The City of WORCESTER

Administration & Finance – Purchasing Division
Christopher J. Gagliastro, MCPPO – Purchasing Director
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February 3, 2023

To All Bidders:

Subject: **7943-M3 Mulcahy Field Improvements- Phase II/DPWP-ARPA**

ADDENDUM NO. 6

To Whom It May Concern:

With reference to our proposal request relative to the above subject, please refer to the changes/modifications/clarifications to the original proposal request.

General Bid Clarification

1. **Bid due date has been extended to Wednesday, February 15, 2023 at 10:00 AM.**
2. This addendum includes the addition of Add-Alternate 1 (playground area), included in the attached revised plans and sections of the technical specifications.
3. A temporary construction entrance has been added to Sheets C-2 and C-3. This entrance is part of the base bid, not Add-Alternate 1.
4. A clarification note has been added to Sheet L-2, regarding damage outside of the construction limits.
5. Delete Article 41 from the Project Special Conditions and Specifications (addendum #2, December 2022) and replace with the attached Revised Article No.41.

Questions & Answers

Question 1: *The addendum 5 response to question 2 is still not clear. We do not find the routing of the fiber optic cable on drawing E-1. Does the cable dead end in the "existing security handhole" shown in the upper left of the drawing? If so please substantiate the need for 1,000' of cable. We only find the need for approximately half that amount.*

(more)

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Answer 1: **Fiber optic cable dead ends in the building. Conduit runs from Building to the existing "security hand hole" shown in the upper left of the drawing. See attached Revised Article No. 41 referenced above.**

Question 2: *Please confirm that the 1,000 feet of fiber optic cable called for in Special Conditions Article 40 includes furnishing, installing and testing the 12 strand, and does not include splices, splice enclosures, terminations, whips, patch panels, or any additional hardware.*

Answer 2: **Revised Article No. 41 includes splices, splice enclosures, terminations, whips, patch panels, and any additional hardware. See attached Revised Article No. 41 referenced above.**

Attachments

Revised Drawing Set (entire set, including revised sheets)
New and Revised Specification Sections 03-40-00, 11-68-13, 32-11-16, 32-18-16.13, and 32-33-00
Revised Article No. 41

Proposers are requested to acknowledge and/or include this addendum with submission. All other terms, conditions and specifications remain unchanged.

Very truly yours,

Maureen McKeon
Assistant Purchasing Director

(DOCUMENTS FOLLOW)

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MULCAHY FIELD IMPROVEMENTS, PH II

ADD ALTERNATE

Add Alternate #1 : Construction of the Playground as per the plans and specifications attached to Addendum No. 6.

Add Alternate #1 price: $ _____(numeric)

_____(written)

SECTION 03 40 00
PRECAST CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

A. The City of Worcester Bid Form, General Conditions, Supplementary Conditions, and applicable parts of the Special Conditions form a part of this Specification and the Contractor shall consult them in detail for instructions.

B. The Contractor shall provide all labor, equipment, and materials; and perform all operations necessary to complete the work of this section as indicated on the Drawings and specified herein which shall include but is not limited to the following:

1. Precast concrete curb edge (add-alternate)

C. The layout of curb edging shall be marked out in the field for review and approval by the Owner's Representative prior to installation.

1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Section 32 11 16 – Aggregate Base Courses
B. Section 32 12 16 – Bituminous Concrete
C. Section 32 18 16.13 – Poured-in-Place Resilient Surfacing

1.03 REFERENCE STANDARDS AND SPECIFICATIONS

A. Except as modified by governing codes and by the Contract Documents, the Contractor shall comply with applicable provisions and recommendations of the following:

1. ASTM: American Society for Testing and Materials, latest edition

1.04 SUBMITTALS

A. The Contractor shall submit shop drawings and manufacturer's literature for precast concrete curb edge, indicating size, shape and dimensions, and finish for approval by Owner's representative.

B. Copies of tests on representative samples of the concrete used in the manufacture of all precast units showing a minimum compressive strength of 5,000 pounds must be received by the Owner's representative prior to shipping any units.

C. Fabrication of any material or performing of any work prior to the final approval of the shop drawings will be entirely at the risk of the Contractor.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Precast concrete curbs shall be adequately protected from damage during transit to the site.

B. Curbs shall be protected against staining, chipping, and other damage. Cracked, badly chipped, or stained units will be rejected and shall not be employed in the work.

1.06 COORDINATION

A. The work specified in this Section shall be coordinated with all work shown/described on the Drawings and in other Sections of the Specifications.

PART 2 – PRODUCTS

2.01 PRECAST CONCRETE CURB

A. The concrete shall have a minimum compressive strength of 5,000 psi at 28 days, and shall contain 5 to 7 percent entrained air.

B. Precast concrete curbing shall be supplied by Scituate Concrete Products (phone # 800-322-4488, www.scituatecompanies.com), or approved equal.

2.02 CONCRETE REINFORCEMENT

A. Reinforcing steel shall conform to ASTM Specification A-615 grade 60, deformed bars.

2.03 DOWEL PINS

A. Dowel pins for connecting curb units together shall be rust-resistant steel, supplied by the curb manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRECAST CONCRETE ELEMENTS

A. Curbing shall be installed at the lines and grades shown on the Drawings, and in accordance with the Drawing detail for curb edging.

B. Curb sections shall be connected to each other with dowel pins.

C. All abutting sections shall be aligned to within ¼" tolerance. Any sections determined to be misaligned shall be reset by the Contractor at no additional cost to the Owner.

END OF SECTION

SECTION 11 68 13
PLAYGROUND EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. The City of Worcester Bid Form, General Conditions, Supplementary Conditions, and applicable parts of the Special Conditions form a part of this Specification and the Contractor shall consult them in detail for instructions.

B. The Contractor shall provide all labor, equipment, and materials; and perform all operations necessary to complete the work of this section as indicated on the Drawings and specified herein which shall include but is not limited to the following:

1. Playground equipment (add-alternate)

C. All equipment locations and applicable safety zone boundaries shall be marked in the field for review and approval by the Owner's Representative prior to installation.

1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Special Conditions and Specifications (additional requirements for playground equipment)
B. Section 03 30 53 – Cast-in-Place Cement Concrete
C. Section 32 11 16 – Aggregate Base Courses
D. Section 32 18 16.13 – Poured-in-Place Resilient Surfacing

1.03 REFERENCE STANDARDS AND SPECIFICATIONS

A. Except as modified by governing codes and by the Contract Documents, the Contractor shall comply with applicable provisions and recommendations of the following:

1. ADA: Americans with Disabilities Act, including latest amendments and additions.
2. AAB: Architectural Access Board, Commonwealth of Massachusetts, Chapter 521 CMR, latest edition.
3. ASTM: American Society for Testing and Materials

1.04 REQUIRED SUBMITTALS

A. The Contractor shall provide complete product literature and applicable color samples for approval by the Owner's Representative prior to ordering the following equipment:

1. Playground equipment

B. The Contractor shall submit additional information and electronic files for the playground equipment as required by the Special Conditions and Specifications.

1.05 QUALITY ASSURANCE

A. This work shall be assigned to experienced and qualified subcontractors employing experienced workers who will work under the full-time supervision of a qualified foreman with a minimum of five (5) years of experience on projects comparable to this project. The Contractor shall use an adequate number of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for the proper performance of the work in this Section. The Contractor shall demonstrate that he/she has successfully completed work of similar size and scope.

B. The playground equipment installer shall have at least one person on site during the entire installation who is a Certified Playground Safety Inspector.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

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

B. The Contractor shall store materials under waterproof covers on planking clear of ground and protect from handling damage, dirt, stain, water and wind.

C. The Contractor shall take all necessary precautions to prevent all items from chipping, cracking, or other damage during the transportation of these materials to the project, unloading and storage on the site. The Contractor shall lift items with wide-belt type slings wherever possible; he/she shall not use wire rope or ropes containing tar or other substances which might cause staining. If required, he/she shall use wood rollers and provide cushioning at end of wood slides. Damaged items will not be allowed to be installed and should any damaged items be found in constructed work, such items shall be removed immediately and replaced, and the Contractor shall assume all expenses incurred therefrom.

D. Stored materials shall be adequately protected against moisture by one (1) stacking in such a manner as to allow a complete circulation of air under each stack, and two (2) covering each stack, including top and sides, with a waterproof paper or membrane. Coverings shall remain in place at all times, when not working from the particular stack.

1.07 EXAMINATION OF CONDITIONS

A. The Contractor shall fully inform his/herself of existing conditions of the site and shall be fully responsible for carrying out all work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. 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. At the beginning of work, the installer shall accept substrates, subgrades, previous work, and conditions. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed.

B. The Contractor shall be solely responsible for judging the potential need for storing materials temporarily and/or re-handling items prior to final installation.

1.08 COORDINATION

A. The work specified in this Section shall be coordinated with all work shown/described on the Drawings and in other Sections of the Specifications.

PART 2 - PRODUCTS

2.01 PLAYGROUND EQUIPMENT

A. Play equipment shall comply with the following requirements:

1. CPSC Handbook for Public Playground Safety, Publication #325
2. ASTM F1487-07, Standard Consumer Performance Specification for Playground Equipment for Public Use
3. All applicable requirements of the ADA (Americans with Disabilities Act)
4. All components shall be certified by the International Playground Equipment Manufacturer's Association
5. The play equipment manufacturer shall carry a minimum of $10 million in liability insurance, and have a minimum of 10 years' experience manufacturing commercial playground equipment.
6. Posts shall be galvanized steel with a powder-coat finish. All posts shall have galvanized steel or aluminum caps, also powder-coated. Caps shall be installed at the factory, and shall fit snugly into post ends.
7. Slides shall be stainless steel.
8. Vertical panels and climbers shall be powder-coated galvanized steel.
9. Wooden components are not allowed.
10. All posts shall be in-ground mounted.

B. Playground equipment shall include the following structures (one of each):

1. Composite Play Structure: One composite structure for preschool-age children shall be provided as indicated on the Drawings, and shall be a custom PlayBooster structure (Plan # ME020258) by Landscape Structures, Inc., phone # 888-438-6574, www.playlsi.com; or approved equal. If the manufacturer does not provide certain components shown, substitute components may be proposed which are similar to those on the Drawings, in which case a scale drawing of each entire structure with the substituted components shall be submitted to the Owner's Representative for approval. Substituted components, structures, and their safety zones shall fit within the play surfacing boundaries indicated on the Drawings. The color scheme shall be blue posts, pine green vertical panels, gray decks, and silver climbers – specific colors will be confirmed by the Owner's Representative.

2. Double-Bay Swing Set: This shall include 2 standard belt seats in one bay and 2 bucket seats in the other bay, as shown on the Drawings. The frame shall be arch-

style, with two support posts at the end of each bay. The swing hinges shall be a maximum of 8 feet above finished grade of the play surface. Bucket seats shall be fully enclosed. Manufacturer shall be Landscape Structures, Inc., or approved equal. The color scheme shall match that of the composite play structure, with blue posts/bar and gray chains – specific colors will be confirmed by the Owner's Representative.

3. Basket Swing Set: This swing set shall include a basket/saucer-type swing that accommodates multiple children at once. Material of seat shall be molded plastic, and shall include hole(s) for drainage. There shall be two support posts at each end of the swing set. The swing hinges shall be a maximum of 8 feet above finished grade of the play surface. Manufacturer shall be Landscape Structures, Inc., or approved equal. The color scheme shall match that of the composite play structure, with blue posts, gray chains, and green basket/saucer – specific colors will be confirmed by the Owner's Representative.

4. Net Climber: The net climber shall be the Kompan product # COR30281 (Mini SpaceNet); phone # 800-426-9788, www.kompan.us; or approved equal. This climber shall be shaped as shown on the Drawings, and shall have a center post. The maximum fall height, as defined by the Consumer Product Safety Commission Publication #325, shall be 8 feet. The horizontal distance from opposite corners of the climber (on opposite sides of the center post from each other), measured at finished grade of the play surface, shall be no more than 24' in order for the structure to fit within the limits of the safety surfacing. The color scheme shall be blue post with black ropes – specific colors will be confirmed by the Owner's Representative.

5. Welcome Sign: A welcome sign shall be provided by the composite play structure manufacturer, which includes the recommended age range for the structure (preschool/2-5 years of age). Post color shall match one of the play structure colors.

PART 3 – EXECUTION

3.01 PLAYGROUND EQUIPMENT

A. The Contractor shall assemble and install the playground equipment in accordance with the Drawings and manufacturer's written instructions. The welcome sign shall be installed near the composite play structure, where shown on the Drawings. See Special Conditions & Specifications for additional installation requirements.

B. All equipment shall be in-ground mounted. Cement concrete footings shall be installed in accordance with Section 03 30 53 – Cast-in-Place Cement Concrete, the Special Conditions & Specifications, and manufacturer's written instructions.

C. The playground equipment installer shall have at least 5 years of experience installing comparable structures, and shall have at least one person on site during the entire installation who is a Certified Playground Safety Inspector.

D. All installation shall conform to ASTM F1487.

E. The Contractor shall mark layout of play equipment and required safety zones prior to installation of adjacent walkway, curb, and fencing, for Owner's Representative to approve.

END OF SECTION

SECTION 32 11 16
AGGREGATE BASE COURSES

PART 1 - GENERAL

1.01 DESCRIPTION

A. The City of Worcester Bid Form, General Conditions, Supplementary Conditions, and applicable parts of the Special Conditions form a part of this Specification and the Contractor shall consult them in detail for instructions.

B. This Section specifies requirements for the preparation and placement of granular pavement base materials. The base courses shall consist of approved granular materials placed on the subgrade and in close conformity with the lines and grades on the plans or as established by the Owner's representative.

C. The Contractor shall provide all labor, equipment, and materials; and perform all operations necessary to complete the work of this section as indicated on the Drawings and specified herein which shall include but is not limited to the following:

1. Fine grading and compaction of pavement subgrade.
2. Furnishing, placing, and compacting of base materials.

1.02 RELATED SECTIONS

A. Other specification sections that directly relate to the work of this Section include:

1. Section 03 30 53 – Cast-in-Place Cement Concrete
2. Section 31 23 10 – Earthwork
3. Section 32 12 16 – Bituminous Concrete
4. Section 32 18 16.13 – Poured-in-Place Resilient Surfacing (add-alternate)
5. Special Conditions and Specifications (additional requirements for gravel)

1.03 COORDINATION

A. The work specified in this Section shall be coordinated with all work shown/described on the Drawings and in other Sections of the Specifications.

PART 2 - PRODUCTS

2.01 AGGREGATE MATERIALS

A. Gravel borrow: Gravel for pavement base courses, mow strip bases, and footing bases shall meet the following gradation requirements. See Project Special Conditions & Specifications for gradation requirements for gravel borrow specified for other construction.

Sieve Size	Percent Passing
3”	100
1/2”	50-85
#4	40-75
#10	30-60
#40	10-35
#100	0-8
#200	0-8

The Contractor shall comply with additional requirements for all gravel borrow in the Project Special Conditions and Specifications.

B. Dynamic Base Blend for resilient surfacing sub-base course (add-alternate) shall be obtained from Lane Trap Rock, Oxford MA quarry, phone # (508) 987-3959, www.jslane.com; or approved equal. Dynamic Base Blend consists of 3/4”, 1/2”, and 3/8” crushed stone; and manufactured sand.

2.02 GEOTEXTILE FABRIC

A. Fabric shall be a non-woven polyester or polypropylene geotextile fabric with a weight of 4 to 6 ounces per square yard.

PART 3 - EXECUTION

3.01 SUBGRADE PREPARATION

A. All subsurface utility construction shall be completed before fine grading is begun.

B. The pavement and mow strip subgrades shall be fine graded to the locations, elevations and cross slopes shown on the Drawings.

C. Subgrades in in-situ soils in excavation areas and in embankment areas shall be compacted in conformance with Section 31 23 10 - Earthwork.

3.02 GEOTEXTILE FABRIC PLACEMENT (FOR RESILIENT SURFACES – ADD-ALT.)

A. Fabric shall be placed on compacted subgrade prior to placement of aggregate base course. Fabric shall overlap between 18 and 24 inches.

B. No construction equipment shall be allowed directly on the fabric.

3.03 BASE AND SUB-BASE MATERIAL PLACEMENT

A. Base course material shall not be placed until the Owner’s Representative has approved the fine grading, compaction, and condition of the subgrade.

B. Base course material shall be placed and spread on the approved subgrade in layers not

exceeding six (6) inches in thickness by approved self-spreading equipment. Any displacement of the compacted subgrade material by the equipment shall be restored to the required grade and re-compacted before placement of the base course material.

C. Aggregate base material for pavements, resilient surface system, and footings/foundations shall be compacted to 95 percent maximum dry density of the material as determined by the Standard AASHO Test Designation T99 compaction test Method C at optimum moisture content.

D. The surface of the base course material shall be fine graded to the locations, elevations, and cross slopes shown on the Drawings during final layer compaction operations.

3.04 PROOF COMPACTION

A. The Contractor shall proof-compact the aggregate base courses for all areas to be paved (asphalt and concrete) and all areas to receive resilient surfacing. Proof compaction shall consist of making ten (10) passes with a ten ton vibratory roller for walkway areas; and by a minimum of three (3) coverages from the rear wheel assembly of a fully loaded ten-wheel dump truck for all other paved areas including athletic courts. All proof-compaction work shall be supervised by either the Owner's Representative, or a geotechnical engineer hired by the Owner.

END OF SECTION

SECTION 32 18 16.13
POURED-IN-PLACE RESILIENT SURFACING

PART 1 - GENERAL

1.01 DESCRIPTION

A. The City of Worcester Bid Form, General Conditions, Supplementary Conditions, and applicable parts of the Special Conditions form a part of this Specification and the Contractor shall consult them in detail for instructions.

B. The Contractor shall provide all labor, equipment, and materials; and perform all operations necessary to complete the work of this section as indicated on the Drawings and specified herein which shall include but is not limited to the following:

1. Poured-in-place resilient surfacing for playground area (add-alternate)

C. The boundaries of all resilient surfaces shall be marked out in the field for review and approval by the Owner's Representative prior to installation.

1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Section 03 30 53 – Cast-in-Place Cement Concrete
B. Section 03 40 00 – Precast Concrete
C. Section 11 68 13 – Playground Equipment
D. Section 31 23 10 – Earthwork
E. Section 32 11 16 – Aggregate Base Courses
F. Section 32 31 13 – Chain Link Fences and Gates

1.03 REFERENCE STANDARDS AND SPECIFICATIONS

A. Except as modified by governing codes and by the Contract Documents, the Contractor shall comply with applicable provisions and recommendations of the following:

1. ASTM: American Society for Testing and Materials, latest edition:

a. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
b. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
c. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
d. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
e. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
f. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems under and Around Playground Equipment.
g. ASTM F1951 Standard Specification for Determination of Accessibility of

Surface Systems under and Around Playground Equipment.

1.04 SYSTEM DESCRIPTION

A. Performance Requirements: The Contractor shall provide a 2-layer rubber-polyurethane playground surfacing system which has been designed, manufactured and installed to meet the following criteria:

1. Shock Attenuation (ASTM F1292):
   a. Gmax: less than or equal to 150.
   b. Head Injury Criteria: less than or equal to 850.
2. Flammability (ASTM D2859): Pass
3. Tear Resistance (ASTM D624): 140%.
4. Water Permeability: 0.4 gal/yd2/second.
5. Accessibility: Comply with requirements of ASTM F1951.

1.05 REQUIRED SUBMITTALS

A. Color samples for initial selection
B. Manufacturer's standard verification square sample for field testing of 18" x 18"
C. Manufacturer's product data and installation instructions
D. Certificates of qualifications of the playground surfacing installer (See Quality Assurance under this Section.)
E. Following completion of the resilient surface installation, the Contractor shall submit repair materials, warranty, testing documents, and maintenance/repair instructions specified herein to the Owner's Representative.

1.06 QUALITY ASSURANCE

A. Qualifications: Installer shall be approved and trained by the manufacturer of the playground surfacing system, having experience with other projects of the scope and scale of the work described in this section. For installation of the poured-in-place safety surface, the contractor shall have a minimum of five (5) years of experience. Contractor shall provide the following information to the Owner's Representative:

1. Evidence that installer has successfully completed at least twenty-five (25) similar surfaces installed during the past five (5) years with names of clients and phone numbers.
2. Certification by manufacturer that installer is an approved applicator of the playground surfacing system.
3. Certification of installer by International Play Equipment Manufacturers Association (IPEMA).

B. Testing: After seventy-two (72) hours but within thirty (30) days following installation of the finished resilient surface, the Contractor shall be required to perform, with the Owner's Representative present, field testing by a third party (qualifications to be reviewed/approved by Owner), demonstrating that the surface is in compliance with ASTM F1292 for impact attenuation, ASTM F1951 for wheelchair accessibility, and Project Documents.

C. No request for payment for materials and labor for safety surfacing shall be reviewed or approved by the Owner without written submittal of the testing report results, verifying proof of 100 percent compliance with this article.

1.07 DELIVERY, STORAGE & HANDLING

A. Materials shall be delivered in manufacturer's original, unopened, undamaged containers with identification labels intact.
B. Materials shall be protected from exposure to harmful environmental conditions and at a minimum temperature of 40 degrees F (4 degrees C) and a maximum temperature of 90 degrees F (32 degrees C).

1.08 PROJECT/SITE CONDITIONS

A. Environmental Requirements: Surfacing system shall be installed when minimum ambient temperature is 40 degrees F (1 degree C) and maximum ambient temperature is 90 degrees F (32 degrees C). The Contractor shall not install system during steady or heavy rain.

