

ADDENDUM NO. 2

TO

CONTRACT DOCUMENTS

IMPROVEMENTS TO LOKER CONSERVATION AND RECREATION AREA Wayland, MA

IFB #19-1054

March 18, 2019

NOTICE TO BIDDERS

The attention of all bidders submitting proposals for “Improvements to Loker Conservation and Recreation Area” is called to the following Addenda to the specifications and plans. The items set forth herein, whether of omission, addition or substitution are to be included in, and form part of the specifications and plans of the above-named project for bids to be received as advertised.

PLEASE BE SURE TO ACKNOWLEDGE THIS ADDENDUM ON BID PRICING PAGE

The following clarifications, modifications, deletions and additions are hereby incorporated into and become part of the Contract Documents.

WRITTEN CHANGES AND CLARIFICATIONS TO SPECIFICATIONS

- DELETE:** Specification Section 00300 – FORM FOR GENERAL BID
ADD: Specification Section 00300 – FORM FOR GENERAL BID per attachment
- DELETE:** Specification Section 32 18 13 – SYNTHETIC GRASS INFILL SYSTEM
ADD: Specification Section 32 18 13 – SYNTHETIC GRASS INFILL SYSTEM per attachment.

QUESTIONS AND CLARIFICATIONS

Question 1: The Spec calls for #6-gauge steel core mesh, but says .148 core which #9 Gauge is, please advise to the correct gauge.

Response: For clarification, the black vinyl chain link mesh shall be 6 gages.

Question 2: Spec says 2” mesh, detail states 1-3/4 mesh, please advise.

Response: For clarification, mesh shall be 2”.

Question 3: Are #6 aluminum tie wires acceptable in lieu of #7 steel ties?

Response: Wire ties shall be 7-gauge galvanized steel coated wire for attachment of fabric to line post, per Specification Section 32 3100 – FENCES AND GATES, Section 4.04, item 4.d.

Question 4: Is polyester powder coated pipe with U.V. treatment an acceptable alternative to vinyl coated pipe?

Response: Polyester powder coated pipe with U.V. treatment is acceptable alternative to vinyl coated pipe.

Question 5: Is the intent of Section 01 45 23-STRUCTURAL TESTS AND INSPECTIONS to have the Contractor hire an independent engineering firm to monitor and inspect the Contractor's work?

Response: Yes, the contractor shall hire a third-party inspector and or testing agency at various stages of the work as required including but not limited to compaction, infiltration, etc.

Question 6: Please specify the CLF Size. Section 32 31 00-3 (4.04) calls for 6-gauge core with a diameter of .148". This is a 2A wire class which is extruded and bonded. However, the specifications call for Class 2B (fused and bonded finish). This would be a .148" core with an 8-gauge finish or a .192" core with a 5-gauge finish. Please specify which Class 2B finish you would like to be included in the bid.

Response: For clarification, the black vinyl chain link fence mesh shall be 6 gages.

Question 7: There was a question and response regarding builder's risk insurance. Since there is no building, we are having issues finding someone to quote this. Can you define what the builder's risk is meant to cover?

Response: The General contractors "risk" insurance shall be designed for a project that is under construction. Also known as "course of construction" insurance, the contractor's risk coverage shall begin on the policy mobilization date and shall ends when the work is completed, and the project is completed and handed back to the owner. The owner shall not be responsible for theft, damage, loss of any equipment or materials throughout the course of construction.

Question 8: Could you explain how we should cover the cost of rock excavation if there is no quantity provided. Also, could we get a clarification on the rock core borings and furnishing a bore rig. How are these to be paid for. Is there a unit cost or day rate we should carry?

Response: Rock excavation shall be carried through a base bid allowance of ten thousand dollars (\$10,000.00). Should the allowance be exceeded, rock excavation will change to a unit price or time and materials for complete

excavation and disposal of rock as directed by the Owner's Representative. Refer to Allowance and Unit Price Form.

Question 8: On the foundations for the Musco light pole base foundation, how are we to price these if there is no design for them. It talks about a shallow spread footing but there is no design. Please let us know how to proceed with this pricing.

Response: See Musco light pole base foundation design attachment.

Question 9: One other thing on submittals it says electronic email through Submittal Exchange software. Is this software we will be put on as a sub for free or are we expected to purchase this ourselves.

Response: Contractor may DELETE the requirement to procure an electronic exchange software. Software is not in contract and will be procured independent of this invitation to bid. The contractor will be required to use the exchange software to be provided by others throughout the project duration and closeout form but not limited to submittals, request for information, etc.

ATTACHMENTS:

Specification Section 00300 - FORM FOR GENERAL BID
Specification Section 32 18 13 – SYNTHETIC GRASS INFILL SYSTEM
Musco Sport Light Pole Foundations

END OF ADDENDUM NO. 2

SECTION 00300

FORM OF GENERAL BID

Bid of _____ (hereinafter called "Bidder")*

(____) a corporation, organized and existing under the laws of the state of _____

(____) a partnership

(____) a joint venture

(____) an individual
doing business as _____

To the Town of Wayland, Massachusetts (hereinafter called "Owner").

Gentlemen:

(A) The undersigned Bidder, in compliance with your invitation for bids for the project known as **19-1054-IFB Improvements to Loker Conservation and Recreation Area**, having examined the plans and specifications and related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the contract documents and the plans and specifications within the time set forth below, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this bid is a part.

The Bidder hereby agrees to commence work on or before the date to be specified in written "Notice to Proceed" of the Owner, and to fully complete the project within 285 consecutive calendar days thereafter.

The Bidder further agrees to pay as liquidated damages the sum of Two Hundred (\$200.00) Dollars for each consecutive calendar day thereafter that the work is not complete as provided in the contract.

*Specify corporation, partnership or individual as applicable

B) Bidder acknowledges receipt of, and this bid includes the following addenda:

No. _____ Dated: _____

No. _____ Dated: _____

No. _____ Dated: _____

No. _____ Dated: _____

C) The Bidder agrees to perform the bid work of the Base Bid described in the specifications and shown on the plans for the following contract price:

\$ _____ (\$ _____) Dollars.

