PLANNING BOARD
Town of Ayer
1 Main Street, Ayer, MA 01432
Tel: (978) 772-8220 ext. 144| Fax: (978) 772-3017 |
Planning@Ayer.MA.US

December 14, 2021
****6:15PM ****
Open Session Meeting of the Ayer Planning Board
Agenda

Due to the ongoing COVID-19 Pandemic, in accordance with Chapter 20 of the Acts of 2021, suspending certain provisions of the Open Meeting Law (OML), public bodies otherwise governed by the OML are temporarily relieved from the requirement that meetings be held in public places, open and physically accessible to the public, so long as measures are taken to ensure public access to the bodies' deliberations "through adequate, alternative means." This meeting will be live on Zoom. The public may participate remotely by joining Zoom (Meeting ID# 833 6548 0732) or by calling 929-205-6099. For additional information about remote participation, please contact Heather Hampson, Administrative Coordinator at hhampson@ayer.ma.us or 978-772-8220 ext.144 prior to the meeting.

6:15 PM **Call to Order**
General Business
Approve Agenda
Covenant/Bond Releases – Patriot Way Release, Lots 3A – 14 inclusive

Site Plan Review – 141 Washington Street, Ayer Shirley Regional High School, Athletic Field Project

Public Hearing Stormwater Management permit – 141 Washington Street, Ayer Shirley Regional High School – Athletic Field Project

Continued Public Hearing, Definitive Subdivision, Wright Road, Stratton Hill
Continued Public Hearing, Stormwater Management Permit, Wright Road, Stratton Hill
Continued Site Plan Review, Ayer Zoning Bylaw Section 9.6, Land Clearing and Grading, Wright Road, Stratton Hill

Town Planner Update
- Announcements

Meeting Minutes November 9, 2021
Administrative Announcements
Old Business
New Business
- Planning Board Materials: Residents Request

Adjourn

*All meetings are held at Town Hall unless posted otherwise. Order of agenda items may change without notice. Amendments may be made to the agenda to include any emergency or time sensitive material that was unforeseen at the time the agenda was posted. All meetings are subject to video recording.

Town of Ayer
1 Main Street, Ayer, MA 01432
Tel: (978) 772-8220 ext. 144 | Fax: (978) 772-3017 |
Planning@Ayer.MA.US

FORM J

RELEASE FORM

The undersigned, being a majority of the Planning Board of the Town of Ayer, Massachusetts,hereby certify that:

A. *The requirements for the construction of ways and municipal services called for by the Covenant dated March 9, 2006 and recorded in the Middlesex South District Registry of Deeds, Book 51468, Page 334, has been* ***completed,*** *to the satisfaction of the Planning Board to adequately serve the enumerated lots shown on Plan entitled "Patriot Estates" Definitive Subdivision of Land, Ayer, Mass. Prepared for Sandy Pond Investment Trust dated June 2, 2005 as revised through 2/20/06, David E. Ross Associates, Inc. Civil Engineer, Land Surveyors, Landscape Architect, Environmental Consultants, PO Box 368-111 Fitchburg Road, Ayer, MA 01432, which plan is recorded at South Middlesex Registry of Deeds as Plan #881 of 2007. Lots designated on said plan as follows:*

Lots 1-A-14 inclusive Sandy Pond Road/Patriot Way, Ayer, MA

B. *The Town of Ayer, a municipal corporation situated in the County of Middlesex, Commonwealth of Massachusetts, acting by its duly organized Planning Board, holder of a Covenant dated March 9 of 2006, from the Planning Board of the Town of Ayer, Middlesex County, Massachusetts recorded with the Middlesex South District Registry of Deeds, Book 51468, Page 334, acknowledges satisfaction of the terms thereof and hereby release its right, title and interest in the lots designated on said plan as follows:*

Lot 11 - 9 Patriot Way, Ayer, MA

Executed as a sealed instrument this ___ day of _____ 2021.

Majority of Planning Board

_____ _____

_____ _____

_____

COMMONWEALTH OF MASSACHUSETTS

Middlesex, 55

On this____ day of_____, 2021, before me, the undersigned notary public, personally appeared one of the above named members of the Ayer Planning Board, who proved to me through satisfactory evidence of identification, which were driver's license, to be the persons whose name is signed on the preceding or attached document, and acknowledge to methat he/she signed it voluntarily for its stated purpose and that the foregoing instrument to be the free act and deed of said Planning Board.

_____

Notary Public:

My Commission

DEPARTMENT OF PUBLIC WORKS

Water, Wastewater, Highway & Solid Waste Divisions

Dan Van Schalkwyk, P.E., Director
Pamela J. Martin, Business Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

December 9, 2021

Town of Ayer Planning Board
Town Hall
Ayer, MA 01432

RE: Patriot Way Covenant/Bond Releases

Dear Board Members:

Patriot Way was accepted as a Town street in 2012 and, thus, met the requirements for a completed subdivision. There are no outstanding issues related to this project and I recommend release of all remaining bond monies or covenants.

Should you have any questions or comments, please do not hesitate to contact this office.

Regards,
AYER PUBLIC WORKS DEPARTMENT

Dan Van Schalkwyk, P.E.
Director

Town of Ayer
Office of the Town Planner

Town of Ayer| Ayer Town Hall| 1 Main Street, 3rd Floor| Ayer, MA 01432|978-772-8218| www.ayer.ma.us

Staff Report # 1: ASRHS Athletic Fields project

Prepared by Mark Archambault, Ayer Town Planner

Date: December 10, 2021

Site Location / Zoning District(s): Ayer Shirley Regional High School, 141 Washington Street / District A-1

Assessor's Map and Parcel Numbers: Map 20, Parcel 1

Tract or Parcel Size Undergoing Development: Total school property is approximately 55 acres

Type of Application: Site Plan Review with Stormwater Management Permit

Other Permits needed: Stormwater Management Permit, Site Plan per Section 9.6 Land Clearing and Grading

Applicant: Town of Ayer through the Ayer Shirley Regional High School

Landowner if different from Applicant: ---

Engineer or Surveyor: Jonathan Charwick at Activitas

EXECUTIVE SUMMARY / KEY POINTS FOR THE PB TO CONSIDER:

See the Applicant's narrative below which summarizes the proposal very well.

As a number of items on the Site Plan application checklist were left blank, *most of which are very likely not applicable,* I recommend that the PB review these with the applicant before deeming the Plan complete:

I ask the PB to bring up the following items from the application checklist that were left blank by the applicant's engineer to make sure they are not needed:

1. Are any new **parking spaces** needed or does the existing parking at the school suffice?
2. Any additional **signage** proposed?
3. Location and rendering of any **bicycle storage rack** or areas as well as **bicycle paths**.
4. Location of any and all **fire hydrants, fire alarm and terminal boxes**.

I recommend that the PB find the application to be complete if the above items are satisfactorily answered.

Regarding Section 9.6 Land Clearing and Grading, I ask the PB to request the **total square footage of area to be cleared** along the woodland edge behind the baseball and soccer fields to be calculated. I don't see any figures associated with this.

I recommend that the PB schedule a site visit as one of its first orders of business.

1. **Project Description and Interdepartmental Review**

    a. Location Description and Surrounding Neighborhood (*inc. Locus Map from Assessor's Maps and Google Earth*) **Note**:

Project locus from Mr. Mapper

Project Proposal: Project Overview from application narrative:

Project Overview

The proposed project is on the Ayer Shirley Regional High School property located at 141 Washington Street in Ayer. The school is located in Residential Zone A-1 and is parcel 20-1. The parcel is 55 acres and all of the proposed work is well outside the front (35'), side (15') and rear (30') yard setbacks. The project proposes to reconstructed the existing track and field to expand and convert the natural grass athletic field inside the track to synthetic turf. The construction of a synthetic turf field with a free draining stone base below it will generate excess topsoil which will be placed onsite or will be hauled to the Town of Ayer Department of Public Works yard to be used in town. The existing 6-lane running track will be expanded to accommodate 8-lanes on the straight away and 6-lanes on the running oval.

The existing two-story press box does not currently have an accessible route to either story of the building and the existing bleachers don't meet current ADA requirements. The press box will be demolished and replaced with a new elevated press box with a hydraulic lift for ADA access and the bleachers will be replaced with one new permanent bleacher unit (attached to the press box) and two semi-portable bleacher units, all three bleachers totaling 483 seats.

The existing concessions building does not have restrooms and will be replaced with a new concessions and restroom building. The building is intended to be used by booster groups and volunteers during athletic events, the building is not intended to be used as a commercial kitchen and will not employee anyone. The building proposes three female toilets, three male toilets and one family restroom. Per the proposed permanent bleacher seat count, six female toilets and three male toilets are required by the State of Massachusetts Plumbing Code. A variance application to the State Plumbing Board requesting a 50% reduction in the female toilets required has been submitted and will be heard at their December 1 hearing. Table 1 below provides the area of the existing and proposed buildings.

Table 1

	Existing Square Footage	Proposed Square Footage
Press Box	576 SF (2 stories)	240 SF (1 story)
Ticket Booth	34 SF (1 story)	53 SF (1 story)
Concessions Building	196 SF (1 story)	785 SF (1 story)

The existing track and field has eight sport light poles that light Norton Field. These lights will be removed and a new four pole LED sports lighting system is proposed. The project also proposes five site light poles at the new track and field facility entrance. Photometrics plans are included in the drawing set. Cutsheets for both light fixtures are attached to this application.

Due to the expansion of the track and field, a new baseball backstop (fencing and netting) is proposed. New cement concrete team areas with benches and fencing will be installed at the baseball field. The project proposes to expand the baseball outfield into the woods to be able to play soccer on a wider field. A large segmental retaining wall (ranging in height between 6' and 13') will be built into the slope and onsite soils will be used to backfill behind the wall. A 6' high chain link fence will be installed at the top of the wall. The baseball outfield will be regraded so that onsite topsoil can be placed in the outfield. The baseball field will have a new irrigation system and will be sodded. The irrigation system will tap of the existing water service coming from the high school.

A 6' high fence (ornamental and chain link) is approved around the perimeter of the track and field facility. The existing emergency/maintenance access from the parking lot north of the track will remain. Universal accessibility is proposed throughout the project limit of work.

A topographic survey that illustrates the site's existing conditions, existing utilities, with one foot contours and spot elevations is included in the drawing set. A series of test borings and geoprobes were conducted in Norton Field, the track and baseball field. Locations of the test borings,

geoprobes and proposed erosion and sedimentation control measures can be found on the Site Preparation Plans. The geotechnical report is attached to this application.

Proposed utilities (sewer and water) for the concessions/restroom building and stormwater utilities and details for the site improvements described above can be found on the utility plans. The Stormwater Report and Operation and Maintenance Plan are also attached to this application.

Interdepartmental Reviewer's Comments:

Board of Health: "The concession stand will need to be designed in accordance with the state and federal food code if food will be prepared there." – Bridgette Braley, NABOH

Conservation Commission: "Does not appear to have any work within wetlands or buffer zones, so no Conservation concerns." – Jess Gugino, Clerk, Ayer Conservation Commission

Tax Collector: "Approved."

Assessor's Office: "Approved."

Town Clerk: "No issue with Clerk's office."

Building Commissioner: "Approved"

DPW: See separate email from DPW Director

I. Applicable Zoning, Site Plan and/or Subdivision Regulations

a. Zoning District(s) and Applicable Dimensional Requirements:

Zoning District: A-1. Min. Lot Area: 40,000 sq.ft. / Min. Frontage: 150 feet /
Min. Front yard: 35 feet / Min. Side Yard: 15 feet / Min. Rear Yard: 30 feet

b. **Plan Completeness**: Before I recommend that the PB find the Site Plan complete, I ask the PB to bring up the following items from the application checklist that were left blank by the applicant's engineer to make sure they are not needed. I suspect most are not applicable:

- Are any new **parking spaces** needed or does the existing parking at the school suffice?
- Any additional **signage** proposed?
- Location and rendering of any **bicycle storage rack** or areas as well as **bicycle paths**.
- Location of any and all **fire hydrants, fire alarm and terminal boxes**.

c. Needed Reviews, Approvals and Permits: In addition to Site Plan, a Section 9.6 Land Clearing and Grading and a Stormwater Management Permit are needed.