1.09 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: The Contractor shall submit, for the Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.

C. Warranty Period: Surfacing shall maintain impact performance criteria as per the latest edition of ASTM F1292 and be guaranteed against defects in workmanship and materials for a period of no less than seven (7) years from the date of acceptance of the work.

1.10 COORDINATION

A. The work specified in this Section shall be coordinated with all work shown/described on the Drawings and in other Sections of the Specifications.

PART 2 – PRODUCTS

2.01 SOURCE LIMITATIONS

A. The Contractor shall obtain primary poured-in-place playground surface system materials from a single playground surface system manufacturer. The Contractor shall obtain secondary materials, including geosynthetics and repair materials of type and from source recommended by manufacturer of primary surface system materials.

2.02 POURED-IN-PLACE (PIP) RESILIENT SURFACE SYSTEM

A. Poured-in-place playground surfacing system shall include the following:

1. Dynamic Stone Base Blend and geotextile fabric: See Section 32 11 16 – Aggregate Base Courses.

2. Poured-In-Place Primer:

   a. Material: Polyurethane.

3. Poured-in-Place Basemat:

   a. Material: Blend of 100% recycled SBR (styrene butadiene rubber) and polyurethane.
   b. Thickness shall meet ASTM F1292 requirements for Impact Attenuation of Surface Systems within use areas of Playground Equipment and Swings for designed maximum critical fall height.
   c. Formulation Components: Blend of strand and granular material.

4. Poured-In-Place Top Surface:

   a. Material: Blend of recycled EPDM (ethylene propylene diene monomer) and Aromatic polyurethane
   b. Thickness: Nominal 1/2" minimum
   c. Color: Uniform Custom Combination - 50% Black and 50 % of Manufacturer's three (3) premium colors
   d. Dry Static Coefficient of Friction (ASTM D2047): 1.0
   e. Wet Static Coefficient of Friction (ASTM D2047): 0.9
   f. Dry Skid Resistance (ASTM E303): 89
   g. Wet Skid Resistance (ASTM E303): 57

2.03 PRODUCT SUBSTITUTIONS

A. Substitutions: Approved Equal

2.04 MIXES

A. Required mix proportions by weight:

   1. Basemat: 14% polyurethane, 86% rubber.

   2. Top Surface: 18% polyurethane, 82% rubber

PART 3 – EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. The Contractor shall comply with the instructions and recommendation of the playground surfacing manufacturer.

3.02 EXAMINATION

A. Site Verification of Conditions: The Contractor shall verify that substrate conditions are suitable for installation of the playground surfacing system.

B. The Contractor shall not proceed with installation of the system until unsuitable conditions are corrected, in accordance with Section 31 23 10 – Earthwork.

3.03 PREPARATION

A. The Contractor shall prepare the area to receive resilient surfacing as follows:

1. Stake locations of surfacing perimeter, playground equipment, walkways, and other objects that will be adjacent to and within surfacing. Also mark safety zone limits.
2. Install play equipment, fence posts, and other items within and adjacent to areas to receive resilient surfacing. See relevant specification sections for these items.
3. Prepare subgrade in accordance with Section 31 23 10 – Earthwork.

3.04 INSTALLATION OF GEOTEXTILE FABRIC, SUB-BASE COURSE, & EDGING

A. The Contractor shall install edging, geotextile fabric, & sub-base course as follows:

1. Place geotextile fabric on prepared subgrade in accordance with Section 32 11 16 – Aggregate Base Courses.
2. Place and compact Dynamic Stone Blend sub-base layer in accordance with Section 32 11 16 – Aggregate Base Courses.
3. Install curb edging at walkways adjacent to resilient surface areas, in accordance with the Drawings and Section 03 40 00. Also install mow strip (where fencing is adjacent to resilient surface areas) in accordance with the Drawings and Sections 03 30 53 and 32 31 13. Curb edge and mow strip installation may take place prior to placement of geotextile fabric and stone base in the playground area, but the fabric and stone shall first be installed below the curb edge and mow strips as shown on the Drawing details for resilient surface edging.

B. Sub-base Layer, General: The Contractor shall prepare, fill, patch, clean, remove high spots and ridges, and remove incompatible coatings from substrate to receive surfacing products according to playground surface system manufacturer's written instructions. The Contractor shall verify that substrate is sound without high spots, ridges, holes, and depressions.

3.05 INSTALLATION OF POURED-IN-PLACE RUBBER SURFACING

A. Examination:

1. The Contractor shall examine substrates, areas, and conditions, with installer present, for compliance with requirements for subgrade and substrate conditions, for compliance with playground surface system manufacturer's requirements, and for other conditions affecting performance.

2. Aggregate Substrate: The Contractor shall verify that substrate is satisfactory for resilient playground surface system, as follows:

    a. Verify that surfaces are uniformly sloped to drain in accordance with the Drawings.
    b. Verify that substrate is dry, free from dirt, grease, oil, and other contaminants and foreign objects incompatible with resilient surface system.
    c. Verify that substrate is compacted in accordance with Section 32 11 16 – Aggregate Base Courses
    d. Determine adhesion and dryness characteristics by performing procedures recommended in writing by resilient surface system manufacturer.

3. The Contractor shall proceed with installation only after unsatisfactory conditions have been corrected.

B. The Contractor shall comply with playground surface system manufacturer's written installation instructions. He/she shall install playground surface system over area and in thickness indicated on the Drawings, and as required to comply with specified requirements for impact-attenuation performance and, where indicated, for accessibility.

C. The Contractor shall install the poured-in-place resilient surface system as follows:

1. Basemat Installation:

    a. Using screeds and hand trowels, install the basemat at a consistent density of approximately 29 pounds, 1 ounce per cubic foot to the specified thickness or as determined by Article 1.04 and verification sample or whichever is more stringent.
    b. Allow basemat to cure for sufficient time so that indentations are not left in the basemat from applicator foot traffic or equipment.
    c. Do not allow foot traffic or use of the basemat surface until it is sufficiently cured.

2. Primer Application: Using a brush or short nap roller, apply primer to the basemat top surface, perimeter and any adjacent vertical and horizontal barriers such as playground equipment support legs, curbs or slabs that will contact the surfacing system at the rate of 300 cubic feet per gallon

3. Top Surface Installation: Using a hand trowel, install top surface at a consistent density of approximately 58 pounds, 9 ounces per cubic foot to a nominal thickness of 1/2 inch or as determined by Section 1.04 and verification sample or whichever is more stringent.

    a. Single application of each color/blend, no cold seams.
    b. Where color pattern is indicated, place adjacent colored material as soon as placed colored material is sufficiently cured using primer or adhesive if required by manufacturer's written instructions.
    c. Allow top surface to cure for a minimum of 48 hours.
    d. At the end of the minimum curing period, verify that the top surface is sufficiently dry and firm to allow foot traffic and use without damage to the surface.

e. Do not allow foot traffic and protect the safety surfacing until it is sufficiently cured.

3.06 CLEANING AND PROTECTION

A. The Contractor shall clean and protect the poured-in-place resilient surfacing as follows:

1. Prevent traffic over system for at least 48 hours after installation. Protect resilient surface system from damage and wear during the remainder of the construction period.
2. Clean surface system after time period recommended in writing by resilient surface system manufacturer but not more than four days before dates scheduled for inspections intended to establish date of Substantial Completion. Use cleaning materials and procedures recommended in writing by playground surface system manufacturer.
3. During installation of adhesively applied products, immediately remove visible adhesive from surrounding surfaces. Use cleaner recommended by playground surface system manufacturer.

END OF SECTION

SECTION 32 33 00
SITE FURNISHINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The City of Worcester Bid Form, General Conditions, Supplementary Conditions, and applicable parts of the Special Conditions form a part of this Specification and the Contractor shall consult them in detail for instructions.

B. The Contractor shall provide all labor, equipment, and materials; and perform all operations necessary to complete the work of this section as indicated on the Drawings and specified herein which shall include but is not limited to the following:

1. Team benches
2. Trash receptacles
3. Picnic tables
4. Benches with backrests

C. The locations of all site furnishings shall be marked in the field for review and approval by the Owner's Representative prior to installation.

1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Section 03 30 53 – Cast-in-Place Cement Concrete

1.03 REQUIRED SUBMITTALS

A. The Contractor shall provide complete product literature and applicable color samples for all site furnishings, for approval by the Owner's Representative, prior to ordering the furnishings.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

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

B. The Contractor shall store materials under waterproof covers on planking clear of ground and protect from handling damage, dirt, stain, water and wind.

C. The Contractor shall take all necessary precautions to prevent all items from chipping, cracking, or other damage during the transportation of these materials to the project, unloading and storage on the site. The Contractor shall lift items with wide-belt type slings wherever possible; he/she shall not use wire rope or ropes containing tar or other substances which might cause staining. If required, he/she shall use wood rollers and provide cushioning at end of wood slides. Damaged items will not be allowed to be installed and should any damaged items be found in constructed work, such items shall be removed

immediately and replaced, and the Contractor shall assume all expenses incurred therefrom.

D. Stored materials shall be adequately protected against moisture by one (1) stacking in such a manner as to allow a complete circulation of air under each stack, and two (2) covering each stack, including top and sides, with a waterproof paper or membrane. Coverings shall remain in place at all times, when not working from the particular stack.

1.05 EXAMINATION OF CONDITIONS

A. The Contractor shall fully inform his/herself of existing conditions of the site and shall be fully responsible for carrying out all work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. 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. At the beginning of work, the installer shall accept substrates, subgrades, previous work, and conditions. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed.

B. The Contractor shall be solely responsible for judging the potential need for storing materials temporarily and/or re-handling items prior to final installation.

1.06 COORDINATION

A. The work specified in this Section shall be coordinated with all work shown/described on the Drawings and in other Sections of the Specifications.

PART 2 - PRODUCTS

2.01 TEAM BENCHES

A. Team benches shall be anodized aluminum, 7.5 or 8 feet long without backrest. Subject to compliance with requirements, the Contractor shall provide products by one of the following or approved equal:

1. National Recreation Systems, (888) 568-9064, www.bleachers.net

2. Outdoor Aluminum, (800) 225-4249, www.outdooraluminum.com

3. Seating Solutions, (888) 959-7328, www.seatingsolutions.com

B. Each bench shall have minimum three 2.375” O.D. galvanized steel pipe legs for permanent installation.

C. Bench plank end caps shall be channel design with a matching finish and pop riveted at two points to underside of seat and foot boards. Die-formed end caps are not be acceptable.

D. Quantity of team benches: 2

2.02 TRASH RECEPTACLES

A. Trash receptacles shall be surface-mounted model 84-32-BT, black color, by DuMor Site Furnishings, Inc., phone # 800-598-4018, www.dumor.com; or approved equal.

B. Quantity of trash receptacles: 1

2.03 PICNIC TABLES

A. Square picnic tables with 3 and 4 seats shall meet the following specifications, and shall be in-ground mounted model 76-34 PL (4-seat) and 76-33 PL (3-seat), with gray color slats and black frame, by DuMor Site Furnishings, Inc., phone # 800-598-4018, www.dumor.com; or approved equal.

B. Picnic tables shall meet the following requirements:

1. 3” x 4” recycled high density polyethylene (HDPE) plastic slats, gray color
2. Steel post and supports, coated with zinc-rich epoxy primer and finished with polyester powder coat, black color
3. Center post: 4” square x 3/16” thick steel tube
4. Horizontal supports: 2-1/2” square x ¼” thick steel tubes

C. Quantities of picnic tables: 1 with three seats; and 1 with four seats

2.04 BENCHES WITH BACKRESTS (ADD-ALTERNATE)

A. Benches with backrests shall be surface-mounted model # 117-60, black color, with central armrest # 94-00AR, by DuMor Site Furnishings, Inc., phone # 800-598-4018, www.dumor.com; or approved equal.

B. Quantity of benches with backrests: 5

PART 3 – EXECUTION

3.01 TEAM BENCHES

A. Team benches shall be in-ground mounted in cement concrete footings. See the Drawing detail and Section 03 30 53 (Cast-in-Place Cement Concrete) for footing requirements.

B. All aluminum parts in contact with cement concrete shall be coated with zinc chromate paint to a minimum of a three (3) mils thickness.

C. The aluminum team benches shall be set and bolted in place. The Contractor shall dip all nuts in locktite or lochnut epoxy or approved equal, to secure permanently.

3.02 TRASH RECEPTACLES

A. Trash receptacles shall be assembled and secured to concrete surface in accordance with manufacturer's written instructions and the Drawing detail.

3.03 PICNIC TABLES

A. Picnic tables shall be in-ground mounted in cement concrete footings. See the Drawing detail and Section 03 30 53 (Cast-in-Place Cement Concrete) for footing requirements.

B. Picnic tables shall be assembled and installed in accordance with manufacturer's written instructions and the Drawing detail. Tables and attached seats shall be level.

3.04 BENCHES WITH BACKRESTS (ADD-ALTERNATE)

A. Benches with backrests shall be assembled and installed in accordance with manufacturer's written instructions and the Drawing detail.

B. The Contractor shall surface-mount benches to concrete surface with 1/2" x 3-3/4" galvanized expansion anchor bolts and steel plates provided by manufacturer.

END OF SECTION

MULCAHY FIELD IMPROVEMENTS, PHASE II

158 DORCHESTER STREET, WORCESTER, MASSACHUSETTS
CITY OF WORCESTER, DEPARTMENT OF PUBLIC WORKS & PARKS

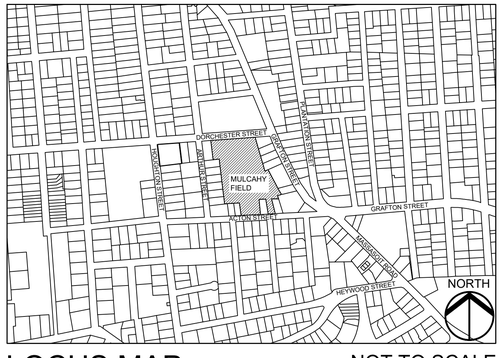
CONSTRUCTION DOCUMENTS - 9/15/2022

ERIC D. BATISTA, ACTING CITY MANAGER

JAY J. FINK, P.E., COMMISSIONER
DEPARTMENT OF PUBLIC WORKS AND PARKS

ROBERT C. ANTONELLI, JR., ASSISTANT COMMISSIONER

PLANS PREPARED BY:



LOCUS MAP NOT TO SCALE

INDEX OF DRAWINGS:

SHEET L-1:	EXISTING CONDITIONS
SHEET L-2:	SITE PREPARATION & DEMOLITION PLAN
SHEET L-3:	LAYOUT & MATERIALS PLAN
SHEET L-4:	GRADING & SEEDING PLAN
SHEETS L-5 - L-8:	CONSTRUCTION DETAILS
SHEET C-1:	CIVIL SURFACE DRAINAGE PLAN
SHEET C-2:	CIVIL EROSION CONTROL PLAN
SHEET C-3:	CIVIL DETAILS & NOTES
SHEET E-1:	ELECTRICAL SITE PLAN
SHEETS E-2 - E-8	ELECTRICAL DETAILS

LANDSCAPE ARCHITECT:

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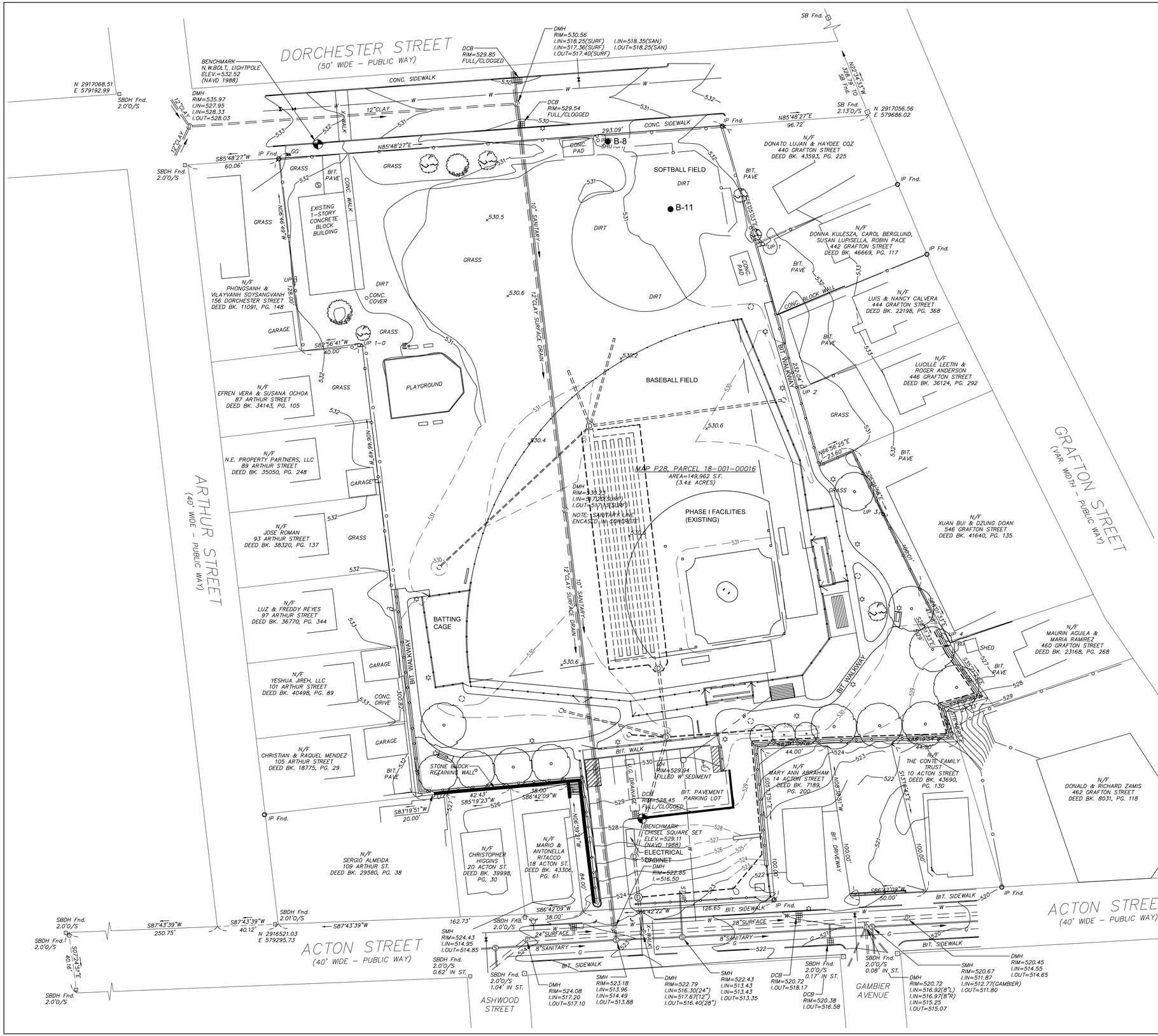
CIVIL ENGINEER:

QUINN ENGINEERING, INC.
P.O. Box 107
Paxton, Massachusetts 01612
(508)753-7999 Fax:(508)795-0939

ELECTRICAL ENGINEER:

ART Engineering
we build the future.



LEGEND:

Ⓓ	DRAIN MANHOLE*
	DRAINAGE LINE*
▦ ◌	CATCH BASIN / DRAIN BASIN*
	SEWER LINE
Ⓢ	SEWER MANHOLE
	BITUMINOUS CURBING
	EDGE OF PAVEMENT*
	GUARD RAIL*
W	WATER LINE
	HYDRANT
⧓	WATER GATE
G	GAS LINE
	GAS GATE
	UTILITY POLE & GUY WIRE
	CHAIN LINK FENCE*
☼	WALKWAY / PARKING LIGHT POST*
◌	SPORTS LIGHT POST*
♿	HANDICAP SPACE
⊠	ELECTRIC TRANSFORMER*
	SIGN
	VERTICAL BENCHMARK
	DECIDUOUS TREE
	EVERGREEN TREE
	TREE LINE
530.6×	SPOT GRADE
● B-8 ● B-11	SOIL BORING LOCATIONS - REFER TO SPECIFICATIONS FOR CORRESPONDING BORING LOGS BY SOIL X CORP.

*EXISTING FEATURES THAT WERE BUILT AS PART OF PHASE I ARE SHOWN IN APPROXIMATE LOCATIONS.

NOTES:

1) EXISTING CONDITIONS INFORMATION (PRIOR TO CONSTRUCTION OF PHASE I) WAS OBTAINED FROM A SURVEY TITLED "EXISTING CONDITIONS PLAN, MULCAHY FIELD, IN WORCESTER MA" AND DATED DECEMBER 21, 2011, BY CONNORSTONE, NORTHBOROUGH, MASSACHUSETTS; AND FROM AS-BUILT SURVEY FOR DUGOUTS & FIRST BASE-SIDE BLEACHER & PAD (INSTALLED PRIOR TO PHASE I), WHICH IS TITLED "AS-BUILT SURVEY, MULCAHY FIELD DUGOUT IMPROVEMENTS, WORCESTER, MA", AND DATED OCTOBER 19, 2018, BY ALPHA SURVEY GROUP, MIDDLEBOROUGH, MA.

2) EXISTING PHASE I FACILITIES & FEATURES SHOWN (BASEBALL FIELD AND RELATED FACILITIES, WALKWAYS, RETAINING WALLS, FENCING, LIGHTING, STORM DRAINAGE, AND TREES) ARE APPROXIMATE, BASED ON CONSTRUCTION DRAWINGS FOR THAT PHASE.

3) ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL NOTIFY "DIG-SAFE" AT 1-888-344-7233 AT LEAST 72 HOURS BEFORE EXCAVATING ON SITE.

4) SOIL BORINGS SHOWN ON THIS SHEET CORRESPOND TO BORING LOGS BY SOIL X CORP INCLUDED WITH THE SPECIFICATIONS. THESE BORINGS ARE FOR THE PURPOSE OF PROVIDING INFORMATION ON PHYSICAL SOIL CHARACTERISTICS ONLY, AND ARE NOT TO BE CONFUSED WITH SEPARATE BORINGS & SAMPLES TAKEN & DESCRIBED IN REPORT BY BETA GROUP REGARDING SOIL CONTAMINANTS.

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ALICE WEBB
NO. 1404

PROJECT:
MULCAHY FIELD,
PHASE II

CLIENT:
CITY OF
WORCESTER

DATE: 9/15/2022

REVISIONS:

NO.	DATE	DESCRIPTION

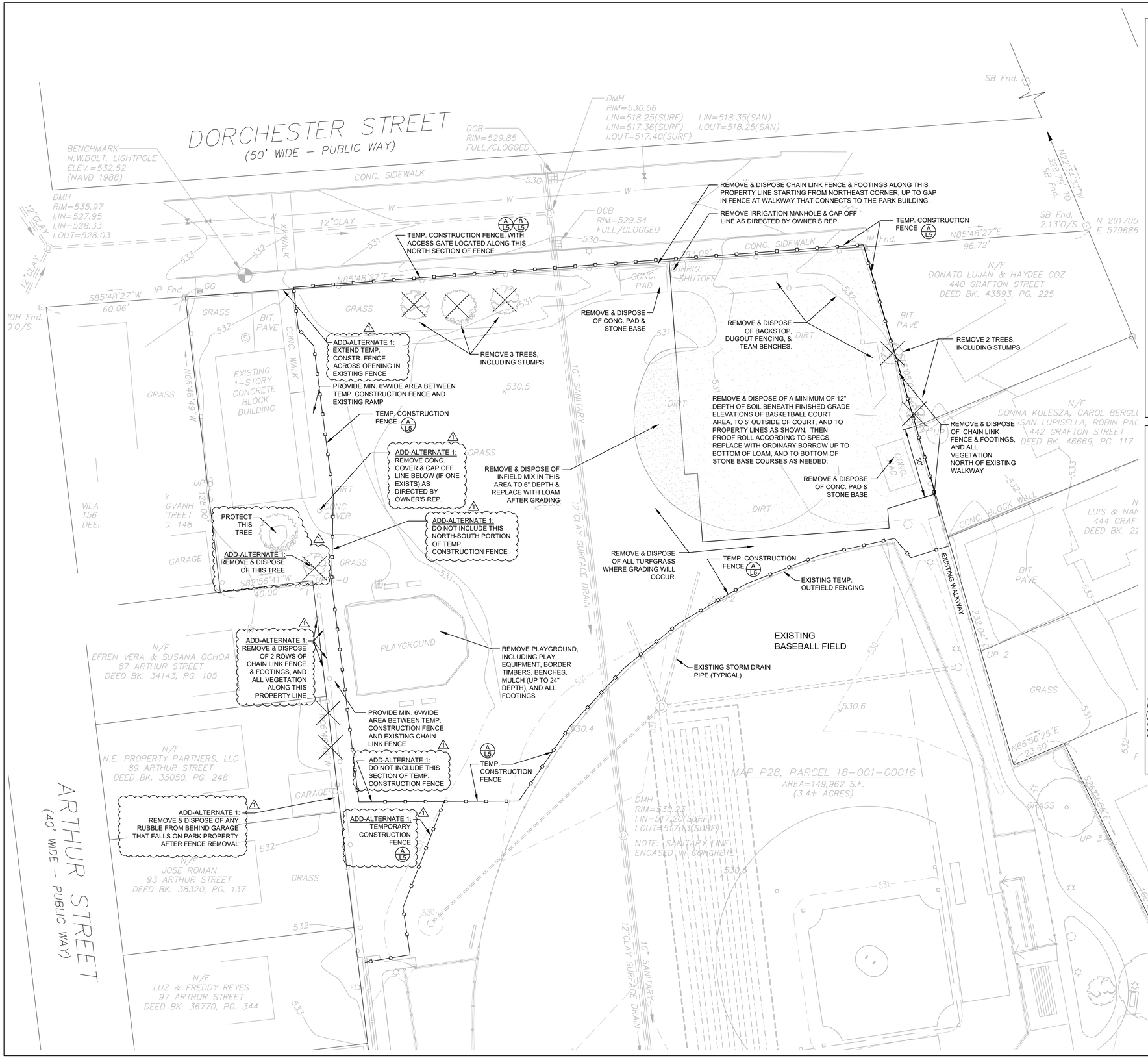
N

SCALE: 1" = 30'

0' 15' 30' 60'

EXISTING
CONDITIONS

SHEET L-1



LEGEND:

EXISTING: PROPOSED:

- A/L5 — DETAIL NUMBER / SHEET NUMBER
- TEMPORARY CONSTRUCTION FENCE
- 6" INFIELD MIX TO BE REMOVED
- 12" DEPTH SOIL TO BE REMOVED
- TREE OR GROUP OF TREES TO BE REMOVED
- TYP. — TYPICAL
- DRAIN MANHOLE*
- DRAINAGE LINE*
- CATCH BASIN / DRAIN BASIN*
- SEWER LINE
- SEWER MANHOLE
- BITUMINOUS CURBING
- EDGE OF PAVEMENT*
- GUARD RAIL*
- WATER LINE
- HYDRANT
- WATER GATE
- GAS LINE
- GAS GATE
- UTILITY POLE & GUY WIRE
- CHAIN LINK FENCE*
- WALKWAY / PARKING LOT LIGHT POST*
- SPORTS LIGHT POST*
- VERTICAL BENCHMARK
- DECIDUOUS TREE*
- EVERGREEN TREE
- TREE LINE
- 530.6x — SPOT GRADE

*EXISTING FEATURES THAT WERE BUILT AS PART OF PHASE I ARE SHOWN IN APPROXIMATE LOCATIONS.

NOTES:

1) ALL ITEMS INDICATED TO BE REMOVED SHALL BE LEGALLY DISPOSED OF OFF SITE, EXCEPT FOR ANY ITEMS THAT ARE NOTED BE STORED FOR RE-INSTALLATION.

2) THE CONTRACTOR SHALL FILL AND COMPACT SOIL IN HOLES LEFT BY REMOVAL OF EXISTING OBJECTS.

3) TEMPORARY CONSTRUCTION FENCING SHALL BE INSTALLED BEFORE DEMOLITION OPERATIONS BEGIN, AND SHALL REMAIN IN PLACE THROUGH CONSTRUCTION UNLESS OTHERWISE NOTED.

4) SEE CIVIL PLANS FOR TEMPORARY EROSION CONTROL MEASURES.

5) FOR TREES INDICATED TO BE REMOVED, DISPOSE OF ALL WOOD IN ACCORDANCE WITH ASIAN LONG-HORNED BEETLE QUARANTINE REGULATIONS.

6) EXISTING PARK PERIMETER FENCING ALONG THE EASTERN AND NORTHERN PROPERTY LINES SHALL SERVE AS CONSTRUCTION FENCING, UNTIL SUCH TIME THAT IT IS REMOVED. INSTALL TEMPORARY CONSTRUCTION FENCING ALONG ALL PROPERTY LINES WHERE NO FENCING (EXIST. OR NEW) IS IN PLACE, INCLUDING ACROSS GAPS IN EXISTING & NEW FENCING. FOR ADD-ALTERNATE 1, THIS INCLUDES THE FENCING ALONG THE EASTERN PROPERTY LINE.

7) ACCESS TO THE SITE SHALL BE FROM DORCHESTER STREET, THROUGH A TEMPORARY CONSTRUCTION FENCE GATE.

1 8) IF EXISTING PAVEMENT, CURBING, OR STRUCTURES IN THE DORCHESTER STREET RIGHT-OF-WAY, OR ANYWHERE ELSE OUTSIDE THE LIMITS OF WORK, ARE DAMAGED BY THE CONTRACTOR, THESE ITEMS SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO THE CONDITION THEY WERE PRIOR TO CONSTRUCTION WORK.

9) INSUFFICIENT TOPSOIL EXISTS IN THE AREAS WHERE GRADING WILL TAKE PLACE, SO TOPSOIL STRIPPING IS NOT PART OF THIS PROJECT.

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MASSACHUSETTS ALICE WEBB REGISTERED LANDSCAPE ARCHITECT NO. 1404

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

NO.	DATE	DESCRIPTION
1	1-17-23	ADDENDUM 6

N

SCALE: 1" = 20'

0' 10' 20' 40'

SITE PREPARATION & DEMOLITION PLAN

SHEET L-2

LEGEND:

EXISTING (TO REMAIN):

PROPOSED:

- G/L5 — DETAIL NUMBER / SHEET NUMBER
- P.C. CONCRETE SURFACE
- BITUMINOUS SURFACE (BEYOND COURT)
- R — RADIUS
- TYP. — TYPICAL
- PVT. — PAVEMENT
- EDGE OF PAVEMENT*
- UTILITY POLE & GUY WIRE
- FENCING*
- SPORTS LIGHT POST*
- WALKWAY / PARKING LIGHT POST*
- CATCH BASIN / DRAIN BASIN*

*EXISTING FEATURES THAT WERE BUILT AS PART OF PHASE I ARE SHOWN IN APPROXIMATE LOCATIONS.

NOTES:

1) POINT OF BEGINNING (P.O.B.) FOR LAYOUT IS NORTHEAST PROPERTY CORNER.

2) DIMENSIONS ARE TO CENTER LINE OF CHAIN-LINK FENCING POSTS.

3) CHAIN-LINK FENCE HEIGHTS & OTHER REQUIREMENTS:

- EXTERIOR COURT FENCING: 10' HIGH, WITH FABRIC ON COURT SIDE
- PARK PERIMETER FENCING: 6' HIGH, WITH FABRIC ON PARK SIDE

4) COURT SHALL HAVE 3 PREMIUM COLORS, PLUS STRIPING. SEE SPECS AND COURT DETAILS.

5) THE CONTRACTOR SHALL CONTACT OWNER'S REPRESENTATIVE TO INSPECT ALL LAYOUT STAKING PRIOR TO CONSTRUCTION.

6) THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON THE GROUND AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE OWNER'S REPRESENTATIVE.

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REVISIONS:

NO.	DATE	DESCRIPTION
1	1-17-23	ADDENDUM 6

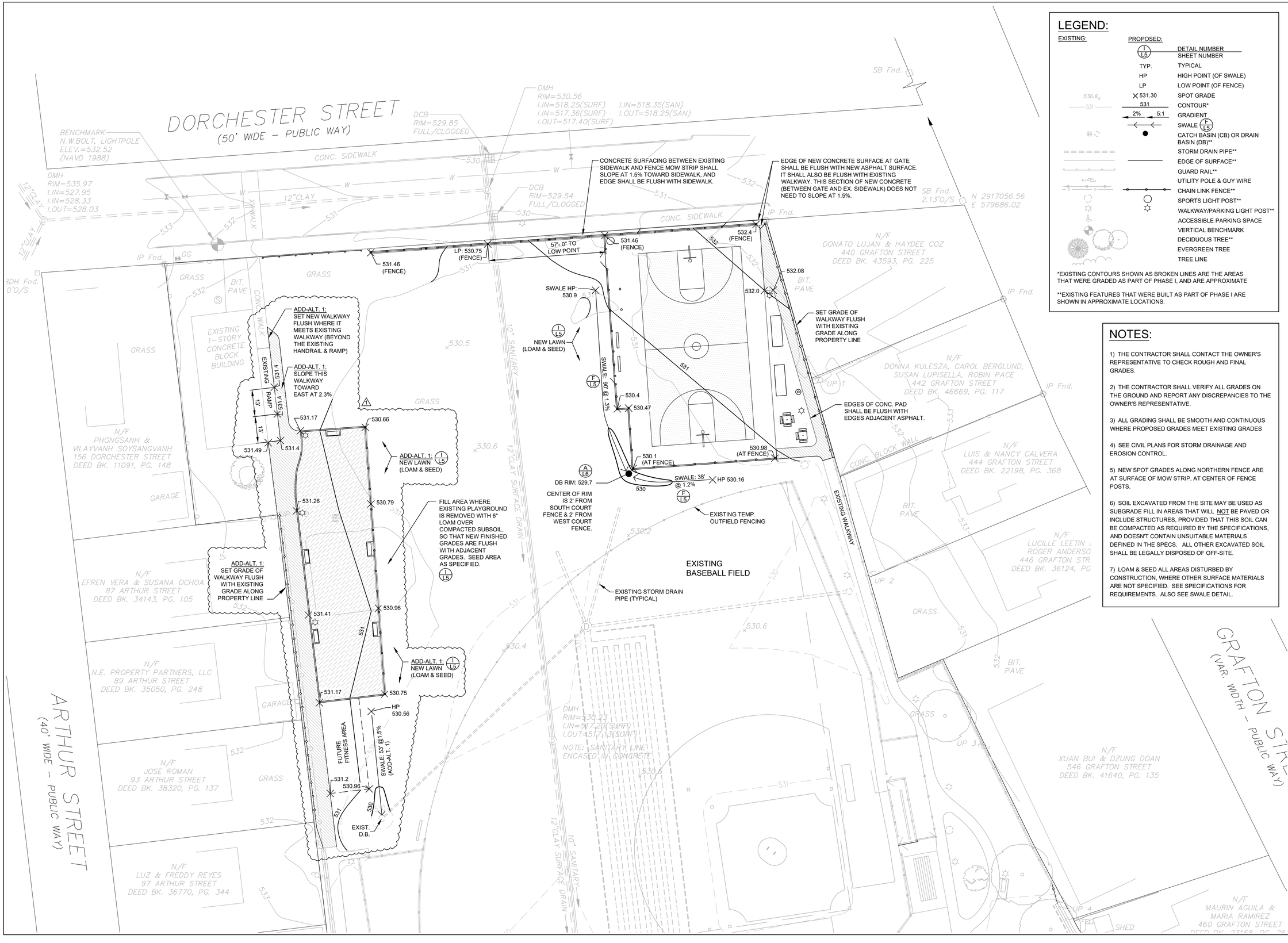
N

SCALE: 1" = 20'

0' 10' 20' 40'

LAYOUT & MATERIALS PLAN

SHEET L-3



LEGEND:

EXISTING: | PROPOSED:

I / L5	DETAIL NUMBER / SHEET NUMBER
TYP.	TYPICAL
HP	HIGH POINT (OF SWALE)
LP	LOW POINT (OF FENCE)
530.6x	531.30 SPOT GRADE
531	CONTOUR*
2% 5:1	GRADIENT
F / L5	SWALE
	CATCH BASIN (CB) OR DRAIN BASIN (DB)**
	STORM DRAIN PIPE**
	EDGE OF SURFACE**
	GUARD RAIL**
	UTILITY POLE & GUY WIRE
	CHAIN LINK FENCE**
	SPORTS LIGHT POST**
	WALKWAY/PARKING LIGHT POST**
	ACCESSIBLE PARKING SPACE
	VERTICAL BENCHMARK
	DECIDUOUS TREE**
	EVERGREEN TREE
	TREE LINE

*EXISTING CONTOURS SHOWN AS BROKEN LINES ARE THE AREAS THAT WERE GRADED AS PART OF PHASE I, AND ARE APPROXIMATE

**EXISTING FEATURES THAT WERE BUILT AS PART OF PHASE I ARE SHOWN IN APPROXIMATE LOCATIONS.

NOTES:

1) THE CONTRACTOR SHALL CONTACT THE OWNER'S REPRESENTATIVE TO CHECK ROUGH AND FINAL GRADES.

2) THE CONTRACTOR SHALL VERIFY ALL GRADES ON THE GROUND AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE.

3) ALL GRADING SHALL BE SMOOTH AND CONTINUOUS WHERE PROPOSED GRADES MEET EXISTING GRADES

4) SEE CIVIL PLANS FOR STORM DRAINAGE AND EROSION CONTROL.

5) NEW SPOT GRADES ALONG NORTHERN FENCE ARE AT SURFACE OF MOW STRIP, AT CENTER OF FENCE POSTS.

6) SOIL EXCAVATED FROM THE SITE MAY BE USED AS SUBGRADE FILL IN AREAS THAT WILL NOT BE PAVED OR INCLUDE STRUCTURES, PROVIDED THAT THIS SOIL CAN BE COMPACTED AS REQUIRED BY THE SPECIFICATIONS, AND DOESN'T CONTAIN UNSUITABLE MATERIALS DEFINED IN THE SPECS. ALL OTHER EXCAVATED SOIL SHALL BE LEGALLY DISPOSED OF OFF-SITE.

7) LOAM & SEED ALL AREAS DISTURBED BY CONSTRUCTION, WHERE OTHER SURFACE MATERIALS ARE NOT SPECIFIED. SEE SPECIFICATIONS FOR REQUIREMENTS. ALSO SEE SWALE DETAIL.

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MASSACHUSETTS ALICE WEBB NO. 1404 REGISTERED LANDSCAPE ARCHITECT

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

NO.	DATE	DESCRIPTION
1	1-17-23	ADDENDUM 6

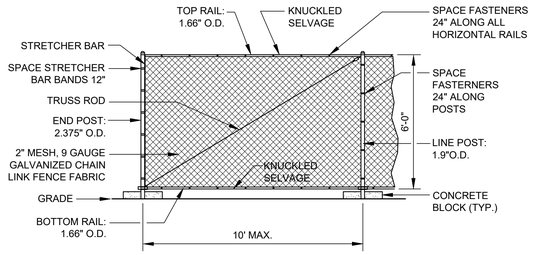
N

SCALE: 1" = 20'

0' 10' 20' 40'

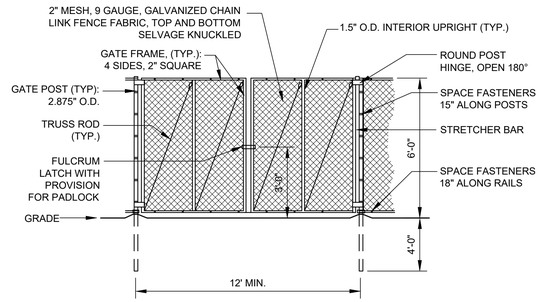
GRADING & SEEDING PLAN

SHEET L-4



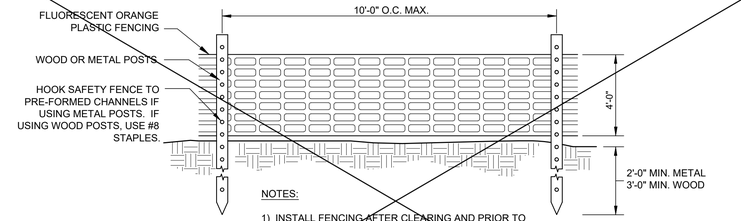
A L5 TEMPORARY CONSTRUCTION FENCE

ELEVATION NOT TO SCALE



B L5 TEMPORARY CONSTRUCTION GATE - DOUBLE

ELEVATION NOT TO SCALE



NOTES:

1) INSTALL FENCING AFTER CLEARING AND PRIOR TO ROUGH GRADING, WHERE SHOWN ON PLANS.

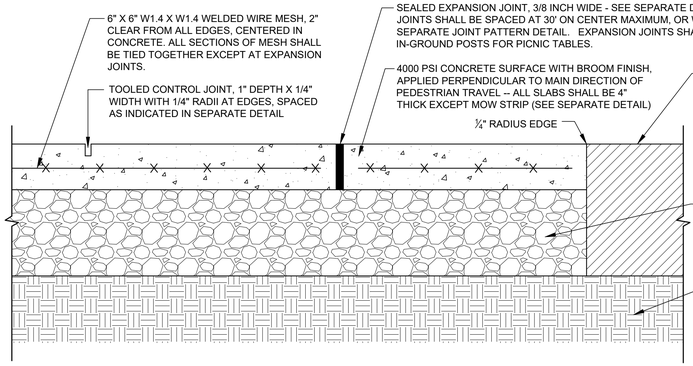
2) NO GRADING, DUMPING, STORAGE, OR VEHICULAR TRAFFIC ARE PERMITTED IN AREAS DELINEATED BY TREE PROTECTION FENCING.

3) REMOVE FENCING AFTER ALL CONSTRUCTION OPERATIONS ARE COMPLETE EXCEPT LANDSCAPING.

NOT IN CONTRACT

C L5 TEMPORARY TREE PROTECTION FENCE

NOT TO SCALE



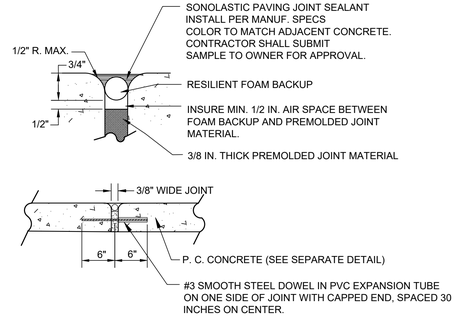
NOTES:

1) SEE TECHNICAL SPECIFICATIONS AND PROJECT SPECIAL SPECIFICATIONS FOR CONCRETE REQUIREMENTS.

2) ALSO SEE SEPARATE DETAILS FOR MOW STRIP.

