grounding materials

D. The Engineer's review shall be only for conformance with the design concept of the project and compliance with the specifications and Drawings. The responsibility of, and the necessity of, furnishing materials and workmanship required by the specifications and Drawings which may not be indicated on the shop drawings is included under the work of this Section.

E. The Contractor shall furnish at least two (2) complete sets of operating and instruction manuals for the equipment provided under this Contract. These manuals shall detail the operation, testing, and maintenance of the electrical equipment and systems. Manuals shall be provided upon Engineer's request or upon project completion, whichever comes first.

1.09 INSPECTIONS AND FEES

A. Obtain all necessary permits and licenses, file necessary plans and pay all fees for permits and inspections. Permit fees are the responsibility of the Contractor as part of his bid, as is all coordination with the local utility. Contractor is also responsible for obtaining any site-specific utility requirements for this project prior to the start of construction and notifying local utility for all inspections prior to backfilling, etc.

1.10 INTERPRETATION OF DRAWINGS

A. Drawings are diagrammatic and indicate general arrangement of systems and work included in Contract. Drawings are not intended to specify or show every offset, fitting or component; however, Contract Documents require components

and materials whether or not indicated or specified as necessary to make installation complete and operational.

B. Any work installed contrary to, or without review by, the Engineer shall be subject to change as directed by the Engineer, and no extra compensation will be allowed for making these changes.

C. Circuit layouts are not intended to show the number of fittings, or other installation details. Additional circuits shall be installed wherever needed to conform to the specific requirements of the equipment or local codes.

D. As work progresses and for duration of Contract, maintain complete and separate set of prints of Contract Drawings at job site at all times. Record work completed and all changes from original Contract Drawings clearly and accurately, including work installed as a modification or addition to the original design.

1.11 ELECTRIC UTILITY

A. All coordination with the Electric Utility is the responsibility of the Contractor. All work and materials for the electric service shall be in accordance with the requirements of the Electric Utility, and are to be met under this Section and included in the bid price of the Contractor.

PART II – MATERIALS & PRODUCTS

2.01 GENERAL

A. Materials and products furnished shall be designed for the intended use, shall meet all requirements of the latest edition of the National Electric Code (NEC), and all local codes.

B. Materials shall be manufactured in accordance with the standards indicated in this Section, and typical industry standards and codes for the products specified. Materials and equipment shall be Underwriter's Laboratory (UL) listed.

C. The materials used shall be new, unused, and of the best quality for the intended use. All equipment shall have the manufacturer's name, address, model or type designation, serial number and all applicable ratings clearly marked thereon in a location which can be readily observed after installation. The required information should be marked on durable nameplates that are permanently fastened to the equipment.

D. Electrical equipment shall at all times during construction be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored outside exposed to the elements. If any equipment or apparatus is

damaged, such damage shall be repaired at no additional cost, or replaced at no additional cost as directed by the Engineer.

2.02 RACEWAYS

A. Rigid Metallic Conduit: UL6 and ANSI C80.1.

B. Polyvinyl Chloride (PVC) Conduit, electrical, gray, Schedule 40 or 80 as specified, meeting the requirements of UL 651 and NEMA TC-2. If concrete encasement is required, a minimum of 3,000 psi concrete shall be used. All conduits placed under roadways, and subject to vehicular traffic, shall be Schedule 80.

C. Minimum size of conduit shall be 2". Unless indicated on Drawings, conduit sizes can be sized in accordance with National Electric Code (NEC). Conduit bends shall not have kinks or flats, and shall not be less than standard radii.

D. Rigid Galvanized Steel (RGS) conduit shall be used into and out of the light pole bases except as allowed. Conduit shall be fully threaded at both ends. All 90 degree conduit sweeps shall be RGS for all entry and exit into concrete pads and at riser poles, with ground bushings connected to new grounding with minimum #4Awg ground wire for conduit grounding bushings.

E. Conduits shall be made electrically continuous at coupling and connections to boxes and cabinets by means of joining fasteners or copper bond wires. Conduit shall be connected to grounded structural steel or the ground network. After assembly all conduit locknuts, all EMT coupling fittings, and all bond wire screws shall be set up tight before installation of wiring. Insulated metallic bushings shall be used on all conduits entering panel cabinets, pull-boxes, and wiring gutters, except on branch lighting circuits.

F. Expansion fittings shall be provided on all conduits as required by the National Electrical Code, and as required by local and state codes. This includes, but is not limited to, vertical conduit risers coming from below-grade.

2.03 WIRE AND CABLE

A. Unless otherwise noted, conductors for power, lighting, and grounding *above grade* shall be No. 12 through No. 8 AWG, NEC type THWN/THHN, meeting the requirements of UL 83. Conductors for power and lighting shall be no smaller than No. 12 AWG.

B. Conductors for power, lighting, grounding, and control *below grade* (and in wet locations) shall be No. 8 AWG or larger, NEC type XHHW (or XHHW-2), meeting the requirements of NEMA WC7 and ICEA S-66-524.

C. All conductors shall be annealed copper, 98% conductivity, Class B stranded. All conductors should be rated for 600 volts or less, with a thermal rating of 90° C.

D. The outside covering of all wiring for power, lighting, grounding, and control uses shall be color coded to identify polarity.

2.04 WIRE AND CABLE CONNECTORS AND DEVICES

A. Wire and cable connectors and devices shall meet the requirements of UL 486. Connectors, including miscellaneous nuts, bolts, and washers shall be silicon bronze. Ferrous materials shall not be used. All connectors below grade shall be water-proof secondary type, gel-filled, bolted submersible connectors (gel-port style). No “wire-nuts” are allowed to be used below grade.

2.05 BOXES

A. Outlet and Switch Boxes: NEMA OS 1.

B. Pull Boxes, Junction Boxes, and Equipment Enclosures: NEMA ICS 6.

C. Pull boxes, junction boxes, and equipment enclosures shall be of NEMA Type 1 construction for indoor use, and NEMA Type 3R construction for outdoor or wet location use, unless otherwise noted.

D. Box sizes shall not be less than that required by the National Electrical Code.

2.06 WIRING DEVICES

A. Wiring Devices: NEMA WD 1.

B. Wiring devices for shall be specification grade, 20 ampere, ivory with Type 302 stainless steel plates. Ground fault current interrupting (GFCI) devices shall be provided where specified and/or required by applicable codes.

2.07 PANELBOARDS

A. Panelboards: NEMA PB1, and UL 67.

B. Panelboards shall be door-in-door construction with copper bus. Circuit breakers shall be molded case, thermal magnetic, **bolt-on type** rated as noted, and rated to

match panelboard voltage and interrupting rating. All panelboard doors shall open full 90 degrees without conflict with cabinets and other equipment. No modifications to panelboards or doors shall be made to accommodate installation or removal inside of Electrical Cabinet.

C. Provide the following panelboards:

1. Panelboard P-1 120/240V, 1-phase, 3-wire, 100A main circuit breaker, 22kA AIC (minimum), 20 space panelboard, (acceptable manufacturer: Square-D QO) NEMA 1 enclosure.

2.08 WARNING TAPE

A. Warning tape shall be six (6) inches wide, polyethylene not less than 3.5 mil thick with a minimum strength of 1,500 psi. Install 8 inches below final grade. Tape shall be red for electric conduit, and red or yellow for communication conduit. Tape shall have black lettering on two lines as indicated below:

B. For Electric conduit:

CAUTION CAUTION CAUTION
BURIED ELECTRIC LINE BELOW

2.09 ELECTRIC HANDHOLES

A. Electric Handholes are to be precast concrete as required by utility company. Handhole size as required by utility company.

B. Handholes shall be provided with skid-resistant cast iron surface covers, with an "Electric" logo. Handholes and Covers shall be design for street-rated, heavy duty applications, meeting the requirements of the either: AASHTO HS-20 loading, with a minimum design load of 15,000 lbs for both the handhole box and cover. . Handholes shall meet the requirements of the latest edition of the National Electric Code (2008 or later) with regards to structural integrity, installation methods, grounding of the cover and metallic parts, etc.