II. Recommendations

a. Recommendations for Upcoming Meeting: If deemed complete, I recommend that the PB first **accept** the Site Plan for consideration to begin the public review process. I recommend that the PB schedule a site visit as soon as possible, given impending winter weather.

b. Recommended Planning Board action: I recommend that the PB then continue Site Plan review and review of the Stormwater Management Permit to the next scheduled meeting.

c. Recommended Planning Board Findings: To be completed for meeting at which PB action is anticipated.

d. Recommended Planning Board Conditions: To be completed for meeting at which PB action is anticipated.

PLANNING BOARD
Town of Ayer
1 Main Street, Ayer, MA 01432
Tel: (978) 772-8218 | Fax: (978) 772-3017 | Planning@Ayer.MA.US

Ayer Planning Board
Application for Site Plan Review

Filing Instructions

In addition to a **complete** application, the applicant must also provide:

1. Sixteen (16) copies of the completed application form and narrative
2. Ten (10) full size copies of the full plan set
3. Six (6) reduced 11X17 copies of the full plan set
4. One (1) electronic copy of the full application including plans
5. Narrative explaining project in detail
6. Certified abutters list (300 feet)
7. Site Plan Application Fee, $500.00

***Site Plan Review will be scheduled for a Planning Board meeting AFTER all required materials are received and reviewed by the Town Planner. ***

Last Revised: September 2018

NOTE: There are several sections to this application. Please read the entire application form before proceeding.

1. OWNER/PETITIONER: Ayer Shirley Regional High School, Town of Ayer
   Address 1 Main Street, Ayer, MA 01432
   Telephone (978) 772-8220
   E-mail dvanschalkwyk@ayer.ma.us

2. AGENT FOR OWNER (if applicable): Jonathan Charwick, Senior Associate, Activitas
   Address 70 Milton Street, Dedham, MA 02026
   Telephone (781) 355-7046
   E-mail jon@activitas.com

3. **PLAN INFORMATION:**

   Plan Title: Norton Field, Track and Baseball Field Renovations, Site Plan Review
   Revision Date: November 18, 2021 original date
   Prepared By: Activitas, Inc.
   Address: Ayer Shirley Regional High School, 141 Washington Street, Ayer, MA 01432
   Phone Number: (978) 772-8600

   REASON FOR SITE PLAN:

   X Construction, alteration or expansion of, or change in use, within a municipal, institutional, commercial, industrial or multi-family structure.

   _____ Construction or expansion of any parking lot for a municipal, institutional, commercial, industrial, or multi-family structure or purpose involving five (5) or more new or additional parking spaces.

   X Clearing or grading more than 10,000 sq. ft. of land, unless specifically exempt under Section 9.6 of the Ayer Zoning Bylaw.

   _____ Any use requiring a special permit, except that where a single-family or two-family dwellings require a special permit, site plan review shall not apply.

   _____ All new commercial and industrial construction.

CHECK LIST FOR SUBMISSION

SITE PLAN INFORMATION REQUIRMENTS:

- [X] Proposed square footage of all proposed and existing buildings
- [X] Setback Limits
- [X] Identify Use
- [ ] Hours of Operation
- [ ] Number of Employees
- [ ] Number of Parking Spaces
- [X] Stormwater Report
- [X] Certified Abutter List
- [X] Table containing area of new or existing buildings proposed and use
- [X] Seating capacity

PLAN REQUIRMENTS

General Information

- [X] Date of Site Plan
- [X] North Arrow
- [X] Title or name of project
- [X] Locational information for the project
- [X] Owner of Record
- [X] Plan Preparer
- [X] Scale
- [X] Locus Map
- [X] Current Zoning
- [X] Location of all buildings proposed and or existing
- [X] All buildings, property line and or wetland resource area setbacks
- [X] Boundaries for lots, streets, easements, right-of-ways, ect.

Buildings, Structures, and Appurtenances

- [X] Proposed use and location of all buildings, including proposed grades and structure height
- [X] Layout of proposed buildings and structures, including elevations and architectural renderings.
- [ ] Exhibits to indicate the visual impact on the surrounding areas
- [ ] Any and all existing non-conformities.
- [ ] Detailed signage plans

Landscaping, Open Space, Drainage, Stormwater and Environmental Features

_X_ Location and square footage of all existing and proposed impervious areas

_____ Location of all wetlands, water bodies, wells, one-hundred year storm flood elevation, and all other natural features including streams, drainage channels and other environmental features

_____ Any and all jurisdictional wetland resource areas

_____ Location and description of proposed natural and manmade open space and recreational areas.

_____Location and estimated yield of any groundwater aquifers and well head protection

_____ Estimated habitat areas

_X_ Any and all erosion control measures

_____ Location of nay hazardous materials

_____ Location of any proposed or existing above or underground storage tanks

_____ Location of any existing or proposed septic systems and leach fields

_X_ Location of all soil boring and test pits

_X_ Location and description of all stormwater managements systems

_X_ Detailed landscaping plan

Utilities

_X_ Location of all proposed or existing utilities lines either above or under ground

_____ Location of all proposed or existing utility poles

_____ Location of any fire alarm and terminal boxes

_____ Location of any and all fire hydrants

_X_ Location of all proposed and or existing water and sewer lines

Vehicular Traffic, Circulation and Parking

_____ Traffic flow patter within the site

_____ Traffic impact statement

_____ Number and location of existing and proposed parking spaces

Pedestrian and Bicycle Circulation and Safety

_X_ Location and dimensions of any existing or proposed sidewalks

_____ Location and dimensions of any existing or proposed bicycle path

_____ Location and rendering of any bicycle storage rack or areas.

_____ Any existing or proposed striping of pedestrian or bicycle lanes

Outdoor Lighting

_X_ Details on all outdoor lighting

_X_ Photometric plans for all outdoor lighting

6. ANY ADDITIONAL SUBMITTALS AS NEEDED

7. SIGNATURE OF OWNER/PETITIONER _____

Date November 18, 2021

8. SIGNATURE OF AGENT FOR OWNER (if applicable) _____

Date November 18, 2021

9. RECEIVED BY THE AYER TOWN CLERK: Date

_____

ACTIVITAS
landscape architecture | civil engineering

MEMORANDUM

Subject: Site Plan Review Narrative and Application Materials

Project: **Ayer Shirley Regional High School**
Norton Field, Track and Baseball Field Renovations

Project No. 21025.00

Date: 18 November 2021

To: Town of Ayer
Planning Board

By: Jonathan Charwick
Senior Associate

Delivery: Hand Delivered

Dear Planning Board Members,

On behalf of The Ayer Shirley Regional School District we are pleased to provide you with this Application for Site Plan Review in regards to the school's proposal to renovate Norton Field, the track and expand the existing baseball outfield. Per the Ayer Zoning Bylaw Sections 3.5.1.A.1 and 3.5.1.A.3, the project is subject to Site Plan Review as there is proposed construction of a municipal structure and proposed clearing and grading more than 10,000 sq. ft. of land. Per the Town of Ayer Stormwater Regulations Section 2.3.B., this project is considered a Major Project and the Planning Board shall be the Stormwater Management Permit Granting Authority.

Project Overview

The proposed project is on the Ayer Shirley Regional High School property located at 141 Washington Street in Ayer. The school is located in Residential Zone A-1 and is parcel 20-1. The parcel is 55 acres and all of the proposed work is well outside the front (35'), side (15') and rear (30') yard setbacks. The project proposes to reconstructed the existing track and field to expand and convert the natural grass athletic field inside the track to synthetic turf. The construction of a synthetic turf field with a free draining stone base below it will generate excess topsoil which will be placed onsite or will be hauled to the Town of Ayer Department of Public Works yard to be used in town. The existing 6-lane running track will be expanded to accommodate 8-lanes on the straight away and 6-lanes on the running oval.

The existing two-story press box does not currently have an accessible route to either story of the building and the existing bleachers don't meet current ADA requirements. The press box will be demolished and replaced with a new elevated press box with a hydraulic lift for ADA access and the bleachers will be replaced with one new permanent bleacher unit (attached to the press box) and two semi-portable bleacher units, all three bleachers totaling 483 seats.

The existing concessions building does not have restrooms and will be replaced with a new concessions and restroom building. The building is intended to be used by booster groups and volunteers during athletic events, the building is not intended to be used as a commercial kitchen and will not employee anyone. The building proposes three female toilets, three male toilets and one family restroom. Per the proposed permanent bleacher seat count, six female toilets and three male toilets are required by the State of Massachusetts Plumbing Code. A variance application to the State Plumbing Board requesting a 50% reduction in the female toilets required has been submitted and will be heard at their December 1 hearing. Table 1 below provides the area of the existing and proposed buildings.

Table 1

	Existing Square Footage	Proposed Square Footage
Press Box	576 SF (2 stories)	240 SF (1 story)
Ticket Booth	34 SF (1 story)	53 SF (1 story)
Concessions Building	196 SF (1 story)	785 SF (1 story)

The existing track and field has eight sport light poles that light Norton Field. These lights will be removed and a new four pole LED sports lighting system is proposed. The project also proposes five site light poles at the new track and field facility entrance. Photometrics plans are included in the drawing set. Cutsheets for both light fixtures are attached to this application.

Due to the expansion of the track and field, a new baseball backstop (fencing and netting) is proposed. New cement concrete team areas with benches and fencing will be installed at the baseball field. The project proposes to expand the baseball outfield into the woods to be able to play soccer on a wider field. A large segmental retaining wall (ranging in height between 6' and 13') will be built into the slope and onsite soils will be used to backfill behind the wall. A 6' high chain link fence will be installed at the top of the wall. The baseball outfield will be regraded so that onsite topsoil can be placed in the outfield. The baseball field will have a new irrigation system and will be sodded. The irrigation system will tap of the existing water service coming from the high school.

A 6' high fence (ornamental and chain link) is approved around the perimeter of the track and field facility. The existing emergency/maintenance access from the parking lot north of the track will remain. Universal accessibility is proposed throughout the project limit of work.

A topographic survey that illustrates the site's existing conditions, existing utilities, with one foot contours and spot elevations is included in the drawing set. A series of test borings and geoprobes were conducted in Norton Field, the track and baseball field. Locations of the test borings,

geoprobes and proposed erosion and sedimentation control measures can be found on the Site Preparation Plans. The geotechnical report is attached to this application.

Proposed utilities (sewer and water) for the concessions/restroom building and stormwater utilities and details for the site improvements described above can be found on the utility plans. The Stormwater Report and Operation and Maintenance Plan are also attached to this application.

Closing

We hope that the submitted information is appropriate and considered complete for this Site Plan Review Application. We look forward to meeting with the Planning Board to discuss this submission on 12/14/21.

If you have any questions on the enclosed documentation please do not hesitate to contact me directly at (781) 355-7046 or by email at jon@activitas.com.