D L5 PORTLAND CEMENT CONCRETE PAVEMENT

NOT TO SCALE



E L5 EXPANSION JOINT

SECTIONS NOT TO SCALE

TEMP. LINER	SWALES	T	D	B	G
STRAW/NET*	ALL	4'-0"	6"	1'-0"	3

*AS SPECIFIED

INSTALLATION NOTES:

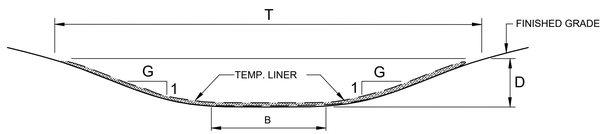
1) LINERS SHALL BE LAID OUT WITH LENGTH PARALLEL TO DIRECTION OF FLOW.

2) LINERS SHALL BE SECURED WITH 6" LONG METAL STAPLES, SET 3' APART IN STAGGERED ROWS.

3) TERMINAL ENDS OF LINER SHALL BE BURIED 6" AND SECURED WITH ROW OF STAPLES, 4" APART. TERMINAL SIDES SHALL BE STAPLED IN SAME MANNER, UNBURIED.

4) PLACE LINER SECTIONS END OVER END: BURY END OF DOWN-SLOPE LINER 6" AND LAP END OF UP-SLOPE LINER 6" OVER TOP. SECURE WITH ROW OF STAPLES, 4" APART.

5) FOR SWALES WITH MULTIPLE ROWS OF LINERS, ONE ROW SHALL BE PLACED DOWN CENTER OF SWALE, AND SIDE ROWS SHALL OVERLAP ROWS 6", SECURED WITH ROW OF STAPLES, 12" APART.



F L5 GRASSED-LINED SWALE

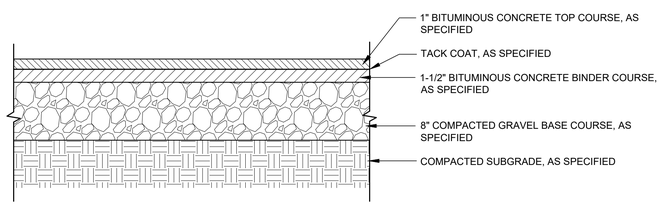
SECTION NOT TO SCALE

NOTES:

1) TACK COAT IS REQUIRED IF BINDER COURSE HAS BEEN IN PLACE FOR MORE THAN 48 HOURS.

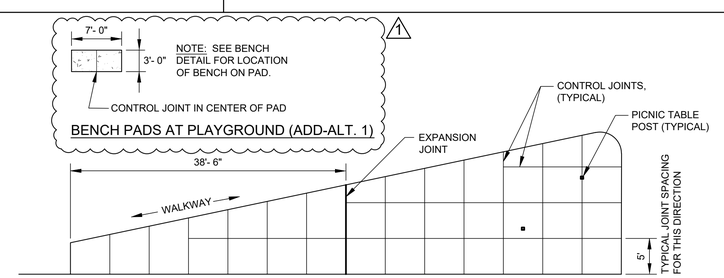
2) ADJACENT GRADES SHALL BE FLUSH WITH EDGES OF WALKWAY.

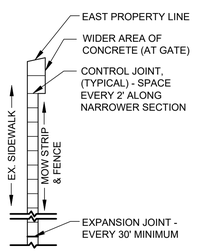
3) SEE SEPARATE DETAIL FOR ASPHALT EXTENSION BELOW FENCING.



G L5 BITUMINOUS PEDESTRIAN PAVEMENT

SECTION NOT TO SCALE





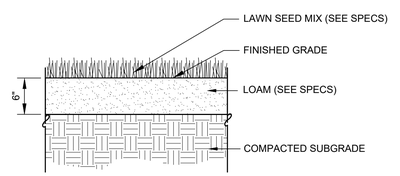
CONCRETE BETWEEN EXISTING SIDEWALK AND MOW STRIP

N

NOTE: ALSO SEE PORTLAND CEMENT CONCRETE PAVEMENT DETAIL & EXPANSION JOINT DETAIL.

H L5 JOINT PATTERNS FOR P.C. CONCRETE PAVEMENT

PLAN VIEW NOT TO SCALE



I L5 SEEDING PROFILE

SECTION NOT TO SCALE

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MASSACHUSETTS ALICE WEBB NO. 1404 REGISTERED LANDSCAPE ARCHITECT

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

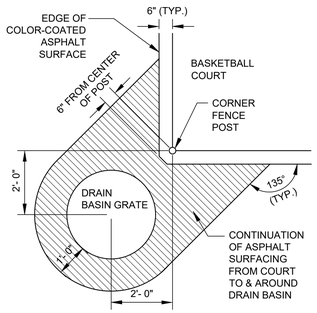
REVISIONS:

NO.	DATE	DESCRIPTION
1	1-17-23	ADDENDUM 6

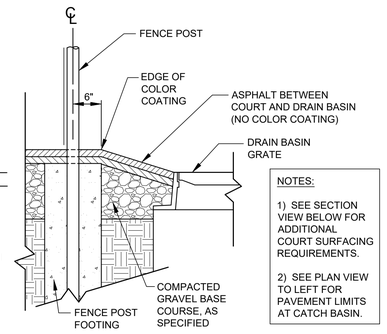
NOT TO SCALE

DETAILS

SHEET L-5



PAVING AROUND DRAIN BASIN AT SOUTHWEST CORNER OF BASKETBALL COURT -- PLAN VIEW

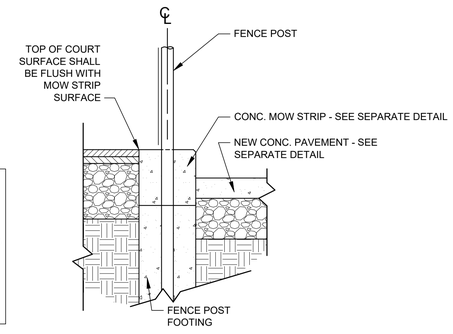


PAVING TO DRAIN BASIN AT SOUTHWEST CORNER OF BASKETBALL COURT -- SECTION VIEW

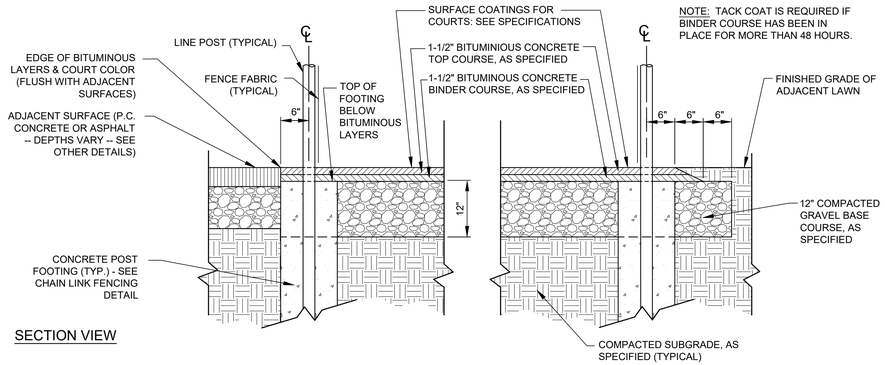
NOTES:

1) SEE SECTION VIEW BELOW FOR ADDITIONAL COURT SURFACING REQUIREMENTS.

2) SEE PLAN VIEW TO LEFT FOR PAVEMENT LIMITS AT CATCH BASIN.



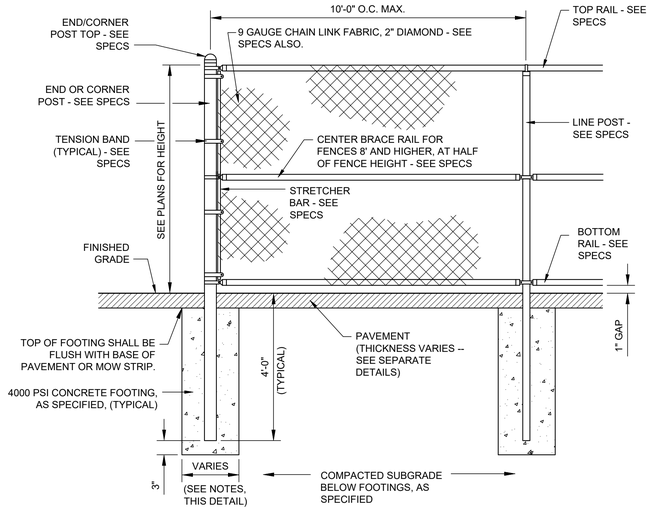
PAVING TO NEW MOW STRIP ALONG NORTH PROPERTY LINE



SECTION VIEW

A L6 BASKETBALL COURT SURFACING

NOT TO SCALE



NOTES:

1) ALL PORTIONS OF FENCING SHALL BE PVC COATED, BLACK COLOR, AS SPECIFIED.

2) INSTALL FENCE FABRIC ON INSIDE OF BASKETBALL COURT, ON PARK SIDE OF PERIMETER FENCING, AND ON EAST (FUTURE SOCCER FIELD) SIDE OF PLAYGROUND (ADD-ALTERNATE 1).

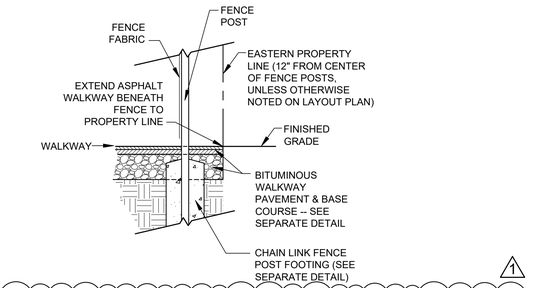
3) WIRE TIES SHALL BE SPACED 12" ALONG RAILS AND LINE POSTS.

4) POST FOOTING DIAMETER SHALL BE 12" FOR POSTS LESS THAN 4" DIA.; AND 16" FOR 4" DIA. POSTS.

B L6 VINYL-COATED CHAIN LINK FENCE

SECTION

NOT TO SCALE

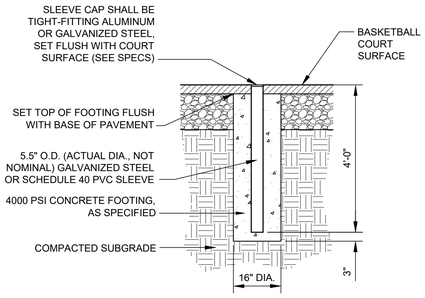


1

C L6 EXTENSION OF BITUMINOUS PAVEMENT BENEATH FENCING ALONG EAST PROP. LINE AND ALONG WEST PROP. LINE (ADD-ALT. 1)

SECTION

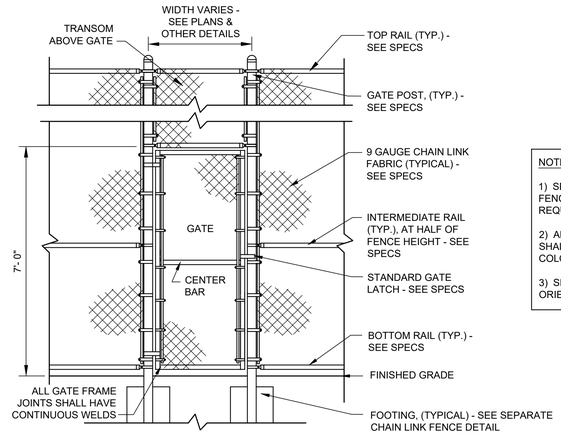
NOT TO SCALE



D L6 SLEEVE FOR FUTURE POST

SECTION

NOT TO SCALE



NOTES:

1) SEE VINYL-COATED CHAIN LINK FENCE DETAIL FOR ADDITIONAL REQUIREMENTS

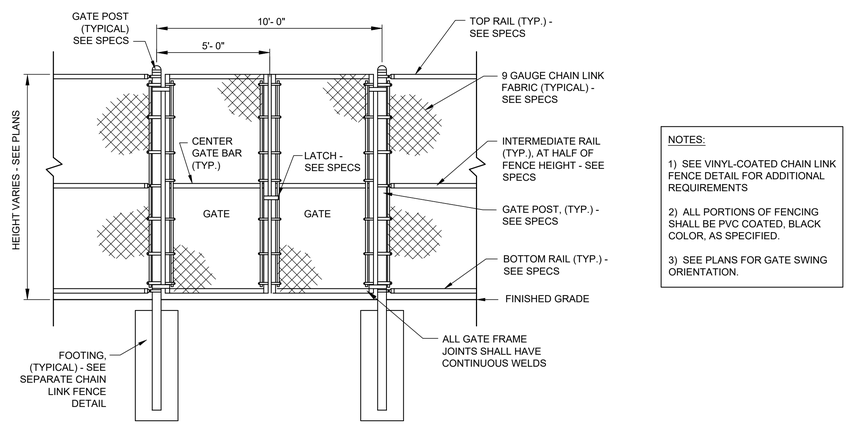
2) ALL PORTIONS OF FENCING SHALL BE PVC COATED, BLACK COLOR, AS SPECIFIED.

3) SEE PLANS FOR GATE SWING ORIENTATION.

E L6 SINGLE GATE -- VINYL-COATED CHAIN LINK FENCE

ELEVATION

NOT TO SCALE



NOTES:

1) SEE VINYL-COATED CHAIN LINK FENCE DETAIL FOR ADDITIONAL REQUIREMENTS

2) ALL PORTIONS OF FENCING SHALL BE PVC COATED, BLACK COLOR, AS SPECIFIED.

3) SEE PLANS FOR GATE SWING ORIENTATION.

F L6 DOUBLE GATE -- VINYL-COATED CHAIN LINK FENCE

ELEVATION

NOT TO SCALE

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MASSACHUSETTS ALICE WEAVER NO. 1484 REGISTERED LANDSCAPE ARCHITECT

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

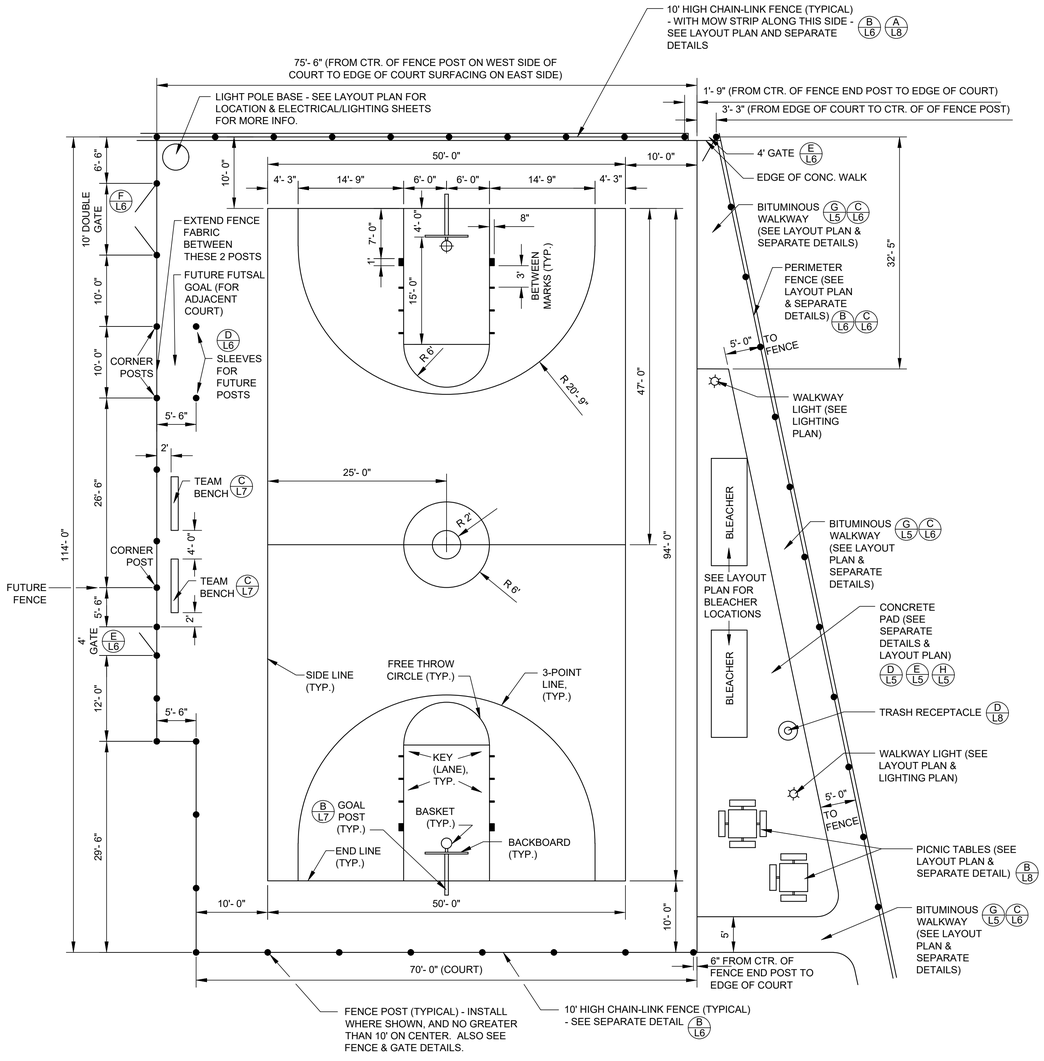
REVISIONS:

NO.	DATE	DESCRIPTION
1	1-17-23	ADDENDUM 6

NOT TO SCALE

DETAILS

SHEET L-6

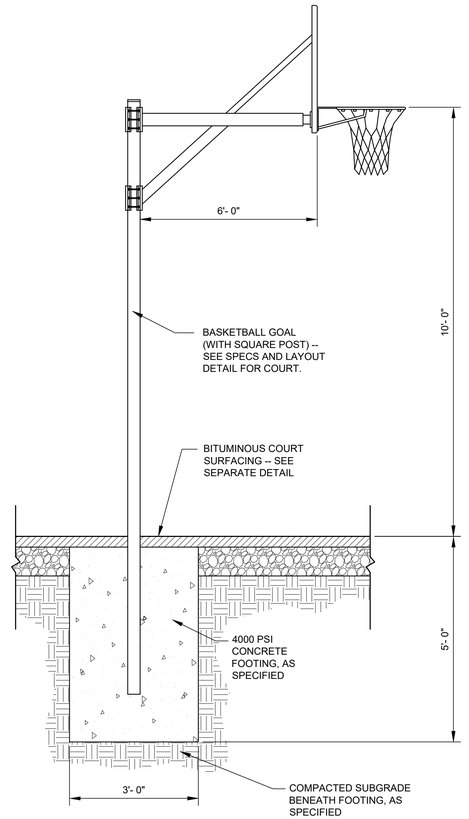


NOTES:

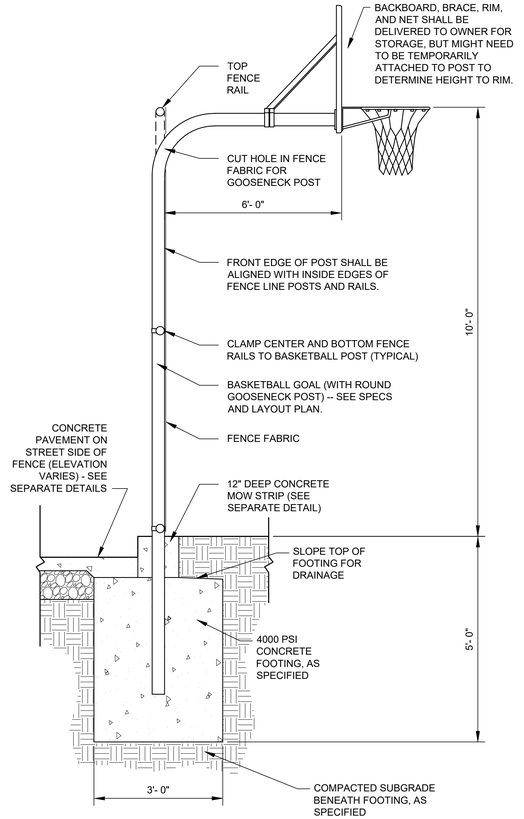
1) COURT SHALL HAVE 3 PREMIUM SURFACE COLORS TO BE SELECTED BY OWNER -- SEE SPECS.
2) DIMENSIONS SHOWN ARE TYPICAL FOR BOTH ENDS OF COURT.
3) DIMENSIONS ARE TO CENTERS OF FENCE POSTS AND BASKETBALL GOAL POST.
4) DIMENSIONS ARE TO INSIDE EDGES OF END LINES & SIDE LINES.
5) DIMENSIONS ARE TO OUTSIDE EDGES OF 3 POINT LINE, FREE THROW RADIUS, AND KEY.
6) DIMENSIONS ARE TO FRONT OF BACKBOARD.
7) ALL LINES AND MARKS ARE 2" WIDE, WHITE COLOR, UNLESS OTHERWISE NOTED.
8) SEE SEPARATE DETAILS FOR FENCING, SLEEVES, GATES, BENCHES, PICNIC TABLES, BASKETBALL GOAL, COURT SURFACING, AND OTHER OTHER PAVEMENT SURFACING.
9) SEE SPECS FOR BLEACHER REQUIREMENTS.