C. A layer of 6-inches of crushed rock shall be installed below and in the bottom of each handhole to assist with drainage, and this compacted gravel base material shall extend out beyond the sidewalls of the handhole. Conduits shall sweep up and be at least 4-inches above top of crushed rock layer.

2.10 ELECTRICAL CABINET

A. Provide one (1) outdoor NEMA 3R 5052 aluminum powder coated black outside, white inside size M cabinet enclosure with corbin ¼ turn lock, to contain 100A 1-phase, 3-wire, 120/240V panelboard and associated electrical equipment,

etc. Cabinet and equipment components shall be UL listed. Cabinets to have 5052 aluminum back panel, mounted inside. Cabinets to have integral keyed locking mechanism, with provision for pad-lock. Cabinets shall be ventilated type. Utility electric meter to be mounted to the side of this cabinet.

B. Contractor to coordinate with sizes of equipment to be installed within cabinets, including panelboard. Dimensions shown are typical and are for reference only. Cabinet to allow installation and removal of all electrical equipment with no interference between equipment. All equipment doors shall open 90 degrees. Electrical Cabinet doors to be provided with stay-open door catches. Contractor is responsible for coordinating size of this equipment prior to submitting Electrical Cabinet for approval.

2.11 CAST-IN-PLACE CONCRETE FOUNDATION

A. Provide the materials, labor and equipment necessary for the installation of the following cast-in place concrete foundations, in accordance with these Specifications, Contract Drawings, Utility & City requirements and all applicable codes & regulations.

Electrical Cabinet Foundation: complete with reinforcing rebar, ground rods, grounding connectors, conduit entrances, etc. as shown and as directed by Owner or Engineer. Contractor responsible for coordinating foundation dimensions to be 6-inches wider than cabinet base dimensions, on all four sides. Cabinet grounding to include a buried loop on all four sides, connected to the two buried ground rods as shown. Foundation shall be 6” above finish grade and 30” deep below grade.

B. Foundations shall be built with 4,000 psi. Class AA concrete, on a base of crushed gravel and sand, as shown.

C. Reinforcing rod to be #3 or #4 (as shown) grade 60 bars and shall conform to ASTM A-615 (latest revision). Reinforcing rods shall not be installed any closer than 2” from the face of the concrete.

D. Provide grounding in the form of one (1) 5/8” diameter x 8’-0” long copperweld ground rod for each foundation, connected with a loop of #1/0Awg bare copper stranded ground wire (as shown), leaving a 3 foot long tail to ground the enclosure, transformers, etc. Buried loop for Electrical Cabinet to be buried approx. 6-8” below finished grade, offset approximately 12-inches from the edge of concrete foundation on all four sides.

2.12 FOUNDATIONS FOR LIGHTING POLES

A. Provide approved cast-in-place foundations, and other devices as necessary and as required.

B. Contactor shall submit Shop Drawings designed and stamped by a New Hampshire licensed Professional Engineer for review and approval.

C. Foundations for light poles shall be as shown on Drawing, including number, type and location of anchor bolts. Foundations shall be made of minimum 4,000 psi concrete (at 28 days) and have steel reinforcement meeting ASTM A-615, grade 60 (cover to steel, 1" minimum). Foundations shall have 2-2" RGS conduits for lighting circuits, 180 degrees apart. Foundations to be installed with the top of the concrete in relation to final grade as shown on the drawing. Conduits to be flush with top of concrete to not interfere with anchor bolts or pole base.

2.13 LIGHTING

Install light poles and fixtures in quantities and locations as shown.

A. Fixture Type A

Manufacturer: Holophane.

Description: LEDG-084-35-5K-AS-2H-L3 LEDGF1FUS10C

LEDgend (LEDG): LEDgend Roadway LED, 84 LEDS, 350mA Driver, 5,000 K CCT, Auto-sensing voltage, 120 thru 277, Black, Type III, Wide Asymmetric, Single Fusing F1 BR1062:

Construction: One-piece die cast aluminum housing, Tool less access to LED Driver.

Lamp: 14x6 5K LED Array Cree XP-G.

B. Fixture Type B

Manufacturer: Holophane

Description: LEDG-084-35-5K-AS-2H-L2 LEDGF1FUS10C

LEDgend (LEDG): LEDgend Roadway LED, 84 LEDS, 350mA Driver, 5,000 K CCT, Auto-sensing voltage, 120 thru 277, Black, Type II, Medium Asymmetric, Single Fusing F1 BR1066

Construction: One-piece die cast aluminum housing, Tool less access to LED Driver.

Lamp: 14x6 5K LED Array Cree XP-G.

C. Pole Type A

Manufacturer: Holophane

Description: BR1062 BK RTA3080E PL ND AK

BR1062 Aluminum Arm 1 Unit, Black (RTA3080E) Round Tapered Aluminum Pole 30FT, 8.0 x 4.5 x .156 Wall: RTA3080E, Plain Top, No Drill Pattern, Black Anodized, Anchor Bolts

Finish: Black Anodized

D. Pole Type B

Manufacturer: Holophane

Description: BR1066 BK RTA3080G PL ND AK

BR1066 Aluminum Arm 2 @ 180, Black (RTA3080G) Round Tapered Aluminum Pole 30FT, 8.0 x 4.5 x .188 Wall: RTA3080G, Plain Top, No Drill Pattern, Black Anodized, Anchor Bolts.

Finish: Black Anodized

2.14 LIGHTING CONTACTOR

A. Provide 6-pole, 20A per pole, 240V rated lighting contactor with H/O/A switch in Electrical Cabinet. Provide with 120V, single-phase coil voltage input to latch contactor. Feed to contactor shall be from photo-control, to be mounted on outside of Electrical Cabinet.

PART III – EXECUTION

3.01 GENERAL

A. This Section covers the requirements for installation of materials, proper workmanship, testing, cleaning, grounding, and work methods to be followed by the Contractor. This Section also includes specific instructions and to be used in conjunction with the contract Drawings. Any discrepancies noted between the specification, Drawings, and actual installation shall be reported immediately to the Owner, Engineer, and Architect. Failure on the part of the Contractor to

report discrepancies immediately will be considered negligent and Contractor will be responsible for correcting actions at no cost to Owner.

B. Contractor is responsible for coordinating work with other trades, Owner, and Architect's schedule. Work will be coordinated such that systems can be properly located, and conflicts and delays are avoided. Contractor shall consider commencement of work acceptance of existing conditions.

3.02 MATERIALS AND WORKMANSHIP

A. Work shall be executed in workmanlike manner and shall present neat, rectilinear and mechanical appearance when completed. Do not run raceway exposed unless shown exposed on Drawings. Material and equipment shall be new and installed according to manufacturer's recommended best practice so that complete installation shall operate safely and efficiently.

3.03 CONTINUITY OF SERVICES

A. Do not interrupt existing services without Owner's, Utilities, or Engineer's approvals.

3.04 TESTING, INSPECTION AND CLEANING

A. Insulation resistance between conductors and grounds for secondary distribution systems shall meet National Electrical Code (NEC) and interNational Electrical Testing Association (NETA) requirements.

B. Verify and correct as necessary: voltages, tap settings, trip settings and phasing on equipment from secondary distribution system to point of use. Test secondary voltages at transformers, bus in panelboards, and at other locations on distribution systems as necessary. Test secondary voltages under no-load and full-load conditions.

C. Test lighting fixtures with specified lamps in place for 100 hours. Replace lamps that fail within 90 days after acceptance by Owner at no extra cost to Owner (no exceptions).

D. Provide necessary testing equipment and testing services.

E. Failures or defects in workmanship or materials revealed by tests or inspection shall be corrected promptly and retested. Replace defective material.

F. Clean panels and other equipment. Panelboard interiors shall be cleaned and vacuumed. Equipment with damage to painted finish shall be repaired to Engineer's or Architect's satisfaction. After completion of project, clean exterior surfaces of electrical equipment.

3.05 WIRING METHODS

A. Install wire and cables in approved raceways as specified and as approved by authorities that have jurisdiction.

B. Follow homerun circuit numbers and/or notes as shown on Drawings to connect circuits to panelboards. Where homerun circuit numbers are not shown on Drawings, divide similar types of connected loads among phase buses so that currents are approximately equal in normal usage.