Respectfully,

ACTIVITAS

Jonathan Charwick
Senior Associate
jon@activitas.com

Attachments: Application for Site Plan Review
Sports Lighting Cutsheets (Musco)
Site Lighting Cutsheets (Kim Lighting)
Geotechnical Report dated 8 September 2021
Stormwater Management Permit Application
Stormwater Report dated 18 November 2021
Operation and Maintenance Manual dated 18 November 2021
Certified Abutters List (300 feet)
Site Plan Approval Drawings (separate attachment)

TLC for LED®

5 Easy Pieces™

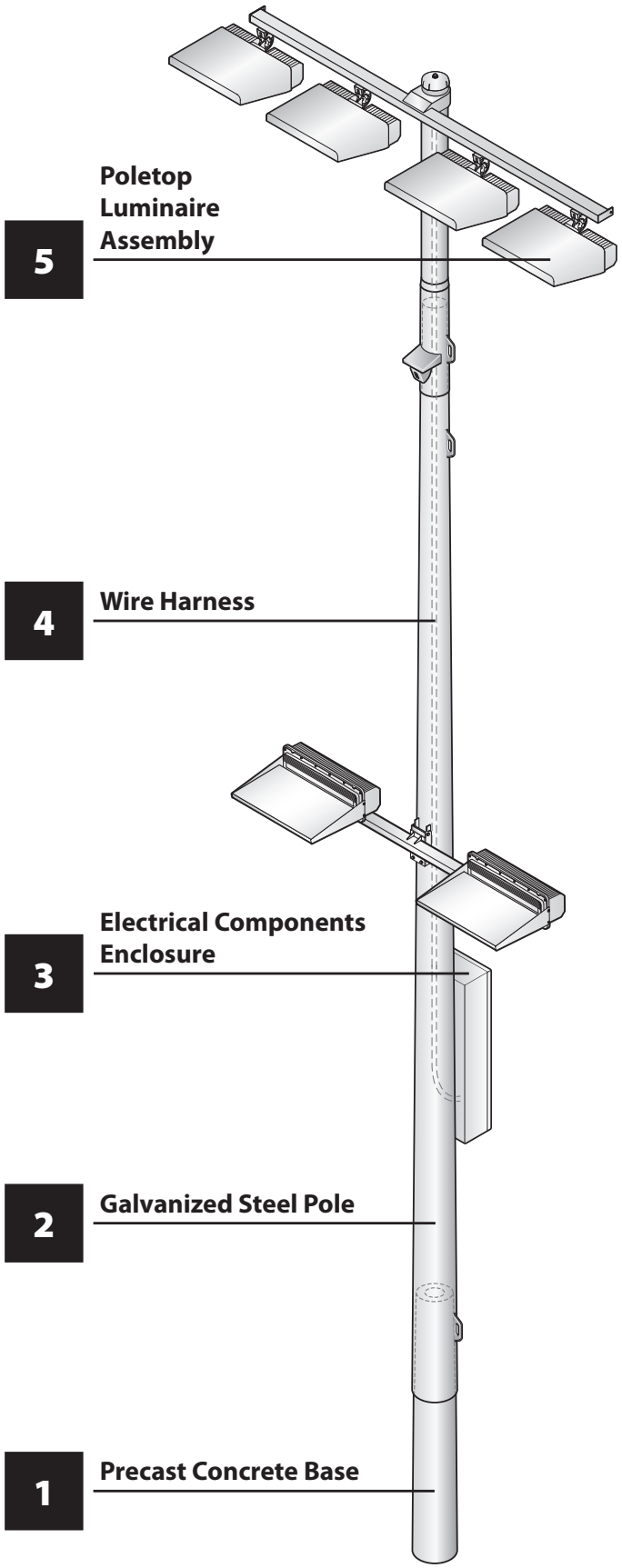
Complete System from Foundation to Poletop

Factory wired, aimed, and tested

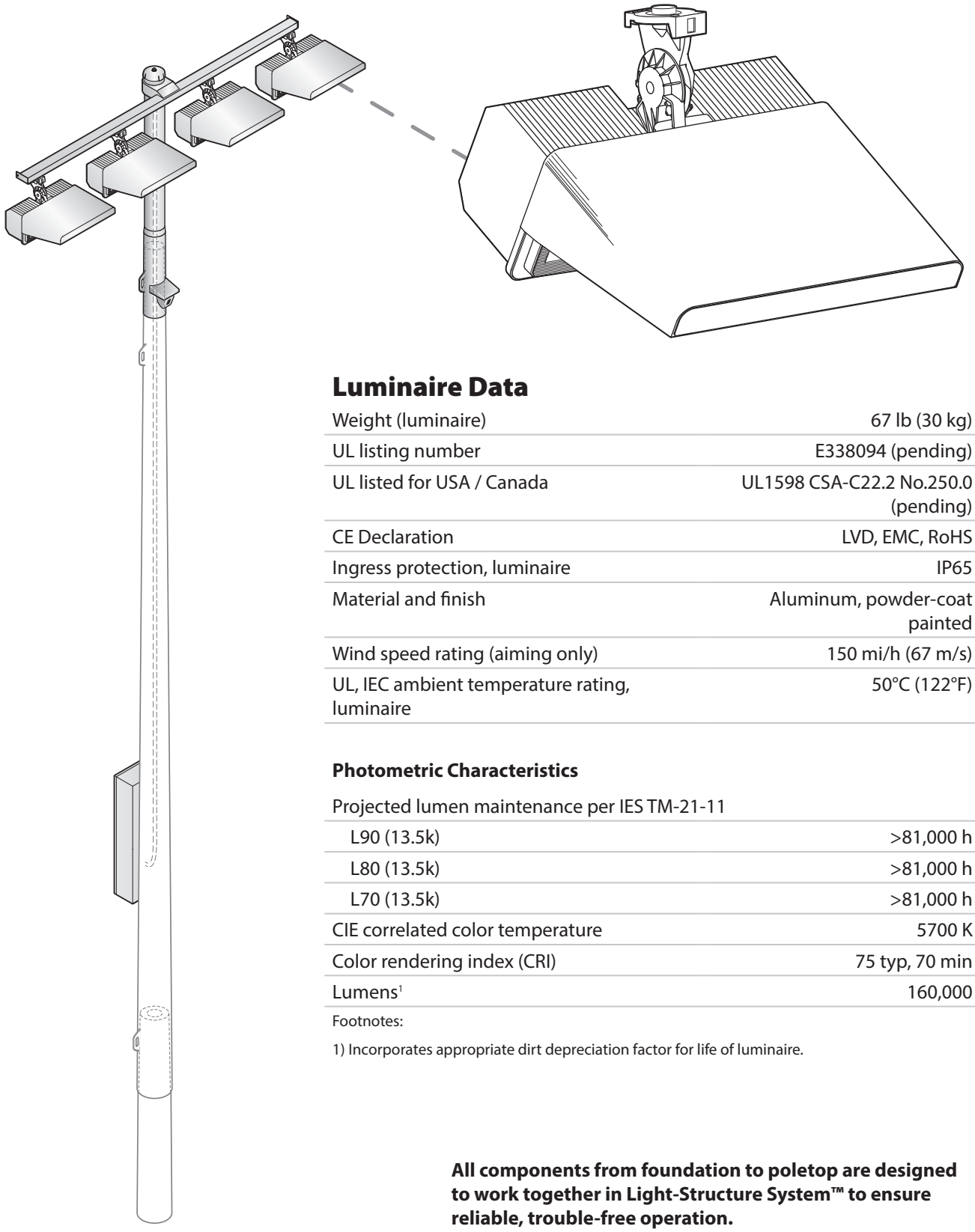
Fast, trouble-free installation

Comprehensive corrosion package

Integrated lightning ground



Luminaire and Driver – TLC-LED-1500



Luminaire Data

Weight (luminaire)	67 lb (30 kg)
UL listing number	E338094 (pending)
UL listed for USA / Canada	UL1598 CSA-C22.2 No.250.0 (pending)
CE Declaration	LVD, EMC, RoHS
Ingress protection, luminaire	IP65
Material and finish	Aluminum, powder-coat painted
Wind speed rating (aiming only)	150 mi/h (67 m/s)
UL, IEC ambient temperature rating, luminaire	50°C (122°F)

Photometric Characteristics

Projected lumen maintenance per IES TM-21-11	
L90 (13.5k)	>81,000 h
L80 (13.5k)	>81,000 h
L70 (13.5k)	>81,000 h
CIE correlated color temperature	5700 K
Color rendering index (CRI)	75 typ, 70 min
Lumens[1]	160,000

Footnotes:

1) Incorporates appropriate dirt depreciation factor for life of luminaire.

All components from foundation to poletop are designed to work together in Light-Structure System™ to ensure reliable, trouble-free operation.

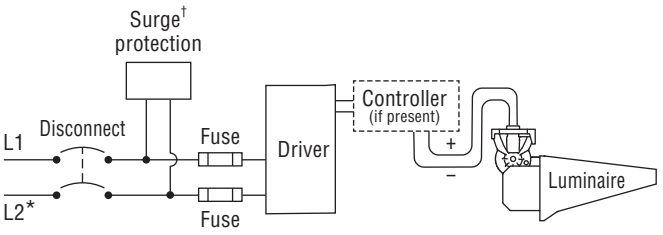
Luminaire and Driver – TLC-LED-1500

Driver Data

Electrical Data

Rated wattage[1]	
Per driver	1430 W
Per luminaire	1430 W
Number of luminaires per driver	1
Starting (inrush) current	<40 A, 256 µs
Fuse rating	15 A
UL, IEC ambient temperature rating, electrical components enclosure	50°C (122°F)
Ingress protection, electrical components enclosure	IP54
Efficiency	95%
Dimming mode	optional
Range, energy consumption	12 – 100%
Range, light output	17 – 100%

Typical Wiring



* If L2 (com) is neutral then not switched or fused.
† Not present if indoor installation.

	200 Vac 50/60 Hz	208 Vac 60 Hz	220 Vac 50/60 Hz	230 Vac 50 Hz	240 Vac 50/60 Hz	277 Vac 60 Hz	347 Vac 60 Hz	380 Vac 50/60 Hz	400 Vac 50 Hz	415 Vac 50 Hz	480 Vac 60 Hz
Max operating current per luminaire[2]	8.86 A	8.52 A	8.06 A	7.71 A	7.39 A	6.40 A	5.11 A	4.67 A	4.43 A	4.27 A	3.70 A

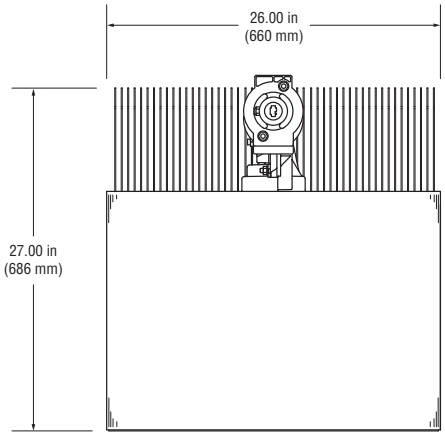
Footnotes:

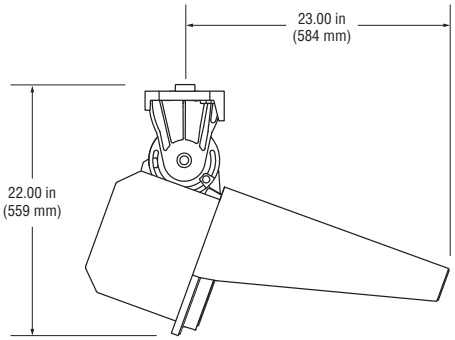
1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25°C ambient temperature environment.

2) Operating current includes allowance for 0.90 minimum power factor, operating temperature, and LED light source manufacturing tolerances.