A L7 BASKETBALL COURT LAYOUT

PLAN VIEW — SCALE: 1" = 10'



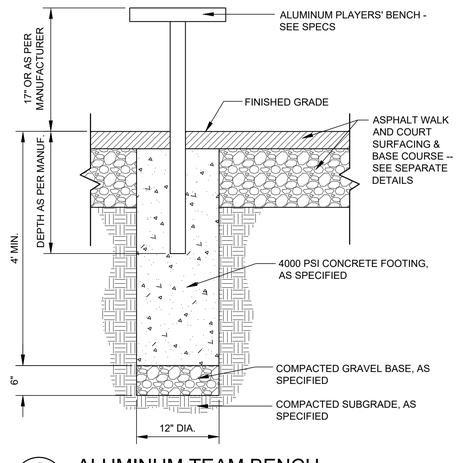
GOALS AT BASKETBALL COURT



GOALS AT FUTURE MULTI-PURPOSE COURT

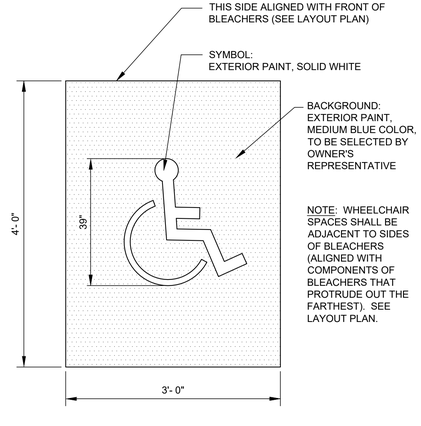
B L7 BASKETBALL GOALS

SECTIONS — NOT TO SCALE



C L7 ALUMINUM TEAM BENCH

SECTION — NOT TO SCALE



D L7 WHEELCHAIR SPACE

SECTION — NOT TO SCALE

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MASSACHUSETTS ALICE WEBB NO. 1404 REGISTERED LANDSCAPE ARCHITECT

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

NO.	DATE	DESCRIPTION

NOT TO SCALE

DETAILS

SHEET L-7

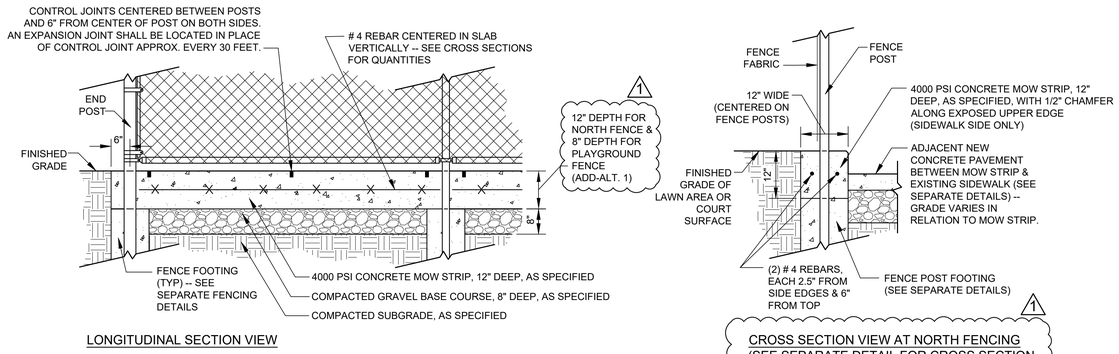
NOTES:

1) NOT ALL FENCING INCLUDES A MOW STRIP -- SEE LAYOUT PLAN.

2) ALSO SEE SEPARATE DETAILS FOR CHAIN LINK FENCING, ADJACENT SURFACING, AND FOR CONCRETE JOINTS (P.C. CONCRETE PAVEMENT AND EXPANSION JOINT DETAILS).

3) SLOPE ACROSS MOW STRIP SHALL BE 1.5%, IN DIRECTION OF SLOPE PROPOSED FOR ADJACENT AREA OF PARK -- SEE GRADING PLAN.

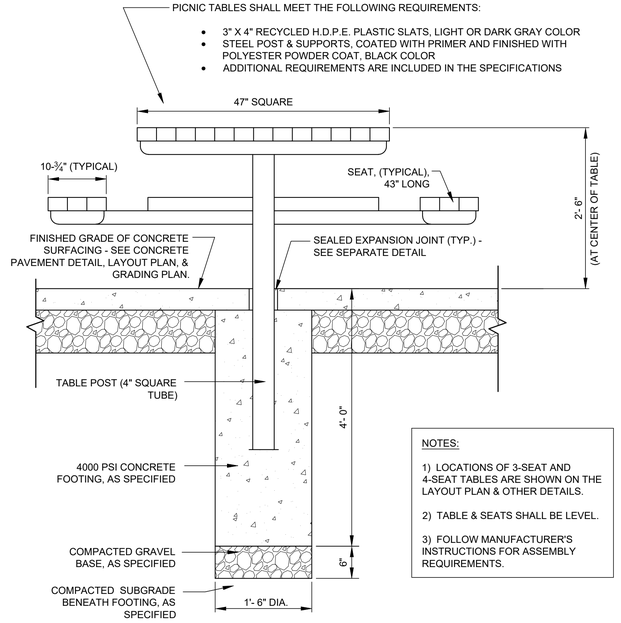
4) DO NOT EXTEND REBAR THROUGH EXPANSION JOINTS.



A L8 CONCRETE MOW STRIP

SECTIONS

NOT TO SCALE



B L8 PICNIC TABLE

SECTION

NOT TO SCALE

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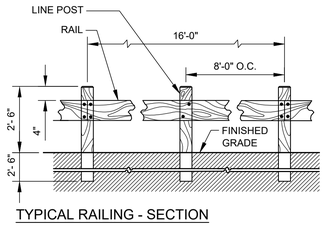
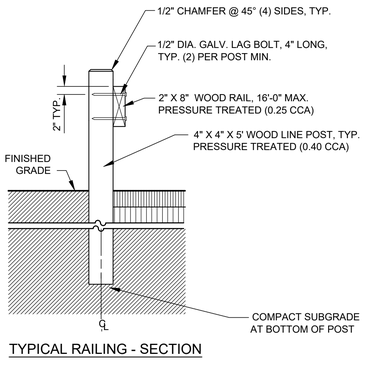
NOTE:

1) ALL HARDWARE SHALL CONFORM TO ASTM A307 AND SHALL BE GALVANIZED PER ASTM A153.



TYPICAL RAILING - SECTION



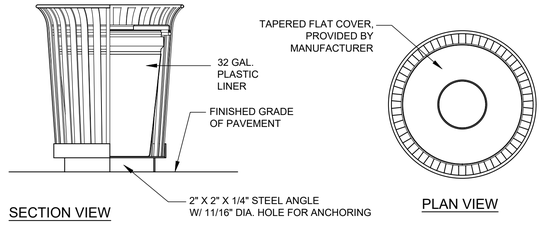
TYPICAL RAILING - SECTION

C L8 WOOD GUARDRAIL

NOT TO SCALE

NOTES:

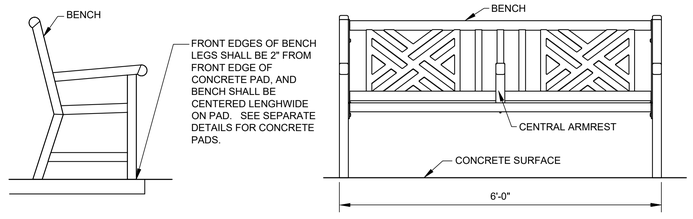
1) TRASH RECEPTACLE SHALL BE #84-32 BY DUMOR, OR APPROVED EQUAL.
2) ASSEMBLE RECEPTACLE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3) INSTALL RECEPTACLE ON PAVEMENT. SEE STAKING PLAN FOR LOCATIONS.
4) SECURE RECEPTACLE TO PAVEMENT WITH 1/2" X 3 3/4" GALVANIZED EXPANSION ANCHOR BOLTS.
5) COLOR OF TRASH RECEPTACLE SHALL BE BLACK.



D L8 TRASH RECEPTACLE

NOT TO SCALE

1



SIDE ELEVATION

FRONT ELEVATION

NOTES:

1) BENCH SHALL BE # 117-60 & CENTRAL ARMREST SHALL BE # 94-00AR BY DUMOR, OR APPROVED EQUAL.
2) ASSEMBLE AND INSTALL BENCH IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3) INSTALL BENCH ON CONCRETE PAD. SEE SEPARATE DETAILS FOR PAD REQUIREMENTS.
4) SECURE BENCH TO CONCRETE SURFACE WITH 1/2" X 3-3/4" GALVANIZED EXPANSION ANCHOR BOLTS AND STEEL PLATES PROVIDED BY MANUFACTURER.
5) COLOR OF BENCHES SHALL BE BLACK.

E L8 BENCH WITH BACK (ADD-ALTERNATE 1)

ELEVATIONS

NOT TO SCALE

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

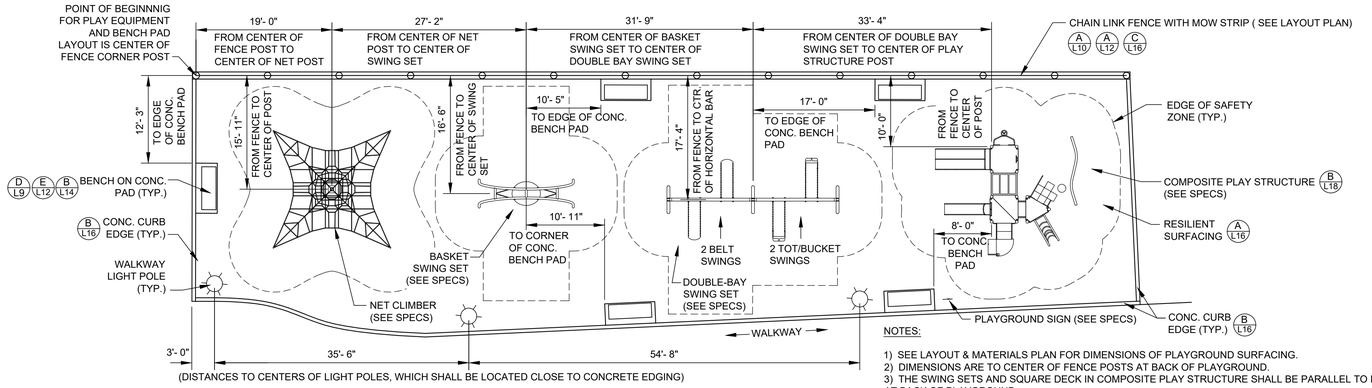
REVISIONS:

NO.	DATE	DESCRIPTION
1	1-17-23	ADDENDUM 6

NOT TO SCALE

DETAILS

SHEET L-8

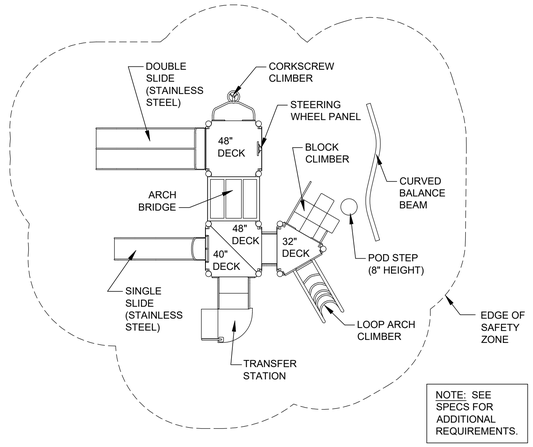


NOTES:

1) SEE LAYOUT & MATERIALS PLAN FOR DIMENSIONS OF PLAYGROUND SURFACING.
2) DIMENSIONS ARE TO CENTER OF FENCE POSTS AT BACK OF PLAYGROUND.
3) THE SWING SETS AND SQUARE DECK IN COMPOSITE PLAY STRUCTURE SHALL BE PARALLEL TO FENCING AT BACK OF PLAYGROUND.
4) NORTHEAST & SOUTHEAST "POINTS" OF NET CLIMBER SHALL BE THE SAME DISTANCE FROM THE FENCING AT BACK OF PLAYGROUND.
5) SAFETY ZONES SHALL BE COMPLETELY WITHIN RESILIENT PLAY SURFACE BOUNDARIES -- 6' FROM ALL PLAY STRUCTURES EXCEPT 16' FROM FRONT & BACK OF BELT SWING BAR, 15' FROM FRONT & BACK OF BASKET SWING CENTER, AND 13' FROM FRONT & BACK OF TOT/BUCKET SWING BAR. ADJACENT FENCING & WALKWAY/EDGING SHALL NOT BE INSTALLED UNTIL PLAY EQUIPMENT & SAFETY ZONES HAVE BEEN LAID OUT.
6) ALL PLAY EQUIPMENT SHALL BE IN-GROUND MOUNTED. FOOTINGS SHALL BE 4' DEEP FROM FINISHED SURFACE GRADE, 4000 PSI CONCRETE. SEE MANUFACTURER'S INSTRUCTIONS FOR OTHER FOOTING DIMENSIONS AND REQUIREMENTS, AND SPECS FOR THIS PROJECT.
7) LIGHT POLES/BASES AND HANDHOLES FOR LIGHTS SHALL NOT BE INSTALLED WITHIN PLAY EQUIPMENT SAFETY ZONES.

A L9 PLAYGROUND LAYOUT & INSTALLATION REQUIREMENTS (ADD-ALT. 1)

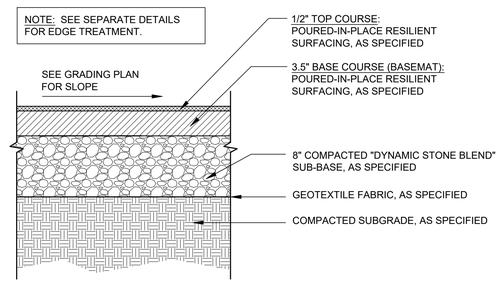
PLAN VIEW — SCALE: 1" = 10'



NOTE: SEE SPECS FOR ADDITIONAL REQUIREMENTS.

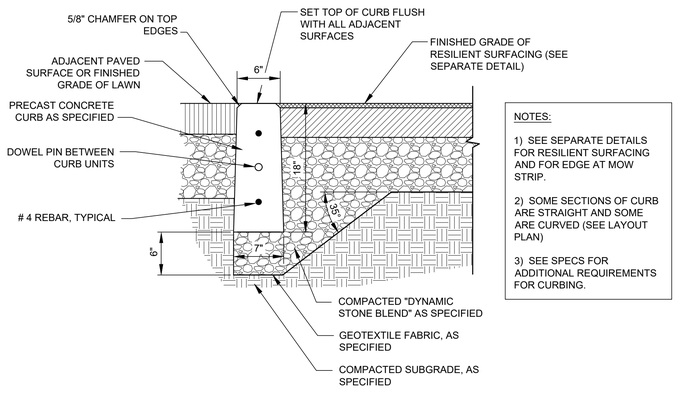
B L9 COMPOSITE PLAY STRUCTURE LAYOUT DETAIL (ADD-ALT. 1)

PLAN VIEW — NOT TO SCALE



C L9 RESILIENT SURFACING (ADD-ALTERNATE 1)

SECTION — NOT TO SCALE



NOTES:

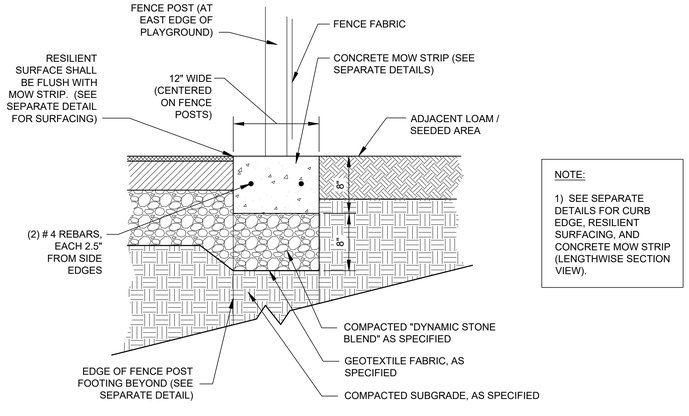
1) SEE SEPARATE DETAILS FOR RESILIENT SURFACING AND FOR EDGE AT MOW STRIP.

2) SOME SECTIONS OF CURB ARE STRAIGHT AND SOME ARE CURVED (SEE LAYOUT PLAN)

3) SEE SPECS FOR ADDITIONAL REQUIREMENTS FOR CURBING.

D L9 CURB EDGE AT RESILIENT SURFACING (ADD-ALTERNATE 1)

SECTION — NOT TO SCALE



NOTE:

1) SEE SEPARATE DETAILS FOR CURB EDGE, RESILIENT SURFACING, AND CONCRETE MOW STRIP (LENGTHWISE SECTION VIEW).

E L9 MOW STRIP EDGE AT RESILIENT SURFACING (ADD-ALTERNATE 1)

SECTION — NOT TO SCALE

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MASSACHUSETTS ALICE WEBB NO. 1404 REGISTERED LANDSCAPE ARCHITECT

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MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

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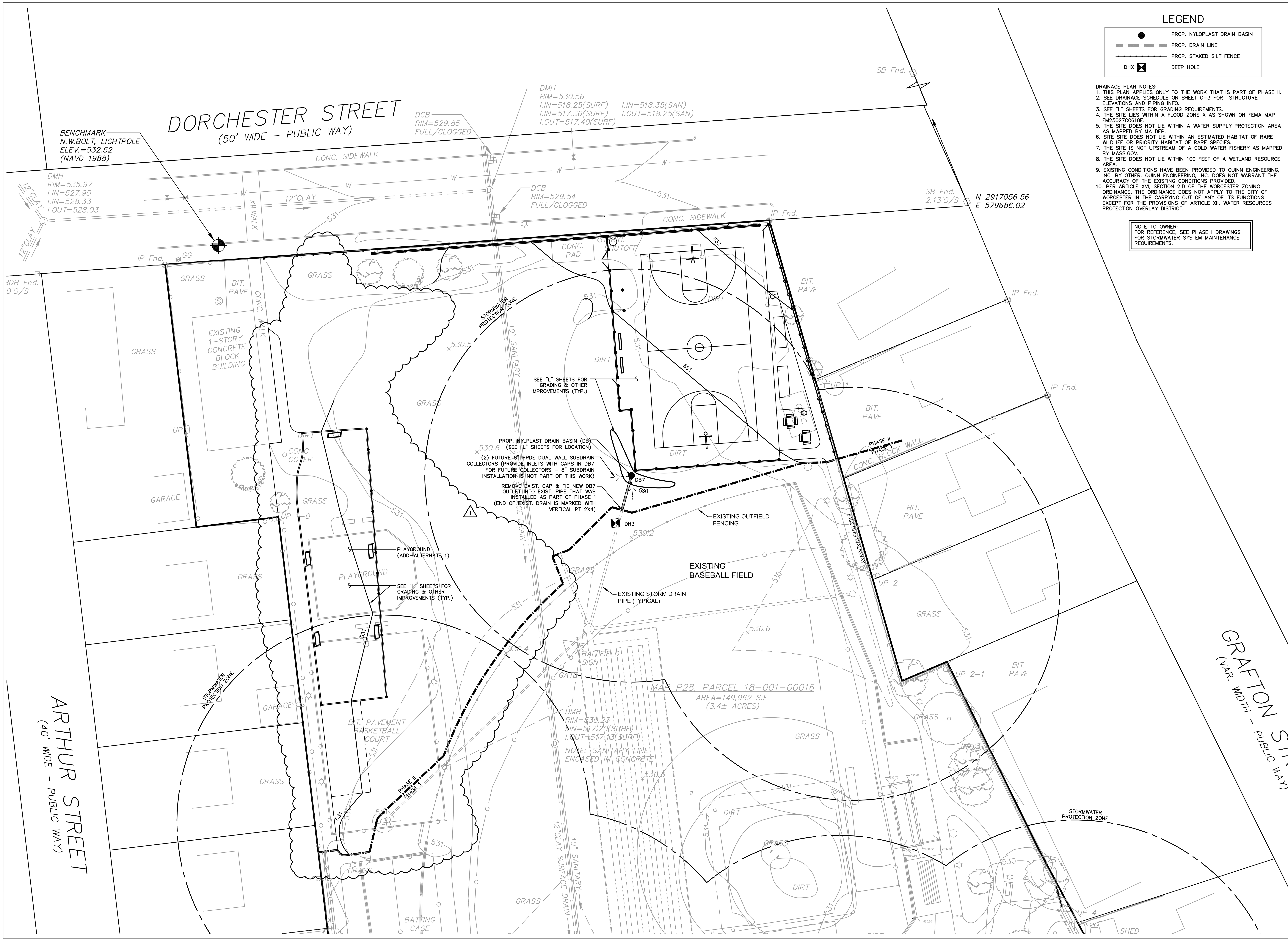
NO.	DATE	DESCRIPTION
1	1-17-23	ADDENDUM 6

NOT TO SCALE

DETAILS

SHEET L-9



LEGEND

●	PROP. NYLOPLAST DRAIN BASIN
▬ ▬ ▬	PROP. DRAIN LINE
-•-•-•-	PROP. STAKED SILT FENCE
DHX ⊠	DEEP HOLE

DRAINAGE PLAN NOTES:

1. THIS PLAN APPLIES ONLY TO THE WORK THAT IS PART OF PHASE II.
2. SEE DRAINAGE SCHEDULE ON SHEET C-3 FOR STRUCTURE ELEVATIONS AND PIPING INFO.
3. SEE "L" SHEETS FOR GRADING REQUIREMENTS.
4. THE SITE LIES WITHIN A FLOOD ZONE X AS SHOWN ON FEMA MAP FM25027C0618E.
5. THE SITE DOES NOT LIE WITHIN A WATER SUPPLY PROTECTION AREA AS MAPPED BY MA DEP.
6. SITE SITE DOES NOT LIE WITHIN AN ESTIMATED HABITAT OF RARE WILDLIFE OR PRIORITY HABITAT OF RARE SPECIES.
7. THE SITE IS NOT UPSTREAM OF A COLD WATER FISHERY AS MAPPED BY MASS.GOV.
8. THE SITE DOES NOT LIE WITHIN 100 FEET OF A WETLAND RESOURCE AREA.
9. EXISTING CONDITIONS HAVE BEEN PROVIDED TO QUINN ENGINEERING, INC. BY OTHER. QUINN ENGINEERING, INC. DOES NOT WARRANT THE ACCURACY OF THE EXISTING CONDITIONS PROVIDED.
10. PER ARTICLE XVI, SECTION 2.D OF THE WORCESTER ZONING ORDINANCE, THE ORDINANCE DOES NOT APPLY TO THE CITY OF WORCESTER IN THE CARRYING OUT OF ANY OF ITS FUNCTIONS EXCEPT FOR THE PROVISIONS OF ARTICLE XII, WATER RESOURCES PROTECTION OVERLAY DISTRICT.