C. Run concealed conduit in as direct lines as possible with a minimum number of bends of longest possible radius. Run exposed conduit parallel to or at right angles to building/field lines. Bends shall be free from dents or flattening. The exact locations and routing of conduit shall be determined by the Contractor subject to the approval of the Owner and Engineer.

D. Polarity of all electrical connections shall be observed in order to preserve phase relationship in all feeders and equipment.

E. Splices shall be made in neat, workmanlike manner using approved mechanical connectors. After splicing, insulation equal to that on the spliced wires shall be applied at each splice. Splices are permitted only in junction boxes, outlet boxes, or other permanently accessible locations. Splices installed in electric handholes shall be weather and waterproof, pre-molded polymer splices. Hand taping of splices below-grade is not acceptable.

3.06 GROUNDING

A. Bond and ground equipment and systems connected under this Section in accordance with standards of the NEC and other applicable regulations and codes.

B. Conduit system shall be electrically continuous throughout, grounded at service entrance. Equipment frames, enclosures, boxes, etc. shall be grounded by use of green-jacketed (or bare copper) ground, sized as per Table 250-95 of the NEC.

C. Green bonding jumper shall be installed in flexible conduits.

D. Copper fittings for ground connections shall conform to the requirements of ASTM B 30. All bolts, u-bolts, cap screws, nuts, and lock washers for copper fitting shall be of approved corrosion-resisting material. Compression connectors required for all below-grade grounding connections. Exothermic (cad-weld)

connectors are also acceptable for use below grade. The use of bolted grounding and ground rod connectors below grade is not acceptable.

E. Ground Rods shall be 5/8" diameter and 8' in length, copperweld as required by applicable codes (NEC, NESC). Bonding connections to ground rods shall be permanent, welded or crimped, with copper connectors. All wire used for grounding shall be no smaller than #4 Awg copper, stranded conductor. Contractor shall bond all meter enclosure cabinets, meter sockets, safety disconnects, conduit grounding bushes, etc. .

3.07 INSTALLATION OF LIGHTING FIXTURES

A. Verify construction of light pole foundations is suitable, and provide fixtures, poles, hardware, and other accessories suitable for construction encountered.

B. Install Lighting System, as specified elsewhere in this Specification. Ground pole steel/aluminum to power system grounding conductor at each pole location, per NEC.

C. Coordinate installation of fixtures with installation of surrounding materials and landscaping (if applicable). Investigate lighting fixture locations and foundation supports to ensure that no interference exists between lighting fixtures, supports, and other equipment including that provided by other trades. Report any possible interference's to the Engineer.

3.08 EXECUTION – INSTALLATION OF ELECTRICAL EQUIPMENT

A. Contractor to Provide (furnish & install) all items as indicated as Contractor-furnished and install all items, and all necessary minor and expected accessories.

B. Contractor to meet with local wiring inspector prior to the start of any work and obtain any local site requirements and restrictions, which must be followed. Contractor shall also meet with local utility, any other Town/City officials, as directed by Owner and wire inspector, prior to the start of work, or ordering of materials. Failure to meet with the local officials and utility prior to ordering materials and start of construction will be considered negligent and all necessary corrections resulting form this failure will be at no cost to Owner.

C. Provide, furnish and install all products and work outlined in Paragraph 1.02.G of this Specification Section.

D. Provide all grounding of electrical cabinet installations and lighting. Grounding to be installed per installation details and National Electrical Code.

E. Balance the lighting, receptacle and electrical load evenly on all circuits and on all phases of each circuit. Add additional circuits as necessary to balance loads.

F. Provide new handholes and conduit system for lighting and electrical work, in locations as shown on Contract Drawings and as required.

G. Install all equipment in locations as shown on Contract Drawings. All deviations must be approved, in advance by Owner and Engineer.

H. Install all equipment per manufacturer's instructions.

I. Provide complete "As-Built" drawings to Engineer & Owner.

3.09 BASIS OF PAYMENT

A. Pay item and unit:

Pay Item		Pay Unit
614.321	2" Steel Conduit	LF
614.72114	2" PVC Conduit, Schedule 40	LF
614.72118	2" PVC Conduit, Schedule 80	LF
614.73114	3" PVC Conduit, Schedule 40	LF
614.74114	4" PVC Conduit, Schedule 40	LF
625.20	Concrete Light Pole Base	Each
625.52	Light Pole and Fixture	Each

END OF SECTION

SPECIAL PROVISIONS

AMENDMENT TO SECTION 618.6 – Uniformed Officers
and
AMENDMENT TO SECTION 619.1 – Maintenance of Traffic
And
AMENDMENT TO SECTION 619.253 – Portable Message Boards

618.6 TRAFFIC CONTROL

Daily traffic control personnel will be required to help traffic get through the work zone quickly and safely. The use of, type of, and number of personnel will be reviewed and approved with the Engineer. Work in Woodbury Avenue will require the use of Portsmouth Police officers with or without a police car as determined by the Engineer. Traffic control for other areas of the site will generally be handled by civilian flaggers.

Method of Measurement:

The traffic flagger and police work shall be measured by the exact cost billed to the contractor based on the man-hours worked.

Basis of Payment:

This work shall be paid for from the Contract Price Allowance as listed under Items 618.6 & 618.7 in the Bid Proposal Form using the actual man-hours worked in the field on the project. The City will reimburse the exact cost for this item, no cost markup is allowed.

619.1 MAINTENANCE OF TRAFFIC

All work shall be prosecuted so pedestrian and traffic flow can be maintained. No travel lane or sidewalk closures will be allowed without prior approval from the Engineer. If lane closures are required, a detour plan will be generated and approved by the Engineer. Signs required for traffic detours shall be considered subsidiary to this item.

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

Access shall be maintained to the abutting driveways and entrances at all times during construction.

Dust control may be ordered by the Engineer. The Contractor shall have methods of dust control readily available for use at all times. Dust control as ordered by the Engineer is subsidiary to this item.

Temporary 6’ x 6’ Traffic Loops will be required and subsidiary to this item for signal impacts lasting more than 4 days.

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

Method of Measurement:

The traffic control items shall be measured on a unit basis under Maintenance of Traffic.

The following items are incidental to the 619 item: Traffic control, construction signs, temporary message boards, temporary traffic loops, traffic control plans, traffic cones and barrels and calcium and/or other methods of dust control as ordered by the Engineer.

Basis of Payment:

619.1: This work shall be paid for from the Contract Unit Price as listed under Item 619.1 (Maintenance of Traffic). This unit price shall include all equipment, materials and labor thereto.

619.253 PORTABLE MESSAGE BOARDS

If directed by the Engineer and required based on anticipated work, the Contractor shall provide and setup 54” x 92” (+/-) message boards to help traffic navigate any road closures or anticipated detours. These boards shall be readily available within 48 hours.

Method of Measurement:

This item will be paid at the rate of Unit week for each message board in place.

Basis of Payment:

619.253: This work shall be paid for from the Contract Unit Price as listed under Item 619.253 (Portable Message Boards). This unit price shall include all equipment, materials and labor thereto.

SPECIAL PROVISION – Not a Standard NHDOT Specification

SECTION 646

LOAMING AND SEEDING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Contract Documents: All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, are hereby made a part of the work of this Section. Where paragraphs of this section conflict with Division 1, requirements of this Section will govern.

B. Seeded Lawns: Provide seeded lawns as shown and specified.

1. New Loam.
2. Spreading new and existing on site loam.
3. Soil preparation.
4. Seeding lawns.
5. Mulching.
6. Maintenance.

C. Related work:

1. Plantings and Plant Bed Preparation

1.02 QUALITY ASSURANCE

A. Materials Testing: Provide and pay for materials testing. Testing agency shall be acceptable to the Landscape Architect or Owner's representative. Provide the following data:

1. Test representative material samples proposed for use.
2. Loam (Topsoil that will be brought in or reused from the site shall be tested).:

a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System.

b. The silt clay content shall be determined by a Hydrometer Test of soil passing the #207 sieve,

c. Percent of organics shall be determined by an Ash Burn Test or Walkley/Black Test.

d. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Soluble Salts and acidity (pH)

e. Soil Analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish particular lawn and planting objectives noted.

f. All tests shall be performed in accordance with the current standards of the Association of Official Agricultural Chemists.