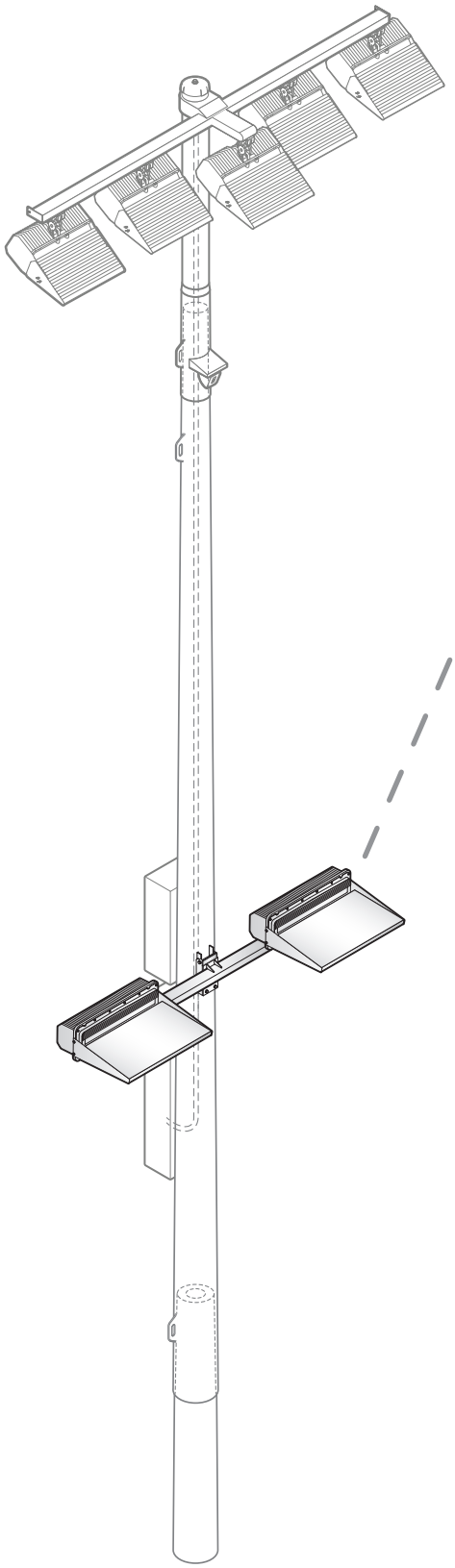
Notes

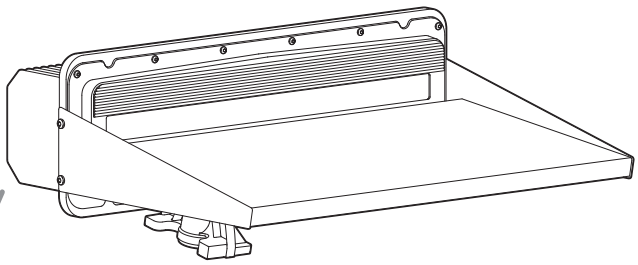
1. Use thermal magnetic HID-rated or D-curve circuit breakers.
2. See *Musco Control System Summary* for circuit information.





Luminaire and Driver Components – TLC-BT-575





Luminaire Data

Weight (luminaire)	34 lb (15 kg)
UL listing number	E338094
UL Listed for USA / Canada	UL1598 CSA-C22.2 No.250.0
Ingress protection, luminaire	IP65
Material and finish	Aluminum, powder-coat painted
Wind speed rating (aiming only)	150 mi/h (67 m/s)

Photometric Characteristics

Projected lumen maintenance per IES TM-21-11	
L90 (13.5k)	>81,000 h
L80 (13.5k)	>81,000 h
L70 (13.5k)	>81,000 h
CIE correlated color temperature	5700 K
Color rendering index (CRI)	75 typ, 70 min
Lumens[1]	52,000

Footnotes:

1) Incorporates appropriate dirt depreciation factor for life of luminaire.

All components from foundation to poletop are designed to work together in Light-Structure System™ to ensure reliable, trouble-free operation.

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

WP9SA2

ARCHITECTURAL AREA/SITE

Warp9®

FEATURES

- TIR Strike Optics
- Patented low profile luminaire
- Available in Monochromatic Amber, 2700K, 3000K, 3500K, 4000K and 5000K
- Type 1, 2, 3, 4, 4W, 5Q, L, and R distributions
- 0 - 10V dimming drivers standard
- IP65 optical assembly

c UL us LISTED

BUY AMERICAN SOLUTIONS — See Certification Specifications

ida DARK SKY APPROVED 2016 — 3000K and warmer CCTs only

RELATED PRODUCTS

Ouro Pavilion PGL8

CONTROL TECHNOLOGY

NX DISTRIBUTED INTELLIGENCE SiteSync LIGHTING CONTROLS wiSCAPE™

SPECIFICATIONS

CONSTRUCTION

- One piece die-cast housing, low copper (<0.6% Cu) Aluminum Alloy with integral cooling ribs over the optical chamber and electrical compartment
- Solid barrier wall separates optical and electrical compartments
- Double-thick wall with gussets on the support-arm mounting end
- Housing forms a half cylinder with 55° front face plane providing a recess to allow a flush single-latch detail
- All hardware is stainless steel or electro-zinc plated steel
- Finish: fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) polyester powdercoat
- One-piece die-cast, low copper (<0 6% Cu) aluminum alloy lens frame with 1" minimum depth around the gasket flange
- Optional clear 1/8" thick tempered glass lens retained by eight steel clips with full silicone gasketing around the perimete
- Optional, fixture supplied with a one-piece flat, clear, UV stabilized polycarbonate, fully gasketed, replacing the standard tempered glass lens. CAUTION: Use only when vandalism is anticipated to be high. Useful life is limited by UV discoloration from sunlight. A program of regular inspection and periodic replacement is highly recommended to maintain optimum fixture performance
- One-piece extruded aluminum arm with internal bolt guides and fully radiussed top and bottom
- Luminaire-to-pole attachment is by internal draw bolts, and includes a pole reinforcing plate with wire strain relief
- Arm is circular cut for specified round pole

CONSTRUCTION (CONTINUED)

- Optional cast, low copper aluminum horizontal slip-fitter with adaptor plate to secure the luminaire to 2" IPS pipe size arms
- Optional cast aluminum wall mount plate assembly. Attaches to the wall over the junction box. Luminaire attaches to the wall plate

OPTICS

- Optical cartridge system consisting of a die cast heat sink, LED Total Internal Reflection (TIR) optics, gasket and bezel plate
- Molded silicone gasket ensures a weather-proof seal around each individual LED
- Features revolutionary individual LED optical control based on high performance TIR optical designs
- Optional BackLight Control for complete control of unwanted backlight
- IP65 Optical assembly
- Type 1, 2, 3, 4, 4W, 5Q, R, and L standard distributions
- Available in Monochromatic Amber, 2700K, 3000K, 3500K, 4000K and 5000K
- Die-cast, low copper aluminum heat sink modules provide thermal transfer at PCB level
- Anodized aluminum heat sink modules

INSTALLATION

- Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury

ELECTRICAL

- Dimming range from 10% to 100% through the use of standard 0-10V interface on the programmable driver

ELECTRICAL (CONTINUED)

- Modular wiring harness in the service area provides user access to the dimming circuitry
- Optional factory programmed dimming profile
- Surge protection: 10kV surge suppression
- SF for 120, 277, 347 Line volts
  DF for 208, 240, 480 Line volts

CONTROLS

- 7-pin Receptacle and Button Photocell

CERTIFICATIONS AND LISTINGS

- Listed to UL1598 and CSA C22.2#250.0-24 for wet location and 40°C ambient temperature
- IDA approved, 3000K and warmer CCTs only
- ANSI C136.31-2010 3G Vibration tested and compliant
- RoHS compliant
- This product qualifies as a "designated country construction material" per FAR 52.225-11 Buy American-Construction Materials under Trade Agreements effective 6/06/2020. See Buy American Solutions

WARRANTY

- 5 year warranty
- See HLI Standard Warranty for additional information

KEY DATA	
Lumen Range	1,783–14,924
Wattage Range	31.6–116.5
Efficacy Range (LPW)	55.8–134.4
Reported Life (Hours)	L70/60,000
Weight	30 lbs 13.6 kg
EPA Side View	.52

701 Millennium Blvd • Greenville, SC 29607 / Tel 864.678.1000 / Website www.kimlighting.com

HUBBELL® Lighting

HALEY & ALDRICH, INC.
465 Medford St.
Suite 2200
Boston, MA 02129
617.886.7400

8 September 2021
File No. 201576-000

Activitas Inc.
16 School Street
Dedham, Massachusetts

Attention: Jonathan Charwick

Subject: Athletic Field Renovation Project
Ayer Shirley High School
Ayer, Massachusetts

Ladies and Gentlemen:

This letter report summarizes the results of a recently completed subsurface exploration program, provides recommendations for geotechnical design, and comments on geotechnical-related construction considerations for proposed renovations at the existing Ayer Shirley High School Athletic Complex. Proposed renovations include construction of:

- A synthetic turf field;
- A synthetic running track with D-areas;
- Sport lighting system and other supporting amenities;
- Infrastructure for a support building;
- Renovations to the adjacent baseball field; and
- Upgrades in the baseball outfield to include a natural grass playing

Our work for the subject project was undertaken in accordance with the Base Scope of Work outlined in the Haley & Aldrich, Inc. (Haley & Aldrich) proposal dated 5 May 2021 and your subsequent written authorization to proceed.

SITE CONDITIONS

The project site is located south/southwest of the existing Ayer Shirley High School buildings and east of the Paige Hilltop Elementary School. The west portion of the athletic complex is currently occupied by a

natural grass athletic field and six lane track (Herald G. Norton Field). The East portion of the athletic complex is occupied by a natural grass baseball field.

Existing ground surface elevations within the limits of the natural grass field and synthetic track are relatively flat at El. 359 to El. 306.5 (NAVD88 Datum). Existing ground surface elevations within the natural grass baseball field slope downward from approximately El. 359 in the northwest portion of the site to approximately El. 355 in the southeast portion. Beyond the south limits of the baseball field (generally beyond right and center field), ground surface steeply slopes downward from El. 355 to El. 330 (approximate 3H:1V slope).

Several utilities (drainage, electric conduits, and sport lighting system) are located adjacent to the perimeter of the natural grass field and synthetic track. An empty underground conduit located within the north portion of the field is noted on the existing site survey completed by others. Bleacher style seating exists on the east and west sides of the existing athletic field and track. Existing utilities below the natural grass baseball field were not noted on recently completed site survey.

SUBSURFACE EXPLORATION PROGRAM

A subsurface exploration program was completed at the site between 2 August and 6 August 2021 by Seaboard Drilling, inc. of Chicopee, Massachusetts to observe subsurface conditions at the track and field as well as the baseball field. The subsurface exploration program consisted of test boring and geoprobe explorations as noted on the attached Figure 1, Site and Subsurface Exploration Location Plan. Both the test boring and geoprobe explorations were observed in the field by a Haley & Aldrich Geologist.

Subsurface explorations are generally summarized in the below table:

Athletic Facility Renovation Location	Subsurface Exploration Type	Subsurface Exploration Designation	Subsurface Exploration Logs (refer to)
Synthetic Turf Field	Geoprobes	STF-1 through STF-13	Appendix A-1
Synthetic Track	Geoprobes	ST-1 through ST-8	Appendix A-2
Sport Lighting Foundations	Test Borings	HA-1 through HA-4	Appendix A-3
Baseball Field	Geoprobes	BB-1 through BB-14	Appendix A-4

Subsurface Conditions

Following is a summary description of each subsurface unit encountered in descending order of occurrence below ground surface.

- ***Topsoil / Loamy Fill*** – Topsoil typically consisted of brown to dark brown silty SAND with varying amounts of gravel and roots. Topsoil generally ranged in thickness from 0.4 ft to 2.0 ft.

  A former topsoil layer was encountered at varying depths below ground surface within STF-1, STF-2, STF-5, BB-7, BB-8 BB-13 and ST-4.

- ***Track Surface*** – Consisted of an approximate ½-in. thick synthetic turf surface overlying an approximate 0.3-ft thick asphalt layer. Underlying the asphalt, an approximate 1.4 to 3.0 ft thick layer of granular Fill with varying amounts of gravel was encountered.

