CONTRACT DOCUMENTS AND SPECIFICATIONS

for

Plains Park Improvements

Bid Proposal #37-12

John P. Bohenko, City Manager

City of Portsmouth, New Hampshire

Prepared by:

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100 International Drive, Suite 152
Portsmouth, NH

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Department of Community Development

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INVITATION TO BID

Sealed bid proposals, **plainly marked, Plains Park Improvements Project**, Bid Proposal #37-12 **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 **2:00 p.m.** on **Thursday, June 28, 2012** at which time all bids will be publicly opened and read aloud. A mandatory pre-bid meeting will be held Friday, June 15, 2012 at 10:00am at the Department of Public Works, 680 Peverly Hill Road, Portsmouth, N.H.

The project consists of improvements to Plains Park in Portsmouth, NH. Specifically, the work includes selective demolition of existing gravel parking area, pruning and removal of existing trees, regrading and drainage improvements as well as the development or installation of new parking lot, pathways, play equipment, and tree plantings. The project also includes relocation of batting cage, storage box, and utility poles (by others) including all associated utilities.

Specifications may be obtained by visiting the City's website: www.cityofportsmouth.com. Plan sets can be obtained by contacting Infinite Imaging, 933 Islington Street, Portsmouth, NH 03801 (603) 436-3030. Questions may be addressed to the Purchasing Coordinator. Addenda to this bid document, if any, including written answers to questions, will be posted on the City of Portsmouth website under the project heading.

Work may begin in accordance with the Notice to Proceed with work completed within 90 days once commenced. Liquidated damages shall be assessed at $100.00 per day.

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

Firms submitting bids need to be pre-qualified by the State of New Hampshire Department of Transportation for Site Work, Road or Landscape.

The City of Portsmouth reserves the right to reject any or all bids, to waive technical or legal deficiencies, to re-bid, and to accept any bid that it may deem to be in the best interest of the City.

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

INSTRUCTIONS TO BIDDERS

BIDDING REQUIREMENTS AND CONDITIONS

1. Special Notice to Bidders and Addenda

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 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.

The City of Portsmouth has made full set plans available for this project. The plans can be purchased from:
Infinite Imaging
933 Islington Street
Portsmouth, NH 03801
(603) 436-3030
www.infiniteimaging.com

2. Interpretation of Quantities in Bid Schedules

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

3. Examination of Plans, Specifications and Site Work

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

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

4. Familiarity with Laws

The bidder is assumed to have made himself or herself familiar with all federal and state laws and all local by-laws, ordinances and regulations which in any manner affect those engaged or employed on the work or affect the materials or equipment used in the work or affect the conduct of the work, and the bidder, if awarded the contract, shall be obligated to perform the work in conformity with said laws, by-laws, ordinances and regulations notwithstanding its ignorance thereof. If the bidder shall discover any provision in the plans or specifications which is in conflict with any such law, by-law, ordinance or regulation the bidder shall forthwith report it to the engineer in writing.

5. Preparation of Proposal

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

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

6. Nonconforming Proposals

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

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

7. Proposal Guaranty

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

- In a form satisfactory to the Owner;
- With a surety company licensed, authorized to do business in, and subject to the jurisdiction of the courts of the State of New Hampshire; and

- Conditioned upon the faithful performance by the principal of the agreements contained in the sub-bid or the general bid.

In the event any irregularities are contained in the proposal guaranty, the bidder will have four business days (not counting the day of opening) to correct any irregularities. The corrected guaranty must be received by 4:00 p.m. If irregularities are not corrected to the satisfaction of the Owner, the Owner, in its sole discretion, may 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;
- Unqualified to complete the work as demonstrated by previous project experience and reference checks;
- 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

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

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

c) The Owner reserves the right to reject subcontractors proposed for this work.

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.

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

Determination of the lowest bidder will be based on the Base bid, or the Base Bid with any combination of Add Alternates the City deems to be in its best interest, for the work described on the bid proposal form.

3. Cancellation of Award

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

4. Return of Proposal Guaranty

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

5. Contract Bond

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

- 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 file an acceptable bond 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 work may be re-advertised as the Owner may determine in its sole discretion.

PROPOSAL FORM

Plains Park Improvements

CITY OF PORTSMOUTH, N.H.

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

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

1. All interested in the Bid as Principals are named herein;

2. This bid is not made jointly, or in conjunction, cooperation or collusion with any other person, firm, corporation, or other legal entity;

3. No officer, agent or employee of the Owner is directly or indirectly interested in this Bid;

4. The bidder has carefully examined the sites of the proposed work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this Bid, and the bidder has carefully read and examined the Drawings, Agreement, Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof;

5. The bidder understands that the quantities of work calculated in the Bid or indicated on the Drawings or in the Specifications or other Contract Documents are approximate and are subject to increase or decrease or deletion as deemed necessary by the Portsmouth Engineer. Any such changes will not result in or be justification for any penalty or increase in contract prices; and agrees that, if the Bid is accepted the bidder will contract with the Owner, as provided in the Contract Documents, this Bid Form being part of said Contract Documents, and that the bidder will supply or perform all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other activities required by the Contract Documents in the manner and within the time therein set forth, and that the bidder will take in full payment therefore the following item prices; and

6. 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.

PROPOSAL FORM (continued)

ITEM #	EST. QTY.	ITEM DESCIPTION & LUMP SUM PRICE IN WORDS	LUMP SUM PRICE IN FIGURES
1	**LS**	**Plains Park Improvements, per lump sum**	
		_____	_____

Basis of award will be based on the Base bid, or the Base Bid with any combination of Add Alternates the City deems to be in its best interest. SEE NOTE ON PAGE 7

ADD ALTERNATIVES

At the owner's option, and in accordance with the General Conditions, the following Alternates and Unit Prices shall be used for additions and/or deletions to the Scope of Work, and shall be inclusive of furnishing and installing of material, labor, trucking, overhead, profit, equipment, hoisting, engineering, scaffolding, power hookups, protection, shop drawings, taxes, permits, appliances, delivery and supervision and shall remain in effect until completion of the contract.

The Owner will inform the Contractor which Alternates, if any, will be to the Base Bid prior to contract execution and bonding.

ADD ALTERNATIVES:

Bid Alternate #1: Reinforced turf surface for overflow parking area

$_____

Bid Alternate #2: Post & rail fence around overflow parking area

$_____

Bid Alternate #3: Stonedust path at perimeter of outfield fence

$_____

PROPOSAL FORM (continued)

UNIT PRICES

Please provide unit prices for these items, which are included in the base bid. City may require additional unit prices during its review of bids. These unit prices should include installation as well as equipment/material costs.

Site Furnishing: Picnic Table (See Special Provision Section)

$_____

Site Furnishing: Bike Rack (See Special Provision Section and D-4 Sheet D-6)

$_____

Site Furnishing: Trash/Recycling Units (See Special Provision Section)

$_____

Trees:

Tree Label- # -Tree Common - Tree Botanical Name - Size	**Price Per unit**	**Total Cost**
GB 6 Ginkgo Ginkgo Biloba 2.5-3" caliper		
PC 3 "Chanticleer" Callery pear Pyrus calleryana 'Chanticleer' 2.5-3" caliper		
FG 3 American beech Fagus grandifolia 2.5-3" caliper		
GT 1 "Shademaster" Thornless Honey locust Gleditsia triacanthos inermis 'Shademaster' 2.5-3" caliper		
QR 2 Red oak Quercus rubra 2.5-3" caliper		
LT 3 Tuliptree Liriodendron tulipifera 2.5-3" caliper		
AS 6 Sugar maple Acer saccharum 2.5-3" caliper		
PP 2 Colorado blue spruce Picea pungens 7-8'		
QP 2 Pin oak Quercus palustris 2.5-3" caliper		
AF 3 "Autumn Blaze" Freeman maple Acer x freemanii 'Autumn Blaze' 2.5-3" caliper		
CT 5 Atlantic white cedar Chamaecyparis thyoides 7-8'		
CC 1 Eastern Redbud Cercis canadensis 1.5-2" caliper		
PK 3 Jack Callery Pear Pyrus calleryana "Jack" 1.5-2" caliper		
PL 1 Jill Callery Pear Pyrus calleryana "Jill" 1.5-2" caliper		

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

_____
Date

_____
Company

By:_____
Signature

_____
Business Address

Title:_____

_____
City, State, Zip Code

Telephone:_____

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.

We certify that the Company is currently pre-qualified with the State of New Hampshire for Plains Park Improvements.

By:_____
Signature

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

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

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

1. Name of Bidder

2. Permanent Main Office Address

3. Form of Entity

4. When Organized

5. Where Organized

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

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

8. General character of work performed by your company.

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

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

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

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

13. List your major equipment available for this contract.

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

15. List the names, locations and contact information for previous park and/or playground projects.

16. List the names of relevant park and/or playground projects from above which had playground equipment installation components.

STATEMENT OF BIDDERS QUALIFICATIONS (continued)

15. List any subcontractors whom you will use for the following
(unless this work is to be done by your own organization, if so please state).
a. Tree Pruning/Removal_____
b. Play Equipment Installation_____
c. Site work & Paving_____
d. Above ground utility relocation & sub-surface drainage improvements_____
d. Planting_____
e. Signage Production_____
(The City reserves the right to approve subcontractors for this project)

16. With what banks do you do business?

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

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

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

_____
Name of Bidder

BY_____

TITLE_____

State of_____ County of_____

_____being duly sworn, deposes and

says that the bidder is _____ of_____
(Name of Organization)

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

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

_____
Notary of Public

My Commission expires_____

Plains Park Improvements
Portsmouth, NH

CONTRACT AGREEMENT

Plains Park Improvements

THIS AGREEMENT made as of the ___th day of _____ in the year **2012,** 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. 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 - Work will begin in accordance with the Notice to Proceed and work shall be completed within 90 days.

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 certain amounts in the percentage of the Contract Price and for the time specified as provided 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 **one hundred dollars ($100)** 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 Intent to Award, Notice to Proceed
8.4 Instruction to Bidders
8.5 General Requirements, Control of Work, Temporary Facilities, Measurement and Payment, Standard Specifications
8.6 Insurance Requirements
8.7 Standard and Technical Specifications
8.8 Drawings
8.9 Special Provisions
8.10 Stormwater Pollution Prevention Plan
8.11 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 or non-performance of its obligations under this Contract. Contractor will defend all such actions with counsel satisfactory to Owner at its own expense, including attorney's fees, and will satisfy any judgment rendered against Owner in such action.

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

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

ARTICLE XIII – MISCELLANEOUS –

A. Neither Owner nor Contractor shall, without the prior written consent of the other, assign, sublet or delegate, in whole or in part, any of its rights or obligations under any

of the Contract Documents; and, specifically not assign any monies due, or to become due, without the prior written consent of Owner.

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

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

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

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

IN WITNESS WHEREOF, the parties hereunto executed this

AGREEMENT the day and year first above written.

BIDDER:

BY:_____

TITLE:_____

CITY OF PORTSMOUTH, N.H.

BY:_____
John P. Bohenko

TITLE: City Manager

NOTICE OF INTENT TO AWARD

Date:

TO:

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

Plains Park Improvements
Bid Proposal #37-12

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:

PROJECT: **Plains Park Improvements**

TO:

YOU ARE HEREBY NOTIFIED TO COMMENCE WORK IN ACCORDANCE

WITH THE AGREEMENT DATED, ON _____

WORK SHALL BE COMPLETED PRIOR TO _____.

CITY OF PORTSMOUTH, N.H.

_____

BY: Steven F. Parkinson, 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 # 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

Original Contract Price:
$

Contract Price prior to this Change Order:
$

Net Increase of this Change Order:
$

Contract Price with all approved Change Orders:
$

CHANGE IN CONTRACT TIME

Original Completion Date:

Contract Time prior to this Change Order:

Net Increase or Decrease of this Change Order:

Contract Time with all approved Change Orders:

RECOMMENDED: APPROVED: APPROVED:

by_____ by_____ by_____ by_____

CD Director City Finance City Manager Contractor

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 and the Community Development, 1 Junkins Avenue, Portsmouth, NH 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: **Plains Park Improvements**

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

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

_____

Plains Park Improvements
Portsmouth, NH

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:

Plains Park 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: _____

Plains Park Improvements
Portsmouth, NH

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. Cutting and Capping existing water lines
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. Technical Specifications will govern General Requirements.

2. 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.

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

3. MAINTENANCE DURING CONSTRUCTION

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

4. SAFETY PRECAUTIONS

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

5. PERMITS

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

6. BARRICADES, WARNING SIGNS AND TRAFFIC OFFICERS

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

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

(c) The Contractor shall provide such police officers as the 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 any applicable electrical permits 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

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.

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

ADDITIONAL INSURED

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

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

SHOP DRAWINGS

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

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

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 but without regard to Section 100 “General Conditions” of those Standard Specifications.

Special Provision

To Section 201 (NHDOT Standard Specifications)

<u>Amend</u> Section 201 to include:

Section 201.21
REMOVING SMALL TREES

Section 201.22
REMOVING LARGE TREES

Section 201.31
TREE PRUNING

GENERAL

PART I - GENERAL

1.01 SCOPE OF WORK

A. The work of this Section includes the following:

1. Pruning - Class II, including the removal of all limbs necessary to execute the field, playground and fence work required under this contract.

2. Removal of trees and stumps.

B. Refer to the Contract Drawings for general location of trees along the site perimeter. In general, all trees are to remain and be pruned in conformance with this Specification. Tree removals shall be limited to the area denoted on the plans and shall include the removal of individual trees that would impede the construction of proposed facilities.

1.02 QUALIFICATIONS OF CONTRACTOR

A. This work shall be limited to individuals, partnerships and corporations who are actively engaged in the field of Arboriculture, and who demonstrate competence, experience and financial capability to carry out the terms of this project. Eligible contractors must derive a majority of their income from arboricultural work. The Owner may require proof of these qualifications.

B. All work shall be conducted by qualified and trained personnel under the direct supervision of a New Hampshire Certified Arborist in the Contractor's employ.

1.03 SPECIAL REQUIREMENTS

A. Dutch Elm diseased wood shall be disposed of in accordance with any additional local regulations. All wood shall be removed from the site and be properly disposed of in accordance with state and local regulations.

B. No burning shall be permitted on the project site.

C. Prior to commencing work, the Contractor shall submit a plan to the Owner for legal disposal of removed materials, in conformance with State and Federal regulations.

1.04 STANDARDS AND DEFINITIONS

A. All pruning work shall be performed in accordance with the following:

1. The ANSI A300 'Standard Practices for Trees, Shrubs, and Other Wood Plant Materials' of the Secretariat: National Arborist Association, Post Office Box 1094, Amherst, New Hampshire 03031.

2. American National Standards Institute (ANSI) Standard Z-133.1.

3. The standards and practices of the International Society of Arborists.

4. The standards and practices of the New Hampshire Arborist Association.

5. The standards and practices of the American Association of Nurserymen.

B. The term 'Owner' shall meat the City of Portsmouth's designated representative charged with carrying out the requirements of this Project –'Landscape Architect', 'Engineer', 'Planner', or 'Tree Warden' as referenced herein, rendering approvals for the Owner.

1.05 EXAMINATION OF SITE AND DOCUMENTS

A. The Contractor shall be responsible for having a clear understanding of the existing site conditions and shall be responsible for fully carrying out the work of this Section, regardless of actual site conditions encountered.

1.06 ORDER OF WORK

A. Based on the site conference, the Contractor shall submit a schedule of work for the Owner's review and approval prior to beginning work. Unless otherwise authorized by the Owner, failure of the Contractor to comply with the approved removal schedule shall be sufficient cause to give notice that the Contractor is in default of the contract.

1.07 PROTECTION OF THE VEGETATION TO BE PRESERVED

A. The Contractor shall protect all existing trees, shrubs, lawns and other site features designated to remain. The placement of protection devices, such as snow fence enclosures, shall, however, be at the Contractor's discretion.

B. Damage no plant to remain by burning, pumping water, cutting of live roots or branches, or any other means. Neither vehicles nor equipment shall be parked within the dripline of trees to remain, or where ever damage may result to trees to be saved. Construction material shall not be stored beneath trees to be saved.

C. The Contractor shall be liable for any damage to any trees, shrub, lawn or other site features to remain, and shall immediately report to the Owner. Damaged shrubs or lawns shall be restored or replaced to match existing to remain to the satisfaction of the Owner.

D. The Contractor shall compensate the Owner for damages by installing replacement tree(s) of the size and species approved by the City and of sufficient quantity such that the sum of the Diameter at Breast Height (DBH) inches for replacement trees equals the total DBH inches of the damaged tree(s). Damaged shrubs shall be replaced with shrubs(s) of the same size, species, and quantity, unless determined otherwise by the Owner.

1.08 USE AND CARE OF THE SITE

A. The Contractor shall leave the work site at the end of each working period in a condition satisfactory to the Owner.

B. Pavements shall be swept and lawns or other surfaces raked and/or otherwise cleaned of all material related to the work operation. Degree of clean-up required will be described by the Owner and will be based upon the character of the work area.

C. All trimmings or any other form of debris (except diseased materials or trimmings from Elms) shall be collected and chipped. The Contractor shall remove all materials and shall dispose of such materials off site in a legal manner.

D. The Contractor shall be fully and solely responsible for any damage to equipment or vehicles left at the site of the work. All necessary permits shall be obtained by the Contractor.

PART II - MATERIALS

2.01 EQUIPMENT

A. Equipment necessary for this Contract shall be properly maintained and in good operating condition to the City's satisfaction. The Contractor shall promptly remove and replace any equipment which the Owner deems to be in unsatisfactory condition or otherwise unsuitable.

B. Cutting tools shall be kept well sharpened to provide clean smooth cuts. Any tools utilized on any tree suspected to have cankers or other fungal, bacterial or viral diseases shall be sterilized or not used on any other specimen.

C. A disc chipper shall be used which will process material up to twelve (12) inches in diameter.

2.03 PERSONNEL

A. The Contractor shall submit each employee's name and title prior to the commencement of work. The Contractor shall advise the Owner of any changes in roster assigned to this Contract.

B. A crew shall consist of one (1) tree trimmer/climber, and one (1) ground person (one which shall be a crew foreman). The crew foreman shall have a minimum of five (5) years climbing/pruning experience. At least one (1) crew person shall be a MCA and shall be certified in CPR.

C. Each trimmer shall be experienced and highly qualified with the necessary tree worker skills to successfully complete the work of this Section, including the ability and training to perform aerial rescue. Said skill shall also include worker safety and ability in compliance with current OSHA and ANSI Z-133.1 Standards.

PART III - EXECUTION OF PRUNING/REMOVALS

3.01 PRUNING

A. Under this Section, the Contractor shall furnish all labor, materials, equipment and transportation required to complete all aspects of the work in accordance with

all local, state and federal regulations in force at the same time of this Contract and in accordance with tree pruning as specified herein.

B. The work of this Section consists of all pruning work and related items as specified herein and includes, but is not limited to:

1. Pruning - Class II throughout the designated areas and limb removal required to allow for the proper installation of all fields, play equipment and new fencing.

   Class II pruning is defined as medium pruning and shall consist of the removal of dead, dying, diseased, interfering, objectionable and weak branches on the main trunks as well as those within the leaf area. An occasional branch one (1) inch or less in diameter may remain within the main leaf area where it is not practical to remove it.

3.02 DESCRIPTION OF PRUNING WORK

A. Pruning and trimming are generally described as the removal and disposal of limbs, branches and stubs which are either dead, potentially detrimental to the health of the tree or dangerous to pedestrians, visually deficient, interfering or otherwise objectionable as determined by the Owner.

B. The limits of all trees to be pruned have been identified on the plans or referenced elsewhere in this specification section.

C. Vehicle access shall be controlled and approved by the City Representative.

D. If the Contractor discovers tree(s) which have not been marked for pruning, but whose condition is such that removal is warranted, whether due to death, disease, decay, or structural weakness, such tree(s) shall not be pruned and the Contractor shall immediately report these findings in writing to the Owner and await the Owner's direction before proceeding with work on the particular tree(s) in question.

E. All pruning shall be performed in a manner that maintains the natural aesthetic characteristics of the species and variety of trees. No topping or dehorning of trees or stubbing back of branches shall be permitted. All cuts shall be made to a lateral branch that is a minimum of one third (1/3) the size of the branch being removed, unless otherwise instructed by the Owner.

F. The use of climbing spurs or spiked shoes shall not be permitted and their use will result in the immediate cancellation of the contract.

G. All cuts shall be made sufficiently close to the parent stem so that wound closure can be readily started under normal conditions. Cuts shall, however, never be made through the branch collar. Slab cuts and rip cuts will result in cancellation of the contract.