B. Work shall be performed by experienced personnel specialized in landscaping and by qualified, experienced horticultural technicians. Provide full time, qualified supervision.

C. Contractor shall notify the Owner in writing of any material specified herein that, in the opinion of the Contractor is inappropriate for the proposed site conditions. No substitutions of materials may be made without the prior written approval of the Owner.

1.03 SUBMITTALS

A. Submit seed vendor's certification for required grass seed mixture, indicating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed for each grass species. Seed shall conform to seed laws of Department of Agriculture.

B. Submit the following material samples:

1. Seed for lawn

C. Submit the following materials certification:

1. Fertilizer analysis.

2. Tackifier.

3. Asphaltic emulsion.

D. Submit materials test reports. A copy of test results and recommendations shall be made available to the owner or owner's representative. No topsoil shall be used until test results have been approved and all required amendments for intended crop have been made.

E. Upon seeded lawn acceptance, submit written maintenance instructions recommending procedures for maintenance of seeded lawns.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver seed and fertilizer materials in original unopened containers, showing weight, analysis, and name of manufacturer. Transport and store in a manner to prevent wetting and deterioration.

1.05 PROJECT CONDITIONS

A. Work notification: Notify Landscape Architect at least 7 working days prior to start of seeding operations.

B. Protect existing utilities, paving, and other facilities from damage caused by seeding operations.

C. Perform seeding work only after planting and other work affecting ground surface has been completed.

D. Restrict traffic from lawn areas until grass is established. Erect signs and barriers as required.

E. Provide hose and lawn watering equipment as required.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Lawn seed: Fresh, clean, and new crop seed mixture as specified.

1. Seed may be mixed by an approved method on the site or may be mixed by the dealer. If the seed is mixed on the site, each variety shall be delivered in the original containers bearing the dealer's guaranteed analysis. If the dealer mixes

seed, the Seeding Contractor shall furnish to the Owner the dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.

2. Composed of the following varieties, mixed to the specified proportions by weight and tested to minimum percentages of purity and germination. Poa Annua, bent grass, and noxious weed seed free. All see shall consist of 25% Kentucky Bluegrass , 25% Tall Fescues and 50% Perennial Ryegrass by volume.

B. Topsoil: Fertile, friable, natural loam, without admixture of subsoil material, obtained from a well-drained arable site, free from toxic substances, clay, lumps, coarse sands, stones, plants, roots, sticks, and other foreign materials. All topsoils used on site shall be tested at an Analytical Services Lab at the contractor's expense.

1. Loam that has been stripped and stockpiled on site shall be utilized on this project. Provide additional loam if necessary. On site loam shall be tested, screened, and amended as required in this section before use.

2. Provide additional loam as needed to meet project requirements, all loam shall be free of substances harmful to the plants which will be grown in the soil, shall be tested and amended as required by these specifications prior to use.

3. Soil Analysis: The contractor shall submit representative samples of loam, which he intends to bring onto the site and samples of loam from onsite sources, to a soil testing facility. All reports shall be sent to the Engineer, Landscape Architect or Owner's Representative for approval. Samples of loam to be brought to the site must be approved prior to delivery of the soil. Deficiencies in the loam shall be corrected by the contractor, as directed by the engineer/landscape architect after review of the testing agency report by a soils consultant. Testing reports shall include the tests and recommendations outlined in sections 1.02 Material Testing and Recommendations.

4. Organic Matter Amendment: Organic matter may be horticultural compost it is it free from toxins and sewage sludge and meets all state standards. Analysis and certification of compliance shall be submitted for approval before use.

5. Typical Sand Amendment

Sand shall be mixed with topsoil as required to meet the required sand content of 50% to 65%. The material shall be uniformly graded coarse sand consisting of clean, inert, rounded grains of quartz or other durable rock and free from loam or clay, surface coatings, mica, other deleterious materials with the following gradation.

U.S. Sieve Size Number	Minimum	Percent Passing Maximum
10	100	-----
18	60	80
35	35	55
60	8	20
140	0	8
270	0	3
0.002mm	00	0.3

Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 10% by weight for the total sample.

The ratio of the particle size for 70% passing (D_{70}) to the particle size for 20% passing (D_{30}) shall be 3.0 or less ($D_{70}/D_{20} < 3.0$).

Tests shall be combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

C. Fertilizer: Shall be a starter type fertilizer with a 1:2:1 nitrogen-phosphorus-potassium ratio to be applied at a reate of 3.5 lbs. per 1000 sq. ft.. Fertilizer should contain at least 3% water insoluble nitrogen.

D. Compost: Shall be horticultural compost, free from toxins and sewage sludge and meets all state standards. Analysis and certification of compliance shall be submitted for approval before use.

E. Ground limestone: Containing not less than 85% of total carbonates with a minimum of 30% magnesium carbonates and ground to such fineness that 50% will pass through a 100 mesh sieve and 90% will pass through a 20 mesh sieve.

F. Mulch: No material shall be used which is so wet, decayed, or compacted as to inhibit even a uniform spreading. No chopped hay, grass clippings or other short fiber material shall be used unless directed.

1. Clean oat or wheat straw well seasoned before bailing, free from mature seed-bearing stalks or roots of prohibited or noxious weeds.

2. Wood cellulose fiber mulch: Degradable green dyed wood cellulose fiber or 100% recycled long fiber pulp, free from weeds or other foreign matter toxic to seed germination and suitable for hydromulching.

3. Salt marsh hay or straw will consist of salt marsh hay or straw, reasonably free from noxious weeds or other undesirable materials.

G. Tackifier: Liquid concentrate diluted with water forming a transparent 3-dimensional film like crust permeable to water and air and containing no agents toxic to seed germination.

H. Water: Free of substance harmful to seed growth. Hoses or other methods of transportation shall be furnished by Contractor.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine finish surfaces, grades, topsoil quality, and depth. Do not start seeding work until unsatisfactory conditions are corrected in a manner acceptable to Owner.

B. Cooperate with other contractors and trades working in and adjacent to landscape work areas. Examine drawings that show development of entire site and become familiar with scope of the other work required.

3.02 PREPARATION

A. Limit preparation to areas which will be immediately seeded.

B. All slopes and other areas where topsoil is required shall be brought to the required subgrade.

C. Loosen subsoil in areas to be seeded to a depth of 4”, provided the area is not over tree roots, immediately prior to placement of topsoil. Remove stones, sticks, roots, rubbish, and extraneous matter over 1" in any dimension.

D. Spread loam to a depth of 6” to provide consistent coverage. Work topsoil into loosened subsoil below.

E. Grade lawn areas to a smooth, free draining even surface with a loose, moderately coarse texture. Roll and rake, remove ridges, and fill depressions as required to drain.

F. Apply limestone, along with other soil amendments recommended by the soil test, at rate determined by the soil test, to adjust pH of topsoil to not less than 6.4 nor more than 6.8 within a three month period. Distribute evenly by machine and incorporate thoroughly into topsoil.

G. Apply fertilizers to renovated lawn areas by mechanical rotary or drop type distributor, thoroughly and evenly incorporated with soil to a depth of 3" by discing or other

approved method. Fertilize areas inaccessible to power equipment with hand tools and incorporate into soil.

H. Restore prepared areas to specified condition if eroded, settled, or otherwise disturbed after fine grading and prior to seeding.

3.03 INSTALLATION

A. Seeding:

1. Seed lawn immediately after preparation of bed. Spring seeding between April 15 and June 15 and fall seeding between August 15 and October 10 or at such other times acceptable to the Landscape Architect or Owner's representative.

2. Seed indicated areas within contract limits and areas adjoining contract limits disturbed as a result of construction operations.

3. Perform seeding operations when the soil is dry and when winds do not exceed 5 miles per hour velocity.

4. Apply seed to areas with a rotary or drop type distributor. Install seed evenly by sowing equal quantities in 2 directions, at right angle to each other.

5. Sow grass seed for lawn at a rate of 6.0 lbs per 1,000 sq. ft. (250 lbs/acre).

6. After seeding, rake or drag surface of soil lightly to incorporate seed into top 1/8" of soil. Roll with light lawn roller.