D) Alternates

The Alternates may or may not be included in the contract and will be accepted at the discretion on the Owner, in numerical order.

Alternate No.1

Under Add Alternate No. 1 the contractor shall install the specified sports lighting poles, fixtures, wiring and related appurtenances needed to have a complete and fully operational system. Note that work under the base bid shall include the installation of an “empty” sports lighting system to include light pole footings/foundations, underground conduits, hand holes, pull string and all other electrical and lighting system components throughout the project site as indicated on the plans and as specified.

The Bidder agrees to perform the bid work described in Alternate No. 1 in the specifications and shown on the plans for the following contract price:

\$ _____ (\$ _____) Dollars.

Alternate No.2

Under Add Alternate No. 2, the contractor shall construct the designated cast in place concrete stair and handrails as indicated on the plans and as specified.

The Bidder agrees to perform the bid work described Alternate No. 2 in the specifications and shown on the plans for the following contract price:

\$ _____ (\$ _____) Dollars.

ALLOWANCES

Refer to Instructions to Bidders for any specific requirements for cash allowances.

The cash allowances listed shall be included in the Bidder's proposed Contract Price.

<u>FOR ALLOWANCE NO.</u>	<u>ALLOWANCE</u>
1 – Rock removal and disposal related costs.	\$10,000 _____ <u>Written:</u> <u>Ten-Thousand</u> _____ <u>Dollars</u> <u>and</u> _____ <u>Zero Cents</u> _____
2 – Eversource service related costs associated with the placement of a new electrical service to the site.	\$11,683.00 _____ <u>Written:</u> <u>Eleven -housand Six Hundred Eighty-Three</u> _____ <u>Dollars</u> <u>and</u> _____ <u>Zero Cents</u> _____

The Supplemental Unit Prices set forth herein shall be used to determine any equitable adjustment of the Contract in connection with the changes or extra work performed under this Contract as directed by the **Town**.

It is mutually understood and agreed that such Supplemental Unit Prices include all items of costs, equipment, taxes and insurance of every kind, overhead, and profit for the **Contractor** and they shall be used uniformly, without modification for addition and deductions. Prices listed under ADDITIONS and DEDUCTIONS are to be the complete total price billed to and paid by the **Town** therefor. There can be no more than fifteen (15) percent difference in price between the additions and deductions.

SUPPLEMENTAL UNIT PRICES FORM

ITEM DESCRIPTION	UNIT	ADDITIONS	Owner Approval
1. Rock / Ledge excavation (drill) including disposal off site, including replacement with equal volume of gravel borrow:	C.Y.	\$	
2. Rock / Ledge excavation (pneumatic bullpoint) including disposal off-site, including replacement with equal gravel borrow:	C.Y.	\$	
3. Boulder excavation including disposal off site:	C.Y.	\$	

The Bidder understands that all bids for this project are subject to the applicable bidding laws of the Commonwealth of Massachusetts, including General Laws Chapter 149 and Chapter 30, Section 39M, as amended.

The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of bids.

Within 10 days of receipt of the written notice of acceptance of this bid, the Bidder will execute the formal Agreement set forth in Section 00500 CONTRACT.

Bid security is attached in the sum of five percent (5%) of the total bid in accordance with the conditions of Section 00100 INSTRUCTIONS TO BIDDERS. The bid security may become the property of the Owner in the event the contract and bond are not executed within the time set forth above.

The selected Contractor shall furnish a payment bond in an amount at least equal to fifty percent (50%) of the contract price in accordance with Section 00620 PAYMENT BOND, and as stipulated in the contract.

The undersigned offers the following information as evidence of his qualifications to perform the work as bid upon according to all the requirements of the plans and specifications.

1. Have been in business under present name for ____ years.
2. The names and addresses of all persons interested in the bid (if made by a partnership or corporation) as principals, are as follows:

(attach supplementary list if necessary)

3. The bidder is requested to state below what work of a similar character to that included in the proposed contract he has done and give references that will enable the Owner to judge his experience, skill and business standing (add supplementary page if necessary).

<u>Completion</u> <u>Date</u>	<u>Project</u> <u>Name</u>	<u>Contract</u> <u>Amount</u>	<u>Design</u> <u>Engineer</u>	<u>Reference</u> <u>Name</u>	<u>Telephone</u> <u>No.</u>
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a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

Bank reference _____
(Name)

(Bank)

(Address)

(Telephone No.)

Pursuant to G.L. c.62C, §49A, I certify hereby in writing, under penalties of perjury, that the within named Bidder/Contractor has complied with all laws of the commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting of child support.

The undersigned Bidder hereby certifies under penalties of perjury, as follows: (1) that he/she is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

The undersigned bidder hereby certifies, under pains and penalties of perjury, that the foregoing bid is based upon the payment to laborers to be employed on the project of wages in an amount no less than the applicable prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned bidder agrees to indemnify the awarding authority for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work arising out of or as a result of (1) the failure of the said bid to be based upon the payment of the said applicable prevailing wage rates or (2) the failure of the bidder, if selected as the contractor, to pay laborers employed on the project the said applicable prevailing wage rates.

Respectfully submitted:

Date: _____

By: _____

(Signature)

(Type Name of Bidder)

(Title)

(Business Address)

(City and State)

(Telephone Number)