H. All limbs over two (2) inches in diameter to be removed shall be precut to prevent splitting. Any branches that by falling would injure existing trees to remain or other objects shall be lowered to the ground by proper ropes.

I. On trees known to be diseased and where there is known to be danger of transmitting the disease on tools, tools shall be disinfected with alcohol or bleach after each cut between trees.

J. Lateral branches as well as occasional branch suckers ("water sprouts") may be retained. Complete removal of secondary laterals and branch suckers resulting in the stripping of major limbs, ("lion tailing") will not be permitted.

K. Tree paint to seal pruning cuts shall not be used.

L. All branches and limbs shall be manually lowered to the ground via rope and pulley. This practice must be consistent with the National Arborist Association Standards for Pruning. All grade-level artifacts and landscaping must be protected from damage.

3.03 REMOVALS

A. The Contractor shall furnish all labor, materials, equipment and transportation required to complete all aspects of the removals work in accordance with all local, state, and federal regulations in force at the time of this contract and in accordance with tree and stump removals as specified herein.

3.04 DESCRIPTION OF WORK

A. Removal is generally described as the removal of groups and individual trees and shrubs which interfere with the growth of more desirable types of trees; the clearing away of lesser growth that may obscure outstanding trees; and thinning out to provide space for healthy growth by the elimination of thinner, weaker trees.

B. The Contractor shall adhere to the specifications and provide suitable facilities for inspecting the work. Failure of the Owner to immediately reject unsatisfactory work or to notify the Contractor of deviations from the specification shall not relieve the Contractor of responsibility to correct or remedy unsatisfactory work.

C. The Contractor shall only work on trees designated by the Owner. No compensation will be made for work performed on any other tree or trees.

D. Trees designated to be removed shall be taken down and all leaves, branches and trunks of trees properly disposed of by chipping and removal from the premises.

E. Fell trees in a manner that allows all site features and those trees to be saved undamaged.

F. Removal of all the parts of each tree shall be completed on the same day that the tree is cut.

G. Stumps shall be ground to eighteen (18) inches below grade by grinding or other means acceptable to the Owner. The void from the stump removal operations shall be filled with ordinary borrow soil to within six (6) inches of finished grade. The top six (6) inches shall be filled with screened loam, moderately tamped to prevent future settling. In grass areas the disturbed area shall be sown with grass seed of a mix appropriate to the location, as directed by the Owner.

H. Excavation or grading within the branch spread of trees to be saved shall be performed only under the direction of the Owner unless otherwise directed.

I. All equipment to be used and all work to be performed must be in full compliance with all standards as promulgated by OSHA at the time of bidding, including, but not limited to those regulations concerning noise levels, protective devices and operator safety.

J. The Contractor shall be solely responsible for pedestrian and vehicular safety and control within the work site and shall protect the public and its property from injury or damage that could be caused by the progress of the work. To this end the Contractor shall provide, erect, and maintain protective devices acceptable to the Owner, including but not limited to barricades, lights and warning signs.

K. Any practice employed by the Contractor that is obviously hazardous as determined by the Owner shall be immediately discontinued by the Contractor upon receipt of either written or oral notice from the Owner to discontinue such practice.

END OF SECTION

Special Provision

To Section 202 (NHDOT Standard Specifications) Demolition

<u>Amend</u> Section 202 to include:

Section 202.0
Selective Demolition

PART I - GENERAL

1.01 SCOPE OF WORK

A. Work under this Section shall consist of the careful removal, storage for reuse, transportation off-site, or demolition, of all structures and site features encountered or noted to be removed or abandoned to three feet below finished grade, and the removal and disposal of all materials not called for to be reused or salvaged, in accordance with the contract drawings, these specifications, and the directions of the Engineer. Provide all labor, equipment, materials and transportation necessary to complete the work.

B. Items plan referenced to be removed and stored shall be carefully removed and stored on site in a manner and location designated by the Engineer for reinstallation later as shown on the plans or as directed by the Engineer.

C. Items plan referenced, or as directed by the Engineer to be removed and disposed of shall be removed from the site and properly and legally disposed of by the Contractor.

D. Items indicated on the contract drawings or in the specifications to be removed and salvaged, or other items directed to be removed by the Engineer, shall be transported to a municipal storage facility, located within the City confines, and unloaded and stacked as directed by the Engineer.

E. The following scope describes the general work/demolition requirements of this Section.

1. Cement concrete and bituminous concrete pavements.

2. Selected play equipment to be confirmed in field by Owner's Representative prior to removal.

3. Play area edging and curbing.

4. Pavement & gravel parking area.

5. Other features as indicated on the drawings.

1.02 PROTECTION

A. The Contractor shall assume complete responsibility and liability for the safety and structural integrity of all work and utilities to remain during demolition.

B. Provide safeguards including, but not limited to, warning signs, barricades, temporary fences, warning lights and other items required for protection of personnel and the general public during performance of all work. Secure construction fence of 5' minimum height to be installed and maintained until park opening date.

C. All features related to protection shall be maintained until that work has been completed to the point when such safeguards are no longer required.

1.03 SPECIAL REQUIREMENTS

A. Removal of pavement within dripline of trees to remain is required to be done by hand tools or an air spade.

PART II - MATERIALS

2.01 BACKFILL

A. The Contractor shall provide suitable backfill as specified, to fill voids left by removal or abandonment of site features, and shall provide all pipe cap ends needed to cap off or plug the existing water line.

B. Suitable materials shall be used as base course fill and topsoil to the depth as specified herein. Restore disturbed areas with similar materials blended to match the line and grades of adjacent surfaces.

PART III - EXECUTION

3.01 ABANDONED PIPES OR CONDUITS

A. Abandon discontinued water supplies that are encountered during the execution of this contract in accordance with City requirements.

B. Notify Owner's Representative of location of abandoned pipes and conduits,

- - - END OF SECTION - - -

Special Provisions

To Section 209.

GRANULAR BACKFILL

Amend Section 209 to include:

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall make excavations of normal depth in earth for trenches and structures, shall backfill and compact such excavations to the extent necessary, shall furnish the necessary material and construct embankments and fills, and shall make miscellaneous earth excavations and do miscellaneous grading.

1.02 RELATED WORK:
Not used.

1.03 REFERENCES:

American Society for Testing and Materials (ASTM)

ASTM	C131	Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
ASTM	C136	Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM	C330	Specification for Lightweight Aggregate for Structural Concrete.
ASTM	D1556	Test Method for Density of Soil in Place by the Sand Cone Method.
ASTM	D1557	Test Methods for Moisture-density Relations of Soils and Soil Aggregate Mixtures Using Ten-pound (10 Lb.) Hammer and Eighteen-inch (18") Drop.
ASTM	D2922	Test Methods for Density of Soil and Soil-aggregate in Place by Nuclear Methods (Shallow Depth).

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Samples of all materials proposed for the project shall be submitted to the Engineer for review. Size of the samples shall be as approved by the Engineer.

1.05 PROTECTION OF EXISTING PROPERTY:

A. The work shall be executed in such manner as to prevent any damage to facilities at the site and adjacent property and existing improvements, such as but not limited to streets, curbs, paving, service utility lines, structures, monuments, bench marks, observation wells, and other public or private property. Protect existing improvements from damage caused by settlement, lateral movements, undermining, washout and other hazards created by earthwork operations.

B. In case of any damage or injury caused in the performance of the work, the Contractor shall, at its own expense, make good such damage or injury to the satisfaction of, and without cost to, the Owner. Existing roads, sidewalks, and curbs damaged during the project work shall be repaired or replaced to at least the condition that existed at the start of operations. The Contractor shall replace, at his own cost, existing benchmarks, observation wells, monuments, and other reference points which are disturbed or destroyed.

C. Buried drainage structures and pipes, observation wells and piezometers, including those which project less than eighteen inches (18") above grade, which are subject to damage from construction equipment shall be clearly marked to indicate the hazard. Markers shall indicate limits of danger areas, by means which will be clearly visible to operators of trucks and other construction equipment, and shall be maintained at all times until completion of project.

1.06 DRAINAGE:

A. The Contractor shall provide, at its own expense, adequate drainage facilities to complete all work items in an acceptable manner. Drainage shall be done in a manner so that runoff will not adversely affect construction procedures nor cause excessive disturbance of underlying natural ground or abutting properties.

1.07 FROST PROTECTION AND SNOW REMOVAL:

A. The Contractor shall, at its own expense, keep earthwork operations clear and free of accumulations of snow as required to carry out the work.

B. The Contractor shall protect the subgrade beneath new structures and pipes from frost penetration when freezing temperatures are expected.

PART 2 - PRODUCTS

2.01 MATERIAL:

A. GRAVEL BORROW:

Gravel Borrow shall satisfy the requirements listed in NHDOT Specification Section 304.2.4, Item No. 304.2.

B. CRUSHED STONE:

1. Crushed stone shall satisfy the requirements listed in NHDOT Specification Section 304.2.10, Item No. 304.4.

C. SAND BORROW:

Sand Borrow shall satisfy the requirements listed in NHDOT Specification Section 304.2.3, Item No. 304.1.

D. PEASTONE:

Peastone shall be smooth, hard, naturally occurring, rounded stone meeting the following gradation requirements:

Passing 5/8 inch square sieve opening	-	100%
Passing No. 8 sieve opening	-	0%

E. BACKFILL MATERIALS:

1. Class B Backfill:

Class B backfill shall be granular, well graded friable soil; free of rubbish, ice, snow, tree stumps, roots, clay and organic matter; with 30 percent or less passing the No. 200 sieve; no stone greater than two-third (2/3) loose lift thickness, or six inches, whichever is smaller.

2. Select Backfill:

Select backfill shall be granular, well graded friable soil, free of rubbish, ice, snow, tree stumps, roots, clay and organic matter, and other deleterious or organic material; graded within the following limits:

Sieve Size	Percent Finer by Weight
3"	100
No. 10	30-95
No. 40	10-70
No. 200	0-10

NOTE: Section on lightweight fill should be deleted if not needed.

F. LIGHTWEIGHT FILL:

1. Lightweight Fill shall be rotary kiln expanded shale meeting all the requirements of ASTM C330. Particles shall be tough, durable, non-corrosive and have the following properties:

   Delivered Gradation:

Sieve Size	% Retained
1"	0
3/4"	0 to 20
#4	85 to 100

b. The dry loose unit weight shall be less than 55 PCF.

c. The Contractor shall submit verification of a compacted density of less than 70 PCF. Density shall be verified by testing in accordance with Standard AASHTO Test Designation T99.

d. The maximum soundness loss when tested with five cycles of magnesium sulphate shall be ten percent in accordance with ASTM C131.

e. Moisture content shall be determined by the Engineer.

f. Provide manufacturer's certificate stating materials provided comply with the standards specified.

H. PROCESSED GRAVEL:

1. Processed gravel shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

2. The gradation shall meet the following requirements:

Sieve Designation	Percentage Passing
3 in.	100
1 1/ 2 in.	70-100
1/4 in.	50-85
No. 4	30-60
No. 200	0-10

3. The approved source of bank-run gravel material shall be processed by mechanical means. The equipment for producing crushed gravel shall be of adequate size with sufficient adjustments to produce the desired materials. The processed material shall be stockpiled in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

PART 3 - EXECUTION

3.01 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION:

A. Contractor shall take the necessary steps to avoid disturbance of subgrade during excavation and filling operations, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials, dewatering and other acceptable control measures.

B. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with a minimum 12-inch layer of compacted crushed stone wrapped all around in non-woven filter fabric. Costs of removal and replacement shall be borne by the Contractor.

C. The Contractor shall place a minimum of 12-inch layer of special bedding materials and crushed stone wrapped in filter fabric over the natural underlying soil to stabilize areas which may become disturbed as a result of rain, surface water runoff or groundwater seepage pressures, all at no additional cost to the Owner. The Contractor also has the option of drying materials in-place and compacting to specified densities.

3.02 EXCAVATION:

A. GENERAL:

1. The Contractor shall perform all work of any nature and description required to accomplish the work as shown on the Drawings and as specified.

2. Excavations, unless otherwise required by the Engineer, shall be carried only to the depths and limits shown on the Drawings. If unauthorized excavation is carried out below required subgrade and/or beyond minimum lateral limits shown on Drawings, it shall be backfilled with gravel borrow and compacted at the Contractor's expense as specified below, except as otherwise indicated. Excavations shall be kept in dry and good conditions at all times, and all voids shall be filled to the satisfaction of the Engineer.

3. In all excavation areas, the Contractor shall strip the surficial topsoil layer and underlying subsoil layer separate from underlying soils. In paved areas, the Contractor shall first cut pavement as specified in paragraph 3.02 B.1 of this specification, strip pavement and pavement subbase separately from underlying soils. All excavated materials shall be stockpiled separately from each other within the limits of work.

4. The Contractor shall follow a construction procedure, which permits visual identification of stable natural ground. Where groundwater is encountered, the size of the open excavation shall be limited to that which can be handled by the Contractor's chosen method of dewatering and which will allow visual observation of the bottom and backfill in the dry.

5. The Contractor shall excavate unsuitable materials to stable natural ground where encountered at proposed excavation subgrade, as directed by the Engineer. Unsuitable material includes topsoil, loam, peat, other organic materials, snow, ice, and trash. Unless specified elsewhere or otherwise required by the Engineer, areas where unsuitable materials have been excavated to stable ground shall be backfilled with compacted special bedding materials or crushed stone wrapped all around in non-woven filter fabric.

B. TRENCHES:

1. Prior to excavation, trenches in pavement shall have the traveled way surface cut in a straight line by a concrete saw or equivalent method, to the full depth of pavement. Excavation shall only be between these cuts. Excavation support shall be provided as required to avoid undermining of pavement. Cutting operations shall not be done by ripping equipment.

2. Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, and depths of cover indicated on the Drawings. Trench widths shall be as shown on the Drawings or as specified.

3. Where pipe is to be laid in bedding material, the trench may be excavated by machinery to, or just below, the designated subgrade provided that the material remaining in the bottom of the trench is not disturbed.

4. If pipe is to be laid in embankments or other recently filled areas, the fill material shall first be placed to a height of at least 12-inches above the top of the pipe before excavation.

5. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed.

6. If, in the opinion of the Engineer, the subgrade, during trench excavation, has been disturbed as a result of rain, surface water runoff or groundwater seepage pressures, the Contractor shall remove such disturbed subgrade to a minimum of 12-inches and replace with crushed stone wrapped in filter fabric. Cost of removal and replacement shall be borne by the Contractor.

C. EXCAVATION NEAR EXISTING STRUCTURES:

1. Attention is directed to the fact that there are pipes, manholes, drains, and other utilities in certain locations. An attempt has been made to locate all utilities on the drawings, but the completeness or accuracy of the given information is not guaranteed.

2. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and excavation shall be done by means of hand tools, as required. Such manual excavation, when incidental to normal excavation, shall be included in the work to be done under items involving normal excavation.

3. Where determination of the exact location of a pipe or other underground structure is necessary for properly performing the work, the Contractor shall excavate test pits to determine the locations.

3.03 BACKFILL PLACEMENT AND COMPACTION:

A. GENERAL:

1. Prior to backfilling, the Contractor shall compact the exposed natural subgrade to the densities as specified herein.

2. After approval of subgrade by the Engineer, the Contractor shall backfill areas to required contours and elevations with specified materials.

3. The Contractor shall place and compact materials to the specified density in continuous horizontal layers. The degree of compaction shall be based on maximum dry density as determined by ASTM Test D1557, Method C. The minimum degree of compaction for fill placed shall be as follows:

Location	Percent of Maximum Density
Below pipe centerline	95
Above pipe centerline	92
Below pavement (upper 3 ft.)	95
Embankments	95
Below pipe in embankments	95
Adjacent to structures	92
Below structures	95

4. The Engineer reserves the right to test backfill for conformance to the specifications and Contractor shall assist as required to obtain the information. Compaction testing will be performed by the Engineer or by an inspection laboratory designated by the Engineer, engaged and paid for by the Contractor. If test results indicate work does not conform to specification requirements, the Contractor shall remove or correct the defective Work by recompacting where appropriate or replacing as necessary and approved by the Engineer, to bring the work into compliance, at no additional cost to the Owner. All backfilled materials under structures and buildings shall be field tested for compliance with the requirements of this specification.

5. Where horizontal layers meet a rising slope, the Contractor shall key each layer by benching into the slope.

6. If the material removed from the excavation is suitable for backfill with the exception that it contains stones larger than permitted, the Contractor has the option to remove the oversized stones and use the material for backfill or to provide replacement backfill at no additional cost to the Owner.

7. The Contractor shall remove loam and topsoil, loose vegetation, stumps, large roots, etc., from areas upon which embankments will be built or areas where material will be placed for grading. The subgrade shall be shaped as indicated on the Drawings and shall be prepared by forking, furrowing, or plowing so that the first layer of the fill material placed on the subgrade will be well bonded to the subgrade.

8. Where called for on the Drawings, Lightweight Fill shall be placed and compacted as recommended by the manufacturer. The exact number of passes shall be approved by the Engineer to insure stability of the layer. As soon as the compaction of each layer has been completed, the next layer shall then be placed. The Contractor shall take all necessary precautions during construction activities in operations on or adjacent to the Lightweight Fill to insure that the material is not over-compacted. Construction equipment, other than for compaction, shall not operate on the exposed Lightweight Fill. The top surface of the Lightweight Fill lying directly below the gravel course shall be chinked by additional rolling of the Lightweight Fill to prevent infiltration of fines.

B. TRENCHES:

2. Bedding as detailed and specified shall be furnished and installed beneath the pipeline prior to placement of the pipeline. A minimum bedding thickness shall be maintained between the pipe and undisturbed material, as shown on the Drawings.

2. As soon as practicable after pipes have been laid, backfilling shall be started.

3. Unless otherwise indicated on the Drawings, select backfill shall be placed by hand shovel in 6-inch thick lifts up to a minimum level of 12-inches above the top of pipe. This area of backfill is considered the zone around the pipe and shall be thoroughly compacted before the remainder of the trench is backfilled. Compaction of each lift in the zone around the pipe shall be done by use of power-driven tampers weighing at least 20 pounds or by vibratory compactors. Care shall be taken that material close to the bank, as well as in all other portions of the trench, is thoroughly compacted to densities required.

4. Class B backfill shall be placed from the top of the select backfill to the specified material at grade (loam, pavement subbase, etc.). Fill compaction shall meet the density requirements of this specification.

5. Water Jetting:

a. Water jetting may be used when the backfill material contains less than 10

percent passing the number 200 sieve, but shall be used only if approved by the Engineer.

b. Contractor shall submit a detailed plan describing the procedures he intends to use for water jetting to the Engineer for approval prior to any water jetting taking place.

c. Compaction of backfill placed by water jetting shall conform to the requirements of this specification.

6. If the materials above the trench bottom are unsuitable for backfill, the Contractor shall furnish and place backfill materials meeting the requirements for trench backfill, as shown on the drawings or specified herein.

7. Should the Engineer order crushed stone for utility supports or for other purposes, the Contractor shall furnish and install the crushed stone as directed.

8. In shoulders of streets and road, the top 12-inch layer of trench backfill shall consist of processed gravel for sub-base, satisfying the requirements listed in NHDOT standard specification 304.2.7, Item No. 304.33.

C. BACKFILLING UNDER BUILDINGS AND FOUNDATIONS:

Material to be used as structural fill under structures shall be special bedding material or gravel borrow, as shown on the Drawings or as required by the Engineer. Where gravel borrow fill is required to support proposed footings, walls, slabs, and other structures, the material shall be placed in a manner accepted by the Engineer. Compaction of each lift shall meet the density requirements of this specification.

D. BACKFILLING ADJACENT TO STRUCTURES:

1. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads to which they will be subjected. Excavated material approved by the Engineer may be used in backfilling around structures. Backfill material shall be thoroughly compacted to meet the requirements of this specification.

2. Contractor shall use extra care when compacting adjacent to pipes and drainage structures. Backfill and compaction shall proceed along sides of drainage structures so that the difference in top of fill level on any side of the structure shall not exceed two feet (2') at any stage of construction.

3. Where backfill is to be placed on only one side of a structural wall, only hand-operated roller or plate compactors shall be used within a lateral distance of five

feet (5') of the wall for walls less than fifteen feet (15') high and within ten feet (10') of the wall for walls more than fifteen feet (15') high.

3.04 DISPOSAL OF SURPLUS MATERIALS:

A. No excavated material shall be removed from the site of the work or disposed of by the Contractor unless approved by the Engineer.