7. Mulch seeding with straw blanket not less than ½" to 1" thick, keep seeded areas moist continuously until the seed has germinated. (Expect three weeks for Bluegrass germination).

B. Hydroseeding:

1. Use a hydromulcher (sprayer) and apply mixture(s) at the following rates. Mix in accordance with manufacturer's recommendations.

2. Apply mixture A hydroseed slurry to steep erosion prone areas.

a. Type A fertilizer: 220 lbs./acre.

b. Tackifier: 60 gals./acre.

c. Wood cellulose fiber mulch: 2,000 lbs./acre.

d. Limestone: Rate determined by soil test.

3. Apply mixture B hydroseed slurry to all other areas.

a. Type A fertilizer: 220 lbs./acre.

b. Wood cellulose fiber mulch: 1,500 lbs./acre.

c. Limestone: Rate determined by soil test.

4. Protect buildings, paving, plantings, and all nonseeded areas from liquid tackifier over-spray.

C. Provide straw bale checking in ditches or problem swales at intervals required to adequately slow water velocity and impede soil loss.

D. The Contractor shall erect barricades with warning signs to protect the seeded areas. The Contractor shall be responsible for all such areas during the period when the grass is becoming established, including watering. This period shall extend for a minimum of 60 days after the completion of the final seeding of the areas.

3.04 RECONDITIONING EXISTING LAWNS

A. Recondition existing lawn areas damaged by Contractor's operations, including storage of materials or equipment and movement of construction vehicles, and existing lawn areas as indicated.

B. Provide fertilizer, seed and soil amendments as specified for new lawns and as required to provide a satisfactorily reconditioned lawn. Provide topsoil as required to fill low areas and meet new finish grades.

C. Cultivate bare and compacted areas thoroughly.

D. Remove diseased or unsatisfactory lawn areas. Do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, stone, gravel and other construction materials.

E. Where substantial but thin lawn remains, rake, aerate if compacted, and cultivate soil; fertilizer and seed.

F. Water newly seeded areas thoroughly, but do not create muddy soil condition. Maintain

adequate soil moisture until new grass is established.

3.05 MAINTENANCE

A. Lawn Maintenance: Provide complete maintenance and service as required to promote and maintain healthy growth including, without limitation, watering, fertilizing, weeding, mowing, trimming, rolling, re-grading, fallen leaf removal, treating for insects and disease, and other operations for sixty days after substantial completion, two mowings and acceptance the landscape architect or owner's representative. The owner shall be notified in writing as to the date that they are expected to begin maintenance of the completed project. If seeded in the fall, or sixty days of maintenance has not be completed before the onset of winter, or if turf is not considered acceptable at the end of the growing season, continue maintenance the following spring until an acceptable lawn is established. Any part of seeded areas which fails to show a uniform stand shall be reseeded every twenty one days until areas are covered with grass.

1. Water daily to maintain adequate surface soil moisture for proper seed germination. Thereafter apply 1/2" of water twice weekly until acceptance. Continue daily watering for not less than 60 days.

2. Repair, rework, and re-seed all areas that have washed out, are eroded, or do not catch.

3. Mowing: Mow lawn areas as soon as lawn top growth reaches a 3.5" height. Cut back to 3" in height and never lower than 2.5". Repeat mowing as required to maintain specified height.

4. Length of Maintenance Required: Completely maintain lawns for 60 days or until date of acceptance of project, whichever is later in time.

5. Acceptance Criteria: Create an acceptable lawn which is defined to mean a uniform, smooth lawn with well established, close stands of grass, with no bare or dead spots over 3" in maximum dimension, with not more than one bare spot for each square yard of lawn area, and with an average of at least 6 thriving grass plants per square inch. To be acceptable, the lawn will be free from weeds, disease, and detrimental insect infestation.

3.06 ACCEPTANCE

A. Inspection to determine acceptance of seeded lawns will be made by the Landscape Architect or Owners representative, upon Contractor's request. Provide notification at least 10 working days before requested inspection date.

1. Seeded areas will be acceptable provided all requirements, including

maintenance, have been complied with, and a healthy, uniform, close stand of the specified grass is established free of weeds, undesirable grass species, disease, and insects.

2. No individual lawn areas shall have bare spots or unacceptable cover totaling more than 2% of the individual areas, in areas requested to be inspected.

B. Upon acceptance, the Owner will assume lawn maintenance.

3.07 WARRANTY

A. Provide a uniform stand of grass by watering, mowing, and maintaining seeded areas as specified for 1 year after date of substantial completion or until final acceptance. Reseed areas, with specified materials, which fail to provide a uniform stand of grass until all affected areas are accepted by the Owner.

3.08 CLEANING

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from seeding operations.

3.09 BASIS OF PAYMENT

A. Pay items and units:

Pay Item		Pay Unit
646.51	Turf Establishment with Mulch, Tackifiers, and 6” Loam	Square Yard

END OF SECTION

SPECIAL PROVISION – Not a Standard NHDOT Specification

SECTIONS 650-657

PLANTINGS & BED PREPARATION

PART 1 GENERAL

1.1 DESCRIPTION

A. Contract Documents: All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, are hereby made a part of the work of this Section. Where paragraphs of this section conflict with Division 1, requirements of this Section will govern.

B. Provide trees, shrubs, and ground covers as shown and specified. The work includes:

1. Soil preparation.

2. Trees, shrubs, and ground covers.

3. Planting Mixes

4. Mulch and planting accessories.

5. Existing tree care.

6. Maintenance.

7. Warranty

C. Related Work:

1. LOAMING AND SEEDING

1.2 QUALITY ASSURANCE

A. Plant names indicated; comply with "Standardized Plant Names" as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. Names of varieties not listed conform generally with names accepted by the nursery trade.

B. Work shall be performed by firms specializing in landscaping and by qualified, experienced horticultural technicians. Provide full-time, qualified supervision.

C. Provide stock true to botanical name and legibly tagged.

D. Comply with sizing and grading standards of the latest edition of "American Standard for Nursery Stock". A plant shall be dimensioned as it stands in its natural position.

E. All plants shall be nursery grown under climatic conditions similar to those in the locality of the project for a minimum of 2 years.

F. Stock furnished shall be at least the minimum size indicated. Larger stock is acceptable, at no additional cost, and providing that the larger plants will not be cut back to size indicated. Provide plants indicated by two measurements so that only a maximum of 25% are of the minimum size indicated and 75% are of the maximum size indicated.

G. Plants may be inspected and approved at the place of growth, for compliance with specification requirements for quality, size, and variety.

1. Source: The Landscape Architect or Owner's representative reserves the right to review and reject the source of plant material. The Contractor will submit for the Landscape Architect's or Owner's representatives review and approval a list indicating the plant name, size, quantity, and source prior to construction.

2. The Landscape Architect or Owner's representative has endeavored to locate sources for the plant material indicated to determine if materials are available. However, the Landscape Architect makes no claim that the materials will be available at the sources researched. The Contractor will submit to the Landscape Architect a or Owner's representative ny questions regarding the source of any plant.

H. Materials Testing: Provide and pay for material testing. Testing agency shall be acceptable to the Landscape Architect or Owner's representative. Provide the following data:

1. Test representative material samples proposed for use.

2. Loam (Topsoil that will be brought in or reused from the site shall be tested).:

a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System.

b. The silt clay content shall be determined by a Hydrometer Test of soil passing the #207 sieve,

c. Percent of organics shall be determined by an Ash Burn Test or Walkley/Black Test.

d. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Soluble Salts and acidity (pH)

e. Soil Analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish particular lawn and planting objectives noted.

f. All tests shall be performed in accordance with the current standards of the Association of Official Agricultural Chemists.

I. Reference Standards:

1. ANSI Z133.1 tree pruning, tree removal, and other tree care operations.

2. ASTM: American Society for Testing Materials.

3. AOAH: Association of Official Agricultural Chemists.

4. AAN: American Association of Nurserymen.

1.3 SUBMITTALS

A. Submit the following materials certification:

1. Fertilizer analysis

2. Compost.

B. Submit material test reports for loam (on and off-site) and compost.

C. Upon final acceptance of the job, submit written maintenance instructions recommending procedures for maintenance of plant materials. Provide clear, concise type-written instructions and recommendations for year-round care of all work provided under this Section.