- ***Fill*** – Generally consisted of yellow brown poorly graded SAND with varying amounts of gravel and occasional concrete fragments. Thickness of Fill varied across the Athletic Complex and ranged in thickness from not encountered to 23.0 ft. Thickness of Fill was generally greater within the limits of the existing Baseball Field.

- ***Glacial Deposits*** – Consisted of poorly graded SAND with varying amounts of gravel (Glaciofluvial Deposit) and silty SAND with gravel (Glacial Till). The Glacial Deposit was fully penetrated in at the following locations:

  Sport Lighting Foundations: HA-1, HA-2, HA-3, and HA-4

  Synthetic Turf Field: STF-1, STF-2, STF-6, and STF-12

  Baseball Field: BB-2, BB-3, BB-4, BB-5, BB-7, BB-8, BB-10, and BB-13

Groundwater observation wells were not installed as part of the recently completed subsurface exploration program. Groundwater was observed in soil samples collected at subsurface exploration locations and the depth to groundwater varied below existing grades and ranged from not encountered to 24.1 ft below existing grades based on visual observations from soil samples and at completion of each exploration. Groundwater levels should be expected to vary with season, precipitation, surface runoff, utility installation, construction, and other factors. As a result, groundwater levels observed during and following construction may vary from those observed in the explorations.

GEOTECHNICAL DESIGN RECOMMENDATIONS

Site Development

Construction will require management of existing on-site materials during excavation of Topsoil and Fill across the site. In order to minimize the cost of transporting and disposing of material off-site, every

effort should be made by the designers and contractor to process and reuse excavated material on-site, whether in landscaped areas around the site or for material meeting specific geotechnical criteria as backfill.

Existing utilities to be abandoned will require cut-and-capping beyond the plan limits of the work and/or complete removal. Existing, active utilities to remain and new utilities to be installed will require coordination with new work to avoid potential design conflicts, and construction activities will need to be coordinated to not impact operation of active utilities to remain or new utilities to be constructed. Additionally, construction activities will need to be coordinated to not interrupt/impact underground utilities.

Sport Lighting and Bleacher System

As a general recommendation, foundation design and construction should be performed in accordance with applicable provisions of the 9th Edition of the Massachusetts State Building Code.

Our recommendation, based on the soils on site at the proposed lighting areas, is to use Caissons (Drilled Shafts) for foundation support. Typically, the lighting system includes a pre-cast concrete "base" encased in concrete and designed to bear on natural inorganic soils. The diameter and design depth of the foundation element into the Glacial Deposits will depend on the anticipated combined foundation loadings (vertical, lateral and moment loads) calculated by the designer of the foundations based on the criteria in the below table.

Sport Lighting and Bleacher System Foundation Design Criteria

	Glacial Deposits (1)
Total Unit Weight (lb/ ft^3)	130
Buoyant Unit Weight (lb/ ft^3)	67.6
Effective Friction Angle (deg)	32
Undrained Shear Strength (psf)	NA
Active Earth pressure Coefficient (Ka)	0.3
Passive Earth Pressure Coefficient (Kp)	2.1 (2)

Note:

1. Fill soils are not suitable for foundation support and shall not be counted on for foundation support.
2. Passive Earth Pressure Coefficient (Kp) includes a factor of safety of 1.5.

Footing foundations, if required due to shallow depth to bedrock or for the bleacher system, should be designed based on an allowable bearing pressure of 4.0 kips per square foot (ksf) in the Glacial Deposit or Bedrock. The footing should bear at least 4 ft below the lowest ground surface exposed to freezing.

Synthetic Turf Field

The following section provides general geotechnical design and construction considerations for converting the natural grass field to a synthetic turf field.

- We understand that the new field is planned to be constructed such that the playing surface will be at generally the same grade as the current natural grass field. As such, preparation of the subgrade immediately below the synthetic turf system will require excavation/stripping and removal of all topsoil within the limits of the field.

- In some localized areas where the topsoil thickness could extend below the design subgrade elevation, we recommend that the excavation extend to a depth to completely remove the topsoil materials, followed by controlled placement and compaction of an approved backfill material up to design subgrade elevation. Backfill materials may include previously excavated fill soils encountered during the stripping/removal of the near surface soils or may require importing granular fill. At a minimum, imported backfill shall consist of well graded granular materials containing less than 25 percent fines. Backfill placed to raise grades to the design subgrade elevation shall be compacted to 95% of the material's maximum dry unit weight (determined in accordance with ASTM D1557) using appropriate compactive efforts. As a minimum, each layer of fill should receive four complete coverages with suitable compaction equipment.

- Re-use of any excavated soils will be dependent upon visual characterization of the materials and results of grain size analyses and laboratory compaction tests. Accordingly, we recommend to the extent possible, that an on-site location be established for segregating and stockpiling excavated soils.

- Following completion of excavation to strip/remove the near surface soils down to design subgrade elevation for the turf system, static roll the surface using a large compaction roller to prepare a firm, dry and stable subgrade. If, during static rolling of the subgrades pumping or weaving conditions are observed, alternate compaction techniques may be required and/or additional subgrade preparation may be recommended (e.g., removal and replacement of soft, compressible soils).

- At all times prior to placement of the turf system, we recommend maintaining a dry and undisturbed design subgrade so as to promote a stable working surface to receive the turf system. Temporary re-grading outside the limits of the new field may be considered so as to divert possible surface water runoff away from the work areas. Construction dewatering is not anticipated to be required; however, if it becomes necessary, the contractor shall make efforts to discharge dewatering effluent on-site at distances away from the work areas so as not to disturb subgrade preparation and to allow for construction in-the-dry.

- For the permanent condition, the maintenance, protection and long-term performance of the synthetic turf field will require an effective stormwater runoff collection and management system. At a minimum, the sub-turf drainage systems must be designed such that the system is entirely and at all times above groundwater level. Pending further discussions with Activitas regarding final surface grading and estimated runoff volume calculations, we recommend a sub-turf drainage system design

comprised of a layer of double-washed, crushed stone (Activitas to determine minimum thickness required) with perforated HDPE pipes (sized by Activitas) embedded within the crushed stone so as to effectively collect and transport by gravity any accumulated runoff water that filters from the turf layer above to an appropriately sized on-site collection/groundwater recharge/infiltration system (or direct discharge into a permitted storm drain). Prior to placing the crushed stone and perforated piping, and to facilitate vertical drainage of stormwater, a nonwoven geotextile fabric (Mirafi 140N or similar) should be placed on top of the prepared and approved subgrade.

Rubberized Track

The following provides general design and construction recommendations for design and construction of a new rubberized track.

- Following removal of the rubberized surface, reclaim the existing asphalt track by scarifying and pulverizing the in-place asphalt and underlying material. We recommend the reclaimed asphalt and underlying material be mixed to a minimum depth of 12-in. and result in a homogenous material with a maximum particle size of 3 inches and not an excessive amount of material passing the No. 200 sieve.

- Following reclaiming of asphalt, subgrade preparation should include re-grading and compaction of the reclaimed material to a dry density of at least 95% of the maximum dry density as determined in accordance with ASTM Test Designation D1557. As a minimum, the fill should receive four complete coverages with suitable compaction equipment.

- For backfill material placed to raise site grades to design subgrade elevation, we recommend soil lifts with a maximum 8-in thick layer of granular fill material (dense grade per Mass DOT Specification M2.01.7). Backfill placed to raise site grades to design elevation shall be compacted to 95% of the material's maximum dry unit weight (determined in accordance with ASTM D1557). As a minimum, each layer of fill should receive four complete coverages with suitable compaction equipment.

  Dense grade per Mass DOT Specification M2.01.7 shall be obtained from off-site sources and shall consist of naturally occurring or processed, inert material that is hard, durable natural stone and coarse sand, free from loam, clay, surface coatings, and deleterious materials.

Sieve Size	Percent Passing By Weight
2 inch	100
1-1/2 inch	70 – 100
¾ inch	50 - 85
No. 4	30 – 55
No. 50	8 – 24
No. 200	3 - 10

- If portions of the proposed track extend beyond the existing plan limits of the track, we recommend complete removal of the existing topsoil prior to compacting the subgrade and placement and compaction of a minimum 12-in. thick lift of granular fill to design subgrade elevation.

Site Retaining Walls

Retaining walls must be designed and constructed in accordance with the current Massachusetts State Building Code (Code). The following general guidelines are intended to be consistent with the 9th Edition of the Code, as currently amended, and are provided for use in the design and construction of retaining walls at the project site.

- Construct retaining wall footings on natural suitable bearing soils, rock, or compacted granular fill after removal of unsuitable materials. In general, design footings for an allowable bearing pressure equal to 3.0 kips per square foot.
- Footing bearing levels should be at least four feet below lowest adjacent ground surface exposed to freezing.
- Calculate at-rest earth pressures behind cantilever walls using an equivalent fluid unit weight of soil equal to 45 pounds per cubic foot (pcf), provided the earth slope behind the wall is no steeper than 3 horizontal to 1 vertical (3H:1V) and that positive drainage and freely-draining backfill are provided at the base and behind the wall. Walls with steeper backslopes should be analyzed on an individual basis.
- Calculate surcharge loads from vehicles or other sources as an additional uniform lateral pressure over the entire height of the wall equal to 0.5 times the vertical surcharge pressure.
- Design the wall to resist seismic forces in accordance with Section 1610.2 of the Code and using a total soil unit weight of 130 pounds per cubic foot (pcf) assuming the backfill material is granular backfill placed and compacted to at least 95 percent of the laboratory maximum dry density, as determined by ASTM D1557.
- Design for a minimum factor of safety equal to 1.5 against overturning.
- Design for a minimum factor of safety equal to 1.5 against sliding, with no passive pressure assumed in front of the wall, and in accordance with Section 1807.2.3 of the Code. Use a coefficient of friction at the base of the concrete footing equal to 0.5 to calculate ultimate sliding resistance.
- For walls taller than 4 ft, drainage should be provided behind the wall by the use of a longitudinal perforated pipe positioned behind the wall at the top of the footing surrounded with 6 in. of 3/4 in. sized crushed stone and non-woven geotextile, and leading to a dependable outlet. The zone within 3 ft behind the wall should be backfilled with suitable off-site, freely-draining sandy or gravelly soil such as free-draining processed (washed) rock fill.

CONSTRUCTION CONSIDERATIONS

The primary purpose of this section of the letter report is to comment on items related to excavation, earthwork, and related geotechnical engineering aspects of the proposed construction.

Drilled Shafts (Caissons)

Drilled shafts will need to be inspected in the field for overall depth and size, bottom condition, and alignment prior to placement of concrete. It is anticipated that shafts will extend below the groundwater table and will be drilled inside a steel casing installed to the bottom of shaft excavation within the glacial deposits to retain the ground and stabilize the excavations. Alternatively, bentonite or polymer slurry maybe used to stabilize the excavations.

Concrete should be placed in the dry using a chute or by tremie methods if water is present in the shaft. The actual details of shaft excavation and concrete placement should be proposed by lighting specialty contractor and be submitted to the Engineer for review in the form of shop drawings.

Subgrade Preparation

The Fill soils on site generally do not contain large quantities of fine-grained materials, but if existing Fills with higher silt and clay contents are encountered, they could be susceptible to weaving during compaction especially following rain events and may require changes in compaction techniques. As such, management of soils during subgrade preparation will require surface water and erosion control.

Construction Dewatering

Control of groundwater and surface water runoff into excavations will be necessary in order to retain the integrity of the subgrade soils. The contractor should control the flow of surface water into excavations at all times. Careful water control will be necessary to retain the integrity of the subgrade soils. Dewatering of excavations during construction can likely be performed using collection trenches and shallow sump wells. Every effort should be made to collect and recharge collected water on-site.