B. Surplus excavated materials, which are acceptable to the Engineer, shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill. Upon written approval of the Engineer, surplus excavated materials shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes as indicated by the Owner, within its jurisdictional limits; all at no additional cost to the Owner.

C. Surplus excavated material not needed as specified above shall be hauled away and disposed of by the Contractor at no additional cost to the Owner, at appropriate locations, and in accordance with arrangements made by him. Disposal of all rubble shall be in accordance with all applicable local, state and federal regulations.

END OF SECTION

Special Provision

To Section 411(NHDOT Standard Specifications) Bituminous Concrete

<u>Amend</u> Section 411 to include:

Section 411.1
Bituminous Concrete

GENERAL

1.01 SCOPE OF WORK

A. Under this Section, the Contractor shall furnish all necessary labor, materials, equipment, and transportation necessary to construct the following:

1. The bituminous concrete pavement for the courts and walks shall be composed of materials as specified herein and shall be constructed on a prepared base course to the depth, grade and cross-section shown on the plans, as specified herein and as directed by the Engineer.

2. Unless otherwise specified in the Contract Drawings, bituminous concrete pavement shall be composed of a one and a half (1.5) inch bituminous concrete binder course, and a one and a half (1.5) inch bituminous concrete dense mix course.

3. Where an overlay is proposed, the depth of the bituminous concrete dense mix shall be typically one and one-half (1 ½) inches except that it shall be of greater depth in places to eliminate puddling. Tack coat shall be applied utilizing Type SS-1 asphalt emulsion.

4. Crack repair of existing bituminous concrete pavements prior to installation of overlay pavement.

1.02 REFERENCE STANDARDS AND SPECIFICATIONS

A. Reference to the standards, specifications and tests of technical societies, organizations and governmental bodies are made in the Contract Documents.

1. AASHTO - American Association of State Highway and Transportation Officials (tests or specifications).

2. ASTM - American Society for Testing and Materials.

3. NH. Standard Specs. - Latest edition of the Standard Specifications for Highways and Bridges, New Hampshire Transportation Department, hereinafter referred to as the "New Hampshire Standard Specifications."

1.03 SUBMITTALS

A. Asphalt emulsion Type SS-1 product and application specification.

B. Submit catalog cuts and manufacturer's specifications for Airport Grade Asphalt Emulsion Mix and Aggregate.

C. Submit catalog cuts and manufacturer's specifications for Airport Grade Asphalt Emulsion Mix and Aggregate.

D. Compaction tests are required on all bituminous concrete base surfaces on a 5' grid interval or per Owner's direction. At the Contractor's expense, an independent testing agency must perform the work and submit the results directly to the Landscape Architect.

PART II - MATERIALS

2.01 BITUMINOUS CONCRETE PAVEMENT

A. Bituminous Concrete Pavement shall consist of binder mix and dense mix courses constructed to the thicknesses shown on the plans and shall conform to the relevant provisions of Sections 460 and (M3.11.03) of the New Hampshire Transportation Department, Standard Specifications for Highways and Bridges, Latest Edition, unless specified otherwise hereinafter.

B. Base/Binder Courses

1. Base/Binder Courses shall be Bituminous Concrete Pavement, Dense Finish Course Type I-1.

C. Leveling/Overlay Courses

1. Leveling/Overlay Courses may conform to "Surface Treatment" mix, Table A, Section M3.11.03 of the MHD Standard

Specifications, comprised of Class I Dense Bituminous Concrete, Type St or Sense Mix Type I-1, at the Contractor's option.

2. The general composition of the bituminous concrete mixture (the proportion of asphalt cement to mineral aggregate) shall be in accordance with NHDOT requirements.

3. The mineral aggregate composition for Type St shall be as follows:

TYPE ST SIEVE ANALYSIS U.S. Standard Sieve No.	MINERAL AGGREGATE Percent Passing by Weight (per ASTM C-136)	
Size	Minimum	Maximum
3/8	100	-
4	96	100
8	85	100
16	55	85
30	25	60
50	15	40
100	3	15
200	2	7

2.02 ASPHALT EMULSION

A. Asphalt emulsion tack coat shall be Type SS-1 or SS-1H as specified by the Asphalt Institute.

2.03 TROWELABLE ASPHALT FILLER/PATCH

A. Airport grade asphalt emulsion mix and aggregate shall be used to repair gouges or cracks which can then be brought to grade to receive an overlay or color sealcoat.

PART III - EXECUTION

3.01 BITUMINOUS CONCRETE PAVEMENT

A. Bituminous concrete pavements shall be constructed on a prepared foundation of gravel in accordance with the New Hampshire Standard Specifications, except where overlayment is over existing pavement.

B. The bituminous mixtures shall be placed on the approved base only when, in the opinion of the Engineer, the course is sufficiently dry and weather conditions are suitable.

C. Where walls, curbing, or other suitable permanent supports are not present, the Contractor shall secure proper alignment and adequate compaction of the binder and surface courses as shown on the Contract Drawings and finish all edges with a neat tamped edge.

D. The mixture shall be placed in two (2) courses as shown on the Contract Drawings. Each course shall be spread and finished as required in the New Hampshire Transportation Department, Standard Specifications for Highways and Bridges, latest edition.

E. Prior to completion of bituminous concrete overlay, the Contractor shall have the existing patched surfaces tack coated and leveled to eliminate all "birdbaths" or extreme lows which may create ponding or drainage problems. Leveling course (surface treatment) bituminous concrete applied as necessary, shall be raked and feathered and be properly rolled and compacted. The Contractor shall apply "level" lines, screeds, or use other measures to achieve the proper leveling surface suitable for overlay.

All adhesive fabric shall be in place and approved prior to completing this work.

F. After completion, the bituminous concrete courses shall conform to the thickness shown on the Contract Drawings, smooth and even and of a dense and uniform structure. When tested with a sixteen (16) foot straight edge placed parallel to the centerline of the pavement, there shall be no deviation from a true surface in excess of one-quarter (1/4) inch.

3.02 ASPHALT EMULSION TACK COAT

A. To all existing surfaces to be pave against or overlaid, apply a single very thin (0.05 to 0.15 gallons per square yard) application of diluted asphalt emulsion (Type SS-1) to cover the entire surface of existing pavement.

B. Essential qualities of coverage are (1) it must be very thin and (2) uniformly cover entire surface of existing pavement.

C. Place only that amount of tack coat which can be overlaid with new pavement by the end of each day, and; **IF RAIN IS ANTICIPATED DO NOT APPLY TACK COAT.**

PART IV - GUARANTEE/WARRANTY

4.01 The pavement and coatings shall be guaranteed against defects in workmanship or quality for a period of one (1) year after final acceptance. The Contractor shall replace, repair,

recoat or otherwise make satisfactory to the Owner any unacceptable pavement and or coating at no additional cost to the Owner.

- - - END OF SECTION - - -

Section 520

PORTLAND CEMENT CONTCRETE

Amend Sections 520 to include:

PART 1 – GENERAL

1.01 WORK INCLUDED:

A. This Section covers all concrete and all related items necessary to place and finish the concrete work.

1.02 RELATED WORK:

A. Items furnished under other Sections and installed under this Section include, but are not limited to:

B. Items embedded in concrete, including anchors, sleeves, floor drains, castings, frames for hatches, angles, nosings, and other miscellaneous metals.

1.03 REFERENCES:

A. The following standards form a part of these specifications:

American Concrete Institute (ACI)

ACI 30l Structural Concrete for Buildings

ACI 302 Recommended Practice for Concrete Floor and Slab Construction

ACI 304 Recommended Practice for Measuring, Mixing, Transporting, and Replacing Concrete

ACI 305 Recommended Practice for Hot Weather Concreting

ACI 306 Recommended Practice for Cold Weather Concreting

ACI 318 Building Code Requirements for Reinforced Concrete

ACI 347 Recommended Practice for Concrete Formwork

ACI 350 Concrete Sanitary Engineering Structures

American Society for Testing and Materials (ASTM)

ASTM C33 Concrete Aggregates

ASTM C39 Compressive Strength of Cylindrical Concrete Specimens

ASTM C42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

ASTM C87 Effect of Organic Impurities in Fine Aggregate on Strength of Mortar

ASTM C94 Ready-Mixed Concrete

ASTM C143 Standard Method for Slumps of Portland Cement Concrete

ASTM C150 Portland Cement

ASTM C171 Sheet Materials for Curing Concrete

ASTM C231 Air Content of Freshly Mixed Concrete by the Pressure Method

ASTM C260 Air-Entraining Admixtures for Concrete

ASTM C309 Liquid Membrane-Forming Compounds for Curing Concrete

ASTM C494 Chemical Admixtures for Concrete

ASTM D1751 Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

ASTM D1752 Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

A. Six sets of shop drawings of the materials specified herein shall be submitted to the Engineer for review.

B. Six copies of the statement of materials constituting the design of mixes which satisfy the specified strength for each size aggregate as required by ASTM C94 shall be submitted to the Engineer within one week following award of the contract.

C. Provide one copy of the "Certificate of Delivery" for each load of concrete as it arrives on the site, under the provisions of ASTM C94.

PART 2 - PRODUCTS

2.01 CONCRETE:

A. Concrete conforming to the requirements listed below shall be used where indicated on the drawings. Unless otherwise indicated, concrete used as fill under foundations, and elsewhere approved by the Engineer, shall be the 3,000 psi mix.

TABLE

Minimum Comp. Strength at 28 days (psi)	Maximum Water/Cement ratio (gallons per bag of cement)*	Cement Factor: 94 lb. Bags per cubic yard minimum**
3000	0.59 (6.9)	5.5
4000	0.48 (5.6)	6.5
5000	0.40 (4.7)	7.4

* Based on air-entrained concrete. If non-air-entrained concrete is called for, the listed maximum water/cement ratios may be increased slightly, as approved by the Engineer. The water is the total water in the mix, including free water on the aggregate.

** These are minimum amounts; increase as necessary to meet mix requirements.

B. Concrete shall conform to ASTM C94. One copy of the Certificate of Delivery required by ASTM C94 shall be delivered to the Engineer immediately upon arrival of each load of concrete at the site. The Contractor shall be responsible for the design of the concrete mixtures.

C. Standard compression tests of all proposed mixes shall be made by the testing laboratory or other satisfactory evidence shall be presented that the design mixes will attain the minimum strengths listed on the design drawings or called for herein, within the limitations of the ACI Code. No concrete shall be delivered to the job site until the Engineer has approved the design mixes.

D. All concrete (unless otherwise directed) shall contain an air-entraining agent. Air entrained concrete shall have an air content by volume of 3 to 6 percent for l-l/2-inch aggregate and 4 to 8 percent for 3/4-inch aggregate. The air content shall be the responsibility of the testing laboratory and in accordance with ASTM C23l.

E. All concrete shall contain a mid-range water reducer to minimize cement and water content of the mix, at the specified slump, in accordance with ASTM C494.

F. Slump for all concrete shall be from 3-inch to 4-inch, except for concrete using a superplasticizer, when the maximum slump shall be 8- inches. Any concrete having a slump greater than 4-inches (8-inches with superplasticizer) shall be promptly removed from the site.

G. No calcium chloride or admixtures containing calcium chloride shall be added to the concrete. No admixture other than those specified shall be used in concrete without the specific written permission of the Engineer in each case.

H. No additional water, except for the amount indicated by the design mix shall be added to the concrete without the prior permission of the Engineer.

2.02 CEMENT:

A. The cement shall be an approved brand of American manufactured Portland Cement, Type IIA conforming to ASTM Cl50. The brand name and type of cement proposed for use shall be submitted to the Engineer for approval immediately following award of contract. Only one color of cement, all of the same manufacture, shall be used for the work.

B. When the use of high-early-strength Portland cement (Type IIIA) is permitted by the Engineer the same strength requirements shall apply, but the indicated strengths shall be attained in 7 days instead of 28 days.

2.03 ADMIXTURES:

A. Air entraining agent shall be in accordance with ASTM C260.

B. Water reducing agent shall be a mid-range water reducer meeting ASTM C494, Type A.

C. Water reducing agent-retarder shall be in accordance with ASTM C494, Type D.

D. Superplasticizer agent shall be in accordance with ASTM C494, Type F or Type G and contain no more than 0.1% chloride ions. Product may be plant added or field added based on the best application considering distance, temperature and time.

2.04 AGGREGATES:

A. Except as otherwise noted, aggregate shall conform to the requirements of ASTM C33.

B. Fine aggregate shall consist of washed inert natural sand conforming to the requirements of ASTM C33.

C. Coarse aggregate shall consist of well-graded crushed stone or washed gravel conforming to the requirements of ASTM C33.

D. The following designated sizes of aggregate shall be the maximum employed in concrete.

2-inch for mass concrete
1½-inch for reinforced sections 18-inch and over in thickness
3/4-inch for reinforced and unreinforced sections less than 18-inch thickness.

2.05 WATER:

Water for concrete shall be potable, free from injurious amounts of oil, acid, alkali, organic matter and other deleterious substances.

2.06 GROUT:

Grout shall be mixed in the proportions of one part Portland Cement to 2 parts sand, by volume. Only sufficient water shall be used to enable grout to barely hold its shape when squeezed into a ball in the hand. Aggregate for grout shall conform to the requirements of the reference specification for concrete. Prior approval of the Engineer shall be obtained for the use of proprietary grouts, and the instructions of the Engineer shall be followed in their use.

2.07 CURING MATERIALS:

A. Curing compound shall be a curing/hardener compound such as Acurion by AntiHydro, Sikaguard Cure/Hard by Sika, Super Diamond Clear by Euclid or approved equal.

B. Curing paper shall be a fiber-reinforced laminated Kraft bituminous product conforming to the requirements of ASTM Cl7l.

2.08 JOINT FILLER:

1. Preformed joint filler strip shall conform to ASTM Dl75l or Dl752, having a thickness as indicated on the drawings.

2. Fillers shall be provided in pieces of the full thickness required. Use of multiple layers of thin pieces to make-up the full thickness will not be permitted.

2.09 JOINT SEALANT:

8. Joint sealant for construction and control joints shall be a two-part polysulfide base sealant conforming to Thiokol's Building Trade Performance Specification, Class A (self-leveling), Type II (hardness: 35-45 Shore A).

PART 3 - EXECUTION

3.01 GENERAL:

Under no circumstances shall concrete that has set or partially set before placing be used; and no retempering of concrete or grout will be permitted.

3.02 PREPARATION:

A. Before placing concrete, forms and the space to be occupied by the concrete shall be thoroughly cleaned, and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint or other material which would tend to reduce the bond.

B. Unless otherwise indicated, a moisture barrier shall be used under all slabs placed on the ground in accordance with ACI 302.1R. The moisture barrier shall be fungi-resistant and shall have a vapor permeance rating not exceeding 0.01 perms (Perms [grains/ft^2*hr*in. Hg]) per ASTM F1249 or ASTM E96) and 10 mils thickness (49 lbs/MSF). The moisture barrier shall be a high-performance underslab vapor retarder made from polyethylene resins that exceed ASTM E1745, Class A. Sheets shall be lapped 6-inches at joints and sealed with 2-inch wide tape or as recommended by the manufacturer. The vapor barrier should have all laps, seams, penetrations and terminations sealed and should carry across footings.

C. When no moisture barrier is used, the earth, concrete, masonry, or other water-permeable material against which concrete is to be placed shall be thoroughly saturated with water immediately before concrete is placed. No concrete shall be placed until the consolidation of the ground and the arrangement and details of forms and reinforcing have been inspected and approved by the Engineer.

D. When joining fresh concrete to concrete which has attained full set, the latter shall be cleaned by chipping and washing off all dirt and scum and laitance. It then shall be moistened prior to placing new concrete.

E. Concrete surfaces that act as a seat for structural members (other than those resting on grout) shall be troweled to an extremely flat and level surface. If necessary, such surfaces shall be ground off to achieve the required flatness and level.

F. Fill concrete on top of concrete shall be placed in the locations indicated on the drawings or designated by the Engineer. Before fill concrete is placed, the following procedures shall be used to prepare surfaces; all dirt, scum and laitance shall be removed by chipping and washing. The clean, roughened base surface shall be saturated with water, but shall have no free water on the surface. A coat of 1:2 cement-sand grout, approximately 1/8-inch thick, shall be well scrubbed into the thoroughly dampened concrete base. The concrete fill shall be placed immediately, before grout has dried or set. Fill concrete shall be brought to the lines and grades shown on the drawings or approved by the Engineer.

G. Concrete for thrust and anchor blocks shall be placed against undisturbed earth and wooden side forms shall be used to provide satisfactory lines and dimensions. Felt roofing paper shall be placed to protect joints. No concrete shall be placed so as to cover joints, bolts or nuts, or to interfere with the removal of the joints. Minimum bearing areas and dimensions shall be as shown on the drawings.

3.03 MIXING:

A. Concrete shall be ready-mixed, or transit-mixed, as produced by equipment acceptable to the Engineer. No hand-mixing will be permitted. Adding water in controlled amounts during the mixing cycle shall be done only with the express approval of, and in the presence of the Engineer.

B. Ready-mix or transit-mixed concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of rated capacities for the respective conditions as stated on the nameplate. Discharge at the site shall be within 1-1/2 hours after cement was first introduced into the mix. Central mixed concrete shall be plant-mixed a minimum of 1-1/2 minutes per batch and then shall be truck-mixed or agitated a minimum of 8 minutes. Agitation shall begin immediately after the pre-mixed concrete is placed in the truck and shall continue without interruption until discharge. Transit-mixed concrete shall be mixed at mixing speed for at least 10 minutes immediately after charging the truck, followed by agitation without interruption until discharged.

C. All central plant and rolling stock equipment and methods shall conform to the latest Truck Mixer and Agitator Standards of the Truck Mixer Manufacturers' Bureau of the National Ready-Mixed Concrete Association, as well as ACI 304 and ASTM C94.

D. Attention is called to the importance of dispatching trucks from the batching plant so that they shall arrive at the site of the work just before the concrete is required, thus

avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.

3.04 INSTALLATION/APPLICATION/ERECTION:

A. PLACING:

1. No concrete shall be placed by pumping methods without the prior written approval of the Engineer. Should the Contractor be allowed to place concrete by pumping methods, procedures, mix design of concrete, and all other precautions shall be in accordance with ACI 304.2R and as approved by the Engineer.

2. Concrete shall be placed in alternate areas, as defined by the construction and control joints indicated on the design drawings. A minimum of 3 days shall elapse between placement of adjacent sections.

3. Segregation of the concrete shall be prevented during handling; should any segregation occur, the concrete shall be remixed before it is placed. Concrete shall be placed in the forms in horizontal layers not over l to 2 feet thick. Concrete shall not be allowed to drop freely more than 4 feet. If the free drop to the point of placement must exceed 4 feet, the Contractor shall obtain the approval of the Engineer for the proposed method of depositing the concrete. The concrete shall not be required to flow over distances greater than 3 feet in any direction in the forms or on the ground, unless otherwise permitted by the Engineer.

4. Unless otherwise noted, the work begun on any day shall be completed in daylight of the same day.

5. "Cold Joints" are to be avoided, but if they occur, they are to be treated as bonded construction joints.

6. Chutes for conveying concrete shall be of U-shaped design and sized to insure a continuous flow of concrete. Flat (coal) chutes shall not be employed. Chutes shall be metal or metal-lined, and each section shall have approximately the same slope. The slope shall not be less than 25 nor more than 45 degrees and shall be such as to prevent segregation of the ingredients. The discharge end of the chute shall be provided with a baffle plate or spout to prevent segregation. If the discharge end of the chute is more than 5 feet above the surface of the concrete in the forms, a spout shall be used and the lower end maintained as near the surface of deposit as practicable. When the operation is intermittent, the chute shall discharge into a hopper. Chutes shall be thoroughly cleaned before and after each run, and the debris and any water shall be discharged outside the forms. Concrete shall not be allowed to flow horizontally more than 5 feet.

7. Concrete during and immediately after depositing shall be thoroughly compacted by means of suitable tools. Internal type mechanical vibrators shall be employed to produce the required quality of finish. Vibration shall be done by experienced operators under close supervision and shall be carried on long enough to produce homogeneity and optimum consolidation without permitting segregation of the solid constituents or "pumping" or migration of air. All vibrators shall be supplemented by proper wooden spade puddling adjacent to forms to remove included bubbles and honeycomb. This is essential for the top lifts of walls. All vibrators shall travel at least 10,000 rpm and be of adequate capacity. At least one vibrator shall be used for every 10 cubic yards of concrete per hour. In addition, one spare vibrator in operating condition shall be on the site.