1. Include Maintenance Instructions plus any special instructions deemed necessary by the Contractor:

a. Title and location of project; date of project; name, address, and telephone/ fax number of Landscape Contractor, Owner, Engineer

and Landscape Architect.

b. Botanical and common names of plants and lawn covered by the maintenance instructions.

c. Identify by calendar month the maintenance requirements for pruning, fertilizing, irrigation, mulch, pest/ disease control, staking, mowing, and general maintenance.

d. Indicate type and quantity of fertilizer to be used, which pests/ diseases can be anticipated for each plant type, and quantity of water needed.

e. Indicate the type and source of mulch used on the project.

D. Provide plant material record drawings:

1. Legibly mark drawings to record actual construction.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver fertilizer materials in original, unopened, and undamaged containers showing weight, analysis, and name of manufacturer. Store in manner to prevent wetting and deterioration.

B. Take all precautions customary in good trade practice in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected. Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock and on arrival, the certificate shall be filed with the Landscape Architect or Owner's representative. Protect all plants from drying out. Deliver trees and shrubs after preparations for planting have been completed and plant immediately. If plants cannot be planted immediately upon delivery, set plants in shade and properly protect them with soil, mulch, or in a manner acceptable to the Landscape Architect or Owner's representative. Water heeled-in plantings daily at a minimum or more if weather conditions require.

C. No plant shall be bound with rope or wire in a manner that could damage or break the branches.

D. Cover plants transported on open vehicles with a protective covering to prevent wind burn.

E. Provide dry, loose topsoil for planting bed mixes. Frozen or muddy topsoil is not

acceptable.

1.5 PROJECT CONDITIONS

A. Work notification: Notify Landscape Architect at least 7 working days prior to installation of plant material.

B. Protect existing utilities, paving, and other facilities from damage caused by landscaping operations.

C. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.

D. Concealed Conditions: Notify Landscape Architect or Owner's representative before planting when below grade conditions detrimental to proper plant growth are encountered. Do not proceed with planting without specific written instructions from the Landscape Architect.

1.6 WARRANTY

A. Warrant all plant material ***including perennials*** to remain alive and be in healthy, vigorous condition for a period of 1 year after completion and acceptance of entire project.

B. Replace, in accordance with the drawings and specifications, all plants that are dead or, as determined by the Landscape Architect, are in an unhealthy or unsightly condition, and have lost their natural shape due to dead branches, or other causes due to the Contractor's negligence. The cost of such replacement(s) is at Contractor's expense. Warrant all replacement plants for 1 year after installation.

C. Warranty shall not include damage or loss of trees, shrubs, or perennials caused by fires, floods, freezing rains, lightning storms, or winds over 75 miles per hour, acts of vandalism or negligence on the part of the Owner.

D. Remove and immediately replace all plants, as determined by the Landscape Architect or Owner's representative, to be unsatisfactory during the initial planting installation.

E. Owner's Responsibilities and Warranty Exclusions: After completion of the Contractor's maintenance responsibilities, the Owner is responsible for maintaining the work in reasonable compliance with the Contractor's maintenance instructions.

1. During the warranty period, the contractor will visit the site at one month intervals to review the conditions of the accepted work. The Contractor will submit in writing his/ her concerns regarding the Owner's maintenance practices and/ or any vandalism. The content of this notice will include a list of specific plants involved, the presumed problem, and a method of remedy for the problem(s) cited. The Owner will make reasonable efforts to correct the problems cited by the Contractor but the Owner will not be held responsible for the Contractor's defects in materials or workmanship that result in decline or death to plants and lawns.

2. Failure of the Contractor to make the required monthly review of the site during the warranty period and to submit written notice to the Owner of maintenance defects, will negate the Contractor's ability to make a claim against the Owner for negligence of maintenance.

PART 2 PRODUCTS

2.1 MATERIALS

A. Plants: Provide plants typical of their species or variety; with normal, densely-developed branches and vigorous, fibrous root systems. Provide only sound, healthy, vigorous plants free from defects, disfiguring knots, sunscald injuries, frost cracks, abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation. All plants shall have a fully developed form without voids and open spaces. Plants held in storage will be rejected if they show signs of growth during storage.

1. Dig balled and burlapped plants with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant.

    a. Provide root ball sizes complying with the latest edition of the "American Standard for Nursery Stock".

    b. Cracked or mushroomed balls are not acceptable.

2. Container-grown stock: Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.

    a. No plants shall be loose in the container.

    b. Container stock shall not be pot bound.

3. Provide tree species that mature at heights over 25 feet with a single main trunk. Trees that have the main trunk forming a "Y" shape are not acceptable.

4. Plants planted in rows shall be matched in form.

5. Plants larger than those specified in the plant list may be used when acceptable to the Landscape Architect.

    a. If the use of larger plants is acceptable, increase the spread of roots or root ball in proportion to the size of the plant.

6. The height of the trees, measured from the crown of the roots to the top of the top branch, shall not be less than the minimum size designated in the plant list.

7. No pruning wounds shall be present with a diameter of more than 1" and such wounds must show vigorous bark on all edges.

8. Evergreen trees shall be fully branched to the ground.

9. Shrubs shall meet the requirements for spread and height indicated in the plant list.

    a. The measurements for height shall be taken from the ground level to the height of the top of the plant and not the longest branch.

    b. Single stemmed or thin plants will not be accepted.

    c. Side branches shall be generous, well-twigged, and the plant as a whole well-branched to the ground.

10. Plants shall be in a moist, vigorous condition, free from dead wood, bruises, or other root or branch injuries.

B. Soil for Planting Beds: Fertile, friable, natural loam, without admixture of subsoil material, obtained from a well-drained arable site, free from toxic substances, clay, lumps, coarse sands, stones, plants, roots, sticks, and other foreign materials. All topsoils used on site shall be tested at the contractor’s expense. For specific plant bed mixtures refer to Landscape Notes on plans.

1. Loam that has been stripped and stockpiled on site shall be utilized on this project. Provide additional loam if necessary. On site loam shall be tested, screened, and amended as required in this section before use.

2. Provide additional loam as needed to meet project requirements, loam

shall be free of substances harmful to the plants which will be grown in the soil, shall be tested and amended as required by these specifications prior to use.

3. Soil Analysis: The contractor shall submit representative samples of loam, which he intends to bring onto the site and samples of loam from onsite sources, to a soil testing facility. All reports shall be sent to the Engineer, Landscape Architect or Owner's Representative for approval. Samples of loam to be brought to the site must be approved prior to delivery of the soil. Deficiencies in the loam shall be corrected by the contractor, as directed by the engineer/landscape architect after review of the testing agency report by a soils consultant. Testing reports shall include the tests and recommendations outlined in sections 1.02 Material Testing and Recommendations.

4. Organic Matter Amendment: Organic matter may be horticultural compost it is it free from toxins and sewage sludge and meets all state standards. Analysis and certification of compliance shall be submitted for approval before use.

5. Typical Sand Amendment

Sand shall be mixed with topsoil as required to meet the required sand content of 50% to 65%. The material shall be uniformly graded coarse sand consisting of clean, inert, rounded grains of quartz or other durable rock and free from loam or clay, surface coatings, mica, other deleterious materials with the following gradation.

U.S. Sieve Size Number	Minimum	Percent Passing Maximum
10	100	-----
18	60	80
35	35	55
60	8	20
140	0	8
270	0	3
0.002mm	00	0.3

Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 10% by weight for the total sample.

The ratio of the particle size for 70% passing (D_{70}) to the particle size for 20% passing (D_{30}) shall be 3.0 or less ($D_{70}/D_{20} < 3.0$).

Tests shall be combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

6.

C. Compost: Horticultural compost free from toxins and sewage sludge, meeting all state standards. Analysis and certifications of compliance shall be submitted for approval before use.

D. Fertilizer: Commercial type approved by the Landscape Architect, containing 5% nitrogen, 10% phosphoric acid, and 5% potash by weight. 1/4 of nitrogen in the form of nitrates, 1/4 in form of ammonia salt, and 1/2 in form of organic nitrogen.