It should be anticipated that groundwater will be encountered at the drilled shaft locations. It is also anticipated that dewatering effluent likely can be recharged on site into temporary drywells created and maintained for this purpose. Alternatively, drilled shafts in existing fill or natural soil may also be controlled using drilling fluid during the installation process.

If off-site discharge of collected water is required to manage surface water or groundwater encountered at drilled shaft locations, dewatering will need to be performed with all applicable Federal, State and Local Regulations.

Filling and Backfilling

Compacted Granular Fill beneath the field should consist of suitable bank-run sand and gravel, free of clay, organic material, snow, ice, or other unsuitable materials and should be well-graded within the following limits.

Sieve Size	Percent Finer by Weight
3 in.	100
No. 4	30 - 90
No. 40	10 - 50
No. 200	0 - 8

Compacted Granular Fill should be placed in loose lift thicknesses not exceeding 9 in. and should be compacted to a dry density of at least 95 percent of the maximum dry density as determined in accordance with ASTM Test Designation D1557. As a minimum, each layer of placement of fill should receive four complete coverages with a large suitable compaction equipment.

Handling and Disposal of Excavated Soil

In order to minimize the cost of transporting and disposing of material off-site, every effort should be made by the designers and contractor to reuse excavated material on-site, whether in landscaped areas around the site, or for material meeting specific geotechnical criteria as backfill.

The excavation work will most likely generate quantities of excavated soils, a portion of which will require special handling if off-site disposal is authorized by the Town of Ayer. The management of these excavated soils must be performed in compliance with all applicable Federal, State, and Local Regulations, including the requirements of the Massachusetts Contingency Plan (310 CMR 40.0000).

LIMITATIONS

The scope of work undertaken for this report does not include environmental consulting services to assess the need for cost contingencies associated with handling and disposal of excavated soil materials. If excess soils will be generated for offsite disposal, we recommend that Haley & Aldrich conduct a program to characterize excavated soil for off-site disposal. We would be happy to provide a proposal for these services if the need arises.

This report has been prepared for specific application to the Athletic Field Renovations at Ayer Shirley High School in Ayer, Massachusetts. The recommendations contained in this report are based, in part, on information obtained from subsurface explorations and information that was provided to us by Activitas. The nature and extent of variations in the subsurface conditions between explorations may not become evident until construction, and the project design may change from our current understanding. Any

additional information pertaining to the project that becomes available should be provided to Haley & Aldrich so that our conclusions and recommendations can be reviewed and modified, as necessary.

We also request that we be provided the opportunity for a general review of the final athletic field construction documents to confirm that our recommendations have been interpreted and implemented as intended.

CLOSING

We appreciate the opportunity to provide geotechnical engineering services on this project. Please do not hesitate to call if you have any questions or comments.

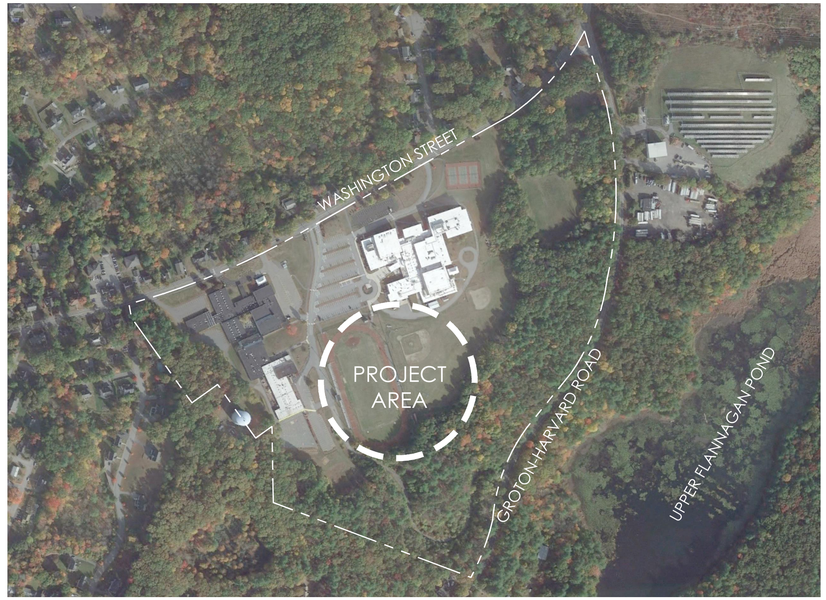
Sincerely yours,
HALEY & ALDRICH, INC.

R. Scott Goldkamp
Program Manager

Enclosures:

Figure 1 – Site and Subsurface Exploration Location Plan
Appendix A – Subsurface Exploration Logs
A-1 Synthetic Turf Field Geoprobe Logs
A-2 Synthetic Track Geoprobe Logs
A-3 Sport Lighting Foundation Test Boring Logs
A-4 Baseball Field Geoprobe Logs

\\haleyaldrich.com\share\CF\Projects\0201576\Report\2021-0908-HAI-Ayer_Shirley-Renovations Letter-F.docx



LOCUS MAP

N.T.S.

LIST OF DRAWINGS

SITE PLAN REVIEW | NOVEMBER 18, 2021

AYER SHIRLEY REGIONAL HIGH SCHOOL

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

AYER, MASSACHUSETTS 01432

ZONE: A1 | BOOK: 8135 | PAGE: 81 | ASSESSOR MAP: 20 | PARCEL: 20-1

OWNER

Ayer Shirley Regional School District
115 Washington Street
Ayer, MA 01432
(978) 772-8600

LANDSCAPE ARCHITECT/CIVIL ENGINEER

Activitas
70 Milton Street
Dedham, MA 02026-2915
(781) 326-2600

GEOTECHNICAL ENGINEER

Haley & Aldrich, Inc.
465 Medford Street, Suite 220
Boston, MA 02129-1400
(617) 886-7312

ELECTRICAL ENGINEER

NV5 Engineers
200 Brickstone Square, Suite 201
Andover, MA 01810-1488
(978) 475-0298

ARCHITECT

OCO Architecture :: Design
709 Hingham Street
Hingham, MA 02043
(617) 699-8395

SURVEY

LandTech Consultants, Inc.
515 Groton Road
Westford, MA 01886
(978) 692-6100

IRRIGATION

Irrigation Consulting, Inc.
20 Merrit Parkway
Nashua, NH 03062
(978) 433-8972

AYER SHIRLEY REGIONAL HIGH SCHOOL
NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

SITE PLAN REVIEW | NOVEMBER 18, 2021

REVISIONS: PROJECT NO. 21025.00

NO.	DATE	SHEETS REVISED	NOTES

ACTIVITAS
landscape architecture | civil engineering

NAD83 (2011)

PAGE HILLTOP ELEMENTARY SCHOOL

AYER SHIRLEY REGIONAL HIGH SCHOOL

DMH RIM=355.69
INV(A)=347.62
INV(B)=347.58

DMH RIM=354.84
INV(A)=348.28
INV(B)=347.97
INV(C)=348.09
INV(D)=347.88

SMH
RIM=355.16
INACCESSIBLE

CONC. WALK

BIKE RACKS

ELEC. EQUIP. ON CONC. PAD WITH BOLLARDS

STOP SIGN

CONC. STAIRS WITH RAILINGS
BOS=355.41
TOS=357.93

PARKING LOT LIGHTING (TYP.)

TC354.92
BC354.38

TC355.74
BC355.17

TC356.32
BC355.67

TC356.61
BC355.95

BIT. PARKING LOT

CONC. LOADING DOCK

SHED

BLDG

BIT. DRIVE

DIRT INFIELD

"AYER SHIRLEY" SIGN

12"CMP

12"PVC

SMH RIM=354.75
INV(A)=347.35
INV(B)=347.29

CONC. RAMP

DETECTABLE ADA PAD

YIELD SIGN

DOUBLE CLF GATE

BIT. WALK

FLAG POLE

CONCESSION STAND

TICKET BOOTH

YARD HYDRANT

HAROLD NORTON MEMORIAL FIELD SIGN w/ELEC. CABINET

SCOREBOARD

CLF GATE

METAL BLEACHERS

BENCH

CLF

CLF BACKSTOP

CB RIM=354.65
INV=350.35 TO TOP OF HUB 12"CMP
SUMP=345.36

TEMPORARY FENCE NETTING

FOUL POLE

MH RIM=357.94
INV(A)=352.75 8"METAL
INV(B)=352.51 12"
INV(C)=352.60 8"METAL
INV(D)=352.49 16"METAL

CB RIM=358.63
INV=354.63 TO TOP OF HUB
SUMP=353.35

CB RIM=358.82
INV=354.96 TO TOP OF HUB
SUMP=352.75

CB RIM=360.54
INV=355.19 8" METAL TO UNKNOWN
SUMP=353.15

CONC. PAD

CB RIM=358.42
INV=356.10(REC.)

ICV

WATER DRINKING FOUNTAIN

BASEBALL FIELD

GOAL POSTS

CB RIM=358.52
INV(A)=355.21 TO UNKNOWN
INV(B)=355.22 8"CONC

CB RIM=365.52
INV(A)=354.12
INV(B)=359.97
INV(C)=354.02
INV(D)=359.97
SUMP=354.02

CB RIM=365.06
INV=361.41 (TOP OF HOOD)
SUMP=359.91

"STAFF AND VISITOR PARKING" SIGN

CONC. RETAINING WALL 364.30

WOODEN BLEACHERS ATTACHED TO CONC. STEPS, TYP.

"STAFF AND VISITOR PARKING" SIGN

MH RIM=366.99
INV(A)=360.64
INV(B)=355.26
INV(C)=355.14

PRESS BOX BUILDING

STAIRS WITH RAILINGS

LIGHT POLE (TYP.)

62' HIGH FIELD LIGHTING (TYP. OF 8)

EMPTY UNDERGROUND CONDUIT (REC.)

RUNNING TRACK

"HERALD G. NORTON" FIELD

CB RIM=358.21
INV=356.26 8"CONC TO UNKNOWN
SUMP=356.21

CB RIM=358.33
INV(A)=355.40 TO UNKNOWN
INV(B)=355.39 8" CONC. TO UNKNOWN
INV(C)=355.33
SUMP=355.32

CB RIM=358.41
INV(A)=352.61 TO UNKNOWN
INV(B)=352.60
SUMP=352.59

CB RIM=358.45
INV=355.92 8"CONC TO UNKNOWN
SUMP=355.9

TEMP. FENCE NETTING

WATER FOUNTAIN

METAL BLEACHERS

62' HIGH FIELD LIGHTING (TYP. OF 8)

SOCCER GOAL

SOCCER GOAL

DOUBLE CLF GATE

WATER DRINKING FOUNTAIN

FOUL POLE

STORAGE METAL CONTAINER

EX. TREE LINE (TYP.)

POLE

CLF (TYP.)

GRASS

CONC.

SURVEY NOTES

1. TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON AN ON-THE-GROUND SURVEY PERFORMED BY LANDTECH CONSULTANTS IN JUNE OF 2021..
2. HORIZONTAL INFORMATION SHOWN ON THIS PLAN ARE IN U.S. SURVEY FEET IN THE MA. STATE PLANE COORDINATE SYSTEM REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), CORS ADJUSTMENT (NA2011/GEOID 12A) AS DETERMINED BY GPS OBSERVATIONS PERFORMED IN JUNE OF 2021 UTILIZING THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION MACORS GPS NETWORK.
3. THE VERTICAL DATUM FOR THIS PROJECT IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), CORS ADJUSTMENT (NA2011/GEOID 12A) AS DETERMINED BY REDUNDANT GPS OBSERVATIONS PERFORMED IN JUNE OF 2021 UTILIZING THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION MACORS GPS NETWORK.
4. UTILITY INFORMATION SHOWN HEREON IS BASED ON FIELD OBSERVATIONS AND RECORD INFORMATION WHERE AVAILABLE. A SUBSURFACE INVESTIGATION WAS NOT PERFORMED ON THE SUBJECT PROPERTY.