8. Concrete slabs on the ground shall be well-tamped into place and foundation material shall be wet, tamped, and rolled until thoroughly compacted prior to placing concrete.

9. Concrete shall be deposited continuously in layers of such thickness that no concrete will be deposited on concrete that has hardened sufficiently to cause the formation of seams and planes of weakness within the section. If a section cannot be placed continuously, construction joints may be located at points as provided for in the drawings or approved by the Engineer.

10. Chutes, hoppers, spouts, adjacent work, etc., shall be thoroughly cleaned before and after each run, and the water and debris shall not be discharged inside the form.

B. CONCRETE PLACING DURING COLD WEATHER:

1. Concrete shall not be placed on frozen ground, and no frozen material or material containing ice shall be used. Materials for concrete shall be heated when concrete is mixed, placed, or cured when the mean daily temperature is below 40°F, or is expected to fall to below 40°F, within 72 hours, and the concrete after placing shall be protected by covering, heat, or both. No accelerant shall be used to prevent freezing.

2. The temperature of concrete surfaces shall not be permitted to drop below 50ºF. for at least 7 days after placement of the concrete.

3. All details of Contractor's handling and protecting of concrete during freezing weather shall be subject to the approval of the Engineer. All procedures shall be in accordance with provisions of ACI 306.

C. CONCRETE PLACING DURING HOT WEATHER:

1. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing shall be sprinkled with cold water. The Contractor shall make every effort to minimize delays that will result in excessive mixing of the concrete after arrival on the job.

2. During periods of excessively hot weather (90°F, or above) ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305. Any concrete with a temperature above 90°F, when ready for placement will not be acceptable, and will be rejected.

3. Temperature records shall be maintained throughout the period of hot weather giving air temperature, general weather conditions (calm, windy, clear, cloudy, etc.) and relative humidity. The record shall include checks on temperature of concrete as delivered and after placing in forms. Data should be correlated with the progress of the work so that conditions surrounding the construction of any part of the structure can be ascertained.

D. PIPES AND EMBEDDED METALS:

1. Special care shall be taken to bring the concrete into solid contact with pipes and iron work embedded in the walls and floors, particularly underneath and around all pipes where a head of water exists, making watertight joints.

2. In general, such embedded items are not shown on the structural design drawings. Design drawings of the other trades shall be consulted for their location and details.

3. Anchor bolt location, size and details shall be verified with the equipment manufacturer's certified drawings before installation.

4. Anchor bolts, reglets, sleeves, edge angles and similar embedded items will be provided, delivered to the site under other Sections of the specification, for installation under this Section.

5. Where edge angles, etc., have nuts welded on to receive machine screws, the threads of the nuts shall be protected from concrete, and the concrete shall be excluded from the space to be occupied by the screw, by the use of wood plugs or other effective means.

6. Inserts required for hanging mechanical and electrical items will be provided and installed in the forms under the mechanical and electrical Sections of the specification.

7. Should the Contractor be allowed to leave openings in the concrete for pipes or ironwork, to await the arrival of items that would delay the prosecution of the work, the openings shall be subject to the approval of the Engineer. Appropriate construction joints shall be provided. In filling any such openings with concrete, a mixture of l: l-l/2 : 3 shall be used and a watertight bond shall be secured between the old and new concrete.

9. In bolting miscellaneous items to concrete after the concrete has set, expansion bolts of an approved pattern and type shall be used. The Contractor shall submit to the Engineer, for approval, the types of expansion bolts. Expansion bolts shall not be used until they are approved.

E. CURING:

1. Concrete curing shall be performed as specified in ACI 30l and as stated herein. All curing procedures shall have prior approval of the Engineer.

2. Concrete Floors

Concrete floors which are to receive paint, concrete fill, mortar setting beds, grout fill, or any other subsequent finish shall be cured by one of the following procedures immediately after completion of placement and finishing:

a. Ponding or continuous sprinkling.

b. Application of absorptive mats or fabric kept continuously wet.

c. Application of sand kept continuously wet.

d. Application of waterproof sheet materials conforming to ASTM Cl7l.

e. Application of curing compounds conforming to ASTM C309, if it can be demonstrated to the Engineer's satisfaction that the compound is applicable and that it will not prevent bonding of the subsequent finish to be received. Compound shall be placed at a rate of 200 square feet per gallon, in two applications perpendicular to each other.

3. Curing procedure shall be continued for at least 7 days.

a. Moisture loss from surface placed against metal or wood forms shall be minimized by keeping forms wet until removal.

b. Curing shall be continued for at least 7 days. When forms are removed during the curing period, surfaces shall be cured by spraying or by the use of a curing compound as previously specified.

c. Surfaces shall be protected from traffic or damage until surfaces have hardened sufficiently. If necessary, 1/2-inch thick plywood sheets shall be used to protect the exposed surface.

F. BRACING AND SUPPORTS:

1. All concrete members shall be adequately and safely supported and braced until the permanent supports and braces are installed.

2. Backfilling against exterior walls shall not be done until supporting slabs are in place and have attained 70 percent of design strength, otherwise walls shall be braced against earth lateral pressure, using a system approved by the Engineer.

3. Backfilling against retaining walls shall not commence until the wall concrete has reached its 28-day strength.

G. REMOVING FORMS AND SUPPORTS:

1. Removal of forms shall take place in accordance with ACI 347, Section 3.6. Except as otherwise specifically authorized by the Engineer, forms shall not be removed until the concrete has aged for the following number of day-degrees or attained 50 percent strength. (Day-degrees equals the total of number of days times the average daily air temperature at the surface of concrete. For example, 5 days at a daily average temperature of 60°F. equals 300 day-degrees.)

Location	Day-Degrees
Beams and Slabs	500
Walls and Vertical Surfaces	200

2. Shores under beams and slabs shall not be removed until the concrete has attained at least 70 percent of the specified cylinder strength and also sufficient strength to support safely its own weight and the construction loads upon it.

H. PATCHING:

1. Defective concrete and honeycombed areas as determined by the Engineer shall be chipped down reasonably square and at least one-inch deep to sound concrete by means of hand chisels or pneumatic chipping hammers. Irregular voids or surface stones need not be removed if they are sound, free of laitance, and firmly imbedded in the parent concrete, subject to Engineer's final inspection. If honeycomb exists around reinforcement, chip to provide a clear space at least 1-inch wide all around the steel. For areas less than 1-1/2 inches deep, the patch may be made following the procedure for filling form tie holes, described in the subsection below, using adequately dry (non-trowelable) mixtures to avoid sagging. Thicker repairs will require build-up in 1-inch layers on successive days. Unless otherwise indicated, thicker repairs shall be made with Vertipatch mortar mixture blended with Acryl-Set, both by Master Builders, Inc., Cleveland, Ohio, or approved equal.

2. For concrete areas exposed to serious abrasion and/or impact forces, the Engineer may order the use of grout with a non-shrink metallic aggregate (Embeco by Master Builders, Inc.; Ironite by Fox Industries, Madison, IL; or approved equal) as an additive in the proportions listed below:

	Small Patches		Large Formed Patches	
Material	Volumes	Weights	Volumes	Weights
Cement	1.0	1.0	1.0	1.0
Metal Aggregate	0.15	0.25	0.2	0.33
Sand	1.5	1.5	1.5	1.0
Pea Gravel	--	--	1.5	1.5

I. FINISHING OF FORMED SURFACES:

1. All concrete that is to be left exposed to view shall be scraped to remove projecting imperfections left by voids in the forms.

2. In addition to scraping, exterior exposed concrete shall be covered with a cement-base plaster mix. The mix shall consist of Thoroseal Plastic Mix and Acryl 60, as manufactured by Standard Drywall Products, Miami, FL, or approved equal. It shall be mixed and applied in accordance with the manufacturer's recommendations.

3. In addition to scraping, interior concrete surfaces which will be exposed to view and concrete surfaces which are to be prepared and painted as specified in Section 09900, PAINTING, shall receive a smooth rubbed finish, in accordance with ACI 301 and as described below.

4. To permit satisfactory finishing, forms shall be removed from the vertical faces of the concrete as early as is possible without damaging the surface. Immediately after stripping forms, any fins or projections left by the forms shall be chipped off, and the surfaces rubbed smooth.

5. Form tie holes and other voids and faults shall be patched. Voids shall be cleaned out, roughened, thoroughly wetted, coated with neat cement paste, and filled with mortar of cement and sand in the same proportions, materials, and color as used in the concrete. The surface of the patch shall be flush with the surrounding surface after finishing operations are complete. Surface shall be kept continuously damp until patches are firm enough to be rubbed without damage.

6. Rubbing shall be performed while the surface is wet using a carborundum or cement sand brick, to achieve a smooth uniform, even textured finish. Patched and chipped areas shall be blended to match as closely as possible the appearance of the rest of the surface. No cement wash or plastering will be permitted, and no mortar shall be used except as required above.

7. Where finishing is performed before the end of the curing period, concrete shall under no circumstances be permitted to dry out, and shall be kept continuously moist from time of placing until end of curing period, or until curing membrane is applied.

L. TESTING:

1. Concrete inspection and testing shall be performed by the Engineer or by an inspection laboratory, designated by the Engineer, engaged and paid for by the Contractor. The laboratory shall supply testing equipment, and the preparation of samples and all testing shall be performed by the laboratory personnel. Full assistance and cooperation, concrete for samples, and such auxiliary personnel and equipment as needed shall be provided by the Contractor.

2. At least one slump test shall be performed from each truckload of concrete. The sample for slump shall be taken from the middle third of a truckload. Air content tests shall be made at the discretion of the Engineer. If the measured slump or air content falls outside the specified limits, a check test shall be made immediately on another portion of the same sample. In the event of a second failure, the concrete shall be considered to have failed the requirements of the specification and shall be immediately removed from the jobsite to be discarded.

3. The Contractor shall advise the Engineer of his readiness to proceed with concrete placement at least one working day prior to each placement. The Engineer will inspect the preparations for concrete, including the preparation of previously

placed concrete, the reinforcing, and the alignment and tightness of formwork. No placement shall be made without the prior approval of the Engineer.

4. A minimum of four standard compression test cylinders shall be made and tested for **each 100 cubic yards or fraction thereof** for each type and design strength of concrete from each day's placement of concrete. One cylinder shall be tested at 7 days and two cylinders at 28 days. The fourth cylinder from each set shall be kept until the 28 day test report on the second and third cylinders in the same set has been received. The Engineer reserves the right to require test cylinders to be made for each truckload of concrete if the nature of the project or project experience indicates such additional tests are required for proper control of concrete quality; **such tests will be at the Owner's expense.**

5. The strength level shall be considered satisfactory so long as the averages of all sets of three consecutive strength test results equal or exceed the specified strength f'c, and no individual strength test (average of two cylinders) result falls below the specified strength f'c by more than 500 psi.

6. In the event the average compressive strength of the two 28 day cylinders do not achieve the required level, the Engineer may elect to test the fourth cylinder immediately or test it after 56 days.

M. FAILURE TO MEET REQUIREMENTS:

1. The Engineer shall have the right to reject concrete represented by low strength tests or to agree to further testing of the concrete. Rejected concrete shall be promptly removed and replaced with concrete conforming to the specification. The decision of the Engineer as to whether substandard concrete is to be accepted or rejected or additional tests shall be conducted shall be final. All direct and indirect costs associated with further curing and testing of the concrete shall be at the Contractor's expense. All costs associated with removing rejected concrete, placing new concrete, and conducting tests on new concrete shall be at the Contractor's expense.

2. If the Engineer agrees to consider further curing and/or testing of the concrete before making a final decision, the Contractor shall submit a detailed plan to the Engineer, including proposed criteria for acceptance of the concrete. The plan may include additional curing of the concrete, drilling and testing of cores, load testing of the structure, or a combination.

3. If additional curing is permitted before further inspection and testing, the Contractor shall provide any necessary materials and labor to further cure the suspect concrete.

4. If drilling and testing of cores is permitted, the Contractor shall be responsible for obtaining the cores, including provision of ladders, scaffolding, and such incidental equipment as may be required. If additional curing is permitted, cores shall be drilled after the curing period, and shall be in accordance with ASTM Methods C39 and C42. The Contractor shall repair all core holes to the satisfaction of the Engineer.

5. The burden of proof, including, but not limited to the work of cutting and testing the cores, inspection, evaluation, engineering, repair of the holes, or removal and replacement of the concrete in question, and all associated costs therefor, shall be at the expense of the Contractor.

6. If load testing of the concrete is permitted, and if not otherwise indicated, slabs or beams under load test shall be loaded with their own weights plus a superimposed load of 2 times the design live load. The load shall be applied uniformly over the portion being tested in the approved manner and left in position for 24 hours. The structure shall be considered satisfactory if deflection "D" in feet, at end of 24-hour period, does not exceed the following value:

   D equals 0.001 (L x L)/t

   in which "L" is span in feet, "t" is depth of slab, or beam in inches. If deflection exceeds "D" in the above formula, the concrete shall be considered faulty unless within 24 hours after removal of the load, the slab, or beam under test recovers at least 75 percent of the observed deflection.

7. If the suspect concrete still fails to meet specification requirements, the Engineer shall have the right to reject the concrete, have it removed and replaced, in accordance with paragraph 5 above, or to require mechanical strengthening of the concrete to satisfy project requirements. The Contractor shall submit a removal and replacement plan for review by the Engineer.

END OF SECTION

Special Provision
To Section 607 (NHDOT Standard Specification)

Amend Section 607 Fences to include:

Section 607.10
BVC Chain Link Fencing and Baseball Backstop

PART I - GENERAL

1.01 SCOPE OF WORK

A. The work under this Section consists of furnishing and installing vinyl coated chain link fence fabric and hardware and framework of various heights as shown on the Contract Drawings and as specified herein including all labor, materials and equipment necessary to finish the work complete in place for both vertical protective fencing and baseball backstop per contract drawings.

1.02 REFERENCE STANDARDS

A. References herein to any technical society, organization, group or body is made in accordance with the following abbreviations:

1. ASTM American Society for Testing Materials

2. AWS American Welding Society

1.03 QUALITY ASSURANCE

A. All fencing shall conform to the specifications of the Chain Link Fence Manufacturer's Institute and as specified herein.

1.04 SUBMITTALS

Per Section SPECIAL CONDITIONS of these Specifications, submit:

A. Three (3) samples, approximately 3" long or 6" square of fabric material, post sections and typical accessories.

B. Shop drawings or catalog cuts including details illustrating fence height, fence post spacing, and sizes of posts, rails, braces, footings, gates and all accessories.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver material in manufacturer's original packaging with all tags and labels intact and legible. Handle and store material in such a manner as to avoid damage.

PART II - MATERIALS

2.01 VINYL CLAD STEEL POSTS, RAILS AND BRACES

A. General

1. All fence pipe for posts, rails, and all braces and appurtenances shall be vinyl clad, schedule 40 round, seamless hot dip galvanized pipe conforming to ASTM-A-120-1, or approved equal.

2. All structural shapes shall be vinyl clad, and galvanized in conformance with ASTM Designation A123.

3. All vinyl clad materials shall be fusion bonded in accordance with ASTM-F668 Class 2B.

B. End, Corner and Pull Posts

1. Fence up to and including 5'-0" in height: 2.375"O.D. pipe, 3.65 lbs. per linear foot.

2. Fence over 5'-0" in height: 2.875" O.D. pipe, 5.79 lbs. per linear foot.

3. Fence over 10'-0" in height: 4.00" O.D. pipe, 9.11 lbs. per linear foot.
4. Maximum Spacing 10’-0” on Center.

C. Line Posts (10'-0" Maximum Spacing)

1. Fence up to 5'-0" in height: 1.90" O.D. pipe, 2.28 lbs. per linear foot.

2. Fence over 5'-0" in height: 2.375" O.D. pipe, 3.12 lbs. per linear foot.

3. Fence over 10'-0" in height: 2.875" O.D. pipe, 5.79 lbs per linear foot.

D. Gate Posts

1. Gate posts for single leaf gates six (6) feet or less in width: 2.875" O.D. pipe, 4.64 lbs. per foot min.

2. Gate posts for single leaf gates six (6) to twelve (12) feet in width: 4.00" O.D. pipe, 6.56 lbs. per foot.

E Rails

1. All rails shall be 1.66" O.D. pipe weighing 2.27 lbs. per linear foot furnished in manufacturer's standard lengths of approximately 21'-0" with outside sleeve type couplings, at least six (6) inches long for each joint – one (1) coupling in each five (5) to have expansion spring. Provide means for attaching rails securely to each corner, pull and end post. Rails shall form continuous brace from end to end of each run of fence.

F. Post Bracing Assembly

1. 1.66" O.D. pipe weighing 2.27 lbs. per linear foot (for horizontal braces). Provide at each side of corner and pull posts and at end posts for fence six (6) feet or higher.

2.02 CHAIN LINK FABRIC (VINYL CLAD)

A. Chain Link fence fabric shall be factory coated 9 gauge core wire with a min .02 inch thick coating of plasticized polyvinyl-chloride applied by the fusion method over a thermoset plastic bonding agent. The bond shall exhibit equal or greater strength than the cohesive strength of the vinyl. All cut ends shall be coated with vinyl at the factory. Fabric shall be 2" mesh and black in color.

B. Top and bottom of fabric shall have knuckled selvage, both sides.

2.03 FITTINGS AND ACCESSORIES (VINYL CLAD)

A. All accessories shall be vinyl clad in accordance with paragraph 2.01 above, and galvanized in conformance with ASTM Designation A153.

B. Post Caps

Furnish and install tight fitting pressed steel or malleable iron caps, designed as a weather tight closure cap. Provide one (1) pass-through looped cap for each line post, and one (1) acorn style cape for each end or corner post. Where top rail is used, provide looped cap tops to permit passage of top rail.

C. Tension Bars

1. One (1) piece lengths equal to full height of fabric with minimum cross section of 3/16" x 3/4", conforming to ASTM Designation A123. Provide one (1) stretcher bar for each end post and two (2) for each corner and pull post.

2. Tension bands and brace bands, if utilized, shall be 7/8" x 12 gauge beveled, galvanized, sized to fit pipe sizes and furnished with galvanized fasteners. Galvanizing shall conform with ASTM Designations A123 or A153 as they pertain.

D. Rail Clamps

1. Rail clamps shall be standard clamps (boulevard clamps) furnished complete with fasteners with ASTM Designation A153.

E. Fabric Bands for Tying Fabric

1. Fabric shall be attached using a BAND-IT band and buckle system
2. Bands shall be 0.020” thickness, 200/300 series stainless steel ½” wide bands, with a minimum breaking strength of 850 lbs., ½” band capacity ear-loct design buckles to be manufactured with 0.050” thick material, 201/301 series stainless steel.

F. Fittings, lugs, clamps and other accessories shall be steel conforming to ASTM Designation F626 and galvanized in conformance with ASTM Designation A153.

2.04 ANCHORING CEMENT

A. Cement for anchoring posts in sleeves embedded in concrete walls shall be "POR-ROK", as manufactured by Hallemite (Lehn and Fink Industrial Products, Division of Sterling Drugs, Inc.), Montage, New Jersey, or approved equal.

B. "Sika Cola-Due" by the Sika Co.

C. "Five Star Grout" the Five Star Co.

2.05 CEMENT CONCRETE

A. Cement concrete for post footings shall conform to Section 03300 of these Specifications.

PART III - EXECUTION

3.01 POST INSTALLATION

A. Install new vinyl coated chain link fence in the location(s) shown on the Contract Drawings, and as approved by the Landscape Architect.

B. Excavation for post footings as herein before specified in Section 02300 of these Specifications, shall be in firm undisturbed or compacted soil. Post footing diameters vary according to post sizes required and are in accordance with attached details. Excavate hole depths six (6) inches lower than post bottom with bottom of posts set not less than thirty-six (36) inches below surface when in firm, undisturbed soil. Where ledge is encountered, the Contractor shall notify the Landscape Architect to determine method of installation. Payment for any additional work required when installations are in ledge shall be in accordance with methods described in SPECIAL CONDITIONS of these Specifications.

C. Place concrete around posts in a continuous pour, tamp for consolidation. Check each post for vertical and top alignment and hold in position during placement and finishing operation. Crown the top of the concrete footings to pitch water away from posts.

D. Under bituminous pavements, tops of footings are to be finished smooth and are to pitch one (1) inch from the posts to the outside edge of the foundation.

E. In mower strip locations, form top twelve (12) inches square and finish to match mower strip with 1/4" pitch away from posts.

1. If applicable, top of fence footings at players' benches and cement concrete mower strips shall terminate six (6) inches below pavement finish grade.