SECTION 32 18 13

SYNTHETIC GRASS INFILL SYSTEM

1. General

A. Work Included

1. Provide all labor, materials, equipment and tools necessary for the complete installation of Synthetic Grass Infill System over a graded stone base as outlined in these specifications and in strict accordance with the manufacturer's written specifications with a specially formulated resilient infill of rounded sand and ambiently recycled rubber.
 - a. Excavation and placement of graded stone sub-base.
 - b. A drainage system consisting of a flat drains and collector piping.
 - c. A synthetic grass system with 2.25" to 2.5" long 100% polyethylene fibers, tufted on a 3/8" -3/4" tufting machine. A minimum of 10,800 denier monofilament yarn, and 10,000 denier low friction parallel slit film yarn specifically designed to reduce abrasion in AB tufting configuration if 3/8" gauge or a combination of minimum 5000 denier slit film and minimum 7200 denier monofilament in single needle stitching, with a fiber weight of not less than 46 ounces per square yard. The turf shall be of dual fiber construction with multi-structured monofilament and slit-film fibers tufted together in same needle stitching if 1/2" or 3/4" gauge, or AB tufting configuration if 3/8" gauge. The system shall include a single, dimensionally stable, two or three-component backing, and have a minimum of 20 ounces of urethane secondary backing per square yard and a total weight of 74 ounces per square yard. The finished product shall also include perforations (1/4" holes on 4" centers) to ensure maximum drainage. Systems that are tufted on larger than 3/4" gauge tufting machines, are not perforated or include any type of nylon fiber "thatch zone" shall not be acceptable.
 - d. A resilient infill system, consisting of a course, rounded, uniformly sized silica sand and graded virgin EPDM crumb rubber. (Minimum total weight of 7 lbs. (4 lbs sand and 3 lbs rubber) per square foot with a 57/43 sand and rubber ratio – No Exceptions). Infill shall be installed to a minimum height of 2 inches providing no more than 1/2 inch exposed fiber.
 - e. Or an Engineer approved equivalent.

2. APPROVED MANUFACTURERS

- a. Sprinturf
- b. Fieldturf
- c. Astroturf
- d. Shaw Sports Turf
- e. Greenfields
- f. Act Global
- g. Approved Equal

B. Qualifications and Submittals

1. Prospective Bidders and / or installers of the turf shall be required to comply with the following:
 - a. The successful turf contractor must be a member of the Synthetic Turf Council (STC), Sports Turf Managers Association (STMA), or American Sports Builders Association.
 - b. The turf contractor and / or the turf manufacturer must be experienced in the manufacture and installation of this specific type of sand and rubber infill synthetic grass system, for at least five (5) years and provide references of ten (10) specific installations in the last five (5) years.
 - c. The turf manufacturer shall have a minimum of ten (10) installations in the State of Massachusetts.
 - d. The turf manufacturer shall have a minimum of Ten (10) NFHS Division 1 game and/or practice fields installed for football or soccer.
 - e. The turf contractor and/or turf manufacturer must provide in-house competent workmen skilled in this specific type of synthetic grass installation with a minimum of 10 fields installed. The designated supervisory personnel on the project must be certified in writing by the turf manufacturer as competent in the installation of this material, including the gluing of seams and the proper installation of the infill mixture. The manufacturer shall have a representative on site to certify the installation and warranty compliance.
 - f. All designs, marking, layouts, materials shall conform to current NFHS rules and other standards that may be applicable to this type of synthetic grass installation unless there is a specific exception identified. Submit a full color rendering/drawing indicating all field markings for final approval prior to placing turf order. Failure to do so shall be at the

contractor's risk and cost.

2. All bidders of the turf contract must submit to the Engineer the following information:
 - a. The Contractor shall submit to the Engineer, after the bid, prior to award, a 1' x 1' minimum sample of the exact synthetic turf and infill system that is specified for this project. A sample of the Resilient Performance Base material shall also be submitted.
 - b. The turf contractor / manufacturer shall submit with the bid, a sample copy of the material warranty demonstrating compliance with the warranty requirements.
 - c. The turf contractor shall provide evidence - direct from the turf manufacturer corporate headquarters- that the installer is certified by the manufacturer to install this type of synthetic grass installation.
 - d. Certified copies of independent (third-party) laboratory reports on ASTM tests as follows:
 - i. Pile Height, Face or Pile Weight & Total Fabric Weight, ASTM D418 or D5848
 - ii. Primary & Secondary Backing Weights, ASTM D418 and D5848
 - iii. Tuft Bind, ASTM D1335
 - iv. Grab Tear Strength, ASTM D1682 or D5034
 - v. Infill Materials, ASTM F3188-16
 - e. List of Ten (10) similar existing installations that have been installed in Massachusetts including, Owner representative and telephone number(s).
 - f. The Turf Contractor and Turf Manufacturer (if different from the company) shall provide evidence that their turf system does not violate any other manufacturer's patents, patents allowed or patents pending. Evidence shall be in the form of a written document stating such and signed by the Turf Manufacturers Corporate Headquarters.
 - g. The Turf Contractor and Turf Manufacturer (if different from the company) shall provide a sample copy of insured, non-pro-rated warranty and NON-CANCELABLE third-party warranty insurance policy with a policy minimum claim limits of at least \$5,000,000 and annual aggregate limit of at least \$60,000,000 in order to fully cover the full replacement of the turf system in the event of total failure.
 - h. Letter stating the products anticipated lifespan.

- i. A letter and specifications sheet certifying that the products in this section meet or exceed specified requirements including certification from the turf manufacturer that lead or lead chromate are not used in the manufacturing of the specified system.
 - j. Warranty must cover full 100% of replacement value of total square footage installed. Minimum \$10.00 per square foot.
 3. The General Contractor / Site Contractor shall be defined as the contractor who is responsible for the construction of the site components related to and located beneath the turf product, inclusive of but not limited to all cuts and fills as needed to establish an approved subgrade, the dynamic stone drainage system, the flat drains, the perimeter collection system. The turf supplier / installer is a subcontractor to the general contractor. The General Contractor / Site Contractor shall have installed a minimum of five (5) Turf Fields in the last three (3) years and shall provide documentation and contact information for such.

C. Shock Attenuation Evaluation:

1. Near the completion of the turf, hire an independent testing laboratory to perform ten (10) in place G max tests in compliance with ASTM F1936 and F355. If any test results exceed 125, modify the infill material ratios as necessary to achieve satisfactory results. Perform additional testing to verify the results as required by the Owner's Representative.
2. Guarantee: During the eight (8) year guarantee period, the G max rating shall remain less than 165. The Contractor shall contract with an independent testing laboratory to perform three (3) in place G max tests each on site during the first, third, fifth, seventh and eighth years. If any test results meet or exceed 165, modify the infill material ratios as necessary to achieve satisfactory results. Perform additional testing to verify the results as required by the Architect. If the G max rating exceeds 165 after three attempts to repair the high rating, replace the field within 90 calendar days at no cost to the Owner.

