CITY OF PORTSMOUTH
Department of Public Works

BID #31-16 South Mill Pond Tennis Courts
ADDENDUM #1
May 18, 2016

This Addendum forms part of the original bid document marked Bid 31-16 South Mill Pond Tennis Courts. Please acknowledge this addendum in the bid document, failure to do so may subject a bidder to disqualification.

The purpose of this addendum is to announce changes in the schedule and work scope.

The following Sections are attached and become part of the original bid document

- Section 16668 Exterior Athletic Lighting
- Section 02755 Hot Mix Asphalt Pavement and Color Sealcoating

Additionally attached is the pre-bid meeting sign in sheet.

The following questions have been asked and answered.

1. **What is the extent of the vertical granite curb?**
   Granite curb to be installed on sidewalk continuation and Alternate 3 ramp as shown on details 1 and 2 on sheet L2.01.

2. **Where is the top of fence footing to be located?**
   Pour fence footing flush with top of the asphalt binder course.

3. **Can existing bituminous concrete be reused as fill?**
   If existing bituminous concrete is pulverized, reuse is acceptable as fill. Otherwise existing bituminous concrete is to be disposed of per note on scheet L2.01.

4. **Can straw wattles be used for erosion control?**
   Wattles may be used per SECTION 01570 ENVIRONMENTAL PROTECTION ARTICLE 2.02

5. **Can existing electrical conduit be abandoned in place?**
   All conduit must be removed and disposed of.

6. **What is the extent of stripping loam and turf within the limit of the Work.**
   Per sheet L2.01, Note 3, Work is to be done with minimal disturbance possible.

7. **What removals will be done by the City?**

Per Preparation Plan L2.01, the City will remove:

- 10’ HT. fence,
- tennis light poles and fixtures
- basketball goals
- water fountains

8. **Please confirm start date.**

The courts will be available to work on September 6, 2016

9. **Please review and revised tennis and basketball surfacing spec – calls out splash pad.**

Refer to revised SECTION 02755, attached.

10. **Please confirm if Band-It ties are required for all fencing.**

Yes

11. **Is there another product we can use to tie the fence in lieu of BandIt ties?**

Contractor can propose an alternate after award with a proposed credit.

12. **For the ramp alternate does the City need Stainless Steel railings?**

Galvanized railings are acceptable.

13. **Could we have the railings galvanized?**

Galvanized railings are acceptable.

31-16 Tennis Courts

PRE BID MEETING **5/10/2016**

Attendees Sign in list

Company Name VT RECREATIONAL	Mailing address	Office Phone 603-638-2738
Your Name TOM VILLENEUVE	email VTRECTOM@HOTMAIL.COM	Cell Phone 802-535-8881
Company Name David W White and Son	Mailing address 635 River Rd Bow NH	Office Phone 603-226-8873
Your Name Jared White	email Jared@DWWSport.com	Cell Phone 603-231-0940
Company Name Target Const LLC	Mailing address 14 PINEWOOD rd Salem, NH 03079	Office Phone 603-893-2229
Your Name CHARLES BESHARA	email TARGETWBE@AOL.COM CBESHARA@COMCAST.NET	Cell Phone 978-265-1171
Company Name Carene Const Co	Mailing address 276 West Rd Portsmouth NH 03801	Office Phone 436-1006
Your Name Ben Carene	email Build@Carenoconstruction.com	Cell Phone 603-231-8595
Company Name ERIC LOFTUS	Mailing address Box 1100 POCASSET MA	Office Phone 508 759 5234
Your Name CAPE ISLAND TENNIS	email ELOFTUS@TENNISANDTRACK.COM	Cell Phone 617 913 0311
Company Name Scarponi Electric	Mailing address 26 Comerce Way Barrington, NH 03825	Office Phone (603)-332-5011
Your Name Tom Ferland	email tom@scarponielectric.com	Cell Phone (603)-817-9258
Company Name	Mailing address	Office Phone
Your Name	email	Cell Phone

SECTION 16668

EXTERIOR ATHLETIC LIGHTING

PART 1 – GENERAL

1.01 SUMMARY

A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.