3.02 FENCE ERECTION

A. <u>Top and Bottom Rails</u>

1. Top and bottom rails shall form a continuous brace from end to end of each fence run. In addition, all end and corner posts shall be braced to the nearest line post with center brace rails. Outside sleeve type top rail coupling shall be placed a maximum of twelve (12) inches from line posts.

B. Middle Rails

1. All chain link fencing ten (10) feet or more in height shall have a continuous middle rail.

C. Brace Assemblies

1. Furnish and install braces and appurtenances so posts are plumb when diagonal rod is under proper tension. All "tension" assemblies shall conform to ASTM 567 and the MASS DPW Standard Specifications Section M.8.09

D. Fabric

1. The fabric shall be installed on the “public” or “sports field” side of the fence.

2. All fabric shall be aligned so that the top row of the fabric mesh is tied to the top rail, and so that the bottom selvage of fabric mesh stands one (1) inches above the finish grade of the lawns, pavements or concrete wall grade and that the bottom row of the fabric mesh is tied to the bottom rail.

3. Fabric shall be properly stretched and securely fastened to the posts and rails, and between posts the top and bottom of the fabric shall be fastened to the horizontal braces as herein specified, and approved by the Landscape Architect. Fabric shall be stretched uniformly taut and as tight as possible, true to line and grade and complete in all details. Install tension bars at corners.

4. The fabric shall be fastened to end and corner posts with tension bars and stretcher bar bands spaced at one (1) foot intervals.

E. Stretcher Bars

1. Thread through fabric and secure to posts with approved metal bands spaced not over twelve (12) inches O.C.

F. Fabric Bands

1. Fabric Bands shall be placed at the intervals indicated on the details and securely fastened to all fence posts.
2. All bands shall be pulled tight an raw ends of steel bands shall be secured in buckle by folding ear tabs around steel bands as per manufacturer's recommended installation procedure. No sharp edges shall protrude from band-it buckles. When applicable, band will be PVC coated, color to match fabric and framework.

G. Fasteners

1. Install nuts for tension band and hardware bolts on side of fence opposite fabric side unless directed otherwise by the Landscape Architect.

3.03 GATE FRAMES (WHERE APPLICABLE)

A. Gate frames shall be galvanized steel 1.90" O.D. standard weight pipe, 2.72 pounds per linear foot. Gates shall be fabricated using welded construction with all welds ground smooth and coated with 3.0 mil. thickness of cold galvanizing compound. Gates must be properly braced to eliminate any possible sagging condition. For gates over eight (8) feet in height, provide additional horizontal and vertical interior members to ensure proper strength.

B. Fabric shall be installed with hookbolts and tension bars on all four (4) sides and attached to gate frame at twelve (12) inches on center.

C. Hardware materials shall be hot dipped galvanized steel. All moveable parts (e.g., hinges, latch, keeper, and drop bar) shall be field coated with PVC touch-up paint, provided by the manufacturer.

D. Hinges shall be of sufficient structural strength and design to support gate leaf and to permit easy and trouble free operation. Non-lift-off type hinge design shall permit the gate to swing 180 degrees inward or outward in accordance with the Contract Drawings

E. All gates shall be equipped with a positive type latching device capable of retaining the gate in a closed position and have provision for padlock. Latches shall permit operation from either side of gate and must be approved by the Landscape Architect prior to the installation. Refer to details for latch device.

F. Gate keepers shall be provided for each gate leaf over five (5) feet wide. Gate keeper shall consist of mechanical device for securing free end of gate when in full open position.

G. Double gates: Provide drop rod to hold inactive leaf. Provide gate stop pipe to engage center drop rod. Provide locking device and padlock eyes as an integral part of the latch, requiring one padlock for locking both gate leaves.

H. Gate Installation

1. Check gate posts for vertical alignment and maintain in position during placement and finishing operations.

2. Set keeper, stops, sleeves into concrete.

3. Install gates plumb, level and secure for full opening without interference.

4. Attach hardware by means which will prevent unauthorized removal.

5. Adjust hardware for smooth operation.

3.03 FINISH PROTECTION

A. During the fence installation, care shall be taken to avoid damaging the vinyl clad or galvanized surfaces of the fence components. All scratches and abrasions shall be thoroughly corrected in a manner satisfactory to the Landscape Architect before final acceptance.

END OF SECTION

Special Provision

To Section 615 (NHDOT Standard Specifications)

Amend Section 615 to include:

Section 615.10
CEDAR POST AND RAIL FENCES

1.01 DESCRIPTION

A. This section describes constructing timber rail guard fence, timber guard posts, appropriate for use in public parks.

PART 2- MATERIALS

2.01 GENERAL

A. Furnish and install materials necessary to conform to design drawings for post and rail fence.

2.02 ROUND POSTS

A. Treat round posts as specified on the plans or in the contract. Peel, trim, shave, and cut posts to length before treatment.

2.03 TIMBER RAILS

A. Furnish sawed rails from one of the species listed in 614.2.5 for wood posts and offset blocks.

B. Furnish untreated sawed rails, unless required otherwise on the plans, conforming to the grade the plans specify. Grade sawed rails according to the grading rules. Furnish unsurfaced sawed rails, or surfaced on all 4 sides (S4S), as the plans specify.

2.04 FURNISHING POSTS

A. Furnish treated, untreated, or cold-dip treated posts, as the plans, or contract specifies.
B. If treated posts are specified, then treat posts by the pressure process according to the methods, requirements, and minimum retention and penetration of preservative. Except, do not use creosote-coal tar or pentachlorophenol for treatment.

2.05 BOLTS, NUTS, AND HARDWARE

A. Furnish all bolts, nuts, and miscellaneous hardware for the work according to the design and dimensions the plans show. Furnish sufficiently threaded bolts to allow secure fastening and supply with the necessary washers.

B. Unless specified otherwise, furnish all bolts, nuts, washers and other hardware zinc coated. Except that the contractor may furnish plain hardware for timber guard fence and treated timber curbs. The zinc coating must conform to methods specified in 614.2.

PART 3 CONSTRUCTION

3.01 GENERAL

A. Under the Guard Fence Timber Rail bid item, support a timber rail on wooden posts.

B. Under the Guard Posts Timber bid item, furnish and erect sawed wooden posts.

C. Construct all work according to the plan details specified for the work. Dig the post holes at the required location and depth, and compact the bottom of the holes to provide a stable foundation. The engineer will allow a tolerance of +/- 3 inches in depth, provided the post length is adequate to obtain the required elevation of the finished top. Set the posts plumb and with the front faces in a straight line or to conform to curves the plans show or as the engineer directs. Backfill the placed posts with engineer-approved material, placed in layers, and compacted in a way that avoids disturbing the position or alignment of the post.

D. After setting the post, determine the finished elevation of the post top and cut off and trim as the plans show. Treat the cut surfaces of treated posts with 2 brush applications of the same type of preservative used in the original treatment. Bore holes in the set posts to support the rails at the required elevation and grade. Bolt the rails to the posts, unless specified otherwise, with round-headed bolts, with heads facing the rail. Burr the threaded ends of all bolts. If the bolt extends one inch or more through the nut, cut off at 1/2 inch from the nut before burring.

E. Perform the drilling, countersinking and beveling of curbs after pressure treatment; however, apply 2 brush applications of the preservative used for the curbs to the surfaces that result from this operation.

3.02 MEASUREMENT

A. The department will measure Guard Fence Timber Rail by the linear foot acceptably completed, measured from end to end of the rail.

END OF SECTION

Special Provision

To Section 645 (NHDOT Standard Specifications)

Amend Section 645 to include:

Section 645.11
Wood Mulch Safety Surfacing

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment and transportation required for the placement and compaction of wood mulch safety surfacing at children's play lots. The surfacing shall be placed at all locations identified on the Contract Drawings to the indicated grades.

B. Work shall include the installation of both wood mulch safety surfacing as described herein and as indicated on the construction details.

1.02 SUBMITTALS

A. In accordance with Specifications submit manufacturer's specification and detail sheets for all materials to be utilized under this section.

B. Provide samples as directed by the Engineer.

PART II - MATERIALS

2.01 WOOD MULCH SAFETY SURFACE

A. The wood mulch safety surfacing shall be "Woodcarpet" as manufactured by Zeager Brothers, Inc., or approved equal. The material used to manufacture the wood mulch safety surfacing shall consist of No. American Hardwoods such as Oak, Maple, Ash, Poplar, Hickory, Beech, Birch, Locust.

All woods shall be debarked and free of soil, leaves and twig material and other contaminates which hasten decomposition. No chemical treatment or additives are permitted. Wood mulch shall be randomly sized, approximately ten (10)

times longer than wide, and shall meet the gradation requirements of ASTM C 136:

Sieve Size	Percent Passing Passing by Weight
3/4 in.	100
3/8 in.	75
No. 4	45
No. 10	15
No. 60	1
No. 200	1

Ninety-eight percent (98%) of wood mulch dimensions shall not exceed 4.00 centimeters in length, 1.30 centimeters in width and 3.25 centimeters in depth.

PERMEABILITY: Coefficient of permeability shall be greater than 0.6 cm/sec ASTM D 2434.

Moisture absorption of wood mulch safety surface shall be no greater than one hundred fifty percent (150%) by weight.

2.02 FILTER CLOTH/FABRIC

A. A drainage type filter cloth shall be used in conjunction with the wood mulch safety surfacing and shall conform to the requirements specified below.

PROPERTY	TEST PROCEDURE	DRAINAGE TYPE
Weight, oz./sq. yd.	ASTM D-1910	4.1
Thickness, mils	ASTM D-1777	40
Tensile Strength, lbs.	ASTM D-1682	115
Elongation, %	ASTM D-1682	6 5
Puncture Strength, lbs.	ASTM D-751 Modified	75
Mullen Burst Strength, psi	ASTM D-751	260
Coefficient of Permeability, m/sec.	Constant Head	0.10

PART III - EXECUTION

3.01 PROCEDURES

A. The Contractor shall deliver, spread and compact or place safety surfaces to conform to the lines and grades shown on the Contract Drawings. All work shall be done in accordance with the manufacturer's installation recommendations for wood mulch or Poured-in-Place Play Surfaces.

B. Compaction of wood mulch shall continue until the surface is true to the proposed lines and grades indicated on the Plans and the material consists of a minimum compacted depth of twelve (12) inches.

C. Bevel all pathway edges and feature (slides etc.) exit landing areas (Base Bid Only) in accordance with manufacturer's recommendations.

D. Any tests of materials, and/or compaction shall be as ordered by the Engineer, and paid for by the Contractor regardless of results.

E. WARRANTY: Safety surfacing shall be free of defects due to workmanship or material for a minimum of two (2) years from date of installation.

END OF SECTION

Special Provision
To section 646 (NHDOT Standard Specifications)

Amend Section 646 to include:

Section 646.10
Reinforced Turf Overflow Parking Area

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. The Conditions of the Contract and all Sections of Division 1 are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK

A. Work Included:
1. Provide and install sandy gravel road base per details, to provide adequate support for parking. See 2.02 Materials.
2. Provide Grasspave2 Paving System or approved equal products including Grasspave2 units and installation per the manufacturer's instructions furnished under this section
3. Provide and install clean sharp sand to fill the Grasspave2 units, when needed.
4. Provide and install grass by using hydroseeding

B. Related Work
1. Subgrade preparation

1.03 QUALITY ASSURANCE

A. Follow specifications for Shop Drawings, Product Data, and Samples requirements.

B. Installation: Performed only by skilled workpeople with satisfactory record of performance on landscaping or paving projects of comparable size and quality.

1.04 SUBMITTALS

A. Submit manufacturer's product data and installation instructions.

B. Submit a 10" x 10" section of Grasspave2 material or approved equal for review. Reviewed and accepted samples will be returned to the contractor.

C. Submit material certificates for base course and sand fill materials.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect Grasspave2 units from damage during delivery and store under tarp to protect from sunlight, when time from delivery to installation exceeds one week. Keep Hydrogrow in a dark and dry location.

1.06 PROJECT CONDITIONS

A. Review installation procedures and coordinate Grasspave2 work with other work affected. Generally, Grasspave2 is installed at the same time as project grass installation, nearly the last site construction activity.

B. All hard surface paving adjacent to Grasspave2 areas, including concrete walks and asphalt paving must be completed prior to installation of Grasspave2.

C. Gradients for grass porous paving surfaces can vary from flat to 20%, depending upon vehicle types to use the surface. Please note that fire lanes, or other emergency vehicles, will generally require a gradient that is less than 6%. If there are any questions regarding existing gradients on this project, please contact the Project Designer, or Invisible Structures, Inc.

D. Cold weather:

1. Do not use frozen materials or materials mixed or coated with ice or frost. Be careful in handling rolls of Grasspave2 in temperatures below 50 degrees F, as product connectors become stiff and can separate, and the individual units will retain the roll curl until warmed to room temperature (aided by placement in sun for 15 to 20 minutes). If cold weather is anticipated, Grasspave2 can be shipped in flat sheets that measure 1-meter (40”) square.

2. Do not build on frozen work or wet, saturated or muddy subgrade.

3. Protect partially completed paving against damage from other construction traffic when work is in progress, and until grass root system has matured (about 3 to 4 weeks). Any barricades constructed must still be accessible by emergency and fire equipment during and after installation.

F. Protect adjacent work from damage during Grasspave2 installation.

PART 2 - PRODUCTS

2.01 AVAILABILITY

A. Manufacturer: (Grasspave2, Hydrogrow) Invisible Structures, Inc., 1600 Jackson Street., Suite 310, Golden, Colorado 80401. Call from USA and Canada 800-233-1510 toll free, International 303-233-8383, Fax 303-233-8282.

2.02 MATERIALS

A. Base Course: Sandy gravel material from local sources commonly used for road base construction, passing the following sieve analysis.

Sieve	%Passing
1”	100
3/4"	90-100
3/8”	70-80
#4	55-70
#10	45-55
#40	25-35
#200	3-8

1. Sources of the material can include either "pit run" or "crusher run.” Crusher run material will generally require sharp sand to be added to mixture (33% by volume) to ensure long-term porosity. If there is difficulty in finding local sources to meet this sieve analysis, and alternative mixture can be created by mixing 2/3 crushed drainage rock (0.75” dia) with 1/3 coarse, well-draining sand (AASHTO M6 or ASTM C-33).

2. Selected materials should be nearly neutral in pH (range from 6.5 to 7.2) to provide adequate root zone development for turf.

3. Alternative materials such as crushed shell, limerock, and/or crushed lava may be considered for base course use, provided they are mixed with sharp sand (33%), and brought to proper compaction.
(Crushed shell and limerock alone can set up like concrete without sand added.)

B. Hydrogrow Mix: A proprietary soil amendment manufactured by Invisible Structures, Inc., provided with Grasspave2.

C. Grasspave2 Grass Paving Units:
1. Lightweight injection-molded plastic units 0.5x0.5x0.025m (20"x20"x1" high, 2.7 ft2 each) with hollow rings rising from a strong open grid allowing maximum grass root penetration and growth.
2. Unit weight = 510 g (18 oz.), volume = 8% solid.

3. The plastic shall be 100% pre-consumer recycled HDPE plastic resin, with minimum 3% carbon black concentrate added for UV protection.

4. Loading capability is equal to 402 kg/cm2 (5721 psi, 823,824 psf, 7.4 million psy, 39,273 kPA, 3707 tons/sq.yd.) when filled with sand, over an appropriate depth of base.

5. Grasspave2 is shipped in pre-assembled rolls that vary from 10 square meters (108 sf) to 50 square meters (1345 sf).

6. Male/Female Fastener Tensile Strength (from a Pull Test) is equal to 80,208 N/m (450 lbsf/in.)

7. Standard color is black.

Any products failing to meet these standards will be rejected.

D. Sand: To fill the 25 mm (one inch) high rings and spaces between the rings when seeding or using 13 mm (half inch) thick sod (soil thickness):

1. Coarse, well-draining sand (washed concrete sand- AASHTO M6 or ASTM C-33).

2. United States Golf Association (USGA) greens (section) sand mix – "The Root Zone Mixture."

E. Grass: Use species resistant to wear by traffic generally a Blue/Rye/Fescue mix used for athletic fields in northern climates, with greatest wear-resistant species possible, available only by seed or sprigging.)

F. Seed: Use seed materials, of the preferred species for local environmental and projected traffic conditions, from certified sources. Seed shall be provided in containers clearly labeled to show seed name, lot number, net weight, % weed seed content, and guaranteed % of purity and germination. Pure Live Seed types and amount shall be as shown on plans.

G. Mulch: (Needed only for seeding.) Shall be of wood or paper cellulose types of commercial mulch materials often used in conjunction with hydroseeding operations. Mulches of straw, pine needles, etc. will not be acceptable because of their low moisture holding capacity.

H. Fertilizer: A commercial "starter" fertilizer, with Guaranteed Analysis of 17-23-6, or as recommended by local grass supplier, for rapid germination and root development.

PART 3 – EXECUTION

3.01 INSPECTION

A. Examine subgrade and base course installed conditions. Do not start Grasspave2 installation until unsatisfactory conditions are corrected. Check for improperly compacted trenches, debris, and improper gradients.

B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance. If existing conditions are found unsatisfactory, contact Project Manager for resolution.

3.02 PREPARATION

A. Place base course material over prepared subbase to grades shown on plans, in lifts not to exceed 150 mm (6"), compacting each lift separately to 95% Modified Proctor. Leave minimum 25 mm (1”) to 35 mm (1.5") for Grasspave2 unit and sand/sod fill to Final Grade.

B. Spread all Hydrogrow mix provided (spreader rate = 4.53 kg per 100 m2 (10 lbs per 1076 ft2) evenly over the surface of the base course with a hand-held, or wheeled, rotary spreader. The Hydrogrow mix should be placed immediately before installing the Grasspave2 units to assure that the polymer does not become wet and expanded when installing the units.

3.03 INSTALLATION OF GRASSPAVE2 UNITS

A. Install the Grasspave2 units by placing units with rings facing up, and using pegs and holes provided to maintain proper spacing and interlock the units. Units can be easily shaped with pruning shears or knife. Units placed on curves and slopes shall be anchored to the base course, using 16d Common nails with fender washer, as required to secure units in place. Tops of rings shall be between 6 mm to 13 mm (0.25" to 0.5") below the surface of adjacent hard-surface pavements.

B. Install sand in rings as they are laid in sections by "back-dumping" directly from a dump truck, or from buckets mounted on tractors, which then exit the site by driving over rings already filled with sand. The sand is then spread laterally from the pile using flat bottomed shovels and/or wide "asphalt rakes" to fill the rings. A stiff bristled broom should be used for final "finishing" of the sand. The sand must be "compacted" by using water from hose, irrigation heads, or rainfall, with the finish grade no less than the top of rings and no more than 6 mm (0.25") above top of rings.

3.04 INSTALLATION OF GRASS

A. Hydroseeding/hydro-mulching - A combination of water, seed and fertilizer are homogeneously mixed in a purpose-built, truck-mounted tank. The seed mixture is sprayed onto the site at rates shown on plans and per hydroseeding manufacturer's

recommendations. Coverage must be uniform and complete. Following germination of the seed, areas lacking germination larger than 20 cm x 20 cm (8" x 8") must be reseeded immediately. Seeded areas must be fertilized and kept moist during development of the turf plants.

3.05 PROTECTION

A. Seeded areas must be protected from any traffic, other than emergency vehicles, for a period of 4 to 8 weeks, or until the grass is mature to handle traffic.

3.06 CLEANING

A. Remove and replace segments of Grasspave2 units where three or more adjacent rings are broken or damaged, reinstalling as specified, so no evidence of replacement is apparent.

B. Perform cleaning during the installation of work and upon completion of the work. Remove all excess materials, debris, and equipment from site. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

END OF SECTION

SPECIAL PROVISION
To Section 651 (NHDOT Standard Specifications) LANDSCAPING

Amend Section 651 to read:

Section 651
LANDSCAPING AND PLANTINGS

GENERAL

1.01 SCOPE OF WORK

A. The work to be done under this section shall require the Contractor to provide all labor, material, equipment and transportation necessary for the furnishing and planting of new trees, shrubs and groundcovers for both interior and exterior, free-standing and built-in, planters as shown on the Contract Drawings and as specified herein.

1.02 APPLICABLE SPECIFICATIONS AND STANDARDS

A. STANDARDIZED PLANT NAMES, 1942 Edition, American Joint Committee on Horticultural Nomenclature.

B. AMERICAN STANDARD FOR NURSERY STOCK, Z 60.1, latest edition, American Association of Nurserymen.

C. New Hampshire Standard Specifications - Latest edition of the Standard Specifications for Highways, Bridges and Waterways, The State of New Hampshire, Department of Transportation.