D. Pre-Installation Meeting:

1. Convene One (1) Week After Bid Opening:
 - a. An interview shall take place at a time and date to be determined by the Engineer at the district office or other location determined by the Engineer and Owner. Present at this meeting shall be the Engineer, Owner's Representative(s), the Project Manager and Site Superintendent for the Prime Contractor and the Project Manager and Project Foreman for the Turf Installer. The purpose of this meeting will be to review turf product and installation means and methods, to interview and ascertain the experience and competence of the Turf Installer, as well as, the onsite

Project Foreman for this project and to review the project schedule. The basis of choosing this product shall be in part due to the results of this interview process. Contractor shall submit all required submittals before this meeting.

2. Convene One (1) Week Prior to Stone Blanket Completion:

- a. A second meeting shall take place at a location, time and date to be determined by the Engineer. Present at this meeting shall be the Engineer, Owner's Representative(s), and the Project Manager for the Site Contractor. The purpose of this meeting shall be to review and confirm schedule. (with attention on the turf installation) and to confirm that the turf product has been ordered by way of notarized copies of the original confirmed Purchase Order and guaranteed delivery date.

E. Delivery, Storage, and Protection

1. Convene Deliver products to project site in wrapped condition.
2. Store products under cover and elevated above grade.
3. Protect all products and installation area from vandalism, theft, other construction, etc.

F. Warranties

1. The Turf Manufacturer shall provide a Warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight (8) years from the date of Substantial Completion. The turf manufacturer must verify that their onsite representative has inspected the installation and that the work conforms to the manufacturer's requirements. The turf fabric shall not lose more than an average 2% per year. The manufacturer shall guarantee the availability of replacement material for the synthetic turf system installed for the life of the warranty.
2. The Manufacturer's Warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer.
3. The Turf Manufacturer's Warranty must be supported by an insurance policy of the full eight (8) year period.
4. The Turf Contractor shall provide a Warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the Manufactures' recommendations and any written directives of the Manufacturer's onsite representative.

5. The synthetic grass turf must maintain an ASTM F355 and ASTM F1936 G-max between 125-165 for the life of the Warranty. Refer to 1.3, B.
6. Any repairs or service to the field requested by the Owner or Owner's representative shall be addressed within 14 days from the date of written notification.

The Turf Manufacturer shall be 100% responsible for and warranty all products installed as part of his system inclusive of the fibers whether the fibers are manufactured by the turf company or by others.

G. Maintenance Service

1. The Turf Contractor will train the Owner's facility maintenance staff in the use of the specified maintenance attachments and equipment to routinely groom and sweep the field. Equipment shall be in good working condition.

H. ADA Handicap Accessible

1. Synthetic turf system shall be approved as ADA compliant as determined by Test-Method ASTM 1951-99.
2. Proof of passing must be submitted for approval.

2. Products

A. Base Stone and Drainage System

Sieves	Base Stone-Type 1	Base Stone-Type 2	Finishing Stone
3"			
2"	100		
1 ½"	90-100		
1"	75-100	100	
¾"	65-95	90-100	
½"	55-85	80-100	100
⅜"	40-75	70-100	85-100
¼"	25-65	60-90	75-100

US#4	15-60	50-85	60-90
US#8	0-40	30-65	35-75
US#16	0-20	10-50	10-55
US#30	0-10	0-35	0-40
US#60	0-8	0-15	0-15
US#100	0-6	0-8	0-8
US#200	0-5	0-2	0-2

PLEASE NOTE THAT THE BASE STONE AND DRAINAGE STONE SYSTEM IS A SPECIAL MANUFACTURED PRODUCT AND ANY DEVIATION FROM THIS MATERIAL SHALL REQUIRE WRITTEN APPROVAL FROM THE TURF MANUFACTURER'S CORPORATE HEADQUARTERS. THE BASE STONE AND FINISHING STONE PRODUCT IS A 100% CLEANED WASHED QUARRY STONE MIXTURE. GRAVEL AND SAND MIX MATERIAL SHALL NOT BE ALLOWED (NO EXCEPTIONS)

RESTRICTIONS:

1. To ensure structural stability: $D_{60}/D_{10} > 5$ and $1 < D_{30}^2 < 3$
 $D_{10} D_{60}$ Fragmentation must be 100%.
2. To ensure separation of both stones: D_{85} of finishing stone > 2
 D_{15} of base stone and $3 < D_{50}$ of base stone < 6
 D_{50} of finishing stone
3. To ensure proper drainage: Permeability of base stone > 50 in/hr. (3.5×10^{-2} cm/sec)
Permeability of finishing stone > 10 in/hr. (7.0×10^{-3} cm/sec)
Porosity of both stones $> 25\%$
(When stone is saturated and compacted to 95% Proctor.)

B. Perimeter Edge: Concrete curb (see Contract Drawings and Specifications).

C. Underdrain System

1. ADS AdvanEdge
 - a. 1 inch by 12-inch flat drain.

- b. ADS AdvanEdge end connector with 4-inch ADS pipe.
- c. 12-inch diameter perforated collector drain pipe.
- d. 6-inch diameter solid wall HDPE cleanout with 8 inches by 8 inches by 8-gauge aluminum plate with synthetic surface glued directly to plate.

2. Approved equivalent.

D. Synthetic Grass Infill System Materials

1. Manufacturer: Subject to compliance with all specified requirements,

A. THE CONTRACTOR SHALL PROVIDE WITH HIS BID, IN THE BID FORM, THE SYNTHETIC GRASS INFILL SYSTEM MANUFACTURER AND SYSTEM HIS/HER BID IS BASED ON.