B. The purpose of these specifications is to define the performance and design standards for South Mill Pond Tennis Courts lighting. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.

C. The primary goals of this sports lighting project are:
   1. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore light levels are guaranteed for a period of 25 years.
   2. Environmental Light Control: It is the primary goal of this project to minimize spill light and glare along the property line.
   3. Life-cycle Cost: In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated, and the field(s) should be proactively monitored to detect luminaire outages over a 25 year life-cycle. To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system.
   4. Control and Monitoring: To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system. Field(s) should be proactively monitored to detect luminaire outages over a 25 year life-cycle.

1.02 LIGHTING PERFORMANCE

A. Performance Requirements: Playing surfaces shall be lit to an average constant light level and uniformity as specified in the chart below. Light levels shall be held constant for 25 years. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Average illumination level shall be measured in accordance with the IESNA LM-5-04. Light levels shall be guaranteed from the first 100 hours of operation for the maximum warranty period.

Area of Lighting	Average Constant Light Levels	Max to Min Uniformity Ratio	Grid Points	Grid Spacing
Tennis Courts 1 and 2	30 footcandles	2:1	30	20'x20'
Tennis Courts 3 and 4	30 footcandles	2:1	30	20' x 20'
Tennis Courts 5 and 6	30 footcandles	2:1	30	20' x 20'
Basketball Court 1	30 footcandles	2:1	40	10' x 10'
Basketball Court 2	30 footcandles	2:1	40	10' x 10'
Parking Lot Area	3 footcandles	4.5:1	140	10' x 10'

1. Lumen maintenance control strategy: A constant light system shall use automatic power adjustments to achieve a lumen maintenance control strategy as described in the IESNA Lighting Handbook 10th Edition, Lighting Controls Section, page 16-8: "Lumen maintenance involves adjusting lamp output over time to maintain constant light output as lamps age, and dirt accumulation reduces luminaire output. With lumen maintenance control, either lamps are dimmed when new, or the lamp's current is increased as the system ages."

2. Independent Test Report: Manufacturers bidding any form of a constant light system must provide an independent test report certifying the system meets the lumen maintenance control strategy above and verifying the field performance of the system for the duration of the useful life of the lamp based on lamp replacement hours. Report shall be signed by a licensed professional engineer with outdoor lighting experience. If report is not provided at least 10 days prior to bid opening, the manufacturer shall provide the initial and maintained designs called for in this specification under Alternate Manufacturers, section 1.8.

3. Project References: Manufacturers bidding any form of a constant light system must provide a minimum of five (5) project references within the state of NH that have been completed within the last calendar year utilizing this exact technology. Manufacturer will include project name, project city, and if requested, contact name and contact phone number for each reference.

B. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, the pole mounting heights from the playing field surface shall be 60' for the T1, T2, T7 and T8 poles and 70' for the T3 and T4 poles.

1.03 ENVIRONMENTAL LIGHT CONTROL

A. Spill Light Control: Footcandle readings shall be taken at 30’ intervals along the specified line. Average illumination level shall be measured in accordance with the IESNA LM-5-04 at the first 100 hours of operation.

1.04 LIFE-CYCLE COSTS

A. Energy Consumption: The average kW consumption for the field lighting system shall be 18.77KW or less for Tennis Courts 1 thru 4 combined and 18.77 kW or less for Tennis Courts 5 thru 6 and Basketball Courts 1 thru 2 combined.

B. Complete Lamp Replacement: Manufacturer shall include all group lamp replacements required to provide 25 years of operation based upon 500 usage hours per year.

C. Preventative and Spot Maintenance: Manufacturer shall provide all preventative and spot maintenance, including parts and labor for 25 years from the date of equipment shipment. Individual lamp outages shall be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.

D. Remote Monitoring System: System shall monitor lighting performance, including on/off status, hours of usage and lamp outages. If luminaire outages that affect playability are detected, manufacturer shall contact owner so that maintenance can be proactively scheduled. The controller shall determine switch position (Manual or Auto) and contactor status (open or closed).

E. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields, to only having permission to execute “early off” commands by phone.

Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

F. Management Tools: Manufacturer shall provide a web-based database of actual field usage and provide reports by facility and user group.

Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.

1. Cumulative hours: shall be tracked to show the total hours used by the facility
2. Current lamp hours: shall be tracked separately to reflect the amount of hours on the current set of lamps being used, so relamping can be scheduled accurately

G. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring systems for a period of 25 years.

H. 25-Year Life-cycle Cost: Manufacturer shall submit 25-year life-cycle cost calculations as follows. Equipment price and total life-cycle cost shall be entered separately on bid form.

a.	**Luminaire energy consumption – 1500 Watt Metal Halide (HID)** **____** # of HID luminaires x _____ kW demand per luminaire x $.10 kWh rate x 500 annual usage hours x 25 years		
b.	**Cost for spot relamping and maintenance over 25 years** Assume 7.5 repairs at $ $500 each if not included with the bid	+	
c.	**Cost to relamp all luminaires during 25 years** 500 annual usage hours x 25 years / 2,100 hours x $125 lamp & labor x **_____** # of HID luminaires if not included with the bid	+	
d.	**Extra energy used without base bid automated control system** $ Energy consumption in item a. x 10 % if control system not included with the bid	+	
	TOTAL 25-Year Life-cycle Operating Cost	=	

1.05 WARRANTY AND GUARANTEE

A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years OR for the maximum hours of coverage based on the estimated annual usage, whichever occurs first. Warranty shall guarantee light levels; lamp replacements; system energy consumption; monitoring, maintenance and control services, spill light control, and structural integrity. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty may exclude fuses, storm damage, vandalism, abuse and unauthorized repairs or alterations. Group lamp replacements for constant light systems must occur in accordance with the independent test report provided by the manufacturer; alternate systems must relamp every 2,100 hours.

1.06 DELIVERY TIMING

A. Equipment On-Site: The equipment must be on-site 4 to 6 weeks from receipt of approved submittals and receipt of complete order information.

1.07 PRE-BID SUBMITTAL REQUIREMENTS

A. Approved Product: Musco's Green Generation Lighting® sports lighting system is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.

B. Design Approval: The owner / engineer will review pre-bid shop drawings from the manufacturers to ensure compliance to the specification. If the design meets the design requirements of the specifications, a letter will be issued to the manufacturer indicating approval for the specific design submitted.

1.08 ALTERNATE SYSTEM REQUIREMENTS

A. Compliance to Specifications: Acceptance of a bid alternate does not negate the contractor and lighting manufacturer's responsibility to comply fully with the requirements of these specifications. Any exceptions to the specifications must be clearly stated in the prior approval submittal documents.

B. Light Level Requirements: Manufacturer shall provide computer models guaranteeing light levels on the field over 25 years. If a constant light level cannot be provided, the specified maximum Recoverable Light Loss Factor and maintenance/group relamping schedule shall be provided in accordance with recommendations in the Pennsylvania State University report "Empirical Light Loss Factors for Sports Lighting", presented at the 2009 IESNA Annual Conference.

Lamp Replacement Interval (hours)	**Recoverable Light Loss Factor (RLLF)**
2,100	0.69

For alternate systems, scans for both initial and maintained light levels are required.

Area of Lighting	Average Initial Light Levels	Average Target/Maintained Light Levels	Max to Min Uniformity Ratio	Grid Points	Grid Spacing
Tennis Courts 1 and 2	43.4 footcandles	30 footcandles	2:1.0	30	20’ x 20’
Tennis Courts 3 and 4	43.4 footcandles	30 footcandles	2:1.0	30	20’ x 20’
Tennis Courts 5 and 6	43.4 footcandles	30 footcandles	2:1.0	30	20’ x 20’
Basketball Court 1	43.4 footcandles	30 footcandles	2:1.0	40	10’x10’
Basketball Court 2	43.4 footcandles	30 footcandles	2:1.0	40	10’x10’
Parking Lot Area	4.3 footcandles	3 footcandles	2:1.0	40	10’x10’

C. Revised Electrical Distribution: Manufacturer shall provide revised electrical distribution plans to include changes to service entrance, panel, and wire sizing.