D. Standards of the Association of Official Agriculture Chemists regarding soil analysis.

E. United States Department of Agriculture – 'Soil Classification System'.

1.03 SUBMITTALS

A. Inspection certificates for plant materials, as required by governmental agencies, shall be submitted to the Engineer.

B. Samples and manufacturer's product data, as applicable, shall be submitted for the following materials:

1. Prepared planting mix.

2. Commercial Fertilizer.

3. Agricultural Limestone.

4. Sphagnum Peat Moss.

5. Humus.

6. Organic Compost.

7. Mulch.

8. Zinc Planters.

9. Stakes.

10. Flexible Nylon Braided Webbing.

1.04 SOILS TESTING

A. Loam Borrow

1. Representative samples of loam borrow shall be sent to a testing laboratory for analysis. Test results with recommended treatments shall be submitted to the Engineer. Deficiencies in the loam and stockpiled topsoil shall be corrected by the Contractor as directed by the testing agency and shall include the use of soil additives listed below. The Contractor shall bear any and all costs for this analysis.

2. Mechanical and chemical (pH soluble salts) analysis shall be by a public extension service agency or a private certified testing lab in accordance with the current 'Standards' of the Association of Official Agriculture Chemists.

3. Soils test report shall be submitted at least one (1) month before any loaming is to be done. Soils tests shall include Nitrate Nitrogen, Ammonium Nitrogen, Phosphorous, Potassium, Calcium, Aluminum, Magnesium, Manganese, Ferric Iron, Sulfate, Soluble Salts (1:2 soil-water

ratio) and pH (1:1 soil water ratio), percent organic matter content, and mechanical gradation (sieve analysis) which shall be compared to the USDA Soil Classification System.

1.05 PERSONNEL QUALIFICATIONS

A. The planting shall be done by contractors regularly engaged in landscape construction work, specifically planting installation, and by skilled workers, trained and experienced in accepted horticultural/nursery practices. The work shall be done under the supervision of a qualified planting foreman. Plant installer shall have a minimum of three (3) years of experience in the landscape contracting profession and be able to provide references to the Owner of past related project work.

1.06 PLANTING SEASON

A. Deciduous plants shall be planted only when dormant, either prior to bud break, before leaves appear in the spring, or subsequent to their loss in the fall, unless otherwise directed by the Owner's Representative.

B. Plants may be planted either in the spring until new growth appears or at any time between September 15 and November 30.

C. If the construction completion date prohibits in-season planting, the Contractor shall complete his work within the project date and prepare himself for out-of-season planting, including application of anti-transpirant and extra water. Plant guarantee periods remain as stated below. Frozen ground planting shall not be permitted.

1.07 TRANSPORTATION, DELIVERY, STORAGE AND HANDLING

A. Each plant shall be handled and packed in the approved manner for that species or variety and all necessary precautions shall be taken to insure that the plants arrive on-site in proper condition for successful growth. Trucks used for transporting plants shall be equipped with covers to protect plants from windburn during transport.

B. No plants shall be transported to the planting site that are not thoroughly wet through the ball of earth surrounding the roots. Any plants that are dry or in a wilted condition when delivered to the site will not be accepted and shall be replaced by the Contractor at his expense.

C. Plants shall be delivered only after preparations for planting have been completed. They shall be planted immediately upon arrival to the site. If planting is delayed more than six (6) hours after delivery, plants shall be heeled in, protected from sun,

wind, weather and mechanical damage, and kept watered.

D. Packaged materials shall be delivered to the site in original unopened packaging showing weight, analysis and the name of the manufacturer.

PART II – MATERIALS

2.01 LOAM BORROW

A. Loam shall be of a uniform composition throughout without admixture of subsoil, and shall be clean and reasonably free from clay, lumps, stones, roots two (2) inches or more in diameter, or other similar substances. Loam shall not contain toxic substances harmful to plant growth. It shall be free of weeds, weed seeds and debris, or other objects that might hinder planting operations.

B. Loam shall have a pH value range between 5.0 and 7.0. If the soil does not fall within the pH range specified, it may be amended to bring it within the specified limit.

C. Loam shall not contain less than four percent (4%) nor more than twenty percent (20%) organic matter, as determined by the loss ignition of samples oven-dried at a constant weight at a temperature of 230°F, ± 9°F.

D. Loam shall not be worked, excavated or delivered while in a frozen or muddy state.

2.02 PREPARED PLANTING MIX

A. The prepared planting soil mix for all plant bed areas shall consist of the following materials and quantities:

1. Seven (7) parts loam borrow.
2. One (1) part organic compost, humus, or peat borrow as specified in the NH Standard Spec
3. To this mixture add fertilizer and/or soil amendments in accordance with the recommendations of the soils testing laboratory.

2.03 SOIL AMENDMENTS

A. The Contractor shall be encouraged to use materials that are naturally occurring, derived from renewable resources, and non-toxic. Alternative materials and products shall be permitted provided that the specifications and application information are submitted to the Engineer for approval prior to use.

B. Limestone

1. Limestone shall be an approved agricultural limestone containing no less than fifty percent (50%) total carbonates and twenty-five percent (25%) total magnesium, with a neutralizing value of at least one-hundred percent (100%). The material shall be ground to such fineness that forty percent (40%) will pass through a No. 100 U.S. Standard Sieve and ninety-eight percent (98%) will pass through a No. 20 U.S. Standard Sieve. The lime shall be uniform in composition, dry, and free flowing, and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any lime that becomes caked or otherwise damaged, making it unsuitable for use, will be rejected.

C. Fertilizer

1. Commercial Fertilizer shall be a complete, standard product complying with State and Federal Fertilizer Laws. The fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Fertilizer shall contain the following minimum percentage of available plant nutrients by weight in which fifty percent (50%) minimum of the nitrogenous elements shall be derived from organic sources or Urea-form. The following fertilizer analysis shall be used for all tree and shrub plantings.

Nitrogen	Phosphorous	Potash
10%	10%	10%

2. As an option for tree plantings, a slow-release, root contact fertilizer packet, "Easy Grow" (16-8-16), or approved equal product complying with State and Federal Fertilizer Laws, may be used in place of the above, at the discretion of the Engineer.

D. Organic Compost

1. Compost shall be a standard commercial product comprised of fully decomposed, one hundred percent (100%) plant derived, natural organic matter. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Compost shall be free of sticks, stones, weed seeds, roots, mineral or other foreign matter and delivered air dry. It shall be free from excessive soluble salts, heavy metals, phytotoxic compounds, and/or substances harmful to plant growth and viability. Organic compost shall have an acidity range of 4.5

to 7.0 pH, as determined in accordance with the testing methods of the AOAC, latest edition.

E. Sphagnum Peat Moss

1. Sphagnum peat moss shall be a standard, commercial product. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Peat moss shall be free of sticks, stones, weeds or weed seeds, roots, mineral or other foreign matter. It shall be free from toxic substances and/or compounds harmful to plant growth and viability. It shall be delivered air dry in standard bales and shall have an acidity range of 3.5 to 5.5 pH, as determined in accordance with the testing methods of the AOAC, latest edition.

F. Humus

1. Humus shall be natural humus, reed peat, or sedge peat. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Humus shall be free of sticks, stones, weeds, roots, mineral or other foreign matter and/or toxic substances harmful to plant growth and viability. It shall be low in wood content, free from hard lumps and excessive amounts of zinc and delivered air dry in a shredded or granular form. According to the testing methods of the AOAC, latest edition, the acidity range shall be 5.5 to 7.5 pH, and the organic matter content shall be not less than eighty-five percent (85%), as determined by loss on ignition. The minimum water holding capacity shall be two hundred percent (200%) by weight on an oven-dry basis.

2.04 WATER

A. Water shall be is available at the site for use, but costs associated with use of the water shall be born solely by the contractor. Hose and other equipment required for application of water shall be furnished by the Contractor.

2.05 MULCH

A. Shredded softwood bark mulch shall be fibrous pliable slices, not exceeding one half (½) inch in width. It shall be ninety-eight percent (98%) organic matter with a pH range of 3.5 to 4.5 and a moisture content not to exceed thirty-five percent (35%). It shall be free of weeds, weed seeds, debris, phytotoxic compounds and materials harmful to plant growth and viability. Organic mulch shall be aged not longer than two (2) years.

B. Contractor to supply sample to Owner's Representative for approval. Dark, un-dyed, mulch color is preferred.

2.06 PLANT MATERIALS

A. Selection of Nursery Stock

1. At least twenty (20) days prior to the expected planting date, the Contractor shall request in writing, that the Engineer provide a representative to select and tag stock to be planted under this Section. This request shall be made ten (10) days prior to the date on which stock selections are to be made. The Contractor shall arrange for and bear the cost of transportation, meals in transit, and overnight accommodations, if necessary, for the Engineer's representative during the period of time required to select and tag the required number of sized stock.

2. The letter of request shall also have attached a letter of certification from the supplier attesting to the availability of the required plants in specified sizes prior to requesting the Engineer to make plant source inspections.

3. Plants shall be selected by the Engineer's representative at the place of growth for conformity to specification requirements as to quality, size and variety. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of work. Any material so rejected shall be removed from the site immediately. Costs of replacements will be borne by the Contractor.

4. All plants shall be legibly tagged with their proper latin name (i.e., genus, species and cultivar) and size. The Contractor shall supply the necessary tags or seals which shall be durable and capable of accepting weather-resistant ink or an embossed process. The tags or seals shall be attached directly and securely to each selected plant.

B. The Contractor shall furnish and plant all plants shown on the drawings, as specified, and in quantities and sizes as designated on the PLANT LIST. No substitutions will be permitted without approval.

C. All plants shall be grown in nurseries that have been inspected by the appropriate State agency and have complied with the regulations thereof. All plants shall comply with Federal and State Laws requiring inspection for plant diseases and pest infestations. Inspection certification, as required by law, shall accompany each shipment of plants, and certificates shall be submitted to the Engineer. The Contractor shall obtain clearance from the applicable Governing Agency, as

required by law, before planting any plants delivered from outside the state in which they are to be planted. Evidence that such clearance has been obtained shall be submitted to the Engineer.

D. All plants shall conform to the American Standard for Nursery Stock of the American Association of Nurserymen, publication Z60.1. All trees and shrubs shall be typical of their species or variety and shall have a normal habit of growth.

E. The root system of each plant shall be well provided with fibrous roots. All parts shall be sound, healthy, and vigorous, well branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs or larvae.

F. The Contractor shall take note that only plant stock grown specifically for hardiness in Zone 6a of the 2012 USDA Plant Hardiness Zone Map, will be accepted. The Contractor's suppliers must certify in writing that the stock has actually been grown under Zone 6a conditions and is hardy, or that the stock was asexually propagated from and grafted onto stock from a strain proven hardy to Zone 6a conditions. Trees and shrubs not so certified may not be accepted.

G. Balled and Burlapped Plants

1. All plants designated balled and burlapped or 'B & B' must be moved with the root systems as solid units with balls of earth firmly wrapped with biodegradable burlap and bound carefully with twine or cord. The diameter and depth of the balls of earth must be sufficient to encompass the fibrous root feeding system necessary for the healthy development of the plant. No plant shall be accepted when the ball of earth surrounding its roots has been badly cracked or broken preparatory to or during the process of planting, or after the burlap, staves, ropes or platform required in connection with its transplanting have been removed. The plants and root balls shall remain intact as a unit during all planting operations. All plants shall be freshly dug. No plants from cold storage or previously heeled-in will be accepted.

2. Soil characteristics (i.e., composition, texture, pH, etc.) of all field-grown balled and burlapped plants shall closely match that of the soil where plant materials are to be planted.

3. All balled and burlapped plants that cannot be planted at once must be heeled in, protected and watered

H. Container Grown Plants

1. All container grown plants shall be well established in the container in which they are sold and shall have been have acclimatized for at least one (1) growing season. Plants shall have a fibrous, healthy root system with sufficient roots to hold earth intact after removal from the container. Plants shall have no girdling roots and shall not be in a root bound condition. Plants shall remain in their container until planted.

2. Container plants shall not be broken up prior to installation unless approved by Landscape Architect, container plants must match planting schedule on Sheet PL-1 and installed one to one.

2.07 STAKING MATERIALS

A. Stakes for trees shall be wooden, as shown in the contract drawing details.

B. Flexible braided nylon webbing shall be 'Arbortie', or approved equal. Nylon webbing shall be three-quarters (¾) inch wide and have a tensile strength of nine hundred (900) pounds.

2.08 ANTITRANSPIRANTS

A. Antitranspirant shall be 'Wilt-Pruf', manufactured by Nursery Specialty Products, Inc., Groton Falls, New York, or approved equal. It shall be delivered in the manufacturer's containers and used in accordance with the manufacturer's instructions.

2.09 PESTICIDES

A. No pesticide shall be used on-site without the knowledge and prior approval of the Engineer. Pesticides shall be E.P.A. registered and approved for use in public open spaces. All pesticides shall be handled by State licensed operators only, delivered in the manufacturer's containers, and used in accordance with the manufacturer's instructions.

2.11 HERBICIDES

A. Herbicide shall be glyphosate contact, 'Roundup', manufactured by Monsanto, Inc., or approved equal. It shall be delivered in the manufacturer's containers, and used in accordance with the manufacturer's instructions.

PART III – EXECUTION

3.01 PLANT LOCATIONS

A. All plant locations and outlines for planting beds shall be staked out on the ground and approved by the Engineer before any excavation is begun. If it is necessary to adjust any of the locations, because of unforeseen problems, the changes shall be under the direction of the Engineer and there shall be no extra charges for these adjustments.

3.02 PLANTING HOLE EXCAVATIONS

A. Planting holes for shrubs shall be at least one (1) foot greater in diameter than the root ball. Planting holes shall not be deeper than the height of the root ball. The walls of the hole shall be sloped, wider at the top than at the bottom, and shall be scarified to eliminate glazing.

3.03 PLANTING TREES, SHRUBS AND GROUNDCOVERS

A. All ties, tags, rope, twine and/or other materials that would potentially girdle plant stems, trunks or branches shall be removed prior to planting.

B. Plants shall be moved being lifted by their root ball masses and shall be set to the lines and grades as shown in the contract drawings. All trees and shrubs shall be faced properly, plumbed straight and planted at the center of the planting pits, at the same level as they had been previously grown. Owner's Representative shall inspect final resting height and exposed trunk flare of all trees and shrubs prior to backfilling planting pits. Contractor shall make any necessary adjustments to meet approval of Owner's Representative.

C. Balled and Burlapped Trees and Shrubs

1. Root ball masses of balled and burlapped (B&B) plants shall not be disturbed, loosened, broken or otherwise damaged during planting operations. All tying materials, twine and ropes shall be cut off and removed. Biodegradable burlap shall be laid back and/or cut away from the top half of the ball. No burlap shall be pulled out from under the ball. Any and all non-biodegradable materials, synthetic and/or treated burlap, shall be entirely removed prior to planting. If a wire basket is present, the upper two-thirds (2/3) of the metal basket shall be cut away and removed. Do not remove the entire basket.

D. Container Grown Plants

1. Container plants shall be removed from the grow container before planting. If roots are densely matted, the outer root mass shall be scored, sliced vertically with a sharp knife to separate roots.

E. Groundcover Planting

1. All groundcover plants shall be evenly spaced to produce a uniform effect, and staggered in rows at intervals detailed in the contract drawings. Groundcover plants shall not be installed individually, but per container or as instructed by Landscape Architect. Landscape Architect shall inspect all groundcover layout prior to planting.

F. Planting pits shall be backfilled with the existing, unamended soil removed from the hole, or prepared soil mix, as specified in the contract drawings, in layers not to exceed eight (8) inches. Each layer is to be tamped firmly and watered to sufficiently settle the backfilled soil. When the pit is approximately two-thirds (2/3) backfilled, water deeply and thoroughly, allowing it to drain through undisturbed. Continue backfilling and tamping in eight (8) inch layers until soil is at the level at which the plant was formerly grown. Water thoroughly and adjust soil level.

G. At the time of planting, during backfill, install fertilizer at a depth of six (6) to eight (8) inches, equally spaced around the plant. Packets and/or granular applications shall be placed approximately three (3) inches away from the plant roots or root ball. Packets shall not be cut, ripped or otherwise damaged. If it becomes necessary to remove and replace dead or unhealthy plants, any damaged or broken packets shall be replaced.

1. The Contractor shall follow the manufacturer's recommendation for fertilizer packets or granular applications to trees and shrubs.

H. The planting mixture shall be spread around the plant to form a temporary saucer, a minimum of three (3) inches deep and equal to the diameter of the planting hole. On slopes, a ridge of soil shall be formed on the downhill side to catch and hold water. Saucers shall not be formed around individual plants in planting beds.

I. After all planting and watering, soil in planting beds shall be cultivated and raked smooth to eliminate compaction between the planting pits.

J. All plants shall be flooded with water twice within the first twenty-four (24) hours from the time of planting.

K. Immediately after planting operations are complete, all tree saucers and plant beds shall be covered with an approved mulch to a depth of no less than three (3) inches. Mulch shall not contact tree trunk bark, nor cover the root flare. No mulch shall be applied prior to the first watering.

L. All thin barked, deciduous, non-evergreen trees shall be wrapped immediately after they are planted and before they are staked. Tree trunks shall wrapped spirally from the bottom to the top with the specified wrapping material and secured. The wrapping shall overlap and completely cover the trunk from the ground to the height of the first branch and shall be neat and snug. Overlap shall be approximately two (2) inches. Wrapping shall be tied securely in place with jute twine.

M. All trees shall be staked or guyed, in accordance with standard practice. Care shall be taken to ensure that the stakes do not pierce the root ball mass and that stakes and guying will not create pedestrian or vehicular hazards. Tree trunks shall be secured at one-third (1/3) the height of the tree with wire with hose and adjustable buckle, fastened to staking apparatus, and shall be approved by owner's representative. The Contractor shall remove all staking apparatus, stakes, and guys after one (1) growing season.

N. Immediately after planting and staking, spray all plant material with an approved antitranspirant, applied in strict accordance with the manufacturer's recommendations.

3.04 PRUNING NEW PLANTS

A. Trees and shrubs shall be pruned in accordance with American Association of Nurserymen Standards to preserve the natural character of the plant.

B. Trees shall be pruned only after the plant has been completely planted. All large pruning cuts, one-half (½) inch diameter and larger, shall be made along the bark branch ridge. Pruning cuts shall not be made to breach or otherwise interfere with the branch collar. All pruning cuts less than one-quarter (¼) inch diameter shall be made with a sharp pair of hand pruners as close to the main stem as possible without damaging the cambium or bud.

C. All dead or dying limps and tips, sucker growth, water sprouts, crossing or rubbing branches, broken or damaged branches, and/or diseased or insect infested limbs shall be removed. Questionable weak limb and branch removal that may disfigure the tree should be left for final approval by the Engineer.

D. Never cut the tree leader.

E. Any and all pruning shall be done with clean, sharp tools.

F. Tree paint shall not be used to cover pruning cuts.

3.07 MAINTENANCE

A. Maintenance shall begin immediately after each plant is planted and shall continue until final acceptance of the project.

B. Maintenance shall consist of keeping plants in a healthy viable growing condition. Plants shall be watered, mulched, weeded, pruned, sprayed, fertilized, cultivated, and otherwise maintained and protected. Settled plants shall be reset to proper grade and position, planting saucer restored and dead material removed. Stakes and guys shall be tightened and repaired. Defective work shall be corrected as soon as possible after it becomes apparent and weather and season permit.

C. Planting beds and individual plant pits shall be kept free of weeds. Mulch shall be replaced as required to maintain a three (3) inch depth. Beds and individual pits shall be neat in appearance and maintained to the original laid out lines.

D. Planting areas that have been compacted for any reason during planting operations and/or the maintenance period, shall be recultivated by the Contractor, at his expense.

E. Application of pesticides shall be included during the maintenance period, as required, with approved materials, at clearly announced and safe hours, by a State licensed pesticide operator.

F. Sidewalks and other paved areas shall be kept clean during planting and maintenance operations.

G. Upon completion of planting, excess soil and debris shall be removed from the site, and all damage resulting from planting operations shall be repaired.

H. Planting areas and plants shall be protected against trespassing and damage of any kind for the duration of the maintenance period. This shall include the provisions and installation of approved temporary fencing if necessary. If any plants become damaged during the maintenance period, they shall be treated or replaced as directed by the Engineer, at no additional cost to the Owner.