2. The Synthetic Grass Material and resilient infill shall be in strict accordance with the following:

- A. The fiber shall be a 7,200 to 12,000 denier 260 micron minimum thickness monofilament, and 5,000-10,000 denier 100 micron minimum thickness parallel slit film 100% polyethylene, low-friction fiber, measuring not less than 2.25-2.5 inches high, as manufactured by Bonar Yarns & Fabrics, Tencate, Field Turf or ITS/Sprinturf. The low friction fiber shall be specifically designed to virtually eliminate abrasion. The fiber shall be a hybrid fiber combo with multi-structured monofilament and slit-film fibers tufted together in same or alternating needle construction per General specification part A-1-c.
- B. The tufted fiber weight shall not be less than 43 ounces per square yard for 2.25" pile height or 46 ounces per square yard for 2.5" pile height. The fiber shall be tufted on a 3/8" to 3/4" tufting machine. The overall product weight must not be less than 74 ounces per square yard. The low friction non-abrasive fiber shall be 100% polyethylene, treated with a UV inhibitor. Systems that use polyethylene/ polypropylene blended fibers and systems that include any type of nylon fibers are unacceptable.
- C. The carpet shall be delivered in 15' wide rolls. The rolls shall be of enough length to go from edge of field to edge of field. Head seams will not be acceptable.
- D. All field lines, numbers and markings indicated on the plans shall be permanently inlaid.
- E. The fiber shall be Field Green/Rye Green in color to simulate natural grass as closely as possible and treated with UV inhibitor, guaranteed a minimum of eight (8) years.

- F. The infill system shall consist of a non-compacting mixture of specifically graded, coarse, rounded, uniformly sized silica sand and coarse, virgin EPDM crumb rubber. EPDM rubber shall conform to all STC regulation standards for safety. The contractor shall submit to the engineer for approval all SBR product data inclusive of material size and content. Failure to do so shall be at the contractor's risk and cost.

Typ. Part. Size Distr. *Mesh (ASTM E-11)	Typ. Part. Size Distr. *Mesh (ASTM E-11)
8 -----	8 -----
12 0.3%	10 Trace
16 57.8%	12 20%
20 32.6%	16 80%
30 5.1%	20 100%
40 -----	PAN 0%
50 -----	
PAN 0.4%	

Minimum total weight of infill to be 7 lbs./square foot with a 57/43 sand and rubber ratio (NO EXCEPTIONS)

*Represents the typical mean percentage (%) retained on individual sieves

G. Turf Data

Pile Weight:	Min. 43 oz/sy for 2.25", Min. 46 oz/sy for 2.5"
Face Yarn Type:	100% Polyethylene
Yarn Size:	
Monofilament	7200-12,000 Denier (260- micron minimum thickness) Depending on gauge and tufting
Slit Film	5,000-10,000 Denier (100- micron minimum thickness) Depending on tufting
Pile Height (Finished)	2.25"-2.5"
Color:	Field Green
Construction:	Broadloom Tufted
Stitch Rate:	10/3"
Tufting Gauge:	3/8" to 3/4" depending on gauge and stitching

Primary Backing:	Woven and non-woven, fiber reinforced backing (three component system)
Secondary Backing:	20 oz/sy Urethane
Total Product Weight:	73 oz/sy (± 2 oz) Min.
Finished Roll Width:	15'
Finished Roll Length:	Up to 220'
Perforation (Outdoors):	3/16" Holes on Staggered 4" (approximate)
Center Permeability:	20" ± Per Hour

Turf contractor shall provide independent study data on permeability requirements

Infill Composition:	Rounded, Uniformly-Sized Silica Sand and virgin SBR Rubber Mixture (43% rubber / 57% sand by weight)
Field Lines & Markings:	Tufted, Inlaid and Painted

H. An Owner's Representative approved equivalent.

C. Installation

1. Subgrade / Subbase Approvals

- A. Prior to the installation of the Synthetic Grass Infill System, the General/Site Contractor shall provide written certification that all subgrade, subbase, leveling course and slopes and elevations are in compliance with the Contract Documents and meets or exceeds all manufacturer's requirements. This certification shall be prepared by an approved Installer. The finished grade of the subbase shall not vary more than 3/16" in ten (10) feet. A laser grader must be used to meet the requirements.
- B. The General/Site Contractor shall also provide an as-built survey of the finished subgrade and finished leveling course with spot grades every 25 feet on center each way for approval.
- C. The General/Site Contractor shall prepare a minimum 25'x25' (twenty-five foot by twenty-five foot) mock-up of the approved materials for the subbase and leveling course system in order to evaluate porosity and stability prior to installing material over the entire field. If acceptable the mock-up may become part of the finished field.

D. Synthetic Grass Infill System

1. Verification of Conditions (by Installer): Examine conditions under which synthetic grass surfacing is to be installed in coordination with Installer of materials and components specified in this Section and notify affected Prime Contractors and Owner's Representative in writing of any conditions detrimental to proper and timely installation. Do not proceed with installation until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
 - A. When Installer confirms conditions as acceptable to ensure proper and timely installation and to ensure requirements for applicable warranty or guarantee can be satisfied, submit to Owner's Representative written confirmation from applicable Installer. Failure to submit written confirmation and subsequent installation will be assumed to indicate conditions are acceptable to Installer.
 - B. Synthetic Grass Infill System: Provide manufacturer's inspection and certification that surface to receive synthetic turf is ready for installation of synthetic turf system, is perfectly clean in accordance with manufacturer's standards, and will be maintained in acceptable clean condition throughout installation.
2. Installation: Install in strict accordance with manufacturer's written specifications and recommendations.
 - A. Unless otherwise recommended by turf and base manufacturer, lay turf loosely across field, stretched, and attached to perimeter edge detail with enough length to permit full cross-field installation without head or cross-seams. (Head and cross-seams shall not be permitted)
 - B. Unless otherwise recommended by the turf and base manufacturer, this shall be a 100% sewn installation. (Gluing of seams shall not be permitted)
 - C. Provide Infill material properly mixed on site and applied/spread evenly with a large fertilizer type spreader (minimum six (6) foot wide) in strict accordance with manufacturer recommendations. Between each application of infill, the field area shall be brushed with a motorized rotary nylon broom. Minimum infill depth shall be 2.0 inches. Comply with manufacturer's recommendations regarding environmental requirements for installation such as dryness and absence of moisture. Please note that prior to final approval of the field the Owner's Representative shall perform field infill height measurements and infill weight tests throughout the field to ensure the proper infill height and weight have been met. The infill weight tests shall include removing a square foot of material and weighing accordingly, in the presence of the turf manufacturer / turf installer, at 8 chosen areas throughout the field of play. Upon completion of the test, the turf manufacturer shall replace the extracted material

accordingly. If it is deemed the proper infill weight is not in compliance with the contract documents, the turf manufacturer, at his/her cost, shall import and install added infill material (in the presence of the Owner's Representative) throughout the field until it has been deemed the infill weight is acceptable.