E. Organic Bio-stimulant such as Roots®, a concentrated organic bio-stimulant that promotes root and shoot growth, increases stress resistance and reduces fertilizer requirements shall be used with all plant installations.

F. Anti-Desiccant: Protective film emulsion providing a protective film over plant surfaces; permeable to permit transpiration. Mixed and applied in accordance with manufacturer's instructions.

G. Mulch: Premium grade, aged, shredded pine bark 3/4" to 1-1/2" diameter free from sawdust, woodchips or contaminants. Color: Black

H. Water: Free of substances harmful to plant growth. Hoses or other methods of transportation furnished by Contractor.

2.2 ACCESSORIES

A. Stakes for Staking: Hardwood, 3" x 3" x 5'-0" long.

B. Stakes for Guying: Hardwood, 3" x 3" x 36" long.

C. Guying/Staking/Wire: No. 10 or 12 gage galvanized wire.

D. Staking and Guying Hose: Two ply, reinforced garden hose not less than 1/2" inside diameter.

E. Tree wrap of any kind shall not be used.

F. Landscape fabric shall not be used.

PART 3 EXECUTION

3.1 INSPECTION

A. Pre-Installation Examination Required: The Contractor will examine previous work, related work, and conditions under which this work is to be performed and notify Landscape Architect in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means Contractor accepts substrates, previous work, and conditions. The Contractor will not place any planting soil mixtures until all work in adjacent areas is complete and approved by the Landscape Architect.

3.2 PREPARATION

A. Planting shall be performed only by experienced workmen familiar with planting procedures under the supervision of a qualified supervisor.

B. Locate plants as indicated or as approved in the field after staking by the Contractor. If obstructions are encountered that are not shown on the drawings, do not proceed with planting operations until alternate plant locations have been selected by Landscape Architect.

C. Planting Seasons: Work only within seasonal limitations for proper planting as follows:

Plant Material	Spring Season	Fall Season
Deciduous [balled and burlapped]	April 15 to Jun 15	Sept 1 to Nov 15
Deciduous [container grown]	April 15 to Jun 15	Sept 1 to Nov 15
Evergreens	April 15 to Jun 15	Sept 1 to Nov 15
Ground Covers	April 15 to Jun 15	Sept 1 to Oct 1
Bulbs	none	Sept 1 to Nov 15

D. Contractor shall notify the Landscape Architect of commencement of planting operations a minimum of seven working days prior to the beginning of work. Contractor shall stake the location of proposed trees for approval by the landscape architect. After this approval contractor shall layout the proposed shrubs for approval by the landscape architect. Landscape architect may require all shrubs to be placed in their proposed locations prior to accepting the layout. Upon acceptance of the tree and shrub layouts and their installation, perennials may be installed.

E. Excavate circular plant pits with sloping sides, as shown on planting details, except for plants specifically indicated to be planted in beds. Provide shrub pits at least 12" greater than the diameter of the root system and 24" greater for trees. Depth of pit shall accommodate the root system. Provide undisturbed subgrade to hold root ball at root flare as shown on the drawings. Remove excavated materials from the site.

F. Tree and shrub pits shall be backfilled with existing soil from the excavation of the planting pit and no amendments shall be used unless the entire area the roots will grow into is amended likewise (such as large plant beds) or if heavy clay conditions exist. See planting details.

G. Planting soils for perennial beds shall be as specified on the drawings.

3.3 INSTALLATION

A. Examine tree and large shrubs for the root/trunk flare. If trunk flare is not visible, gently remove soil from the top of the ball until the flare and the beginning of the horizontal lateral roots can be seen. Give care to avoid damaging the roots. Depth of the plant pit shall be the same as the distance from the bottom of the root ball to the trunk flare.

B. Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure. Set plant material 1”-2" above the finish grade. No filling will be permitted around trunks or stems. Remove all burlap, ropes, and wire cages from root balls. Backfill the pit with planting mixture. Do not use frozen or muddy mixtures for backfilling. Form a raised ring of soil (saucer) around the edge of each planting pit to retain water.

C. After balled and burlapped plants are set, water-in (muddle) planting soil mixture around bases of root balls and fill all voids.

D. Space ground cover plants in accordance with indicated dimensions. Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants. Plant to within 12" of the trunks of trees and shrubs within planting bed and to within 6" of edge of bed.

E. Mulching: Mulch tree and shrub planting pits and shrub and perennial beds with required mulching material 2" deep immediately after planting. Do not place mulch up against trunks or stems. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.

F. Guying, staking:

1. Stake/guy all trees after planting operations and prior to acceptance. When high winds or other conditions which may effect tree survival or appearance occur, the Landscape Architect may require immediate staking/guying.

a. Stake deciduous trees under 3" caliper. Stake evergreen trees under 8'-0" tall.

b. Guy deciduous trees over 3" caliper. Guy evergreen trees over 8'-0" tall.

2. All work shall be acceptable to the Landscape Architect.

G. Pruning: Prune only as indicated on the drawings. Prune evergreens only to remove broken or damaged branches.

3.4 MAINTENANCE

A. Tree, shrub, and perennial maintenance: Begin maintenance immediately after planting. Provide complete maintenance and service as required to promote and maintain healthy growth including, without limitation, watering, fertilizing, pruning, trimming, cultivating, weeding, fallen leaf removal, treating for insects and disease, resetting plants to proper grade and upright position, and other operations and maintenance work.

B. Length of Maintenance Required: Completely maintain trees, shrubs and perennials for 30 days following the date of final acceptance.

C. Watering: Water all plants during the maintenance period at least twice each week. At each watering, thoroughly saturate the soil around each tree and shrub. If sufficient moisture is retained in the soil as determined by the Landscape Architect, the required watering may be reduced. Quantity of water required per watering: Trees will require a minimum of ten gallons (ea.), shrubs require a minimum of 5 gallons (ea.), perennials require a minimum of 1” of water per week. Water trees, shrubs, and perennial beds within the first 24 hours of initial planting, and not less than twice per week until final acceptance.

D. Tighten and adjust guy wires and stakes to keep trees in vertical position. Repair and/or replace any damaged or defective stakes, guys and protective hose.

E. Re-set settled plants to proper grade and position. Restore planting saucer, adjacent material and mulch. Remove any dead material and dispose off-site.

F. Restore planting, saucers and mulch and keep mulch beds weed-free.

G. Correct defective work as soon as possible after deficiencies become apparent and weather and season permit.

3.5 ACCEPTANCE

A. Inspection to determine acceptance of planted areas will be made by the client or client’s representative and/or the Landscape Architect or Owner’s representative, upon Contractor's request. Provide notification at least 10 working days before

requested inspection date.

1. Planted areas will be accepted provided all requirements, including maintenance and watering, have been complied with and plant materials are alive and in a healthy, vigorous condition.

3.6 CLEANING

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, soils, debris, and equipment. Repair damage resulting from planting operations.

3.7 METHOD OF MEASUREMENT

A. Plant material will be measured by the number of units of plants in healthy condition, of the specified sizes and species, furnished in accordance with the drawings, and planted.

3.8 BASIS OF PAYMENT

A. The accepted quantity of plantings will be paid for at the Contract unit price per each planting of the specified size and species complete in place as shown on the Plant Schedule in the Contract Documents and listed below.