3.08 GUARANTEE

A. All plant materials shall be guaranteed for a period of one (1) year after the completion of the specified maintenance period and the date of final acceptance of the entire project, in writing from the Landscape Architect. All trees over a 3" caliper at installation shall be guaranteed for a period of 1 year from date of final acceptance. Plants shall exhibit satisfactory growth and have no less than seventy-five percent (75%) of their branches alive at the end of the guarantee period. If the leader of any single-leader species is dead, the entire plant shall be considered dead.

B. All replacements shall be plants of the same kind and size specified on the PLANT LIST. They shall be furnished and planted as specified above. The cost shall be borne by the Contractor. Replacements resulting from the removal, loss or damage, vandalism or acts of neglect on the part of others, physical damage by animals, vehicles, etc., and losses due to curtailment of water by local authorities, will be approved and paid for by the Owner.

C. At the end of the guarantee period, inspection will be made again. Any plant required under this Contract that is dead or unsatisfactory shall be removed from the site. These shall be replaced during the normal planting season, until the plants live through one (1) year.

- - - END OF SECTION - - -

Special Provision

To Section 661 and 680 (NHDOT Standard Specifications)

Amend Section 661.16, 661.17 and 680 to include:

661.16, 661.17 and 680
SITE FURNISHINGS

GENERAL

1.01 RELATED DOCUMENTS

A. The General Documents, as listed in the Table of Contents, and applicable parts of Division 1, General Requirements shall be included in and made a part of this Section.

B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this trade.

1.02 SCOPE OF WORK

A. The work of this Section consist of all site improvements and related items as indicated on the Drawings and/or as specified herein and includes, but is not limited to, the following:

1. Picnic Tables
2. Bike Racks
3. Aluminum Bleachers
4. Trash & Recycling Receptacle

1.03 EXAMINATION OF CONDITIONS

A. The Contractor shall fully inform himself of existing conditions of the site before submitting his bid, and shall be fully responsible for carrying out all site work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed.

B. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct to the best of the Landscape Architect's knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found therein.

1.04 SCHEDULING

A. The Contractor shall submit to the Landscape Architect, for approval by the Owner, a progress schedule for all work as specified herein.

1.05 QUALITY ASSURANCE

A. Materials and methods of construction shall comply with the following standards:

1. ASTM: American Society for Testing and Materials
2. ANSI: American National Standards Institute
3. FS: Federal Specifications
4. IMI: International Masonry Institute
5. PCA: Portland Cement Association

B. Qualifications of Workers: Use adequate numbers of skilled workers who are trained in the necessary crafts and who are completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.

C. Layout: After staking out the work, and before beginning final construction, obtain the Landscape Architect's approval for layout. Contractor shall make adjustments as determined by the Landscape Architect. Landscape Architect may make adjustments to layout as is required to meet existing and proposed conditions without additional cost to the contract price.

1.06 SUBMITTALS

A. Shop Drawings: Submit shop drawings in accordance with Division 1 requirements.

1. Picnic Tables
2. Bike Racks
3. Aluminum Bleachers
4. Trash & Recycling Receptacle

B. Product Information: Provide manufacturer's data showing installation and limitations in use. Supply Certificates of Compliance for all materials required for fabrication and installation, certifying that each material item complies with, or exceeds, specific requirements. Work includes but is not limited to:

1. Picnic Tables
2. Bike Racks

3. Aluminum Bleachers
4. Trash & Recycling Receptacle

PART 2 - PRODUCTS

2.01 PICNIC TABLES

A. Picnic tables shall be Arbor Table model by www.timberform.com Model No. 2244-6 or approved equal to be installed in concrete footings embedded / direct bury. Surface mounting will not be accepted.

2.02 BIKE RACKS

A. The bike racks shall be manufactured by Bike Security Racks Co. 12 Sawyer Loop, Wentworth, NH 03282 To order, call (800) 545-2757 or (617) 876-1180.

Contractor shall order and install bike racks to meet the following specifications:

1. The racks will be Model BA-2B (AE).

2.04 BLEACHERS

A. Bleachers shall be GT Grandstands by UltraPlay of Plant City, Florida or approved equal. New bleachers shall provide at least as much seating capacity as existing bleachers in both locations. Bleachers shall be commercial grade and fabricated out of aluminum with side picket guard rails. Bleachers shall be installed on site to ensure adjacent HC seating on pavement.

2.05 TRASH & RECYCLING RECEPTACLES

A. Trash and recycling receptacles shall be TR-22 Custom Multi-Cycle with Rain Shield by Fair Weather SF in Port Orchard, WA or approved equal. Receptacles shall be power coated in standard color to be selected by Owner.

2.06 TREE GRATES

A. Tree grates shall be Model 4848 Sunrise as made by Ironsmith in Palm Desert, CA or approved equal. Grates shall be 48” x 48” in two sections. ½” maximum slot opening for ADA compliance. Cast from 100% recycled iron, aluminum or bronze. Finish shall be black dip enamel paint. Grates shall have ¼” thick grinding pads for leveling.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The installer shall examine previous work, related work, and conditions under which this work is to be performed and notify the Contractor in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means installer accepts substrates, subgrades, previous work, and conditions.

3.02 SITE FURNSHINGS

A. Install each site furnishing in accordance with the Drawings and the manufacturer's instructions.

A. The Contractor shall be responsible for timing the delivery of site furnishings so as to minimize on-site storage time prior to installation. All stored materials must be protected from weather, careless handling and vandalism.

B. Installation Tolerances: Install bicycle racks to comply with the following maximum tolerances:

a. Location: Plus or minus 1/2 inch.

b. Height: Plus or minus 1/4 inch.

c. Alignment of Adjacent Units: Plus or minus 1/2 inch in ten feet; 1 inch over total length.

d. Plumb: Plus or minus 1/4 inch.

e. Level: Plus or minus 1/4 inch.

- - - END OF SECTION - - -

Special Provision

To Section 740 (NHDOT Standard Specifications)

Amend Section 740 to include:

Section 740.0
PLAY EQUIPMENT

GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment and transportation required to furnish and install the play equipment as located, described and set forth in the contract plans, specifications and details and in accordance with manufacturer's requirements and recommendations, and as specified herein.

1.02 REFERENCE STANDARDS AND SPECIFICATIONS

A. Playground equipment design, layout, and installation shall comply with the following standards and guidelines as applicable.

1. CPSC - Consumer Product Safety Commission Guidelines for Playground Safety, latest edition.

2. ASTM - American Society for Testing and Materials, Designation: F 1487, Standard Consumer Safety Performance Specification for Playground Equipment for Public Use, latest edition.

3. ANSI - American National Standards Institute.

4. AASHTO - American Association of State Highway and Transportation Officials (tests of specifications).

5. NH Standard Specs. - Latest edition of the Standard Specifications for Highways, Bridges and Waterways, the State of New Hampshire, Department of Public Works, hereinafter referred to as "the New Hampshire Standard Specifications".

B. Requirements not specifically set forth herein, but required by the agencies listed in above shall be understood to be a requirement of this contract since these standards of quality and safety are established as the industry standard(s). Any conflicts between the agency standards and the contract documents shall be brought to the attention of the Engineer, and unless otherwise directed in writing, the agency standards shall be the minimum requirement to be followed.

1.03 SHOP DRAWINGS

A. Prior to ordering, furnishing and/or installing the play equipment as required by the Contract Documents, the following shall be submitted to the Project Representative for review and approval:

1. Certified product data, shop and fabrication drawings showing all important details of construction and dimensions showing the equipment, arrangement, footing spacing and lengths. Shop drawings shall stipulate and certify to compliance with all CPSC and ASTM standards and guidelines as applicable.

2. Descriptive literature and technical specifications for all play equipment installations.

3. Warranty certificates for all applicable play equipment features, components, hardware, finishes and other applicable items.

4. In the event that it is impossible to conform to certain details of this specification due to differing manufacturing techniques or conventions, submit complete summary of all non-compliant components or elements.

1.04 SAMPLES

A. Submit the following samples in accordance with the provisions of the GENERAL CONDITIONS.

1. Submit samples and descriptive literature of all items specified in this Section, including treatments, finishes, colors, and test information.
2. Touch up Paint samples.
3. Power Washing of various intensities shall be sampled and approved.

1.05 QUALIFICATIONS

A. Installer shall have a minimum of five (5) years experience with a minimum of fifteen (15) playground installations. References will be required.

PART II - MATERIALS

2.01 PLAY EQUIPMENT

Playground Equipment Summary for Playground

Equipment to be Landscape Structures or equal
www.playlsi.com

Catalog location (See links to spec sheets or catalog page number references below)
http://www.playlsi.com/Virtual-Catalog/Pages/Virtual-Catalog.aspx

Please Note: EACH PRODUCT HAS MINIMUM SPACING REQUIREMENTS FOR FALL ZONES ETC., A CERTIFIED PLAYGROUND SAFETY INSPECTOR WILL NEED TO CONFIRM FALL ZONES PRIOR TO AND AFTER INSTALLATION.

O'BRIEN & SONS AREA CONSULTANT (WITH QUESTIONS REGARDING EQUIPMENT, FALL ZONES, DELIVERY TIMES ETC.):

John Taylor, ASLA/CPSI/kh
John_Taylor@obrienandsons.com

93F West Street
P.O. Box 650
Medfield, MA 02052
Tel. 508/359-4200
Fax 508/359-2817

All equipment to be purchased, delivered, and installed. Installation to be certified by CPSI.

Note: Contractor should request custom baseball image connector balls for both play structures (Evos & Weevos).

1. Climbing Structure, direct bury, composed of the following components:
    a. WEEVOS Mainstructure with 2 Archs #164343
    b. Cozy Coaster Slide with ASTM Handrail #164174
    http://www.playlsi.com/Explore-Products/Product-Lines/Outdoor-Playsystems/Weevos/Slides/Cozy-Coaster-Slide/Pages/Cozy-Coaster-Slide.aspx
    c. Wee Pod Climber # 164172
    http://www.playlsi.com/Explore-Products/Product-Lines/Outdoor-Playsystems/Weevos/Climbers/Wee-Pod-Climber/Pages/Wee-Pod-Climber.aspx
    d. Swiggly Stix #173575
    http://www.playlsi.com/Explore-Products/Product-Lines/Outdoor-Playsystems/Weevos/Bridges/Swiggly-Stix-Bridge/Pages/Swiggly-Stix-Bridge.aspx
    e. Imagination Panel "Imagination Table" #173582
    http://www.playlsi.com/Explore-Products/Product-Lines/Outdoor-Playsystems/Weevos/More-Fun/Imagination-Table/Pages/Imagination-Table.aspx

2. Climbing Structure "Hemisphere Climber", direct bury, composed of the following components:
    a. Evos 1 Arch with 3 Attach Points #171627
    b. Hemisphere Climber #156447
    http://www.playlsi.com/Explore-Products/Product-Lines/Outdoor-Playsystems/Evos/Playground-Climbers/Hemisphere-Climber/Pages/Hemisphere-Playground-Climber-Frames.aspx
    c. Podstomper #156464
    http://www.playlsi.com/Explore-Products/Product-Lines/Outdoor-

Playsystems/Evos/Playground-Bridges/PodStomper/Pages/Playground-Bridge.aspx

d. Ringtangle #156462
http://www.playlsi.com/Explore-Products/Product-Lines/Outdoor-Playsystems/Evos/Playground-Climbers/RingTangle/Pages/Playground-Ladder-Climber.aspx

e. Overhead Trekker #160254
http://www.playlsi.com/Explore-Products/Product-Lines/Outdoor-Playsystems/Evos/Overhead-Events/Overhead-Trekker/Pages/Playground-Ladder.aspx

3. Independent Play Structure: Omnispin spinner, surface mount, #173591
http://www.playlsi.com/Explore-Products/Product-Lines/Freestanding-Components/Kids-In-Motion/OmniSpin-Spinner/Pages/OmniSpin-Spinner.aspx

4. Independent Play Structure: Double Bobble Spring Rider, direct bury, Product # 164075
http://www.playlsi.com/Explore-Products/Product-Lines/Freestanding-Components/Kids-In-Motion/Playground-Bobble-Rider/Pages/Bobble-Rider.aspx

5. Independent Play Structure: Single Bobble Spring Rider, direct bury, Product # 164074
http://www.playlsi.com/Explore-Products/Product-Lines/Freestanding-Components/Kids-In-Motion/Playground-Bobble-Rider/Pages/Bobble-Rider.aspx

New swing set, 8’ beam height, with four swings: Combination of Single Post Swing #177332 (direct bury) with Two (2) belt swings with Proguard chains #174018, AND Single Post Swing Additional Bay #177333 (direct bury) with Two (2) Full Bucket Seats and Proguard Chains #176038.
SINGLE POST SWING FRAMES: http://www.playlsi.com/Explore-Products/Product-Lines/Freestanding-Components/Playground-Swings/Single-Post-Swings/Pages/Single-Post-Playground-Swing.aspx
BELT SWINGS: http://www.playlsi.com/Explore-Products/Product-Lines/Freestanding-Components/Playground-Swing-Seats/Rubber-Swing-Seat/Pages/Rubber-Swing-Seat.aspx
FULL BUCKET SWING SEAT: http://www.playlsi.com/Explore-Products/Product-Lines/Freestanding-Components/Playground-Swing-Seats/Full-Bucket-Seat/Pages/Full-Bucket-Seat.aspx

2.03 CAST IN PLACE CONCRETE

A. Concrete for the footings will be cast in place cement concrete as specified in the Specifications. Top of concrete footings shall be twelve (12) inches minimum below finished grade.

PART III - EXECUTION

3.01 The Contractor shall assemble the specified equipment under the supervision of an approved Supervisor according to the manufacturer's instructions, the contract drawings and these Specifications.

3.02 The Contractor shall locate the structures to the lines and grades specified in the drawings in these Specifications and according to the specifications of the manufacturer of the equipment. Adjust all equipment to suit site gradients; no sloping platforms, tracks, or members intended to be horizontal shall be accepted.

3.03 The excavation for the footings shall be done as specified in these Specifications and according to the Contract Drawing details.

3.04 The equipment shall be located and brought to the heights as shown in the drawings and as recommended by the manufacturer with vertical and horizontal members set plumb and then braced to be held in place.

3.05 The concrete shall be poured around the supporting pieces of the equipment to the grades detailed. Slope tops of footings to drain; set bottom of vertical members into gravel base to ensure drainage; do not encase bottom in concrete.

3.06 After the specified cure period of the concrete has passed the bracing may be removed.

3.07 The fills and surfaces shall then be placed and brought to the grades shown in the Contract Drawings.

3.08 All exiting play equipment to remain is to be power washed and touched-up with paint per the directions of ME O'Brien's local representative. Power washing techniques and pressures are to be approved by ME O'Brien prior to commencing work.

PART IV - GUARANTEE AND ACCEPTANCE/LIABILITY

4.01 All operating parts and structural elements of the play equipment and safety surface shall be guaranteed against failure or defect during normal use and operation for the entire warrantee period as established by the manufacturer.

4.02 Any defective elements shall be replaced in part or whole by the Contractor at no cost to the Owner.

4.03 The Contractor and the manufacturer shall hold the Owner and Engineer harmless from any and all damages or liability resulting from negligent acts and omissions on the part of the Contractor or manufacturer, or resulting from defective parts, or improperly

assembled equipment. Contractor shall provide secure storage for all equipment on job site.

4.04 The Contractor is responsible for securing a Certified Playground Safety Inspector to ensure ASTM and SPSC compliance. A certificate of compliance will be issued to the Owner prior to final inspection.

- - -END OF SECTION - - -

Special Provision

To Section 740 (NHDOT Standard Specifications)

Amend Section 740 to include:

Section 740.1
ALTERNATES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. All of the Contract Documents, including the General and Supplementary Conditions, apply to the work of this Section.

B. Carefully examine all the Contract Documents for requirements that affect the work of this Section. The exact scope of this Section cannot be determined without a thorough review of all specification sections and other Contract Documents.

1.02 SUMMARY

A. The Schedule of Alternates included in this Section lists all the Alternates that appear in the Contract Documents, and the Specification Sections, which are affected by each Alternate.

B. For each of the alternates scheduled at the end of this Section, state the amount in the proposal to be added to or deducted from the Contract Sum for the work.

C. Consult the individual Specification Sections for detailed requirements of each Alternate.

1.03 GENERAL INSTRUCTIONS

A. Each Bidder shall be held fully responsible for examining the scope of the Alternates generally defined herein and for recognizing any modifications to his work caused by any Alternate.

B. The Bid Alternate Price shall be complete cost, including overhead, profit, bonds, insurance, transportation, and all other costs connected with, or incidental to the

work described.

C. Alternates listed below in the Schedule of Alternates are listed in no particular order. The Contract will be awarded on the basis of the Base Bid only or the Base Bid plus Alternate 1, Base Bid plus Alternates 1 and 2, or Base Bid plus Alternates 1, 2 and 3 in any order the City deems in it's best interest.

1.04 ALTERNATES

A. Definition: "Alternates" are alternate products, materials, equipment, systems, methods, units of work or major elements of the construction, which may, at the Authority's option and under the terms established by the Contract or Agreement, be selected for the work in lieu of the corresponding requirements of the Contract Documents.

B. Alternate Requirements: A Schedule of Alternates is included at the end of this Section. Each alternate is defined using abbreviated language, recognizing that the Contract Documents define the requirements. Coordinate related work to ensure that work affected by each alternate is complete and properly interfaced with work of each selected alternate.

C. Provide written proposals for each alternate on the Bid Form for Authority's consideration. Each proposal amount shall include the entire cost of the alternate portion of the work including overhead, profit, and other costs including cost of interfacing and coordinating the alternate with related and adjacent work.

1.05 SCHEDULE OF ALTERNATES

A. Alternate No. 1 – Reinforced turf at overflow parking area

1. Work: Clear & Grub existing lawn area & replace with reinforced turf.

2. Refer to the following drawing for the work of Alternate No. 1:

a) D-1

B. Alternate No. 2 – Post & Rail fence around overflow parking.

1. Work: Furnish and Install fence materials as shown on contract drawings. Final layout to be approved by owner's representative in field prior to installation.

2. Refer to the following Specification Sections for the work of Alternate No. 2:

a) 607- Fences

C. Alternate No. 3 – Stonedust Path at Outfield Fence.

1. Work: Stonedust Path furnish and install materials as shown on contract drawings.

2. Refer to the following Specification Sections for the work of Alternate No. 3:

a) 740.20- Specialty Pavement

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

- - - END OF SECTION - - -

Special Provision
To Section 740 (NHDOT Standard Specifications)

Amend Section 740 to include:

Section 740.2
DUST CONTROL

1. General

A. This section of the specification covers the control of dust via calcium chloride and water, complete.

2. Calcium Chloride

A. Calcium chloride shall conform to the requirements of AASHTO-M 144, Type I or Type II and Specification for Calcium Chloride, ASTM D98. The calcium chloride shall be packaged in moisture proof bags or in airtight drums with the manufacturer, name of product, net weight, and percentage of calcium chloride guaranteed by the manufacturer legibly marked on each container.

B. Calcium chloride failing to meet the requirements of the aforementioned specifications or that which has become caked or sticky in shipment, may be rejected by the Engineer.

3. Water

A. Water shall not be brackish and shall be free from oil, acid, and injurious alkali or vegetable matter.

4. Application

A. Calcium chloride shall be applied when ordered by the Engineer and only in areas which will not be adversely affected by the application. See Section 740.3, ENVIRONMENTAL PROTECTION.

B. Calcium chloride shall be uniformly applied at the rate of 1-1/2 pounds per square yard or at any other rate as directed by the Engineer. Application shall be by means of a mechanical spreader, or other approved methods. The number and frequency of applications shall be determined by the Engineer.

C. Water may be sprinkler applied with equipment including a tank with gauge-equipped pressure pump and a nozzle-equipped spray bar.

D. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds per square inch, gauge pressure.

- - - END OF SECTION - - -

Special Provision

To Section 740 (NHDOT Standard Specifications)

Amend Section 740 to include:

Section 740.3
ENVIRONMENTAL PROTECTION

1. Description
2. Notification
3. Implementation
4. Area of Construction Activity
5. Protection of Water Resources
6. Protecting and Minimizing Exposed Areas
7. Location of Storage Areas
8. Protection of Landscape
9. Clearing and Grubbing
10. Discharge of Dewatering Operations
11. Dust Control
12. Separation and Replacement of Topsoil
13. Baled Hay or Straw
14. Silt Fence
15. Noise Control

1. Description

The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.