0 40 80 120
SCALE IN FEET

BY	DATE	REVISION

COMMONWEALTH OF MASSACHUSETTS
MICHAEL R. MORAN
No. 49084
REGISTERED LAND SURVEYOR

PREPARED FOR:
ACTIVITAS, INC.
20 MILTON STREET
DEDHAM, MA 02026

SCAN BH/JV | DRAFT MRM | CHECK ART

EXISTING CONDITIONS PLAN
ATHLETIC FIELDS
AYER SHIRLEY REGIONAL HIGH SCHOOL
AYER, MASSACHUSETTS

JULY 15, 2021

SCALE: 1"=40'

LandTech Consultants
Engineering/Design/Surveying/Permitting
515 Groton Road, - Westford, MA 01886
Ph: (978) 692-6100 - landtechinc.com

JOB NO. 21-192 | DWG. NO. 10913 | SHEET EX-1

LOCUS MAP LEGEND

RESIDENCE A-1

RESIDENCE A-2

CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

Board of Assessors
Town Hall
1 Main Street
Ayer, MA 01432

Tel: (978) 772-8220 ext. 140
Email: assessor@ayer.ma.us

October 20, 2021

ABUTTERS LIST FOR PARCEL(s): 20-1 - 115 Washington Street
OWNER(s): Ayer-Shirley Regional High School

#	Parcel ID	Sites	Sites2	Property Location	Owners Name1	Owners Name2	Address1	Address2	City/Town	State	Zip Code
1	13-11	0		WASHINGTON ST REAR	CORFIELD REALTY TRUST II	CALVIN E MOORE - TRUSTEE	39 MAIN STREET	SUITE 204	AYER	MA	01432
2	13-12	0		WASHINGTON STREET	AYER DEVELOPMENT LLC		159-1 PROSPECT STREET		ACTON	MA	01720
3	13-14	0		WASHINGTON STREET	AYER DEVELOPMENT LLC		159-1 PROSPECT STREET		ACTON	MA	01720
4	13-15	128		WASHINGTON STREET	NORTHEAST SITE DEVELOPMENT LLC		159-1 PROSPECT STREET		ACTON	MA	01720
5	13-16	132		WASHINGTON STREET	GENEAU BEVERLY A - TE	VINCENT J GENEAU	132 WASHINGTON STREET		AYER	MA	01432
6	13-17	134		WASHINGTON STREET	FERDAUS FARHAD M - TE	NELL G FERDAUS	134 WASHINGTON STREET		AYER	MA	01432
7	13-18	0		WASHINGTON STREET	NEW ENGLAND POWER CO		PROPERTY TAX DEPT	40 SYLVAN ROAD	WALTHAM	MA	02451
8	13-19	0		WASHINGTON STREET	FLAGG MARY C		152 WASHINGTON ST		AYER	MA	01432
9	13-24	4		MOORE DRIVE	BERGQUIST ERIC	JULIE A PALAMIA	4 MOORE DRIVE		AYER	MA	01432
10	13-25	2		MOORE DRIVE	PAUL N KUDLICH -TR	KUDLICH & MEAD INVESTMENT TRUST	2 MOORE DRIVE		AYER	MA	01432
11	13-26	142		WASHINGTON STREET	WOODS DARREN T	SHARON E WOODS	142 WASHINGTON STREET		AYER	MA	01432
12	13-29	5		MOORE DRIVE	EBERLE MATTHEW W - TE	MICHELLE L EBERLE	5 MOORE DRIVE		AYER	MA	01432
13	13-3	0		GROTON HARVARD ROAD	TOWN OF AYER		1 MAIN ST		AYER	MA	01432
14	13-30	3		MOORE DRIVE	MADIGAN BERNARD W		3 MOORE DRIVE		AYER	MA	01432
15	13-31	1		MOORE DRIVE	LAUREN FRANCESCHI 2014 REV TRUST	LAUREN FRANCESCHI - TRUSTEE	1 MOORE DRIVE		AYER	MA	01432
16	13-32	148		WASHINGTON STREET	BOLTON PHILLIP S		148 WASHINGTON STREET		AYER	MA	01432
17	13-33	150		WASHINGTON STREET	KILBRETH MERIAM P		150 WASHINGTON STREET		AYER	MA	01432
18	13-34	152		WASHINGTON STREET	FLAGG MARY C		152 WASHINGTON STREET		AYER	MA	01432
19	13-35	154		WASHINGTON STREET	PAGANI JONES	TALITA PAGANI	154 WASHINGTON STREET		AYER	MA	01432
20	13-36	156		WASHINGTON STREET	DECOURCEY JOHN		156 WASHINGTON STREET		AYER	MA	01432
21	13-6	0		GROTON HARVARD ROAD	NEW ENGLAND POWER CO		PROPERTY TAX DEPT	40 SYLVAN ROAD	WALTHAM	MA	02451
22	13-8	0		GROTON HARVARD ROAD	BURNHAM ANDREW W - TE	PAULINE BURNHAM	52 FLETCHER STREET		AYER	MA	01432
23	14-3	0		GROTON HARVARD ROAD	TOWN OF AYER		1 MAIN ST		AYER	MA	01432
24	20-10	112		WASHINGTON STREET	WILLEMSEN JORGE A	REBECCA M GORDON	112 WASHINGTON STREET		AYER	MA	01432
25	20-11	116		WASHINGTON STREET	POWERS MITSU		116 WASHINGTON STREET		AYER	MA	01432
26	20-12	122		WASHINGTON STREET	REYNOLDS JAMES M		122 WASHINGTON STREET		AYER	MA	01432
27	20-14	95		WASHINGTON STREET	MURPHY MATTHEW P -TE	ANDREA R MURPHY	95 WASHINGTON STREET		AYER	MA	01432
28	20-15	101		WASHINGTON STREET	TSINDIS CONSTANTINE - TR	LCNC 2019 TRUST	101 WASHINGTON STREET		AYER	MA	01432
29	20-16	103		WASHINGTON STREET	REARDON ELIZABETH		103 WASHINGTON STREET		AYER	MA	01432
30	20-17	50		NORWOOD AVENUE	WOODARD JUSTIN	BRIAN P SCHREMSER	50 NORWOOD AVENUE		AYER	MA	01432
31	20-18	49		NORWOOD AVENUE	JOHNSON CHRISTOPHER D		49 NORWOOD AVENUE		AYER	MA	01432
32	20-21	45		NORWOOD AVENUE	HUMBERSTONE IAN		45 NORWOOD AVENUE		AYER	MA	01432
33	20-22	0	REAR	HIGHLAND AVENUE	TOWN OF AYER		1 MAIN ST		AYER	MA	01432
34	20-3	51		GROTON HARVARD ROAD	WESLEY JOHN H	LINDA J WESLEY	41 GROTON HARVARD RD		AYER	MA	01432
35	20-4	5		MOUNTAIN AVENUE	SERHAN KAMAL	MARLENA J SERHAN	5 MOUNTAIN AVENUE		AYER	MA	01432
36	20-40	0		OAK RIDGE DRIVE	WESLEY LINDA J - TE	JOHN H WESLEY	41 GROTON HARVARD ROAD		AYER	MA	01432
37	20-48	0		WASHINGTON STREET	CORFIELD REALTY TRUST II	CALVIN E MOORE - TRUSTEE	39 MAIN STREET	SUITE 204	AYER	MA	01432
38	20-49	45		GROTON HARVARD ROAD	BRODEUR NORMAND	FIVE GIRLS TRUST	45 GROTON HARVARD RD		AYER	MA	01432
39	20-50	0		WASHINGTON STREET	TOWN OF AYER		1 MAIN ST		AYER	MA	01432
40	20-51	49		LINCOLN STREET	ADAMSON WILLIAM		49 LINCOLN ST		AYER	MA	01432
41	20-53	47		NORWOOD AVENUE	PORTER JOHN S - TE	ALISON J PORTER	47 NORWOOD AVENUE		AYER	MA	01432

1

Board of Assessors
Town Hall
1 Main Street
Ayer, MA 01432

Tel: (978) 772-8220 ext. 140
Email: assessor@ayer.ma.us

October 20, 2021

ABUTTERS LIST FOR PARCEL(s): 20-1 - 115 Washington Street
OWNER(s): Ayer-Shirley Regional High School

#	Parcel ID	Sites	Sites2	Property Location	Owners Name1	Owners Name2	Address1	Address2	City/Town	State	Zip Code
42	20-56	4		BRILAINA COURT	NORIS GREGORY G - TR	GREGORY G NORIS 2018 TRUST	4 BRILAINA COURT		AYER	MA	01432
43	20-59	54		GROTON HARVARD ROAD	GILLES RICHARD D - TE	RAYELLEN K GILLES	54 GROTON HARVARD ROAD		AYER	MA	01432
44	20-6	98		WASHINGTON STREET	TRASK JUDY M		98 WASHINGTON STREET		AYER	MA	01432
45	20-60	56		GROTON HARVARD ROAD	TORRICE JILL A	DANIEL G TORRICE	56 GROTON HARVARD ROAD		AYER	MA	01432
46	20-61	58		GROTON HARVARD ROAD	CHAPIN BRADFORD G	CATHERINE A PRATT	58 GROTON HARVARD ROAD		AYER	MA	01432
47	20-62	5		BRILAINA COURT	CORENOWIT JULIA A		5 BRILAINA COURT		AYER	MA	01432
48	20-63	3		BRILAINA COURT	MALETTE CHRISTINE M		3 BRILAINA COURT		AYER	MA	01432
49	20-64	1		BRILAINA COURT	PROVENSES JANET K		1 BRILAINA COURT		AYER	MA	01432
50	20-66	42		HIGHLAND AVENUE	SHAW KEITH B - TE	LYNN E SHAW	42 HIGHLAND AVENUE		AYER	MA	01432
51	20-69	43		NORWOOD AVENUE	KOAUGHEU JEAN MARMEE - TE	SEVERINE P KOUAGHEU	43 NORWOOD AVENUE		AYER	MA	01432
52	20-7	100		WASHINGTON STREET	COTTONWOOD REALTY LLC		325 AYER ROAD		HARVARD	MA	01451
53	20-75	42		NORWOOD AVENUE	ADUSUMALLI PRATHIMA - TE	VIJAY SANKAR PIDIKITI	42 NORWOOD AVENUE		AYER	MA	01432
54	20-76	46		NORWOOD AVENUE	CAMPISI MICHAEL C - TE	JULIE E CAMPISI	46 NORWOOD AVENUE		AYER	MA	01432
55	20-77	44		NORWOOD AVENUE	LEBLANC CHARLES R - TR	LEBLANC INVESTMENT TRUST	44 NORWOOD AVENUE		AYER	MA	01432
56	20-78	48		NORWOOD AVENUE	MARULIS ZAKERIAH	LINDA NGUYEN	48 NORWOOD AVENUE		AYER	MA	01432
57	20-79	110		WASHINGTON STREET	DOUCETTE JOHN M		110 WASHINGTON STREET		AYER	MA	01432
58	4-9	0		OLD GROTON ROAD	ELIADES DAVID J	BARBARA L ELIADES	199 OLD GROTON ROAD		AYER	MA	01432

of the records as of September 30, 2021 in the Town of Ayer
known names and addresses of owners of land abutting the
it to MGL Chapter 40A Sec. 11 (300 feet)

Certified: Board of Assessors

2

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER -
HALEY & ALDRICH

ELECTRICAL ENGINEER -
NV5

ARCHITECT-
OCO ARCHITECTURE :: DESIGN

SURVEY -
LANDTECH

IRRIGATION -
IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=200'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-L0.0_LOCUS_MAP.dwg
DRAWN:	MJD
CHECKED:	JJC