B. Pay items and units:

Pay Item		Pay Unit
650.1	New planting beds with 12” Loam and mulch	Square Yard
650.2	Planting beds amended with 3” Compost and mulch	Square Yard
651.1	Pinus flexilis 'Vanderwolf's Pyramid'	Each
651.2	Picea orientalis	Each
652.1	Acer Saccharum 'Green Mountain'	Each
652.1	Ulmus Americana ‘Princeton’	Each
652.55	Platanus Acerifolia 'London Planetree'	Each
653.1	Malus 'Spring Snow Crabapple'	Each
653.89	Pyrus Calleryana 'Chanticleer Flowering Pear'	Each

654.1	Juniperus Chinensis Pfitzeriana ‘Compacta’	Each
654.2	Taxus media 'Tauntonii'	Each
655.2	Buxus 'Green Velvet'	Each
655.3	Clethra alnifolia 'Hummingbird'	Each
655.4	Comus alba 'Ivory Halo'	Each
655.5	Forsythia 'Broxensis'	Each
655.6	Fothergrilla gardenia	Each
655.7	Hyrdrangea arborescens 'Annabelle'	Each
655.9	Hydrangea quercifolia 'Sikes Dwarf'	Each
655.10	Hydrangea macrophylla 'All Summer Beauty'	Each
655.11	Ilex glabra 'Shamrock'	Each
655.12	Ilex verticillata 'Red Sprite'	Each
655.13	Juniperus squamata 'Blue Star'	Each
655.14	Juniperus chinensis 'Sargenti'	Each
655.15	Vibumum plicatum tomentosum 'Mariesii'	Each
655.16	Microbiota decussate	Each
655.17	Deutzia gracilis	Each
655.18	Deutzia gracilis 'Nikko'	Each
656.2	Rhododendron 'P.J.M.'	Each
656.3	Rhododendron yakushimanum	Each
656.4	Spirea Nipponica 'Snowmound'	Each
656.5	Rosa 'Double Knockout'	Each
656.6	Rosa 'Pink Double Knockout'	Each
656.7	Spiraea x bumalda 'Anthony Waterer'	Each

656.8	Spiraea x bumalda 'Goldmound'	Each
656.9	Syringa 'Bloomerang'	Each
656.10	Syringa vulgaris 'Charles Joy'	Each
656.11	Thuja occidentalis 'Nigra'	Each
656.12	Rhus aromatica 'Grow-Low'	Each
657.1	Miscanthus Virgatum 'Shenandoah'	Each
657.2	Hemerocallis 'Big Time Happy'	Each
657.5	Anemone 'September Charm'	Each
657.7	Baptisia australis	Each
657.8	Calamagrostis acutifolia 'Karl Foster'	Each
657.12	Hosta 'Frances Williams'	Each
657.13	Hosta 'Guacamole'	Each
657.17	Vinca minor 'Bowles'	Each

END OF SECTION

SPECIAL PROVISION – Not a Standard NHDOT Specification

SECTION 661.10

BENCH

GENERAL

DESCRIPTION

Section includes information, materials, and options for products manufactured by Victor Stanley, Inc. All specifications are subject to change. Contact manufacturer for details.

SUBMITTALS

Specifications Drawing: Detail drawing of product including overall dimensions and options.

Samples: Various component samples available upon request.

DELIVERY, STORAGE, AND HANDLING

Delivery: Deliver products to site in manufacturer's original, unopened containers and packaging. Upon delivery, examine packages immediately to ensure all products are complete and undamaged.

Storage: Store products in a protected, dry area in manufacturer's unopened containers and packaging.

Handling: Protect product's finish from damage during handling and installation.

COORDINATION

Coordinate with site work and other appropriate sections of the specifications to maintain proper provisions of the work specified.

All site furnishings shall be laid out in the field and approved prior to installation.

PRODUCTS

MANUFACTURER Victor Stanley, Inc.

P.O. Drawer 330
Dunkirk, MD 20754 USA
Toll Free: (800) 368-2573 (USA & Canada)
Tel: (301) 855-8300 Fax: (410) 257-7579
E-mail: sales@victorstanley.com
Web site: http://www.victorstanley.com

BENCH: Type: Model C-10 from the Classic Series

MATERIALS

Ductile iron end frames - all ductile iron castings come with a 10-year warranty against breakage; 2” x 3” (nominal) slats; 1-5/16” tubular steel rung used for additional support

OPTIONS

Standard lengths: 6ft

Armrest(s)

Matching full center casting

Slats: Philippine mahogany

Standard colors: VS Black

FINISHES

All fabricated metal components are steel shotblasted, etched, phosphatized, preheated, and electrostatically powder-coated with TGIC polyester powder coatings. Products are fully cleaned and pretreated, preheated and coated while hot to fill crevices and build coating film. Coated parts are then fully cured to coating manufacturer’s specifications. The thickness of the resulting finish coat averages 8-10 mils (200-250 microns).

In high salt abusive climates, hot dip galvanizing before powder coating is available. Hot dip galvanizing will provide greater protection in salty climates but yields a slightly less smooth coating finish. Most fabricated metal components and castings can be hot dip galvanized, lids cannot, please contact manufacturer for details.

EXECUTION

INSTALLATION

Clearance for 3/8” anchor bolts (anchor bolts provided by others)

Mounting: It is not recommended to locate anchor bolts until bench is in place. This Victor Stanley, Inc. product must be permanently affixed to the ground.

BASIS OF PAYMENT

Pay item and units:

Pay Item		Pay Unit
661.10	Bench	Each

END OF SECTION

SPECIAL PROVISION – Not a Standard NHDOT Specification
SECTION 661.20
Bus Shelter

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Installation of Bus Shelters as shown on Contract Documents.

1.2 SUBMITTALS

A. Submit Shop Drawings and product data prior to ordering or installing.

PART 2 MATERIALS

2.1 GENERAL

A. Bus Shelter should be by Tolar Manufacturing Company, Inc.

2.2 SHELTER

A. 14’-2 17/32” wide by 6’-7 11/32” deep by 9’-3” tall with 7’ of headroom from grade.

B. Factory prefabricated from specially engineered AA6063-T5 aluminum extrusions and components, minimum 1/8” wall thickness, specifically designed to meet functional requirements of transit shelters, minimizing the number of individual parts and providing adaptability to various sizes or configurations.

C. Rugged roof perimeter extrusion nominally 4” x 4” is specially shaped with a 4” high flat fascia suitable for application of location ID or logo decal and an integral gasketed glazing channel in the underside.

D. Roof structure is fabricated using 3-way keyed corner components with stubs sleeved and locked into the roof perimeter extrusion and 4” deep sockets for corner posts to provide easy installation, maximum structural stability, with or without wall panels, and eliminate mitered joints.

E. 6mm bronze tinted UV protected Lexan Thermoclear roof panels create a hipped peak palladium style roof with overhang over aluminum bows or rafters retained by gasketed pressure bars, for leak proof performance without the need for silicone seal. Roof panels are easily and quickly replaceable if damaged.

F. Rain diverter directs runoff away from doorway openings to roof the corners.

G. Support posts are specially shaped extrusions nominally 3” x 3” with alignment lips for the glazing system and made to sleeve into the roof corner sockets.

H. Wall back and upstream panels of 3/8” thick clear tempered glass x 44” wide x 82” tall with a Victorian pattern screened into the glass. With its structural stability, relatively large unobstructed surfaces make cleaning quick and easy.

I. Wall panels are retained by the integral gasketed glazing channel in the underside of the roof and by pressure fit gasketed L channel / snap glazing on vertical posts with stainless steel glass supports which anchor to the concrete pad or sidewalk on the bottom of the glass eliminating exposed fasteners and providing fast, easy installation and quick glass replacement without re-riveting.

J. 48” V-box Ad kiosk with two side hinged doors, with clear tempered glass lenses, security screw locking; fluorescent backlighting, 110V UL certified with GFI.

K. All metal surfaces are pretreated and finished in premium powder coat over phosphate conversion coat to create a finish of RAL 9005 Jet Black.

L. Adjustable aluminum shoes internally telescoped into the posts provide up to 12” of height adjustment to accommodate leveling on a concrete pad.

M. All hardware a key connection points and Hilti anchors at ground are stainless steel. No self tapping screws in tension are ever used.

N. Tolar Niagara shelters are shipped in knock down condition with all necessary hardware and complete illustrated instructions for quick installation using standard tools.

O. Tolar Niagara shelters are engineered to meet or exceed all applicable wind, snow and seismic loads, all applicable building code requirements and ADA

P. Warranty: Minimum 1 year against manufactured defects or workmanship covering materials and labor.

PART 3 EXECUTION

3.1 INSTALLATION

A. Bus Shelter

1. Install Bus Shelter in accordance with instructions provided by the manufacturer.

3.2 BASIS OF PAYMENT

Pay items and units:

Pay Item		Pay Unit
661.20	Bus Shelter	Each

END OF SECTION