D. Field markings: Apply and install fixed markings as indicated herein and in accordance with the Contract Drawings.

i. Soccer: All lines/markings shall be inlaid yellow.

All markings can be sheared/shaved or cut and glued.

E. Provide final cleaning of synthetic grass surfacing installations and maintain area clean and free from debris during installation. Clean surfaces, recesses, enclosures, and similar areas as required leaving area of installation in clean, immaculate condition ready for immediate occupancy and using by Owner.

F. Protect installed synthetic grass from subsequent construction operations. Do not permit traffic over unprotected surfacing.

G. The turf manufacturer shall provide training for the Owner's facility maintenance staff in use of grooming equipment recommended by the manufacturer.

D. Maintenance and Warranty

1. The turf installer and/or the turf manufacturer must provide the following:

A. The turf manufacturer shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight years from the date of Substantial Completion. The turf manufacturer must verify that their on-site representative has inspected the installation and that the work conforms to the manufacturer's requirements. The polyethylene yarn manufacturer shall provide an eight (8) year "UV stabilization" warranty.

B. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, acts of War and acts of God beyond the control of the Owner of the manufacturer.

C. The turf contractor shall provide a warranty to the owner that covers defects in the installation workmanship, and further warrant the

installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's on-site representative.

- D. All turf warranties shall be limited to repair or replacement of the affected areas and shall include all necessary materials, labor, transportation costs, etc. to complete said repairs. All warranties are contingent on the full payment by the Owner of all pertinent invoices.

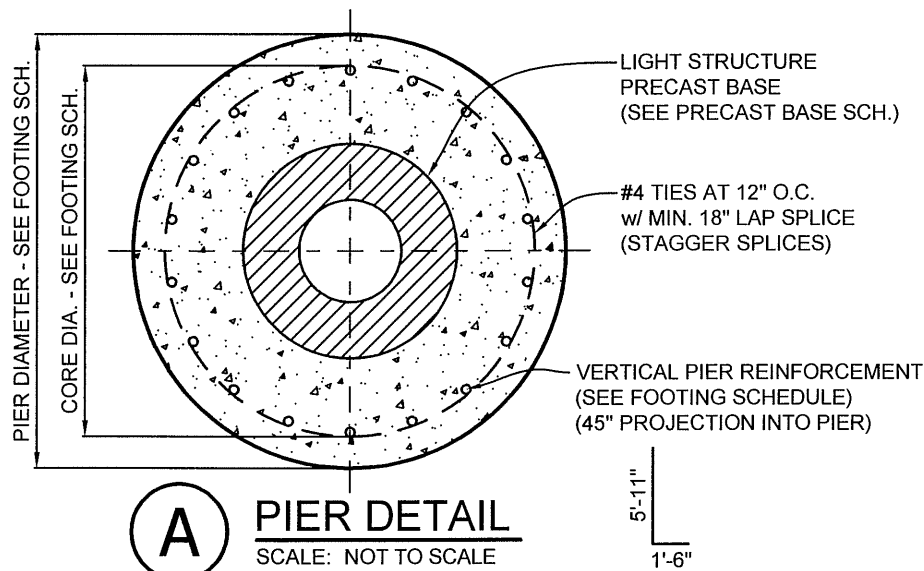
END OF SECTION

POLE IDENTIFICATION AND RESULTANT FORCES							
POLE DESIGNATION	POLE TYPE	PRECAST BASE TYPE	FIXTURE CONFIGURATION (FIX. PER XARM)	FIXTURE AND ACCESSORIES EPA (FT ²)	FORCES (1.)		
					MOMENT (M) FT-LBS	SHEAR (V) LBS	VERTICAL (P) LBS
S1 - S4	LSS70D	5B	6 (6)	19.2	96,422	2,134	3,061

- ASD LOAD COMBINATION D + 0.6W. VERTICAL FORCE IS WEIGHT OF DRESSED POLE.

PRECAST BASE ID FOR SPREAD FOOTING							
PRECAST BASE TYPE	PRECAST BASE WEIGHT (1.)	PRECAST BASE LENGTH (1.)	PROJECTION ABOVE TOP OF PIER	STANDARD EMBEDMENT (1.)	OUTSIDE DIAMETER	CUT LENGTH OFF BOTTOM (2.)	EMBEDMENT INTO PIER & FOOTING (3.)
5B	4,580 LBS	23'-11"	7'-11"	16'-0"	18.25"	10'-0"	6'-0"

- PRECAST BASE WEIGHT, LENGTH AND STANDARD EMBEDMENT ARE PRECUT PROPERTIES
- EPOXY COAT NEW BOTTOM SURFACE OF PRECAST BASE AFTER CUTTING
- EMBEDMENT EQUALS 4'-6" PIER HEIGHT PLUS 1'-6" DEPTH INTO FOOTING



CONCRETE/REINFORCEMENT NOTES

CONCRETE SHALL COMPLY WITH THE FOLLOWING ASTM STANDARDS: MIXTURE WITH ASTM C-94, PORTLAND CEMENT WITH ASTM C-150 TYPE 1-A, AGGREGATES (MAX 0.75") WITH ASTM C-33 AND BE IN CONFORMANCE WITH ACI 318. CONCRETE SHALL BE AIR-ENTRAINED (COMPLY WITH ASTM C-260), HAVE A MAXIMUM WATER-CEMENT RATIO, w/cm = 0.45 AND HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 4,500 PSI.

DESIGN SLUMP LIMITS ARE 4" MINIMUM AND 6" MAXIMUM. THE JOB SITE SLUMP MAY BE INCREASED BY THE USE OF A WATER REDUCING AGENT MEETING ASTM C494-92.

CONCRETE REINFORCEMENT SHALL COMPLY WITH ASTM A615 GRADE 60 AND BE IN CONFORMANCE WITH ACI 315 & 318.

CONCRETE MUST ATTAIN DESIGN STRENGTH PRIOR TO POLE INSTALLATION AND FIXTURE MOUNTING.