PART 2 – PRODUCT

2.01 LIGHTING SYSTEM CONSTRUCTION

A. System Description: Lighting system shall consist of the following:

1. Galvanized steel poles and cross-arm assemblies.
2. Pre-stressed concrete base embedded in concrete backfill allowed to cure for 24 hours before pole stress is applied. Alternate may be an anchor bolt foundation designed such that the steel pole and any exposed steel portion of the foundation is located a minimum of 18 inches above final grade. The concrete for anchor bolt foundations shall be allowed to cure for a minimum of 28 days before the pole stress is applied, unless shorter cure time is allowed by structural engineer of record.
3. All luminaires shall be constructed with a die-cast aluminum housing or external hail shroud to protect the luminaire reflector system.
4. All luminaires, visors, and crossarm assemblies shall withstand 150 mph winds and maintain luminaire aiming alignment.

5. Manufacturer will remote all ballasts and supporting electrical equipment in aluminum enclosures mounted on pole approximately 10’ above grade. The enclosures shall be touch-safe, and include ballast, capacitor and fusing, with indicator lights on fuses to indicate when a fuse is to be replaced for each luminaire.

6. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.

7. Control and Monitoring Cabinet (NEMA Type 4) to provide on-off control and monitoring of the lighting system, constructed of aluminum. Communication method shall be provided by manufacturer. Cabinet shall contain custom configured contactor modules for 30, 60, and 100 amps, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.

B. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, ballast and other enclosures shall be factory assembled, aimed, wired and tested.

C. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel of 18-8 grade or better, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the crossarms, pole, or electrical components enclosure.

D. Lightning Protection: Manufacturer shall provide integrated lightning grounding via concrete encased electrode grounding system as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.

   If grounding is not integrated into the structure, the Manufacturer shall supply grounding electrodes, copper down conductors and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780. The grounding electrode shall be not less than 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.

E. Safety: All system components shall be UL Listed for the appropriate application.

F. Electric Power Requirements for the Sports Lighting Equipment:

1. Electric power: 208 Volt, 3 Phase

2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

2.02 STRUCTURAL PARAMETERS

A. Wind Loads: Wind loads shall be based on the 2009 International Building Code. Wind loads to be calculated using ASCE 7-05, a design wind speed of 100 mph, exposure category C, and wind importance factor of 1.0.

B. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2009 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-5).

C. Foundation Design: The foundation design shall be based on soil parameters as outlined in the Geotechnical Report prepared May 26th, 2015 by Weston & Sampson located in Peabody, MA.; Project No. 2140758.

PART 3 – EXECUTION

3.01 SOIL QUALITY CONTROL

A. It shall be the Contractor's responsibility to notify the Owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the Owner's approval / payment for additional costs associated with:

1. Providing engineered foundation embedment design by a registered engineer in the State of New Hampshire for soils other than specified soil conditions;
2. Additional materials required to achieve alternate foundation;
3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

3.02 FIELD QUALITY CONTROL

A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA LM-5-04.

B. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles, uniformity ratios, and maximum kilowatt consumptions are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be liable to any or all of the following:

1. Manufacturer shall at his expense provide and install any necessary additional luminaires to meet the minimum lighting standards. The Manufacturer shall also either replace the existing poles to meet the new wind load (EPA) requirements or verify by certification by a licensed structural engineer that the existing poles will withstand the additional wind load.
2. Manufacturer shall minimize the Owner's additional long-term luminaire maintenance and energy consumption costs created by the additional luminaires by reimbursing the Owner the amount of $1,000.00 (one thousand dollars) for each additional luminaire required.
3. Manufacturer shall remove the entire unacceptable lighting system and install a new lighting system to meet the specifications.