2. Notification

The ENGINEER will notify the CONTRACTOR in writing of any non-compliance with the foregoing provisions. The CONTRACTOR shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the CONTRACTOR or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the CONTRACTOR fails to act promptly, the ENGINEER may order stoppage of all or part of the work until satisfactory corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the CONTRACTOR as a

result of time lost due to any stop work orders shall be made unless it was later determined that the CONTRACTOR was in compliance.

3. Implementation

A. Prior to commencement of work, the CONTRACTOR shall meet with representatives of the ENGINEER to develop mutual understandings relative to compliance of the environmental protection program.

B. The CONTRACTOR shall submit for approval six sets of details and literature fully describing environmental protection methods to be employed in carrying out construction activities.

4. Area of Construction Activity

Insofar as possible, the CONTRACTOR shall confine his construction activities to those areas defined by the Contract Drawings and Specifications. All land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that, which existed prior to work under this contract. The CONTRACTOR shall keep access points into the site from Bartlett Street, Pine Street, and Meredith Way clear of debris, equipment and vehicles at all times for Fire Department or Emergency Respondent Personnel access. All Contractor vehicles to be parked on the job site at predetermined locations, which may be modified as necessary during project, by City representative and Department of Traffic and Parking.

5. Protection of Water Resources

A. The CONTRACTOR shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or other harmful materials. The CONTRACTOR shall also prevent the transport of soil, dirt, and salt to surface streams, wetlands, and/or catch basins. It is the CONTRACTOR 's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers and streams.

B. Special measures should be taken to insure against spillage of any pollutants into public waters, and run-off of demolition site sediments into stormwater collection systems. Measures shall include placement of haybales around catchbasins and along temporary construction fencing, as indicated on Drawing SP-1 – Demolition Plan.

6. Protecting and Minimizing Exposed Areas

A. The CONTRACTOR shall limit the area of land which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, temporary vegetation, mulching or other protective measures shall be provided as specified.

B. The CONTRACTOR shall take account of the conditions of the soil where temporary cover crop will be used to insure that materials used for temporary vegetation are adaptive to the sediment control. Materials to be used for temporary vegetation shall be approved by the ENGINEER.

7. Location of Storage Areas

A. The location of the CONTRACTOR 's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared as a part of this project, and shall require written approval of the ENGINEER. Plans showing storage facilities for equipment and materials shall be submitted for approval of the ENGINEER.

B. No excavated materials or materials used in backfill operations shall be deposited within a minimum distance of one hundred (100) feet of any watercourse or any drainage facility. Adequate measures for erosion and sediment control such as the placement of baled hay or straw around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation.

C. There shall be no storage of equipment or materials in areas designated on the Contract Drawings as the 100-foot wetlands buffer zone.

D. The ENGINEER may designate a particular area or areas where the CONTRACTOR may store materials used in his operations. Temporary storage trailers shall be installed at Contractor’s cost.

E. Storage areas in cross-country locations shall be restored to pre-construction conditions with the planting of native species of trees and shrubs.

8. Protection of Landscape

A. The CONTRACTOR shall not deface, injure, or destroy trees or shrubs nor remove or cut them without written authority from the OWNER. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized by the ENGINEER. Excavating machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees which are not to be removed, particularly overhanging branches and limbs. The CONTRACTOR shall, in any event, be responsible for any damage resulting from such use.

B. Branches, limbs, and roots shall not be cut except by permission of the ENGINEER. All cutting shall be smoothly and neatly done without splitting or crushing. When there is unavoidable injury to branches, limbs and trunks of trees, the injured portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.

C. Where, in the opinion of the ENGINEER, trees may possibly be defaced, bruised, injured, or otherwise damaged by the CONTRACTOR 's equipment or by his blasting or other operations, the ENGINEER may direct the CONTRACTOR to adequately protect such trees by placing boards, planks, poles or fencing around them. Any trees or landscape feature scarred or damaged by the CONTRACTOR 's equipment or operations shall be restored as nearly as possible to its original condition at the expense of the CONTRACTOR. The ENGINEER will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of under the provisions of Section 02230, CLEARING AND GRUBBING.

D. Cultivated hedges, shrubs, and plants which could be injured by the CONTRACTOR 's operations shall be protected by suitable means or shall be dug up, balled and temporarily replanted and maintained. After construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of a kind and quality at least equal to that existing at the start of the work.

9. Clearing and Grubbing

A. The Contractor shall clear and grub only on the Owner's land or the Owner's easements, and only the area required for demolition operations, as approved by the Engineer.

10. Discharge of Dewatering Operations

A. Any water that is pumped and discharged from the trench and/or excavation as part of the CONTRACTOR 's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.

B. Under no circumstances shall the CONTRACTOR discharge water to the areas designated as wetlands.

C. The pumped water shall be filtered through baled hay, a vegetative filter strip or a vegetated channel to trap sediment occurring as a result of the construction operations. The vegetated channel shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. Accumulated sediment shall be cleared from the channel periodically.

D. Water pumped or drained from excavations, water courses, or other structures encountered in the work shall be disposed of in strict compliance with pertinent federal, state and local environmental regulations. Any damage caused by or resulting from dewatering operations shall be the sole responsibility of the CONTRACTOR.

11. Dust Control

A. During the progress of the work, the CONTRACTOR shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, to minimize creation and dispersion of dust. If the ENGINEER decides it is necessary to use calcium chloride for more effective dust control, the CONTRACTOR shall furnish and spread the material, as directed. Calcium chloride shall be as specified under Section 740.2, DUST CONTROL. Dust control requirements shall be strictly enforced by the City

12. Separation and Replacement of Topsoil

Topsoil shall be carefully removed from cross-country areas where excavations are to be made, and separately stored to be used again as directed. The topsoil shall be stored in an area acceptable to the ENGINEER and adequate measures shall be employed to prevent erosion of said material.

13. Baled Hay or Straw

To trap sediment and to prevent sediment from clogging drainage systems, baled hay or straw shall be used where stormwater runs off the site. Care shall be taken to keep the bales from breaking apart. The bales should be securely staked to prevent overturning, flotation, or displacement. All deposited sediment shall be removed periodically.

14. Silt Fence

A. Where indicated on the drawings or where directed by the ENGINEER, the CONTRACTOR shall erect and maintain a temporary silt fence. In areas designated as wetlands, the CONTRACTOR shall line the limits of the construction easement with a silt fence. The silt fence shall be used specifically to contain sediment from runoff water and to minimize environmental damage caused by construction.

B. The silt fence shall consist of a 3-foot wide continuous length sediment control fabric, stitched to a 22-foot wide, continuous length support netting, and stapled to preweathered oak posts installed as shown on the drawings. The oak posts shall be 1½-inches by 1½-inches (Minimum Dimension) by 48 inches and shall be tapered. The support netting shall be industrial strength polypropylene. The bottom edge of the sediment control fabric shall be buried as shown on the drawings. The sediment control fabric shall conform to the following properties:

Property	Value	Test Method
1. Grab Strength (lbs.)	124	ASTM D-4632
2. Elongation (%)	15%	ASTM D-4632
3. Puncture Strength (lbs.)	65	ASTM D-4833
4. Burst Strength (psi)	300	ASTM D-3786
5. Trapezoid Tear (lbs.)	60	ASTM D-4533
6. Equivalent Opening Size (U.S. Sieve)	No. 30	ASTM D-4571
7. Permittivity (sec^{-1})	0.10	ASTM D-4491
8. Water Flow Rate (gal/min/sf.)	10	ASTM D-4491
9. UV Resistance (%)	70	ASTM D-4355

C. The silt fence shall be Mirafi Envirofence manufactured by Mirafi, Inc. or approved equal.

15. Noise Control

A. The Contractor shall adhere to the City ordinances for Noise Control, (Article VII, Division 2), throughout the construction period. Noise control will be strictly enforced by the City.

B. No construction shall occur between 7pm-7am Monday through Saturday, or any time on Sunday. Any exemption to prohibited construction hours must be authorized by a City representative.

C. Contractor shall not permit engine idling on the job site. This shall be enforced through random, unannounced periodic inspections by City Officials.

- - END OF SECTION - - -

Special Provision

To Section 740 (NHDOT Standard Specifications)

Amend Section 740 to include:

Section 740.20
CONCRETE PAVER UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete pavers

B. Bedding and void opening aggregates

C. Aggregate Base

D. Edge Restraints

1.02 RELATED SECTIONS

A. Not used.

1.03 REFERENCES

A. American Society of Testing and Materials (ASTM) (latest edition):

1. C 33 Specification for Concrete Aggregates

2. C 136 Method for Sieve Analysis for Fine and Coarse Aggregate.

3. C 140 Sampling and Testing Concrete Masonry Units.

4. C 144 Standard Specifications for Aggregate for Masonry Mortar.

5. C 936 Specifications for Solid Interlocking Concrete Paving Units.

6. C 979 Specification for Pigments for Integrally Colored Concrete.

7. D 698 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5 lb (24.4 N) Rammer and 12 in. (305 mm) drop.

8. D 1557 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb (44.5 N) Rammer and 18 in. (457 mm) drop.

9. D 2940 Graded Aggregate Material for Bases or Subbases for Highways or Airports.

10. C 29 Bulk Density and Voids in Aggregate Materials.

1.04 QUALITY ASSURANCE

A. Installation shall be by a contractor and crew with at least one year of experience implacing permeable concrete pavers on projects of similar size.

B. The Contractor shall conform to all local, state/provincial licensing and bonding requirements.

1.05 SUBMITTALS

A. Shop or product drawings and product data shall be submitted.

B. Full size samples of permeable concrete paving units shall be submitted in **Eco-Priora in the Large Square (9.36”x9.36”x3.12”) color: Winter Marvel** or approved equal.

C. Sieve analysis for grading of bedding and joint opening aggregates shall be submitted.

D. Test results shall be submitted from an independent testing laboratory for compliance of paving unit requirements to ASTM C 936 or other applicable requirements.

E. The layout, pattern, and relationship of paving joints to fixtures and project formed details shall be indicated.

1.06 MOCK-UPS

A. A 9 ft. x 9 ft. (2.5m x 2.5m) paver area shall be installed as described in Article 3.02.

B. This area will be used to determine joint sizes, lines, laying pattern(s), color(s), and texture of the project.

C. This area shall be the standard from which the work will be judged.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Concrete pavers shall be delivered to the site in steel banded, plastic banded, or plastic wrapped cubes capable of transfer by fork lift or clamp lift. The pavers shall be unloaded at the job site in such a manner that no damage occurs to the product.

B. Delivery and paving schedules shall be coordinated in order to minimize interference with normal use of buildings adjacent to paving.

1.08 ENVIRONMENTAL CONDITIONS

A. Do not install bedding aggregates or pavers during heavy rain or snowfall.

B. Do not install bedding aggregates and pavers over frozen base materials.

C. Do not install frozen bedding aggregates.

PART 2 MATERIALS

2.01 CONCRETE PAVERS

A. Supplied by:
Unilock® or approved equal
Product name(s)/shape(s), color(s), overall dimensions, and thickness of the permeable paver(s) specified as follows:

Product name:	Eco-Prioria Permeable Pavers
Product shape(s):	Large Square (9.36”x9.36”x3.12”)
Product color(s),	Winter Marvel

Permeable Concrete pavers must have spacer bars on each unit. These spacer bars insure a precise joint spacing between all paving stones. The spacer bars permit the use of mechanical installation equipment for a mechanized installation process.

B. Pavers shall meet the minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units.

1. Average compressive strength 8000 psi (55MPa) with no individual unit under 7,200 psi (50 MPa).

2. Average absorption of 5% with no unit greater than 7% when tested according to ASTM C 140.

3. Resistance to 50 freeze-thaw cycles, when tested according to ASTM C 67, with no breakage greater than 1.0% loss in dry weight of any individual unit. This test method shall be conducted not more than 12 months prior to delivery of units.

C. Maximum allows breakage of product is 5%.

2.02 GRANULAR SUBBASE

A. The granular subbase material shall consist of granular material graded in accordance with ASTM D 2940. The subbase thickness and specific aggregate gradation shall be determined by the Designing Engineer.

2.03 GRANULAR BASE

A. The granular base material shall be crushed stone conforming to ASTM C 33 No 57, as presented in Table 1. The granular base thickness and specific aggregate gradation shall be determined by the Designing Engineer.

TABLE 1
GRANULAR BASE
GRADING REQUIREMENTS

ASTM C 33 No 57	
Sieve Size	**Percent Passing**
1 ½ in (37.5 mm)	100
1 in (25 mm)	95 to 100
½ in (12.5 mm)	25 to 60
No. 4 (4.75 mm)	0 to 10
No. 8 (2.36 mm)	0 to 5

2.04 BEDDING AND VOID OPENING AGGREGATES

A. The granular bedding material shall be graded in accordance with the requirements of ASTM D 33 No 8. The typical bedding thickness is between 1 ½ & 2 inches and the specific aggregate gradation shall be determined by the Designing Engineer.

Note: Aggregate materials used in the construction of permeable pavements shall be clean, have zero plasticity and contain no No. 200 sieve size materials. The aggregate materials must serve as the structural load bearing platform of the

pavement as well as a temporary receptor for the infiltrated water that is collected through the openings in the pavement's surface.

B. The bedding and void opening aggregate shall conform to the grading requirements of ASTM C 33 No 8 as shown in Table 2.

TABLE 2
BEDDING AND VOID OPENING AGREGATE
GRADING REQUIREMENTS

ASTM C 33 No 8	
Sieve Size	**Percent Passing**
½ in (12.5 mm)	100
3/8 in (9.5 mm)	85 to 100
No. 4 (4.75 mm)	10 to 30
No. 8 (2.36 mm)	0 to 10
No. 16 (1.18 mm)	0 to 5

2.05 EDGE RESTRAINTS

A. The provision of suitable edge restraints is critical to the satisfactory performance of interlocking concrete block pavement. The pavers must abut tightly against the restraints to prevent rotation under load and any consequent spreading of joints. The restraints must be sufficiently stable that, in addition to providing suitable edge support for the paver units, they are able to withstand the impact of temperature changes, vehicular traffic and/or snow removal equipment.
Curbs, gutters or curbed gutter, constructed to the dimensions of municipal standards (noting that these standards generally refer to cast-in-place concrete sections), are considered to be acceptable edge restraints for heavy duty installations. Where extremely heavy industrial equipment is involved such as container handling equipment, the flexural strength of the edge restraint should be carefully reviewed, particularly if a section that is flush with the surface is used and may be subjected to high point loading.
Edge restraints shall be used along all unrestrained paver edges and supported on a minimum of 6 in. (150mm) of aggregate base.

PART 3 EXECUTIONS

3.01 EXAMINATION

A. Verify that subgrade preparation, compacted density and elevations conform to the specifications.

B. Verify that geotextiles, if applicable, have been placed according to specifications and drawings.

C. Verify that aggregate base materials, thickness, compaction, surface tolerances and elevations conform to the specifications.

Note: Mechanical tampers (jumping jacks) are recommended for compaction of soil subgrade and aggregate base around lamp standards, utility structures, building edges, curbs, tree wells and other protrusions. Areas not accessible to roller compaction equipment should be compacted to the specified density with mechanical tampers. **CAUTION** - Care shall be taken around the perimeters of excavations, buildings, curbs, etc. These areas are especially prone to consolidation and settlement. Wedges of backfill should not be placed in these areas. If possible, backfilling and compacting in these areas particularly should proceed in shallow lifts, parallel to the finished surface.

D. Verify the proper installation of the concrete curbing, in terms of location, elevation, and adherence to the specifications.

E. Verify that the base is dry, uniform, even and ready to support bedding course aggregates, pavers and imposed loads.

F. Beginning of bedding course aggregates and paver installation shall signify acceptance of the base and concrete curb edge restraints.

3.02 SITE PREPARATION

A. The site must be stripped of all topsoil and other objectionable materials to the grades specified.

B. All subdrainage of underground services within the pavement area must be completed in conjunction with subgrade preparation and before the commencement of subbase construction.

C. After trimming to the grades specified, the pavement is to be proof rolled to a percentage of Standard Proctor Maximum Dry Density as specified by the Designing Engineering with soft spots or localized pockets of objectionable material excavated and properly replaced with approved granular material.

D. The subgrade shall be trimmed to within 0 to 3/8 in. (0 to 10 mm) of the specified grades. The surface of the prepared subgrade shall not deviate by more than 3/8 in. (10 mm) from the bottom edge 39 in. (1 m) straight edge laid in any direction.

E. The Contractor shall insure that the prepared subgrade is protected from damage from inundation by surface water. No traffic shall be allowed to cross the prepared subgrade. Repair of any damage resulting shall be the responsibility of the Contractor and shall be repaired.

F. Under no circumstances shall further pavement construction proceed until the subgrade has been inspected by the Owner or the Consultant.

3.03 GRANULAR SUBBASE AND BASE INSTALLATION

A. After proper construction of the concrete curb edge restraints for the interlocking pavement as per Section 3.4, and upon approval by the Consultant, aggregate subbase (as specified in design) and base shall be placed in uniform lifts not exceeding 6 in (150 mm) loose thickness and roller compacted according to the AASHTO guidelines for installing open graded aggregates. Because the subbase and base are open graded aggregated materials, a method specification is appropriate for guidance in all aggregate compactive force.

B. The granular base shall be trimmed to within to within 0 to 3/8 in. (0 to 10 mm) of the specified grade. The surface of the prepared base shall not deviate more than: (an example: 3/8 in. (10 mm) from the bottom edge of a 10 ft. (3 m) straight edge laid in any direction).

C. Before commencing the placing of bedding aggregate course and the placement of the Unilock® permeable concrete pavers, the base shall be inspected by the Owner or the Consultant.

3.04 EDGE RESTRAINTS

A. Adequate concrete edge restraint shall be provided along the perimeter of all paving as specified. The face of the concrete edge restraint, where it abuts pavers, shall be vertical down to the subbase.

B. All concrete edge restraints shall be constructed to dimensions and level specified and shall be supported on a compacted subbase not less than 6 in (150 mm) thick.

C. Concrete used for the construction of the edge restraints shall be air-entrained and have a minimum compressive strength as specified. All concrete shall be in accordance with ASTM C 94 requirements.

3.05 PAVER INSTALLATION

A. Spread the bedding aggregate evenly over the base course and screed to a nominal 1 ½ in. to 2 in.(28 mm to 51 mm) thickness. The bedding aggregate should not be disturbed. Place sufficient bedding aggregate to stay ahead of the laid pavers. Do not use the bedding aggregate to fill depressions in the base surface.

B. Initiation of paver placement shall be deemed to represent acceptance of the pavers.

C. Pavers shall be free of foreign material before installation.

D. Pavers shall be inspected for color distribution and all chipped, damaged or discolored pavers shall be replaced. Maximum allow breakage as per 2.1, section F.

E. The pavers shall be laid in pattern(s) as shown on the drawings.

F. Joints between the pavers shall be maintained according to the spacer bars.

G. Gaps at the edges of the paved area shall be filled with cut pavers.

Note: Units cut no smaller than one-third of a whole paver are recommended along edges subject to vehicular traffic.

H. Pavers to be placed along the edge shall be cut with a masonry saw.

Note: The use of infill concrete or discontinuities in patterns will not be permitted except along the outer pavement boundaries, adjacent to drains and manholes.

I. Upon completion of cutting, the area must be swept clean of all debris to facilitate inspection and to ensure pavers are not damaged during compaction.

J. Low amplitude, high frequency plate compactor shall be used to compact the pavers. Use Table 3 below to select size of compaction equipment:

TABLE 3
PAVER THICKNESS AND REQUIRED MINIMUM COMPACTION FORCE

Paver Thickness	Compaction Force
3 1/8 in. (80 mm)	5000 lbs [22 kN]

Note: Use of a urethane plate compactor pad is recommended to minimize any scuffing of the paving stone surface.

K. The pavers shall be compacted and the bedding aggregates shall be swept into all joints and void openings until they are full. This will require at least two or three passes with the compactor. Do not compact within 3 ft. (1 m) of the unrestrained edges of the paving units.

L. All work to within 3 ft. (1 m) of the laying face must be left fully compacted at the completion of each day.

M. Excess surface bedding and void opening aggregates shall be swept off when the job is complete.

N. The final surface elevations shall not deviate, as an example, more than 3/8 in. (10 mm) under a 10 ft. (3 m) long straight edge. Acceptable surface elevation deviations shall be specified by the Designing Engineer.

O. The surface elevation of pavers shall be 1/8 to 1/4 in. (3 to 6 mm) above adjacent drainage inlets, concrete collars or channels.

3.06 FIELD QUALITY CONTROL

A. Final elevations shall be checked for conformance to the drawings after removal of excess jointing aggregate.

END OF SECTION