DESIGN NOTES

DESIGN PARAMETERS:
WIND: $V_{ult} = 126$ MPH, $V_{asd} = 98$ MPH (EXPOSURE C, RISK CATEGORY II) PER MASSACHUSETTS STATE BUILDING CODE - 780 CMR, 9TH EDITION (IBC 2015 / ASCE 7-10).

GEOTECHNICAL PARAMETERS:
ALLOWABLE END BEARING SOIL PRESSURE: 6,000 PSF IN ACCORDANCE WITH MASSACHUSETTS STATE BUILDING CODE - 780 CMR, 9TH EDITION, CHAPTER 18.

DESIGN SOIL PARAMETERS ARE AS NOTED. ACTUAL ALLOWABLE SOIL PARAMETERS MUST BE VERIFIED ON SITE. REFERENCE GEOTECHNICAL ENGINEERING REPORT, PROJECT NO. 2180076, PREPARED BY WESTON & SAMPSON; PEABODY, MA.

A GEOTECHNICAL ENGINEER OR REPRESENTATIVE OF IS RECOMMENDED (NOT REQUIRED) TO BE AVAILABLE AT THE TIME OF THE FOUNDATION INSTALLATION TO VERIFY THE SOIL DESIGN PARAMETERS AND TO PROVIDE ASSISTANCE IF ANY PROBLEMS ARISE IN FOUNDATION INSTALLATION.

ENCOUNTERING SOIL FORMATIONS THAT WILL REQUIRE SPECIAL DESIGN CONSIDERATIONS OR EXCAVATION PROCEDURES MAY OCCUR. POLE FOUNDATIONS WILL NEED TO BE ANALYZED ACCORDING TO THE SOIL CONDITIONS THAT EXIST. IF ANY DISCREPANCIES OR INCONSISTENCIES ARISE, NOTIFY THE ENGINEER OF SUCH DISCREPANCIES. FOUNDATIONS WILL THEN BE REVISED ACCORDINGLY. REVISIONS WILL BE ANALYZED PER RECOMMENDATIONS DIRECTED BY A REGISTERED ENGINEER.

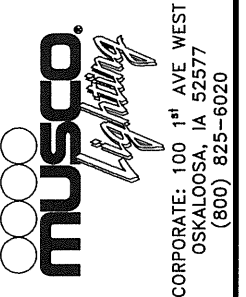
ALL EXCAVATIONS MUST BE FREE OF LOOSE SOIL AND DEBRIS PRIOR TO FOUNDATION INSTALLATION AND CONCRETE BACKFILL PLACEMENT.

CONTRACTOR MUST BE FAMILIAR WITH THE COMPLETE SOIL INVESTIGATION REPORT AND BORINGS, AND CONTACT THE GEOTECHNICAL FIRM (IF NECESSARY) TO UNDERSTAND THE SOIL CONDITIONS AND THE POSSIBILITY OF GROUND WATER PUMPING AND EXCAVATION STABILIZATION OR BRACING DURING PRECAST BASE INSTALLATION AND PLACEMENT OF CONCRETE BACKFILL.

GENERAL NOTES:
FIXTURES MUST BE LOCATED TO MAINTAIN 10'-0" MINIMUM HORIZONTAL CLEARANCE FROM ANY OBSTRUCTION. ENGINEER MUST BE NOTIFIED IF FOUNDATIONS ARE NEAR ANY RETAINING WALLS OR WITHIN / NEAR ANY SLOPES STEEPER THAN 3H : 1V. POLES, FIXTURES, PRECAST BASES, ELECTRICAL ITEMS AND INSTALLATION PER MUSCO LIGHTING.