REQUIRED SUBMITTAL INFORMATION FOR ALTERNATE SYSTEM
Design Submittal Data Checklist and Certification for Alternate System Bids
All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements

Tab	Item	Description
A	Letter/ Checklist	Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer's local representative and his/her phone number. Signed submittal checklist to be included.
B	Equipment Layout	Drawing(s) showing field layouts with pole locations.
C	On Field Lighting Design	Lighting design drawing(s) showing: a. Field Name, date, file number, prepared by, and other pertinent data. b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified. c. Pole height, # of luminaires per pole, as well as luminaire information including wattage, lumens and optics. d. Height of light test meter above field surface. e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in footcandles (fc); uniformity including maximum to minimum ratio, coefficient of variance and uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor. f. Alternate manufacturers shall provide both initial and maintained light scans using a maximum Recoverable Light Loss Factor (RLLF) as specified in section 1.8.
D	Life-cycle Cost Calculation	Document life-cycle cost calculations as defined in the specification. Identify energy costs for operating the luminaires, maintenance cost for the system including spot lamp replacement, and group relamping costs. All costs should be based on 25 Years.
E	Photometric Report	Provide photometric report for a typical luminaire used showing candela tabulations as defined by IESNA Publication LM-35-02. Photometric data shall be certified by laboratory with current National Voluntary Laboratory Accreditation Program or an independent testing facility with over 5 years experience.
F	Aiming Summary	Document showing each luminaire's aiming angle and the poles on which the luminaries are mounted. Each aiming point shall identify the type of luminaire.
G	Aiming Report	Provide test report showing aiming alignment can be maintained to 150 mph winds.
H	Structural Calculations	Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state of NH, if required by owner. (May be supplied upon award).
I	Control & Monitoring System	Manufacturer shall provide written definition and schematics for automated control system to include monitoring. They will also provide examples of system reporting and access for numbers for personal contact to operate the system.
J	Electrical Distributio	If bidding an alternate system, manufacturer must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing, signed

	n Plans	by a licensed Electrical Engineer in the state of NH.
K	Performanc e Guarantee	Provide performance guarantee including a written commitment to undertake all corrections required to meet the performance requirements noted in these specifications at no expense to the owner. Light levels must be guaranteed per specification for 25 years.
L	Warranty	Provide written warranty information including all terms and conditions.
M	Independen t Testing Report	Manufacturer bidding any form of a constant light system is to provide an independent test report certifying the system meets the lumen maintenance control strategy defined in Section 1.2.A.1, verifying the field performance of the system for the duration of the useful life of the lamp based on lamp replacement hours. Report shall be signed by a licensed professional engineer with outdoor lighting experience.
N	Project References	Manufacturer to provide a list of projects where the technology proposed for this project has been installed in the state of NH. If any form of a constant light system is bid, a minimum of 5 project references completed within the last calendar year is required. For a depreciating light system a full list of projects completed within the past 3 years is required. Reference list will include project name, project city, and if requested, contact name and contact phone number.
O	Product Informatio n	Complete set of product brochures for all components, including a complete parts list and UL Listings.
P	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
Q	Non-Complianc e	Manufacturer shall list all items that do not comply with the specifications. If in full compliance, tab may be omitted.

The information supplied herein shall be used for the purpose of complying with the specifications for Portsmouth High School Tennis and Basketball Court lighting. By signing below I agree that all requirements of the specifications have been met and that the manufacturer will be responsible for any future costs incurred to bring their equipment into compliance for all items not meeting specifications and not listed in the Non-Compliance section.

Manufacturer: _____ **Signature:** _____

Contact Name: _____ **Date:** _____/_____/_____

LIGHTING BID PROPOSAL

South Mill Pond Tennis and Basketball Courts Lighting Project
Portsmouth, NH

The undersigned bidder, in compliance with your request for bids for the lighting equipment at the above project, having examined specifications, related documents, and site of the proposed project, hereby proposes to furnish the lighting equipment material as described in the specifications. These prices are INFORMATIONAL ONLY to determine life cycle costs and include all labor, materials, equipment and delivery charges.