NOTE TO OWNER:
FOR REFERENCE, SEE PHASE I DRAWINGS FOR STORMWATER SYSTEM MAINTENANCE REQUIREMENTS.

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LANDSCAPE ARCHITECTURE
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QUINN ENGINEERING, INC.
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Paxton, Massachusetts 01612
(508)753-7999 Fax:(508)795-0939

COMMONWEALTH OF MASSACHUSETTS
KEVIN J. QUINN
No.33922
REGISTERED PROFESSIONAL ENGINEER

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

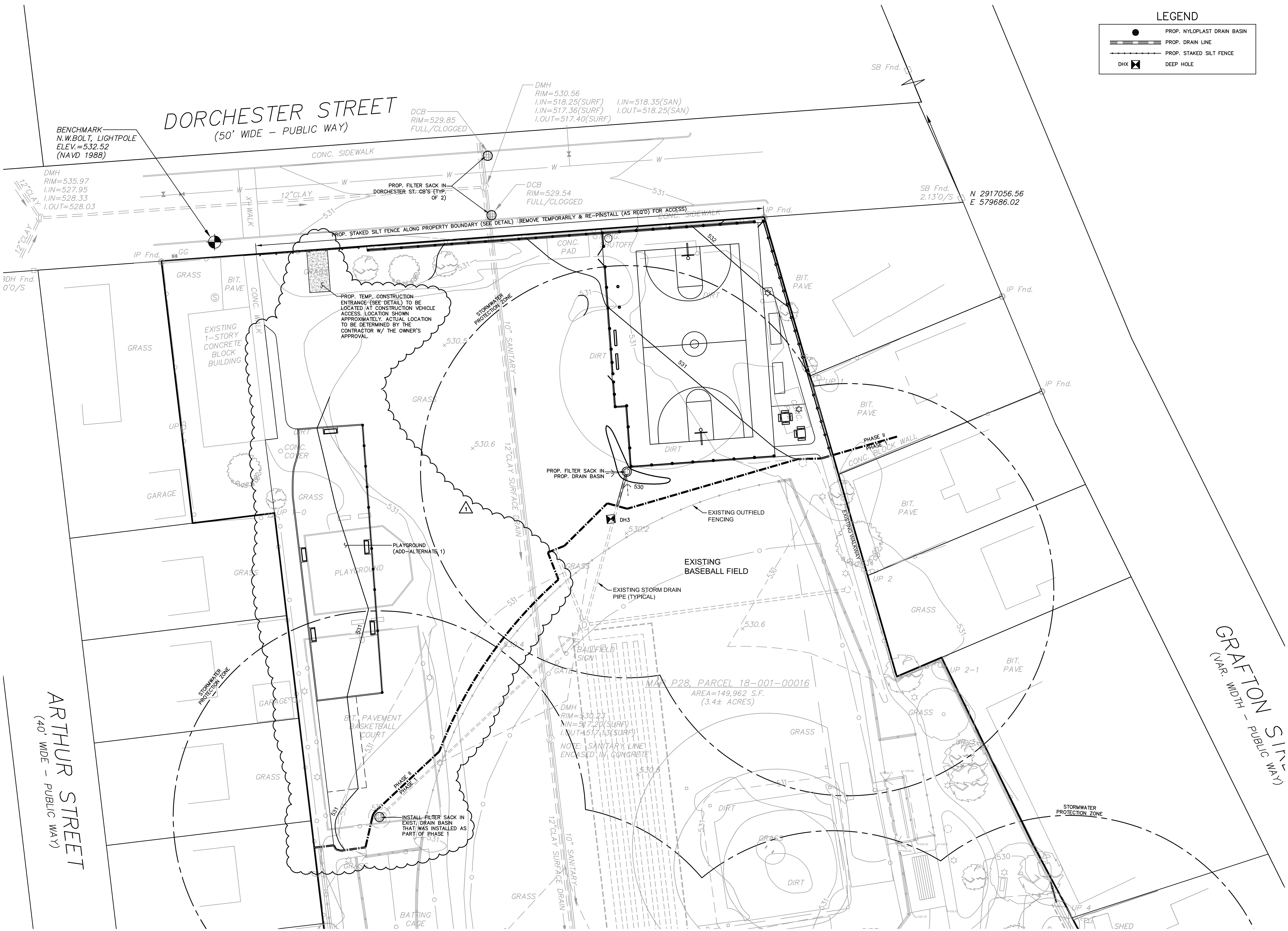
NO.	DATE	DESCRIPTION
1	1-17-23	ADDENDUM 6 - ADD-ALT 1

N

SCALE: 1" = 20'
0' 10' 20' 40'

CIVIL SURFACE DRAINAGE PLAN

SHEET C-1



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QUINN ENGINEERING, INC.
P.O. Box 107
Paxton, Massachusetts 01612
(508)753-7999 Fax:(508)795-0939

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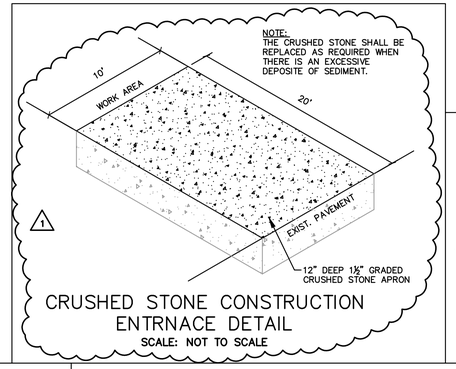
1	1-17-23	ADDENDUM 6 - ADD-ALT 1

N

SCALE: 1" = 20'
0' 10' 20' 40'

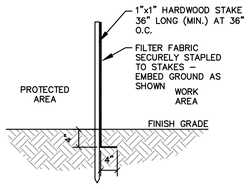
CIVIL EROSION CONTROL PLAN

SHEET C-2



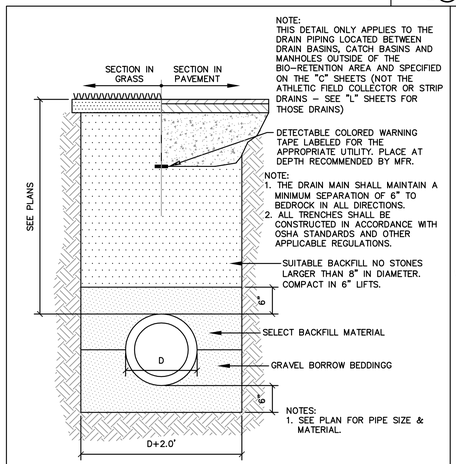
CRUSHED STONE CONSTRUCTION ENTRNACE DETAIL

SCALE: NOT TO SCALE



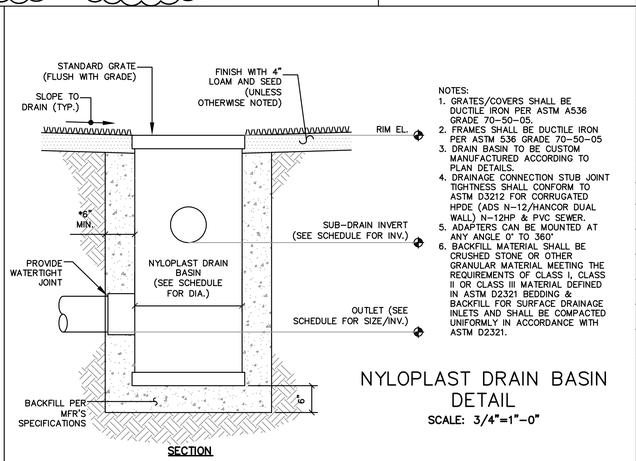
SILT FENCE DETAIL

SCALE: 1"=3/4'-0"



DRAIN TRENCH DETAIL

SCALE: 3/4"=1'-0"



NYLOPLAST DRAIN BASIN DETAIL

SCALE: 3/4"=1'-0"

DRAIN SCHEDULE

STRUCTURE	TO STRUCTURE	CULVERT
DB7 (30" DIA.) RIM=529.7 INV. IN=527.7 (2-8" HPDE) INV. OUT=526.2	EXISTING STUB INV.=±525.98	12" ADS N-12 LENGTH=16' SLOPE=0.0135

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QUINN ENGINEERING, INC.
P.O. Box 107
Paxton, Massachusetts 01612
(508)753-7999 Fax:(508)795-0939

COMMONWEALTH OF MASSACHUSETTS
KEVIN J. QUINN
No. 33922
REGISTERED PROFESSIONAL ENGINEER

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

NO.	DATE	DESCRIPTION
1	1-17-23	ADDENDUM 6 - ADD-ALT 1

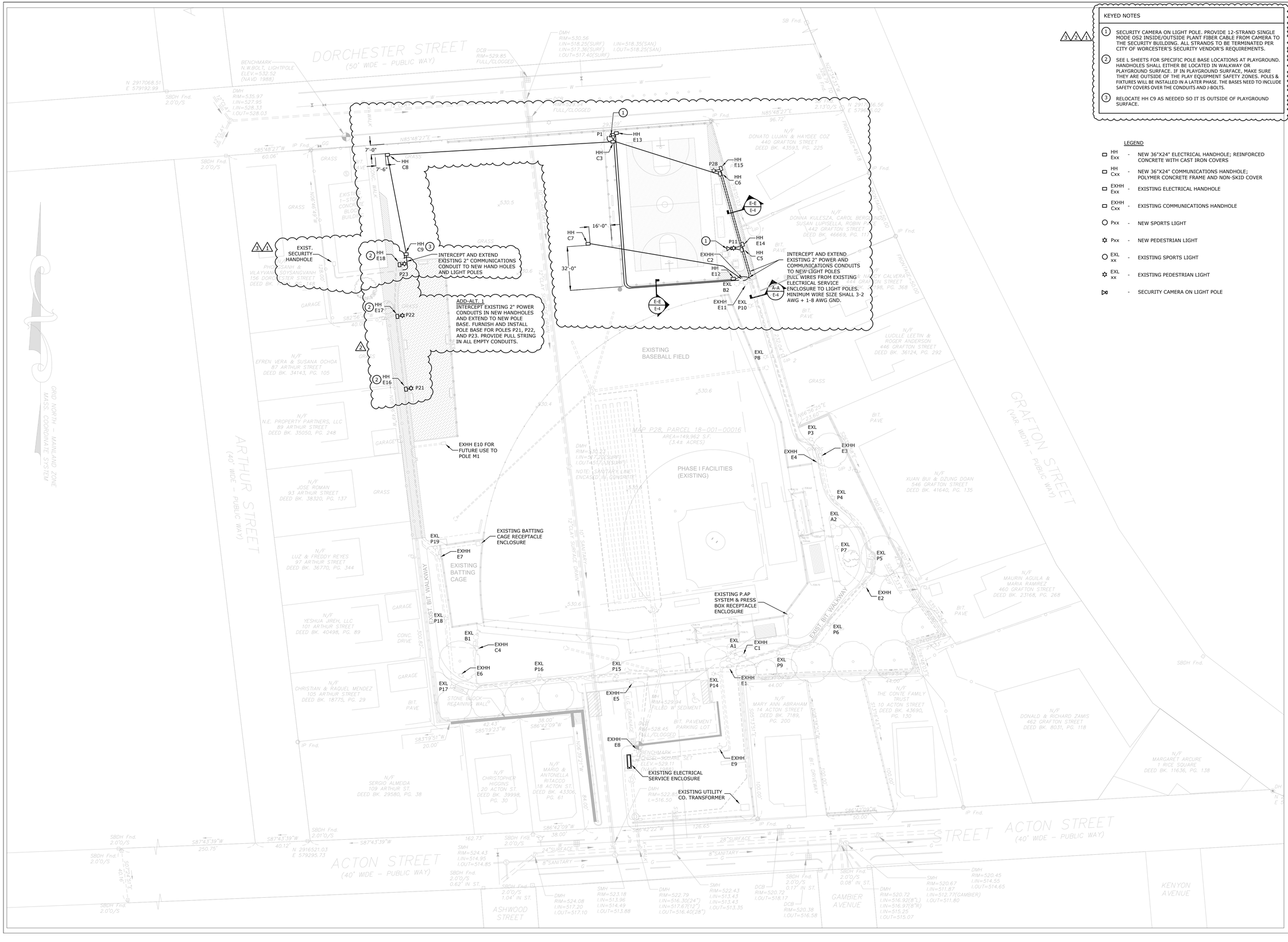
N

SCALE: 1" = 20'

0' 10' 20' 40'

CIVIL DETAILS & NOTES

SHEET C-3



KEYED NOTES

1. SECURITY CAMERA ON LIGHT POLE. PROVIDE 12-STRAND SINGLE MODE OS2 INSIDE/OUTSIDE PLANT FIBER CABLE FROM CAMERA TO THE SECURITY BUILDING. ALL STRANDS TO BE TERMINATED PER CITY OF WORCESTER'S SECURITY VENDOR'S REQUIREMENTS.
2. SEE L SHEETS FOR SPECIFIC POLE BASE LOCATIONS AT PLAYGROUND. HANDHOLES SHALL EITHER BE LOCATED IN WALKWAY OR PLAYGROUND SURFACE. IF IN PLAYGROUND SURFACE, MAKE SURE THEY ARE OUTSIDE OF THE PLAY EQUIPMENT SAFETY ZONES. POLES & FIXTURES WILL BE INSTALLED IN A LATER PHASE. THE BASES NEED TO INCLUDE SAFETY COVERS OVER THE CONDUITS AND J-BOLTS.
3. RELOCATE HH C9 AS NEEDED SO IT IS OUTSIDE OF PLAYGROUND SURFACE.

LEGEND

HH Exx	-	NEW 36"X24" ELECTRICAL HANDHOLE; REINFORCED CONCRETE WITH CAST IRON COVERS
HH Cxx	-	NEW 36"X24" COMMUNICATIONS HANDHOLE; POLYMER CONCRETE FRAME AND NON-SKID COVER
EXHH Exx	-	EXISTING ELECTRICAL HANDHOLE
EXHH Cxx	-	EXISTING COMMUNICATIONS HANDHOLE
Pxx	-	NEW SPORTS LIGHT
Pxx	-	NEW PEDESTRIAN LIGHT
EXL xx	-	EXISTING SPORTS LIGHT
EXL xx	-	EXISTING PEDESTRIAN LIGHT
	-	SECURITY CAMERA ON LIGHT POLE

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COMMONWEALTH OF MASSACHUSETTS
AZIM S. RAWJI
No. 41766
REGISTERED PROFESSIONAL ENGINEER

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

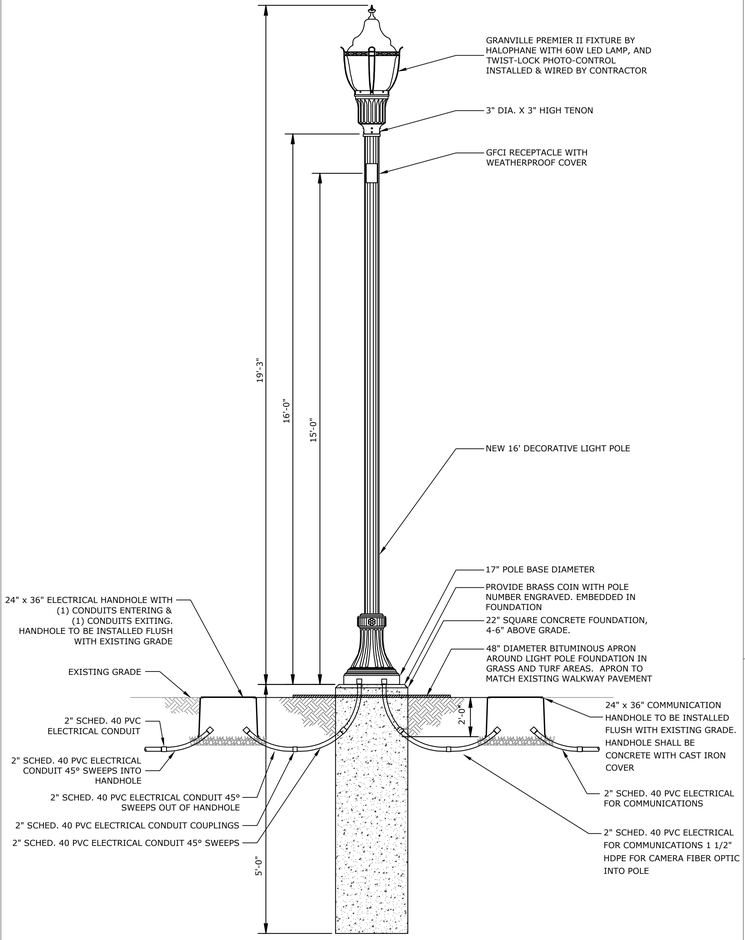
NO.	DATE	DESCRIPTION
1	1/16/23	ADDENDUM 5
2	1/17/23	ADDENDUM 6 - ADD-ALT 1
3	1/17/23	ADDENDUM 6

N

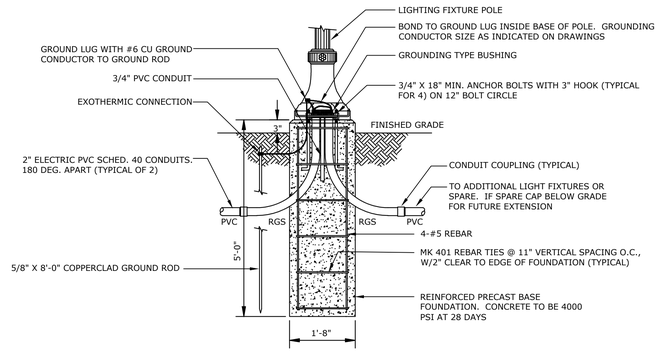
SCALE: 1" = 30'-0"

ELECTRICAL SITE PLAN

SHEET E-1

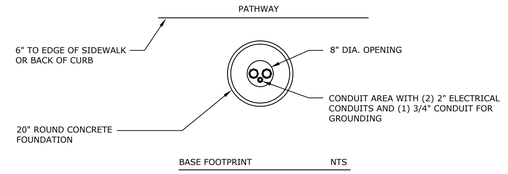


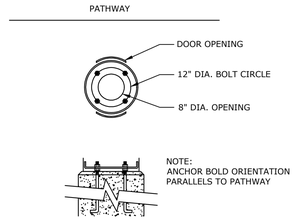
PATHWAY LIGHT POLE INSTALLATION DETAIL NTS



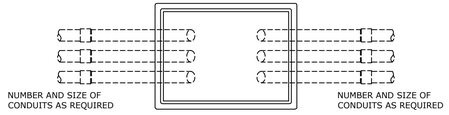
PATHWAY LIGHT POLE FOUNDATION DETAIL NTS

NOTES:
1. BOLT PATTERN SHOWN IS TYPICAL AND NOT FOR CONSTRUCTION CONTRACTOR TO PROVIDE BOLT PATTERN DETAILS BASED ON SELECTED MANUFACTURER.
2. PROVIDE REBAR DETAIL FROM PRECAST CONCRETE VENDOR FOR APPROVAL.
3. CONDUIT LOCATIONS SHOWN ARE TYPICAL.
4. ALL STEEL REINFORCING TO BE ASTM A615 (REBAR) GRADE 60.
5. ALL CONCRETE STRENGTH TO BE EQUAL TO 4000 P.S.I.



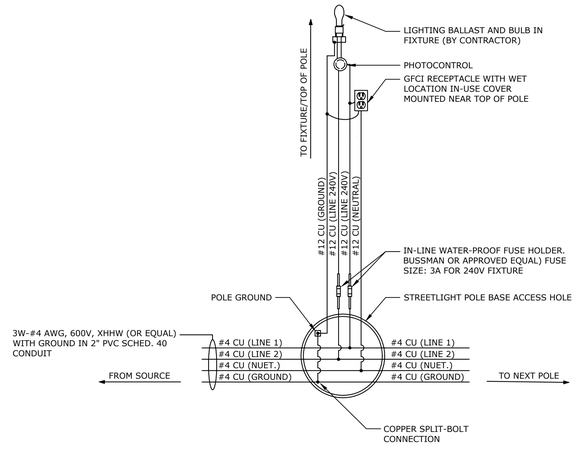


PATHWAY LIGHT POST ANCHOR DETAIL NTS



TYPICAL HANDHOLE INSTALLATION DETAIL NTS

NOTES:
1. HANDHOLE ORIENTATION TO BE SUCH THAT ALL SUPPLY DUCTS ENTER ON SAME SHORT SIDE.
2. SIZE AND NUMBER OF CONDUITS AS REQUIRED.
3. CONDUIT LOCATIONS SHOWN ARE TYPICAL.