LOKER
SOCCER FIELD
ATHLETIC LIGHTING
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 EMAIL: MSL.INFO@SEPC.BIZ

DRAWING TITLE:
 POLE AND FOUNDATION
 SCALE: SEE PLAN
 NOTES:
 SCAN #191248A

PROJECT NUMBER
191248

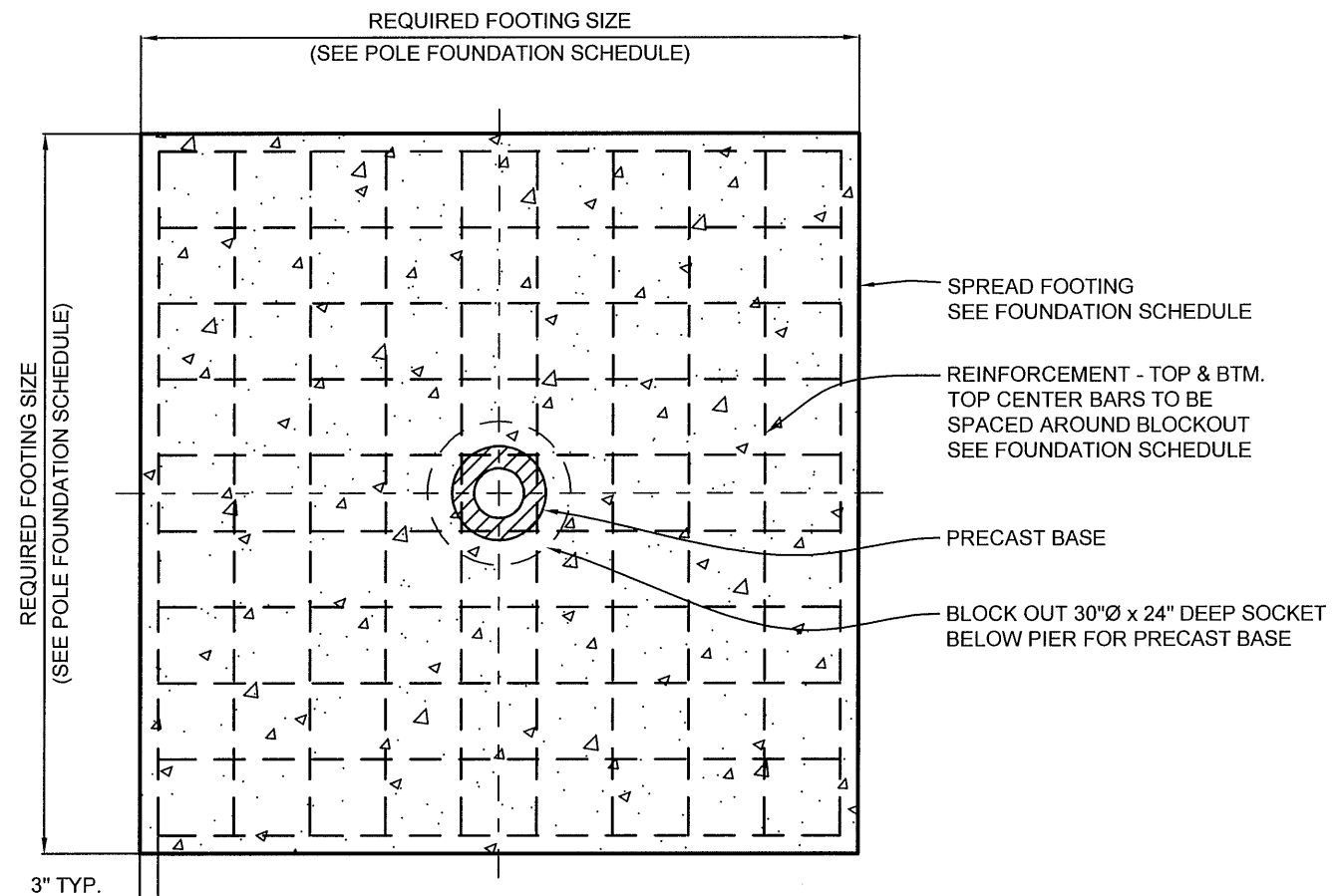
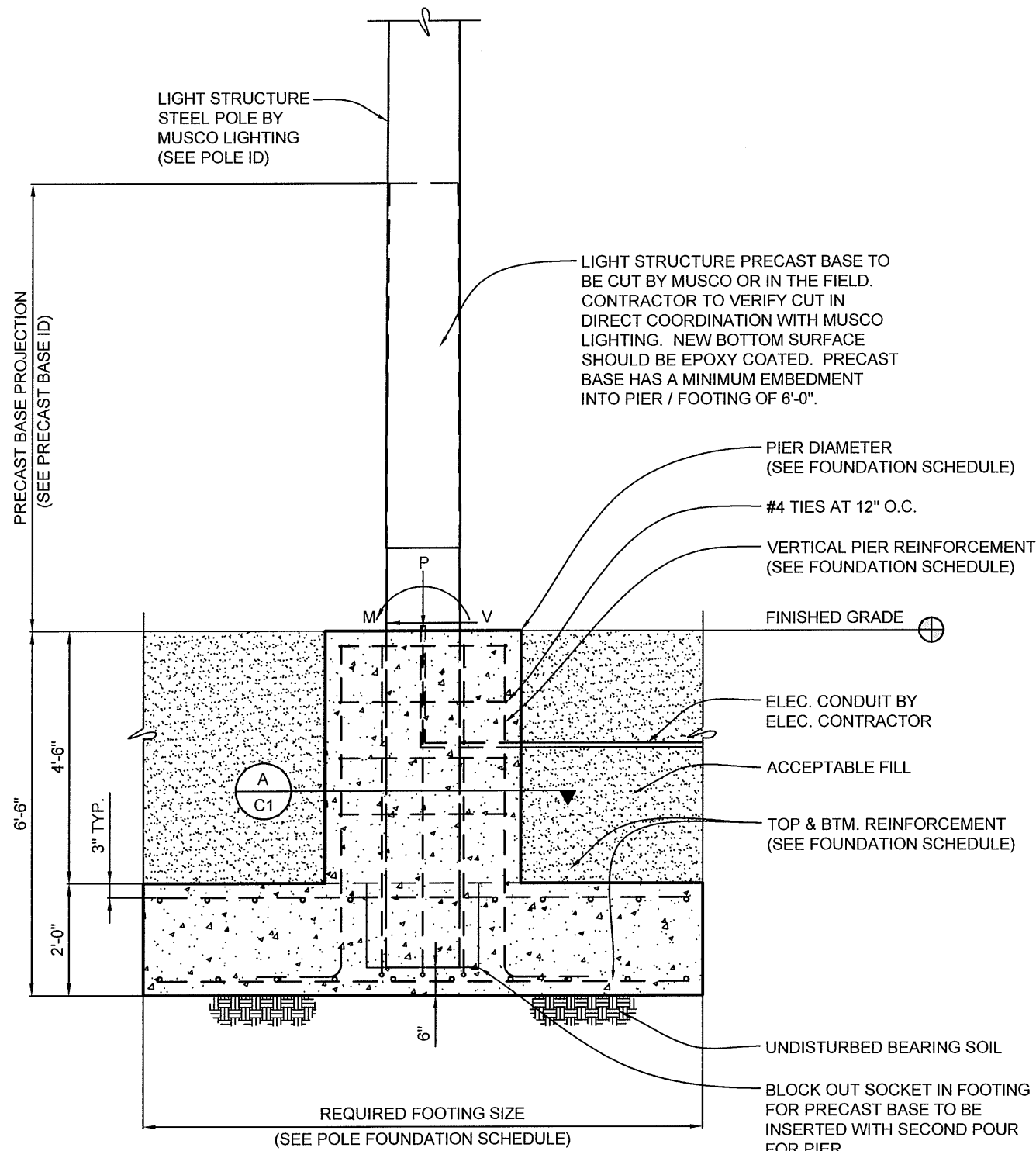
DATE
24 MAY 2018

DRAWING NUMBER
C1

OF TWO

POLE FOUNDATION SCHEDULE							
POLE DESIGNATION	FOOTING			PIER			
	SIZE	THICKNESS	REINFORCEMENT TOP & BOTTOM (TOTAL) QUANTITY - SIZE	DIAMETER INCHES	CORE DIA. INCHES (1.)	VERTICAL REINFORCING	HORIZONTAL TIES
S1 - S4	10'-0" x 10'-0"	2'-0"	(40) 10 - #7's EACH WAY	48	41	18 - #7	#4 @ 12"

1. CORE DIAMETER EQUAL TO INSIDE DIAMETER OF TIES.



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NOTES:
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C2

OF TWO