A. Musco Lighting Bid Price: $_____
(Initial System Purchase Price)

B. 25-Year Operating Cost: $_____
(From Section 1.4, Item H – Life-cycle Cost) (For Evaluation Only)

C. Total Cost of Ownership after 25 Years: $_____
(Add item "A" and "B") (For Evaluation Only)

_____
Company Name

_____
Authorized Signature

_____
Address

_____
City/State/ZIP

_____
Telephone

_____
Date

SECTION 02755

HOT MIX ASPHALT PAVEMENT

AND COLOR SEALCOATING

PART I - 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 hot mix asphalt pavement for the courts 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 required by the Engineer.

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

3. Color sealcoating of hot mix asphalt pavements as shown on the plans and as specified herein.

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. New Hampshire Department of Transportation’s 2010 Standard Specification for Road and Bridge Construction.

1.03 SUBMITTALS

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

B. Color Sealcoat: The Contractor shall submit catalog cuts, manufacturer’s specifications and color chips or charts.

C. Field layout of color sealcoat must be approved by Landscape Architect prior to installation.

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

E. Compaction tests are required on all hot mix asphalt base surfaces on a 10' 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.

1.04 QUALIFICATIONS/SPECIAL REQUIREMENTS – COLOR SEALCOAT APPLICATION

A. The Contractor shall engage the manufacturer's representative to inspect and monitor the application of the initial filler coat upon the prepared surfaces of all pavements to receive color sealcoat. Apply coatings only when ambient temperature is fifty degrees (50°F) and rising, and the surface temperature is not in excess of one hundred forty degrees (140°F).

B. If a latex-ite acrylic sealer/surfacer is to be utilized, the addition of silica by mechanical agitation on-site shall be inspected and monitored by the manufacturer's representative who is to be engaged by the Contractor at the Contractor's cost.

C. Adequate means shall be provided to protect the color seal coating(s) from damage until such time that each layer has cured sufficiently and no seal will adhere to and be picked up by the tires of vehicles or by pedestrian traffic.

D. All NOVACRYLIC coatings are waterborne and cannot cure in cold temperatures or when subject to moisture. Care should be taken not to apply coatings when rain is forecast or sudden drop of temperature is expected. Climatic conditions such as very cool evenings and high dew points dictate that work should be completed early in the day so the coatings can be exposed to enough warm sunlight to form a film before sunset. The opposite applies during times of high heat, low humidity and drying breezes: under these conditions, work very early in the morning or very late in the day. If the product seems to be drying too fast in hot weather, mist the pavement with water to make the application easier. Care must be taken to allow each application to dry thoroughly prior to recoating. Care should be taken to allow the surface to cure 2 weeks before splash pad is activated.

PART II - MATERIALS

2.01 HOT MIX ASPHALT PAVEMENT

A. Hot mix asphalt 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 New Hampshire Department of Transportation's 2010 Standard Specification for Road and Bridge Construction.

B. Base/Binder Courses

1. Base/Binder Courses shall be Hot Mix Asphalt (HMA) Pavement, Base Course.

C. Surface Course

1. Surface Course shall be Hot Mix Asphalt (HMA) Pavement, Dense Mix Course.

D. Pavement Mixtures

1. The general composition of aggregate and the hot mix asphalt mixture (the proportion of asphalt cement to mineral aggregate) shall be as provided in the table below.

Table A
Specifications for Hot Mix Asphalt
Percent Passing by Weight Sieve Designation

Sieve Designation & Percent Binder Content	Base Course	Dense Mix Course
2 inch	100	
1 inch	57-87	
3/4 inch		
5/8 inch		
1/2 inch	40-65	100
3/8 inch		80-100
No. 4	20-45	55-80
No. 8	15-33	48-59
No. 16		36-49
No. 30	8-17	24-38
No. 50	4-12	14-27
No. 100		6-18
No. 200	0-4	4-8
Binder	4-5	7-8

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.

2.04 ADHESIVE FABRIC FOR CRACK PATCHING

A. Fabric shall be the Petromat/Petrotac system, as manufactured by Phillips Fibers Corporation, or approved equal.

2.05 COLOR SEALCOAT

A. The layout and design of color sealcoating shall be installed per contract drawings. Prior to application, contactor shall schedule a meeting to get layout of seal coat approved by Engineer or Landscape Architect.