TYPICAL PATHWAY LIGHT WIRING DETAIL NTS

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COMMONWEALTH OF MASSACHUSETTS
AZIM S. RAWJI
No. 41755
REGISTERED PROFESSIONAL ENGINEER

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

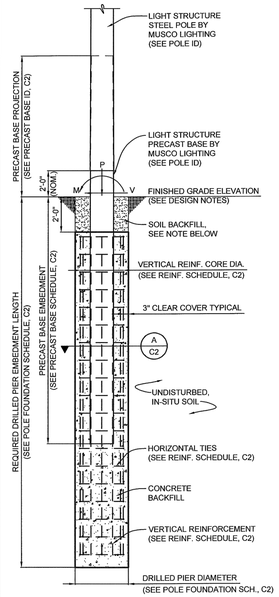
NO.	DATE	DESCRIPTION

N

SCALE: AS NOTED

ELECTRICAL DETAILS

SHEET E-2



POLE FOUNDATION ELEVATION

SCALE: NOT TO SCALE

SOIL BACKFILL NOTE:
THE TOP TWO FEET OF ANNULUS SHALL BE BACKFILLED WITH SOIL, WITH A CLASSIFICATION OF CLASS 5 (TABLE 1806.2) OR BETTER. COMPACTION, 95% FOR COHESIVE SOIL AND 98% FOR A COHESIONLESS SOIL BASED UPON STANDARD PROCTOR TESTING (ASTM D698).

POLE IDENTIFICATION

POLE DESIGNATION	POLE TYPE	PRECAST BASE TYPE	FIXTURE CONFIGURATION (FIX. PER XARM)	FIXTURE AND ACCESSORIES EPA (FT^2)
A1, A2	LSS70A	3B	5 (3)	18.8
B1	LSS70C	4B	8 (5)	27.7
B2	LSS70C	4B	9 (5)	29.1
M1, M2	LSS60A	2B	4 (3)	15.5
P1, P2	LSS50B	2B	6 (5)	19.1

- POLE B1 HAS (1) MUSCO LED FIXTURE AT 50'-0" AGL INCLUDED ABOVE.
- POLE B2 HAS (2) MUSCO LED FIXTURES AT 50'-0" AGL INCLUDED ABOVE.
- EACH POLE HAS (2) SPEAKERS AT 32'-0" AGL INCLUDED IN EPA ABOVE.
- EACH POLE HAS (1) CREE OSQ FIXTURE AT 30'-0" AGL INCLUDED ABOVE.
- EACH POLE HAS (1) CCTV CAMERA AT 25'-0" AGL INCLUDED IN EPA ABOVE.
- A & B POLES HAVE (1) MUSCO LED FIXTURE AT 15'-6" AGL INCLUDED ABOVE.

NOTE

1. P1 IS THE ONLY SPORTS LIGHTING POLE TO BE FURNISHED AND INSTALLED UNDER THIS CONTRACT.
2. ASSEMBLE POLE ACCORDING TO MUSCO'S INSTRUCTIONS.
3. P1 SHALL BE 50 FT. IN HEIGHT.

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 (0.75" MAX) 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 DRILLED PIERS MUST ATTAIN 3,000 PSI STRENGTH PRIOR TO POLE INSTALLATION AND FIXTURE MOUNTING.

THE DEPTH EQUAL TO THE PRECAST BASE EMBEDMENT SHALL BE THOROUGHLY CONSOLIDATED BY MECHANICAL VIBRATION DURING PLACEMENT.

INSTALLATION NOTE:
CONCRETE TO BE PLACED IN A CONTINUOUS POUR OR A COLD JOINT WILL BE ACCEPTABLE AT THE BOTTOM OF THE PRECAST BASE. TWO POUR: WITH THE REINFORCEMENT IN PLACE, THE CONCRETE BELOW THE BOTTOM OF THE PRECAST BASE MAY BE POURED AND ALLOWED TO SET UP LONG ENOUGH TO SUPPORT WEIGHT OF PRECAST BASE. THEN THE PRECAST BASE MAY BE SET IN PLACE AND THE REST OF THE CONCRETE CONCRETE BACKFILL POURED. DEPENDING ON THE DEPTH TO GROUND WATER AT THE TIME OF INSTALLATION, THE TWO POUR METHOD UTILIZING A COLD JOINT MAY NOT BE FEASIBLE.

DESIGN NOTES

DESIGN PARAMETERS:
WIND: V_{ult} = 124 MPH, V_{asd} = 96 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: 1,500 PSF
ALLOWABLE LATERAL SOIL BEARING PRESSURE:
VARIES BY LOCATION, SEE BORING LOGS
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 TEST BORING LOGS PROJECT NO. 14-0835, PREPARED BY SOIL EXPLORATION CORP.; LEOMINSTER, 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 LICENSED ENGINEER.

ALL EXCAVATIONS MUST BE FREE OF LOOSE SOIL AND DEBRIS PRIOR TO FOUNDATION INSTALLATION AND CONCRETE BACKFILL PLACEMENT. TEMPORARY CASINGS OR DRILLERS SLURRY MAY BE USED TO STABILIZE THE EXCAVATION DURING INSTALLATION. CASINGS MUST BE REMOVED DURING CONCRETE BACKFILL PLACEMENT. CONCRETE BACKFILL MUST BE PLACED WITH A TREMIE WHEN SLURRY OR WATER IS PRESENT WITHIN THE EXCAVATION OR WHEN THE FREE DROP EXCEEDS 6'-0".

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.

COMMONWEALTH OF MASSACHUSETTS
KYLE G. LACINA
STRUCTURAL
No. 46148
REGISTERED PROFESSIONAL ENGINEER
1-21-2020

WORCESTER LL
MULCAHY FIELD
ATHLETIC LIGHTING
WORCESTER, MA

musco Lighting
CORPORATE: 100 1st AVE. WEST
OSKALOOSA, IOWA 52577
(800) 825-4020

STRUCTURAL ENGINEERS, P.C.
114 NICHOLAS DRIVE
MARSHALLTOWN, IOWA 50158
PHONE NUMBER: 641-752-8334
EMAIL: MSL.INFO@SEPC.BIZ

DRAWING TITLE: LIGHT POLE FOUNDATION
SCALE: SEE PLAN
NOTES: SCAN #1703808

PROJECT NUMBER 170380
DATE 21 JANUARY 2020
DRAWING NUMBER C1
OF TWO

POLE FOUNDATION SCHEDULE

POLE DESIGNATION	FORCES (1.)			DRILLED PIER			REINFORCING		
	MOMENT (M) FT-LBS	SHEAR (V) LBS	VERTICAL (P) LBS	DIAMETER INCHES	EMBEDMENT DEPTH	CONCRETE BACKFILL YD^3 (2.)	CORE DIAMETER INCH (3.)	VERTICAL REINFORCING	HORIZONTAL TIES
A1, A2	57,376	1,473	1,542	36	18'-0"	3.9	29	12 - #6	#4 @ 12"
B1	88,900	2,047	2,413	36	20'-0"	4.2	29	12 - #6	#4 @ 12"
B2	91,116	2,087	2,504	36	20'-0"	4.2	29	12 - #6	#4 @ 12"
M1, M2	39,460	1,138	1,240	36	17'-0"	3.7	29	12 - #6	#4 @ 12"
P1, P2	40,988	1,263	1,326	36	15'-0"	3.2	29	12 - #6	#4 @ 12"

1. ASD LOAD COMBINATION D + 0.6W.
   VERTICAL FORCE IS WEIGHT OF DRESSED POLE (DOES NOT INCLUDE PRECAST BASE WEIGHT).
2. MINIMUM CONCRETE BACKFILL VOLUME, SITE CONDITIONS MAY REQUIRE ADDITIONAL BACKFILL.
3. CORE DIAMETER EQUAL TO INSIDE DIAMETER OF TIES.

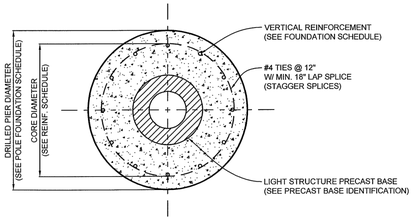
NOTE

1. P1 IS THE ONLY SPORTS LIGHTING POLE TO BE FURNISHED AND INSTALLED UNDER THIS CONTRACT.
2. ASSEMBLE POLE ACCORDING TO MUSCO'S INSTRUCTIONS.
3. P1 SHALL BE 50 FT. IN HEIGHT.

PRECAST BASE IDENTIFICATION

PRECAST BASE TYPE	PRECAST BASE WEIGHT	PRECAST BASE LENGTH	PROJECTION ABOVE GRADE	STANDARD EMBEDMENT	OUTSIDE DIAMETER
2B	1,690 LBS	17'-3"	7'-3"	10'-0"	12.00"
3B	2,470 LBS	20'-0"	8'-0"	12'-0"	13.38"
4B	3,490 LBS	22'-0"	8'-0"	14'-0"	15.75"

REFERENCE POLE ID TABLE ON SHEET C1 FOR POLE TO PRECAST BASE TYPES



A PIER DETAIL

SCALE: NOT TO SCALE

COMMONWEALTH OF MASSACHUSETTS
KYLE G. LACINA
STRUCTURAL
No. 46148
REGISTERED PROFESSIONAL ENGINEER
1-21-2020

WORCESTER LL
MULCAHY FIELD
ATHLETIC LIGHTING
WORCESTER, MA

musco Lighting
CORPORATE: 100 1st AVE. WEST
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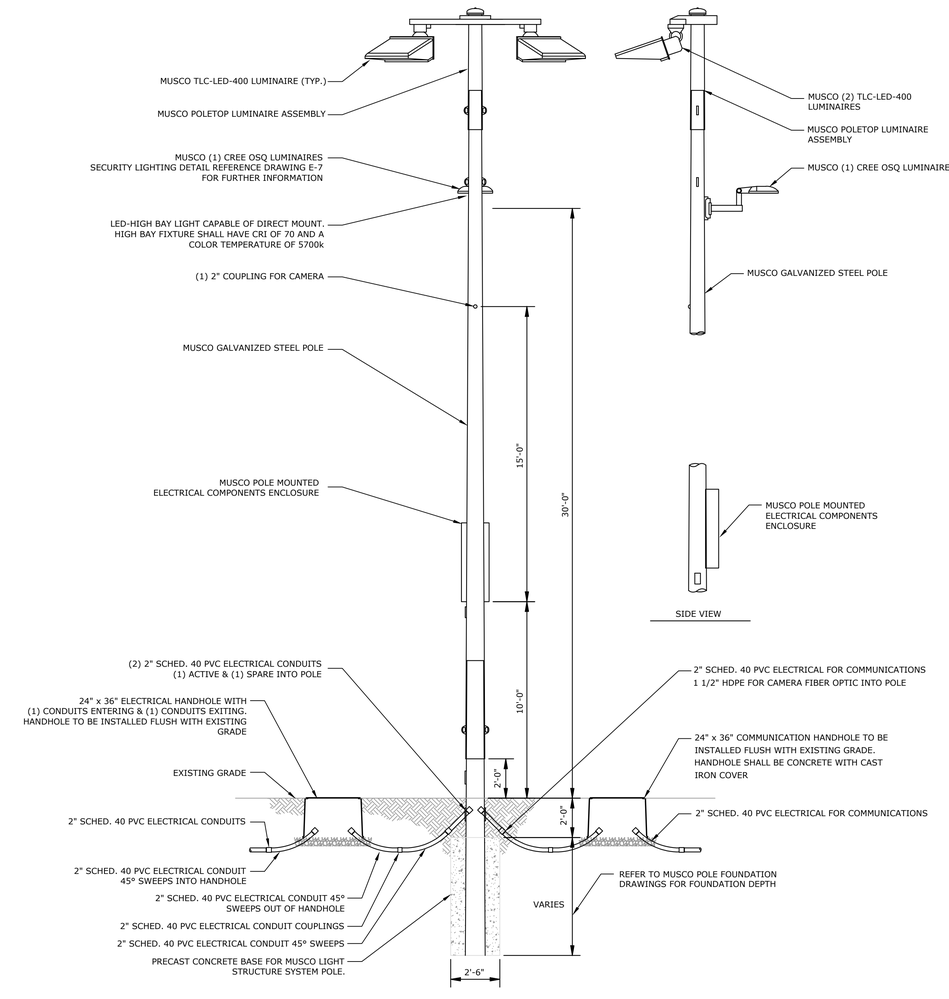
(800) 825-4020

STRUCTURAL ENGINEERS, P.C.
114 NICHOLAS DRIVE
MARSHALLTOWN, IOWA 50158
PHONE NUMBER: 641-752-8334
EMAIL: MSL.INFO@SEPC.BIZ

DRAWING TITLE: LIGHT POLE FOUNDATION
SCALE: SEE PLAN
NOTES: SCAN #1703808

PROJECT NUMBER 170380
DATE 21 JANUARY 2020
DRAWING NUMBER C2
OF TWO



PROPOSED SPORTS LIGHTING POLE INSTALLATION DETAIL NTS

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COMMONWEALTH OF MASSACHUSETTS
AZIM S. RAWJI
No. 41765
REGISTERED PROFESSIONAL ENGINEER

PROJECT:
MULCAHY FIELD,
PHASE II

CLIENT:
CITY OF
WORCESTER

DATE: 9/15/2022

REVISIONS:

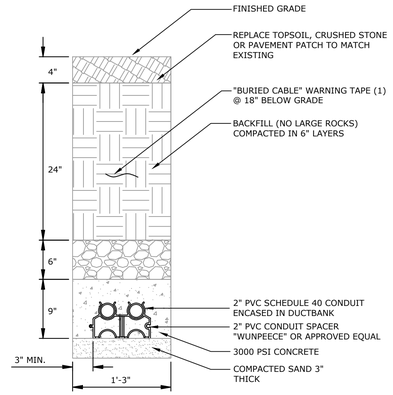
NO.	DATE	DESCRIPTION

N

SCALE: AS NOTED

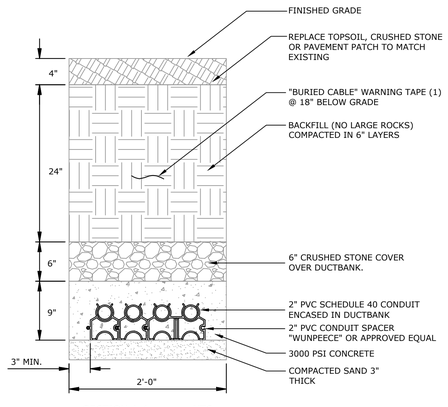
ELECTRICAL
DETAILS

SHEET E-3



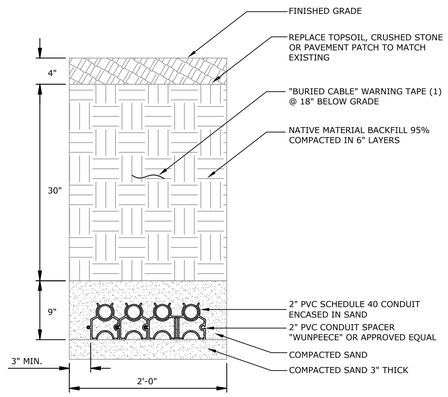
SECTION E-E NTS

(UNDER CONCRETE)



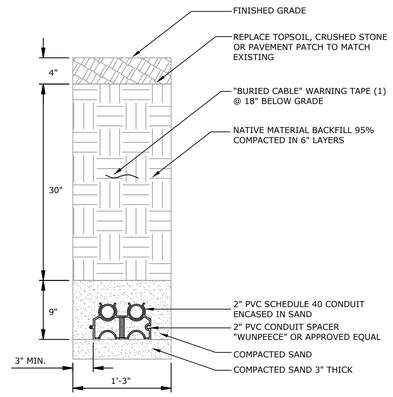
SECTION A-A NTS

(UNDER CONCRETE)



SECTION A-A NTS

(DIRECT BURIED)



SECTION E-E NTS

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COMMONWEALTH OF MASSACHUSETTS
AZIM S. RAWJI
No. 41755
REGISTERED PROFESSIONAL ENGINEER

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

NO.	DATE	DESCRIPTION

N

SCALE: AS NOTED

ELECTRICAL DETAILS

SHEET E-4

<UTF-8>

Control System Summary

Project Specific Notes:

Project Information

Project #:	170380
Project Name:	Worcester Little League [Mulcahy]
Date:	09/30/20
Project Engineer:	TLanphier
Sales Representative:	Mike Berry
Control System Type:	Control-Link™ Control and Monitoring System
Communication Type:	PowerLine-ST
Scan:	170380D
Document ID:	170380P1V8-093010129
Distribution Panel Location or ID:	Service 1
Total # of Distribution Panel Locations for Project:	1
Design Voltage/Hertz/Phase:	240/60/1
Control Voltage:	120

Equipment Listing

DESCRIPTION	APPROXIMATE SIZE
1.Control and Monitoring Cabinet	24 X 72
2.Control and Monitoring Cabinet	24 X 48

	QTY	SIZE (AMPS)
Total Contactors	14	30 AMP
Total Off/On/Auto Switches:	7	

Materials Checklist

Contractor/Customer Supplied:

- ❑ A dedicated control circuit must be supplied per distribution panel location
  - — If the control voltage is NOT available, a control transformer is required
- ❑ Electrical distribution panel to provide overcurrent protection for circuits
  - — HID rated or D-curve circuit breaker sized per full load amps on Circuit Summary by Zone Chart
- ❑ Wiring
  - — See chart on page 2 for wiring requirements
  - — Equipment grounding conductor and splices must be insulated (per circuit)
  - — Lightning ground protection (per pole), if not Musco supplied
- ❑ Electrical conduit wireway system
  - — Entrance hubs rated NEMA 4, must be die-cast zinc, PVC, or copper-free die-cast aluminum
- ❑ Mounting hardware for cabinets
- ❑ Breaker lock-on device to prevent unauthorized power interruption to control power and powerline connection (if present)
- ❑ Anti-corrosion compound to apply to ends of wire, if necessary

Call Control-Link Central™ operations center at 877/347-3319 to schedule activation of the control system upon completion of the installation.

Note: Activation may take up to 1 1/2 hours.

IMPORTANT NOTES

1. Please confirm that the design voltage listed above is accurate for this facility. Design voltage/phase is defined as the voltage/phase being connected and utilized at each lighting pole's electrical components enclosure disconnect. Inaccurate design voltage/phase can result in additional costs and delays. Contact your Musco sales representative to confirm this item.
2. In a 3 phase design, all 3 phases are to be run to each pole. When a 3 phase design is used Musco's single phase luminaires come pre-wired to utilize all 3 phases across the entire facility.
3. One contactor is required for each pole. When a pole has multiple circuits, one contactor is required for each circuit. All contactors are 100% rated for the published continuous load. All contactors are 3 pole.
4. If the lighting system will be fed from more than one distribution location, additional equipment may be required. Contact your Musco sales representative.
5. A single control circuit must be supplied per control system.
6. Size overcurrent devices using the full load amps column of the Circuit Summary By Zone chart- Minimum power factor is 0.9.

NOTE: Refer to Installation Instructions for more details on equipment information and the installation requirements.

Form: T-5030-1

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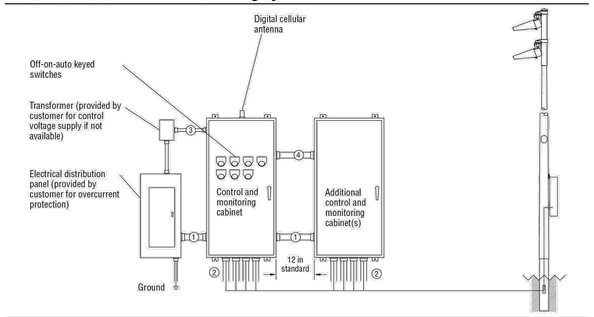
LIGHTING CONTROL SYSTEM SUMMARY

Control System Summary

Control•Link® Control and Monitoring System



Conduit ID	Description	# of Wires	Wire (AWG)	Conduit (in)	Max. Wire Length (ft)	MUSCO Supplied	Notes
1	Line power to contactors, and equipment grounding conductor	*A	*B	*C	N/A	No	A-E
2	Load power to lighting circuits, and equipment grounding conductor	*A	*B	*C	N/A	No	A-E
3	Control power (dedicated, 20A)	3	12	*C	N/A	No	C,E
4	Control harnesses	*F	12	2	*F	Yes	C,E,F

* Notes:
A. See voltage and phasing per the notes on cover page.
B. Calculate per load and voltage drop.
C. All conduit diameters should be per code unless otherwise specified to allow for connector size.
D. Equipment grounding conductor and any splices must be insulated.
E. Refer to control and monitoring system installation instructions for more details on equipment information and the installation requirements.
F. Harness is provided in 8-ft length.

IMPORTANT: Control wires (3,4) must be in separate conduit from line and load power wires (1, 2).

R60-101-00_B

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LIGHTING CONTROL SYSTEM SUMMARY

Control System Summary

SWITCHING SCHEDULE

Field/Zone Description	Zones
Baseball	**1,2**
-Baseball	1
-BB/MP	2
Multipurpose	**2,3**
-BB/MP	2
-Multipurpose (Future)	3
Basketball	**4**
Field Security	**5**
Walkway/Parking	**6**
Security [Spare]	**7**

CONTROL POWER CONSUMPTION		
120V Single Phase		
VA loading of Musco Supplied Equipment	INRUSH: 4003.0	
	SEALED: 439.8	

CIRCUIT SUMMARY BY ZONE

POLE	CIRCUIT DESCRIPTION	# OF FIXTURES	# OF DRIVERS	*FULL LOAD AMPS	CONTACTOR SIZE (AMPS)	CONTACTOR ID	ZONE
A1	Baseball	4	4	**19.6**	30	C1	1
A2	Baseball	4	4	**19.6**	30	C2	1
B1	Baseball	4	4	**17.0**	30	C3	1
B2	Baseball	3	3	**15.0**	30	C4	1
B1	BB/MP	3	3	**18.2**	30	C5	2
B2	BB/MP	3	3	**18.2**	30	C6	2
M2	Multipurpose (Future)	0	0	**0.0**	30	C7	3
M1	Multipurpose (Future)	0	0	**0.0**	30	C8	3
B2	Basketball	2	2	**7.5**	30	C9	4
P1	Basketball	0	0	**0.0**	30	C10	4
P2	Basketball	0	0	**0.0**	30	C11	4
A1,A2,B1,B2	Field Security	4	4	**0.0**	30	C12	5
X1	Walkway/Parking	0	0	**0.0**	30	C13	6
X2	Security (Spare)	0	0	**0.0**	30	C14	7

*Full Load Amps based on amps per driver.