Court surfacing material shall be Novacryllic as manufactured by Nova Sports U.S.A. 6 Industrial Road, Building #2, Milford, MA 01757 tel. 1-800-USA-NOVA, or approved equal.

B. The color emulsion coating shall be Nova Sports "Novaplay" or an approved equal emulsion product. Colors shall match those of the filler coats. Coats shall be applied lengthwise of the court with a wide type pushbroom.

C. The base vehicle for the finish coat shall be an acrylic polymer dispersed in water and which has the ability to withstand extremes in temperature and general weathering. The film former shall provide a non-skid surface upon drying and under all weather conditions. Pigment dispersions in the color coating are to be of the best quality chrome oxides so as to obtain a permanent true color. The coating shall contain no material, which will cause cracking due to extremes in temperatures and is to be factory mixed and consistent in color. It shall be a one hundred percent (100%) acrylic emulsion containing no alkyds, butadiene styrene, or vinyls and shall be thinned with water. It shall not chalk or discolor any equipment.

D. The finished surface shall be smooth and uniform, true to required grade and cross section, and free of depressions, ridges, or other irregularities.

PART III – EXECUTION

3.01 HOT MIX ASPHALT PAVEMENT

A. Hot mix asphalt pavements shall be constructed on a prepared foundation of gravel in accordance with the Massachusetts Standard Specifications, Section 405, 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 Department of Transportation's 2010 Standard Specification for Road and Bridge Construction.

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.**

3.03 COLOR SEAL COAT

A. New asphalt pavement shall cure for 14 days prior to application of any surfacing materials.

B. Contractors must notify the Landscape Architect of all applications, 48 hours prior to installation.

C. The surface to be coated shall be inspected and made sure to be free of grease, oil, dust, dirt and other foreign matter before starting work.

D. The surface shall be flooded. Any ponding water remaining that is deep enough to cover the thickness of a five-cent piece shall be corrected using a patch mix consisting of Novabond, 50-mesh sand and Portland cement, as per manufacturer's directions. Depressions must be primed with a 50% dilution of Novabond and water prior to patching.

E. Application shall proceed only if the surface is dry and clean and the temperature is at least fifty degrees (50°F) and rising, and the surface temperature is not in excess of one hundred forty degrees (140°F). Do not apply coatings when rain is imminent.

F. Each coat in this system must dry completely before next application. Between each coat, inspect entire surface. Any defects should be repaired. Scrape surface to remove any lumps, and broom or blow off all loose matter.

G. Using a neoprene rubber squeegee, apply one (1) coat of Novasurface acrylic resurfacer, diluted with one (1) part clean water, to two (2) parts Novasurface. Clean, bagged sand shall be incorporated into the diluted Novasurface at the rate of five (5) to ten (10) Lbs. per gallon. Sand gradation shall be 50 to 60-mesh. Allow application to dry thoroughly.

H. Using a neoprene rubber squeegee, apply two (2) coats of Novaplay (colors to be designated by owner). Allow each application to dry thoroughly. A small (not to exceed 8 fl. oz per gal.) quantity of water may be used in diluting these coatings, only if coatings are drying too rapidly. Permission of the owner shall be obtained before adding additional water.

3.04 COLOR SEAL COAT LINE PAINT

A. Upon completion and acceptance of the court surface, the Contractor shall prepare and paint lines for court layout. Refer to enlargement plans for layout of these lines.

B. All lines are to be applied by painting between masking tape with a paintbrush or roller, according to U.S.T.A specifications.

C. Prime masked lines with Seal-A-Line. Allow application to dry.

D. Paint lines with Novatex textured line paint. Allow application to dry.

E. Remove masking tape immediately after lines are dry.

F. Protect adjacent areas and structures (fences, posts, sidewalks, buildings, etc.), which are not to be coated. In the event that coatings are applied to above, remove immediately before drying is complete.

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