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LIGHTING CONTROL SYSTEM SUMMARY

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COMMONWEALTH OF MASSACHUSETTS
AZIM S. RAWJI
No. 41795
REGISTERED PROFESSIONAL ENGINEER

PROJECT:
MULCAHY FIELD, PHASE II

CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

NO.	DATE	DESCRIPTION

N

SCALE: AS NOTED

ELECTRICAL DETAILS

SHEET E-5

MUSCO Lighting

Control System Summary

Worcester Little League [Mulcahy] / 170380 - 170380D
Service 1 - Page 4 of 4

PANEL SUMMARY

CABINET #	CONTROL MODULE LOCATION	CONTACTOR ID	CIRCUIT DESCRIPTION	FULL LOAD AMPS	DISTRIBUTION PANEL ID (BY OTHERS)	CIRCUIT BREAKER POSITION (BY OTHERS)
1	1	C1	Pole A1	19.58		
1	1	C2	Pole A2	19.58		
1	1	C3	Pole B1	17.00		
1	1	C4	Pole B2	15.00		
1	1	C5	Pole B1	18.15		
1	1	C6	Pole B2	18.15		
1	1	C7	Pole M2	0.00		
1	1	C8	Pole M1	0.00		
1	1	C9	Pole B2	7.53		
1	1	C10	Pole P1	0.00		
1	1	C11	Pole P2	0.00		
1	1	C12	Pole A1,A2,B1,B2	0.00		
2	1	C13	Pole X1	0.00		
2	1	C14	Pole X2	0.00		

ZONE SCHEDULE

ZONE	SELECTOR SWITCH	ZONE DESCRIPTION	CIRCUIT DESCRIPTION: POLE ID	CIRCUIT DESCRIPTION: CONTACTOR ID
Zone 1	1	Baseball	A1 A2 B1 B2	C1 C2 C3 C4
Zone 2	2	BB/MP	B1 B2	C5 C6
Zone 3	3	Multipurpose (Future)	M2 M1	C7 C8
Zone 4	4	Basketball	B2 P1 P2	C9 C10 C11
Zone 5	5	Field Security	A1 A2 B1 B2	C12 C12 C12 C12
Zone 6	6	Walkway/Parking	X1	C13
Zone 7	7	Security (Spare)	X2	C14

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LIGHTING CONTROL SYSTEM SUMMARY

Bussmann series HEB breakaway and non-breakaway in-line fuse holders for UL 13/32" x 1-1/2" supplemental fuses

Breakaway catalog number system

HEB - A W - RYC

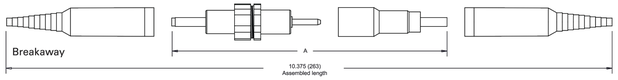
To order:

Specify catalog symbol HEB and the loadside terminal code plus the letter "W." Then select a lineside terminal code that is available with the loadside terminal. Example: HEB-BW-RCL-B defines a breakaway holder with a loadside copper crimp terminal for a single #6 or two #10 wires with a lineside copper crimp terminal for a single #6 or two #10 wires.

Catalog symbol	Loadside terminal	Lineside terminal	Agency Info. UL	Agency Info. CSA	Loadside terminal: Terminal type	Loadside terminal: Wire range*	Lineside terminal: Terminal type	Lineside terminal: Wire range*	Length A (ref.)	Non-breakaway equivalent
HEB	A	RLC-A	X	X	Cu crimp	#8-16; (2) #12-16 Sol/Str	Cu crimp	#8-16; (2) #12-16 Sol/Str	5.8 (147)	HEB-AA
		RLC-B	X	X	Cu crimp	#8-16; (2) #12-16 Sol/Str	Cu crimp	#6; (2) #10	5.9 (150)	HEB-AB
		RLC-C	X	X	Cu crimp	#8-16; (2) #12-16 Sol/Str	Cu crimp	#4; (2) #8	6.2 (158)	HEB-AC
		RLC-J	X	X	Cu crimp	#8-16; (2) #12-16 Sol/Str	Cu setscrew	#3-12 Str #10-12 Sol	6.2 (158)	HEB-AJ
		RYC	X	X	Cu crimp	#8-16; (2) #12-16 Sol/Str	Cu dual setscrew	#2-12 Str†; #10-12 Sol†	6.3 (159)	HEB-AK
		RLA	—	—	Cu crimp	#8-16; (2) #12-16 Sol/Str	Al setscrew	#2-12	6.2 (158)	HEB-AL
		RYA	—	—	Cu crimp	#8-16; (2) #12-16 Sol/Str	Al dual setscrew	#2-12†	6.3 (159)	HEB-AY
	B	RLC-A	X	X	Cu crimp	#6; (2) #10	Cu crimp	#8-16; (2) #12-16	5.8 (147)	HEB-BA
		RLC-B	X	X	Cu crimp	#6; (2) #10	Cu crimp	6#; (2) #10	5.9 (150)	HEB-BB
		RYC	X	X	Cu crimp	#6; (2) #10	Cu dual setscrew	#2-12 Str†; #10-12 Sol†	6.3 (159)	—
	J	RLC-J	X	X	Cu setscrew	#3-12 Str; #10-12 Sol	Cu setscrew	#3-12 Str; #10-12 Sol	6.2 (158)	HEB-JJ
		RYC	X	X	Cu setscrew	#3-12 Str; #10-12 Sol	Cu dual setscrew	#2-12 Str†; #10-12 Sol†	6.3 (159)	HEB-JK
	K	RLC-J	X	X	Cu dual setscrew	#2-12 Str†; #10-12 Sol†	Cu setscrew	#3-12 Str; #10-12 Sol	6.2 (158)	—
		RYC	X	X	Cu dual setscrew	#2-12 Str†; #10-12 Sol†	Cu dual setscrew	#2-12 Str†; #10-12 Sol†	6.3 (159)	—
	L	RLA	—	—	Al setscrew	#2-12	Al setscrew	#2-12	6.2 (158)	HEB-LL
		RLC-J	—	—	Al setscrew	#2-12	Cu setscrew	#3-12	6.2 (158)	—
		RYA	—	—	Al setscrew	#2-12	Al dual setscrew	#2-12†	6.3 (159)	—

* Stranded conductors unless otherwise noted.
† Not dual wire rated. One wire per opening.

Dimensions - in (mm):



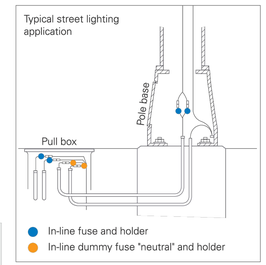
WALKWAY LIGHTING FUSE INSTALLATION DETAILS

Meet code requirements and save money with Bussmann™ series in-line fuse holders

Superior circuit protection in roadway and street lighting applications is key to keeping the lights reliable and safe. Using in-line fuse holders that can adequately withstand the lighting environment can make it easier to apply superior circuit protection.

In fact, **breakaway capability** and **submersibility** are quickly becoming preferred features. Many states already mandate breakaway fuse holders in roadway lighting applications to ensure safe disconnection in the event of a knockdown or if maintenance is required. Submersibility and waterproof requirements have also been enforced as street lighting is prone to wet conditions.

Bussmann series HEB and HEX breakaway in-line fuse holders are **UL® Recognized as fuse holders** and meet breakaway and submersibility requirements. What's more, they can help you realize a reduction in labor time, tools needed and maintenance costs when used as a standard solution.



Specific codes and regulations for street lighting vary by state, for example:

Florida Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 992:

992-2.6 In Line Fuse Holders
In line fuse holders shall provide a breakaway connection and be UL recognized per Guide IZLT2 and rated for 600V. The wire connections in the fuse holders shall be of the copper setscrew type. Fused connections shall utilize... FNQ 10 amp time delay fuse rated for 500V. Fuses shall be UL listed to Standard 248-14. The rating for the fuse holders shall be water resistant or submersible rated.

HEX breakaway, dual-pole holder

HEX - A W - DRLC-A

Catalog symbol	Loadside terminal	Lineside terminal	Loadside terminal: Terminal type	Loadside terminal: AWG wire range*	Lineside terminal: Terminal type	Lineside terminal: AWG wire range*
HEX	A	DRLC-A	Cu crimp	8-16; (2) 12-16	Cu crimp	8-16; (2) 12-16
		DRLC-B	Cu crimp	8-16; (2) 12-16	Cu crimp	6; (2) 10
		DRYC	Cu crimp	8-16; (2) 12-16	Cu dual setscrew	2-12†
	J	DRYC	Cu setscrew	3-12	Cu dual setscrew	2-12†
	K	DRYC	Cu dual setscrew	2-12†	Cu dual setscrew	2-12†

See data sheet No. 2126 for more detail.
* Solid/stranded conductors unless otherwise noted.
† Not dual wire rated. One wire per opening.

- 600 volts
- Up to 30 amps
- Up to 200 kA withstand rating
- UL Recognized per Guide IZLT2, CSA® Certified, CE and RoHS compliant
- Wide range of solid or stranded copper wire sizes
- Extensive wire terminations available to meet both new installations and retrofit/ repair applications
- Insulating boots for submersibility come standard

HET neutral single-pole holder

- Provides means of conductor continuity
- Permanent, solid neutral for use in conjunction with the HEB holder
- Identifiable by white, plastic coupling nut
- Can be used in place of HEB with a supplemental dummy fuse "neutral," Bussmann series NNB

See data sheet No. 2125 for more detail.

WALKWAY LIGHTING FUSE INSTALLATION DETAILS

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REVISIONS:

NO.	DATE	DESCRIPTION

N

SCALE: AS NOTED

ELECTRICAL DETAILS

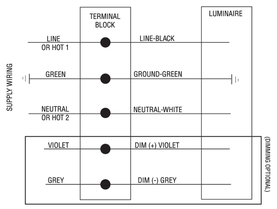
SHEET E-6

Datasheet: **OSQ Area Luminaire on Light-Structure System™**

Electrical Data

Rated wattage per luminaire[1] . . . . . 130-168 W
Input voltage . . . . . 120-277V or 347-480V, 50/60Hz
Driver configuration . . . . . Integral
Driver Efficiency . . . . . >90%
Starting (inrush) current 73A, 120µs
Power factor . . . . . > 0.9
Total Harmonic Distortion . . . . . < 20%
Operating temperature range . . . . . -40°C - +35°C (-40°F - +95°F)
Dimming mode[2] . . . . . 0-10V dimming to 10%

Typical Wiring



	120 Vac	208 Vac	240 Vac	277 Vac	347 Vac	480 Vac
Max operating current[3]	1.41 A	0.84 A	0.73 A	0.64 A	0.50 A	0.37 A

Footnotes:

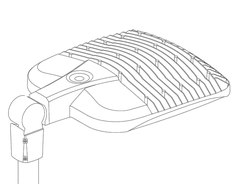
1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25° C ambient temperature environment.

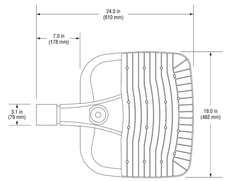
2) Dimming controls not provided by Musco. Driver provides 10V source current at 0.15 mA, compliant with IEC 60929 Annex E dimming standard.

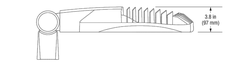
3) Operating current based on 25 degree C.

Notes

1. Use thermal magnetic HID-rated or D-curve circuit breakers.







Installation Instructions: **Light-Structure System™**

Precast Concrete Base

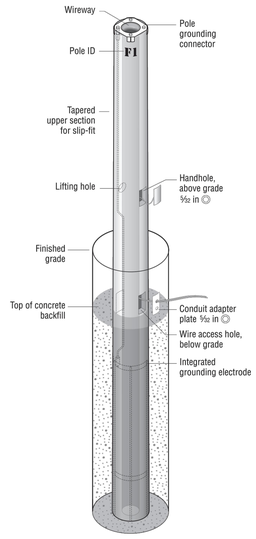
Overview

The precast concrete base is set directly into the ground, backfilled with concrete, and allowed to cure for 12 to 24 hours. The base is designed for easy slip-fit connection to the galvanized steel pole. The remaining components — steel pole, poletop luminaire assembly, electrical components enclosure, and wire harness —are assembled as a unit and set onto the base. The base includes an integrated lightning ground system.

Tools/Materials Needed

Musco Supplied
- ❑ *Field Aiming Diagram*
- ❑ Musco *Foundation and Pole Assembly Drawing* or alternate foundation design
- ❑ Steel bar
- ❑ Wooden base wedges
- ❑ Level with shim for tapered base
- ❑ 5⁄32 in hex key

Contractor Supplied
- ❑ Conduit for underground wiring
- ❑ Concrete backfill
- ❑ Water pump (as needed)



Installation Procedure

Verify pole ID on concrete base matches pole location on *Field Aiming Diagram*.

For options on poor soil conditions, alternative installation methods, or if there are any issues with pole locations given, contact your local Musco representative. Your project engineer's name appears on *Field Aiming Diagram*.

Note: Use only project-specific foundation designs as detailed on Musco Foundation and Pole Assembly Drawing or alternate foundation design plan.

1 Mark pole locations per *Field Aiming Diagram*.

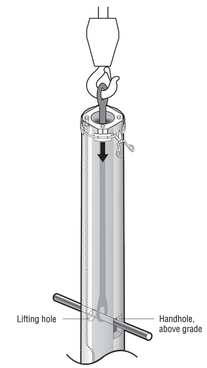
2 Excavate holes to size and depth given on Musco *Foundation and Pole Assembly Drawing* or alternate foundation design.

⚠ **Warning**
Fall hazard
Cover holes or install fencing for fall safety.

Installation Instructions: **Light-Structure System™**

Precast Concrete Base

3 Sling and lower base into hole. Orient wire access hole to accommodate incoming supply wiring. Snip banding and remove tab protectors.

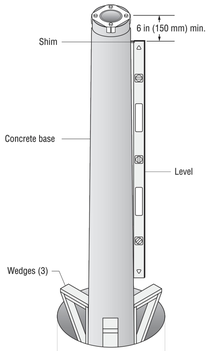


4 Plumb base and wedge into position. Use supplied level with shim on upper end against base. Shim accommodates taper of base. Top of base is beveled. Keep level at least 6 in (150 mm) from top when plumbing.

5 Remove any water from hole to avoid weakening foundation. Water in hole during concrete pour can also cause hollow center of base to fill with concrete.

✓ If backfilling to finished grade with concrete instead of compacted fill, be sure to maintain wire access.

6 Backfill with concrete per Musco *Foundation and Pole Assembly Drawing* or alternate foundation design.



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CLIENT:
CITY OF WORCESTER

DATE: 9/15/2022

REVISIONS:

NO.	DATE	DESCRIPTION

N

SCALE: AS NOTED

ELECTRICAL DETAILS

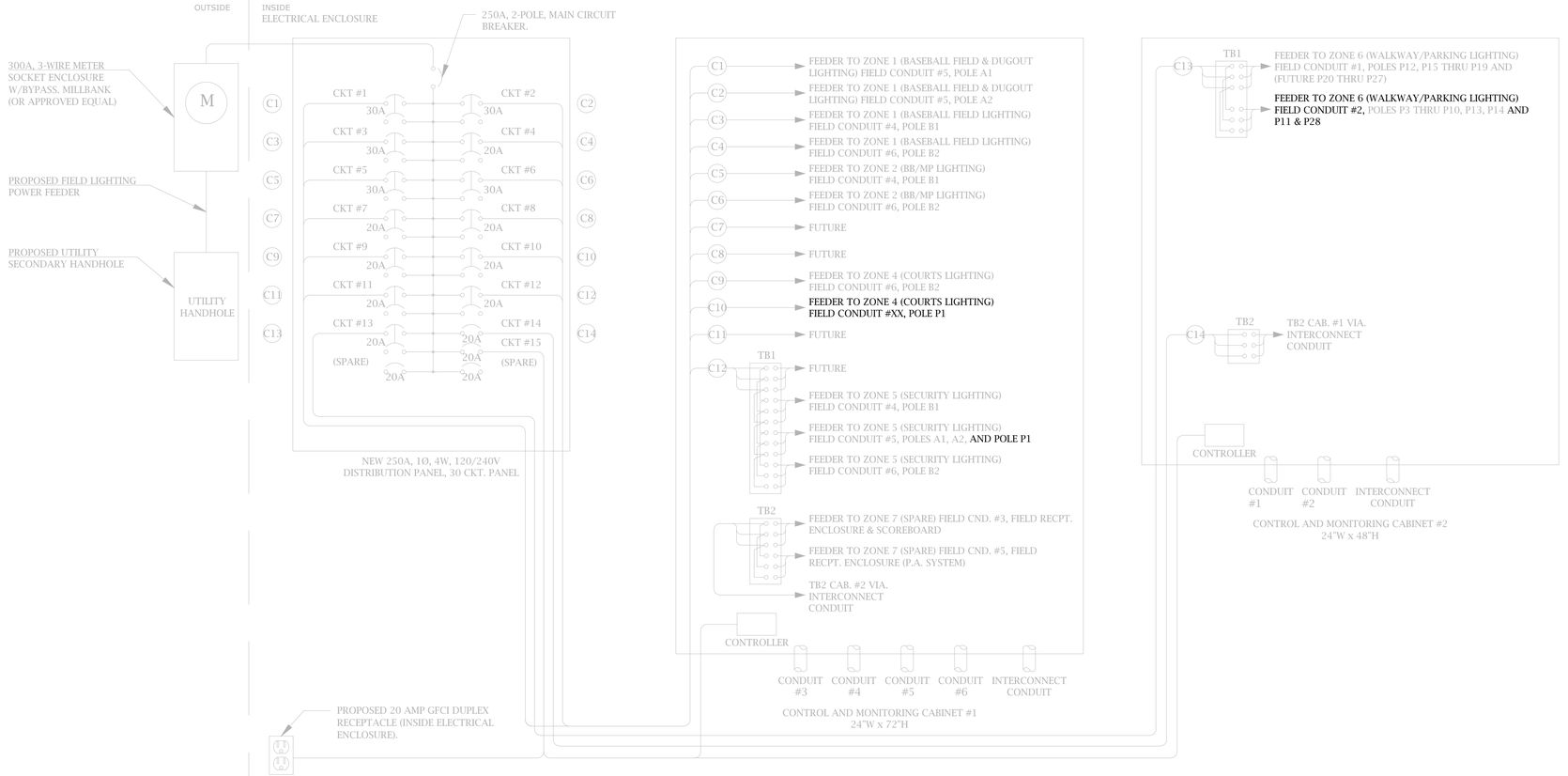
SHEET E-7

SECURITY LIGHTING DETAIL

LIGHT POLE INSTALLATION DETAILS

LIGHT POLE INSTALLATION DETAILS

NOT TO SCALE



EXISTING ELECTRICAL SERVICE ENCLOSURE NTS

NOTES:
1. EXISTING ELECTRICAL SERVICE ENCLOSURE INSTALLED UNDER PHASE 1.
2. THE ELECTRICAL SUBCONTRACTOR SHALL BE RESPONSIBLE FOR WIRING SPORTS LIGHT POLE P1 AND WALKWAY LIGHTS P11 AND P28 UNDER THIS PHASE. RUN 3-6AWG AND 1-10 AWG IN EXISTING CONDUIT EACH FOR POLE P1, SECURITY LIGHTING (AT POLE P1), AND WALKWAY LIGHTING (P11 & P28).

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SCALE: AS NOTED

ELECTRICAL DETAILS

SHEET E-8

ARTICLE 41 SECURITY CAMERA APPURTENANCES

a. ***Include $40,000.00 in Base Bid for allowance to furnish and install cameras and associated appurtenances. Owner will be responsible to secure specifications and vendor pricing for products, installation labor and connection of security system. Project Contract terms apply.***

b. Include in Base Bid, to furnish, install, horizontal run, all vertical splices to cameras and testing of 600 LF of fiber optic cable, type 12 strand single mode outdoor plant fiber and required connections/appurtenances.

c. Communications conduits shall be 2-inch type HDPE continuous roll, smooth wall SDR 09 between handholes, communication conduits run into light poles can be Schedule 40 PVC. Electrical and HDPE conduits shall be in separate handhole/pullbox.

d. Include in base bid, to coordinate, furnish and install on each pedestrian light pole with communication handhole, one pole mounted NEMA 3R rated utility cabinet, with stainless steel back panel, include labor and materials to energized duplex outlet for security cameras, security camera appurtenances. Cameras and appurtenances inside pole mounted utility cabinet are not included in Base Bid (see item “a” of Article 41. Furnish and install manufacturer’s standard auxiliary wire exits (2). Mount utility cabinets with pole manufacturer’s standard and provided “trac nut” hardware, include fabrication of custom H-bracket for the utility cabinet. Utility cabinet standard shall be Stahlin Part# RJ1614HW-P, Type# 1,3R,4X,6P,12 painted black, or approved equal.