SEAL:

SHEET TITLE:

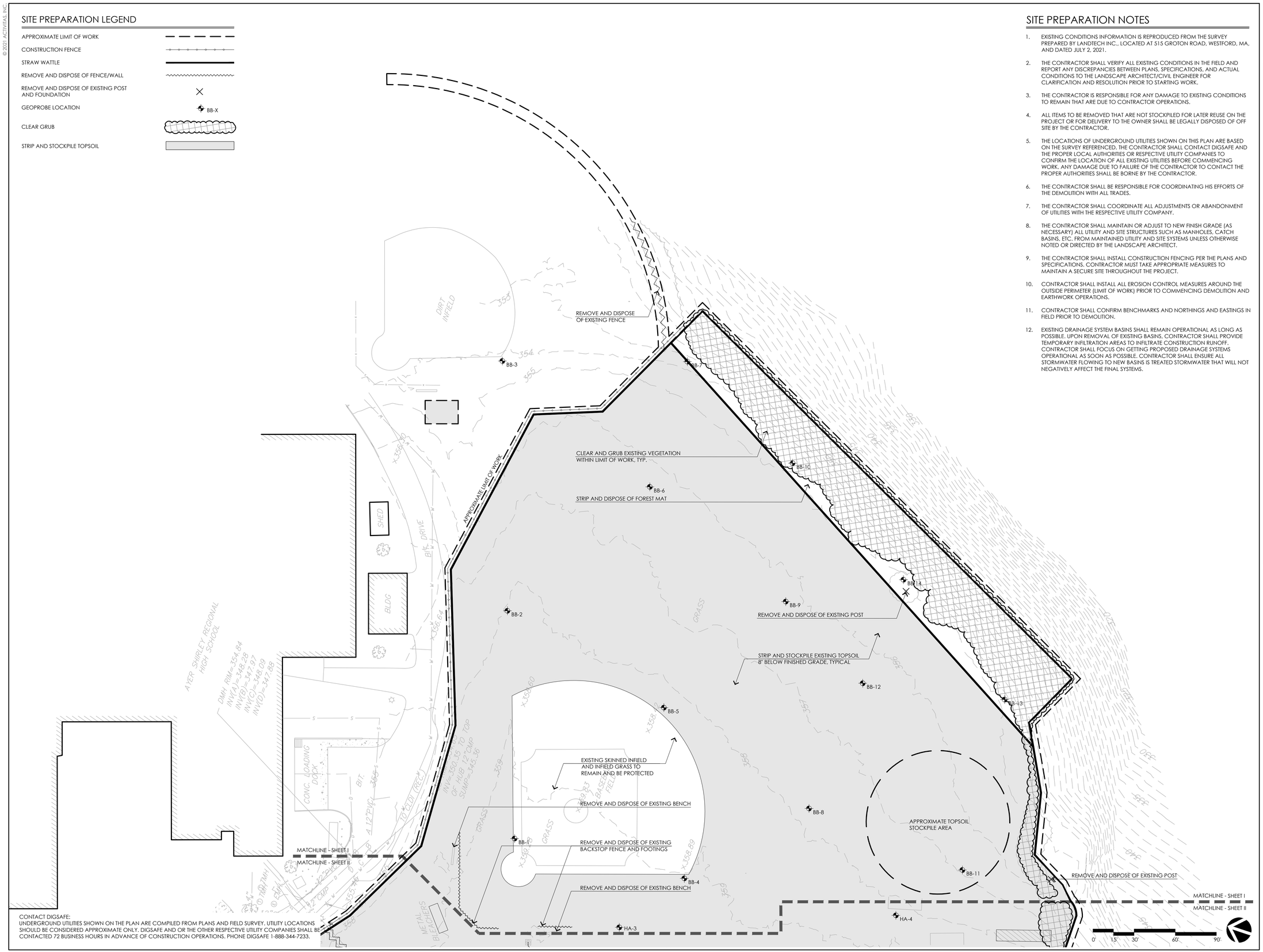
LOCUS MAP

SHEET NO:

L0.0

SITE PREPARATION LEGEND

- APPROXIMATE LIMIT OF WORK
- CONSTRUCTION FENCE
- STRAW WATTLE
- REMOVE AND DISPOSE OF FENCE/WALL
- REMOVE AND DISPOSE OF EXISTING POST AND FOUNDATION
- GEOPROBE LOCATION (BB-X)
- CLEAR GRUB
- STRIP AND STOCKPILE TOPSOIL



SITE PREPARATION NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY LANDTECH INC., LOCATED AT 515 GROTON ROAD, WESTFORD, MA, AND DATED JULY 2, 2021.
2. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS, SPECIFICATIONS, AND ACTUAL CONDITIONS TO THE LANDSCAPE ARCHITECT/CIVIL ENGINEER FOR CLARIFICATION AND RESOLUTION PRIOR TO STARTING WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS TO REMAIN THAT ARE DUE TO CONTRACTOR OPERATIONS.
4. ALL ITEMS TO BE REMOVED THAT ARE NOT STOCKPILED FOR LATER REUSE ON THE PROJECT OR FOR DELIVERY TO THE OWNER SHALL BE LEGALLY DISPOSED OF OFF SITE BY THE CONTRACTOR.
5. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED ON THE SURVEY REFERENCED. THE CONTRACTOR SHALL CONTACT DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS EFFORTS OF THE DEMOLITION WITH ALL TRADES.
7. THE CONTRACTOR SHALL COORDINATE ALL ADJUSTMENTS OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
8. THE CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADE (AS NECESSARY) ALL UTILITY AND SITE STRUCTURES SUCH AS MANHOLES, CATCH BASINS, ETC. FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED OR DIRECTED BY THE LANDSCAPE ARCHITECT.
9. THE CONTRACTOR SHALL INSTALL CONSTRUCTION FENCING PER THE PLANS AND SPECIFICATIONS. CONTRACTOR MUST TAKE APPROPRIATE MEASURES TO MAINTAIN A SECURE SITE THROUGHOUT THE PROJECT.
10. CONTRACTOR SHALL INSTALL ALL EROSION CONTROL MEASURES AROUND THE OUTSIDE PERIMETER (LIMIT OF WORK) PRIOR TO COMMENCING DEMOLITION AND EARTHWORK OPERATIONS.
11. CONTRACTOR SHALL CONFIRM BENCHMARKS AND NORTHINGS AND EASTINGS IN FIELD PRIOR TO DEMOLITION.
12. EXISTING DRAINAGE SYSTEM BASINS SHALL REMAIN OPERATIONAL AS LONG AS POSSIBLE. UPON REMOVAL OF EXISTING BASINS, CONTRACTOR SHALL PROVIDE TEMPORARY INFILTRATION AREAS TO INFILTRATE CONSTRUCTION RUNOFF. CONTRACTOR SHALL FOCUS ON GETTING PROPOSED DRAINAGE SYSTEMS OPERATIONAL AS SOON AS POSSIBLE. CONTRACTOR SHALL ENSURE ALL STORMWATER FLOWING TO NEW BASINS IS TREATED STORMWATER THAT WILL NOT NEGATIVELY AFFECT THE FINAL SYSTEMS.

CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-SP1.1-SP_PLAN.dwg
DRAWN:	MJD
CHECKED:	JJC

SEAL:

COMMONWEALTH OF MASSACHUSETTS
MEGANN E. BUCZYNSKI
CIVIL
No. 47382
REGISTERED PROFESSIONAL ENGINEER
11-18-21

SHEET TITLE:

SITE PREPARATION PLAN
SHEET I

SHEET NO:

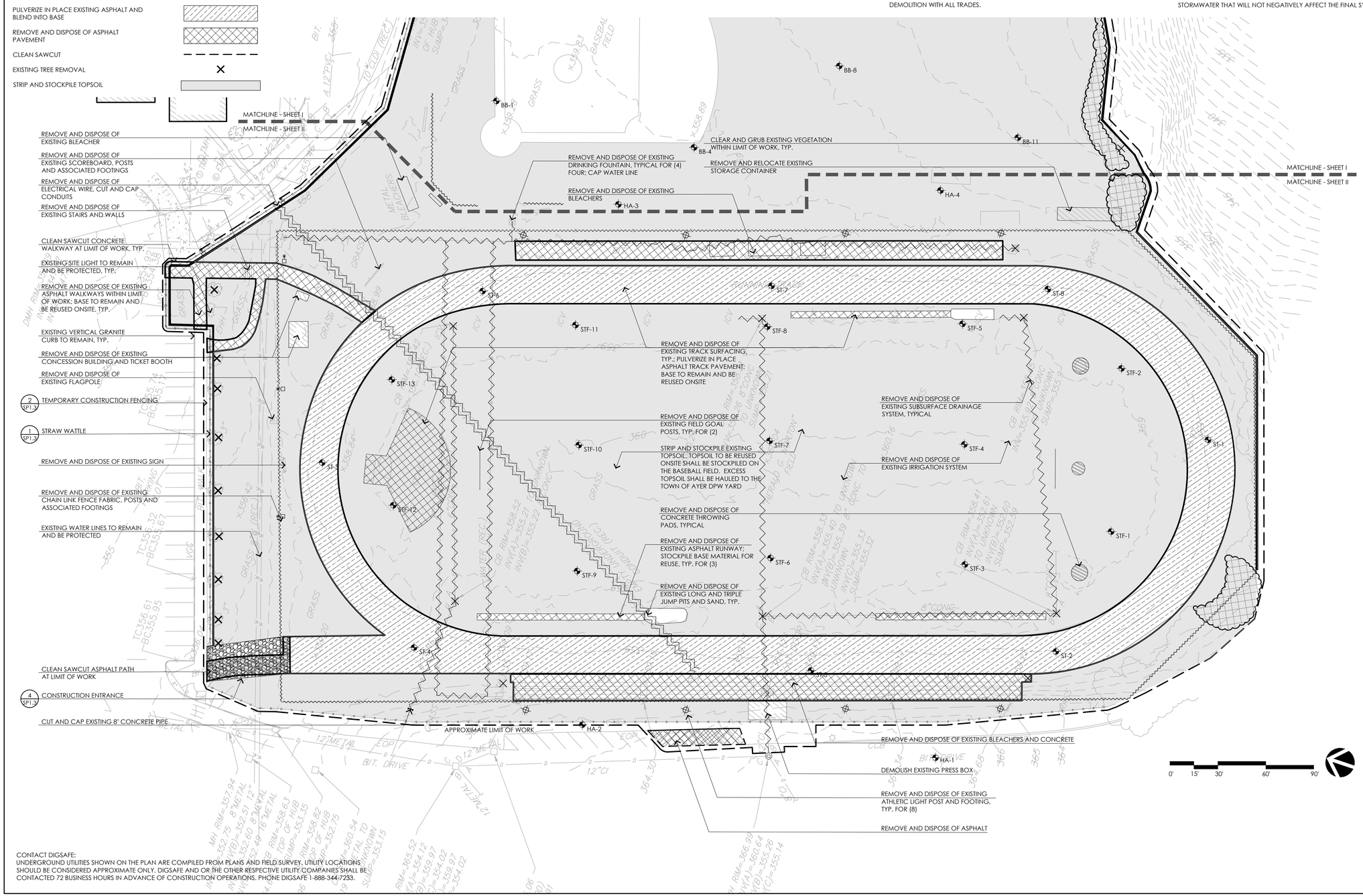
SP1.1

SITE PREPARATION LEGEND

- APPROXIMATE LIMIT OF WORK
- CONSTRUCTION FENCE
- STRAW WATTLE
- REMOVE AND DISPOSE OF FENCE/WALL
- REMOVE AND DISPOSE UTILITY LINES
- REMOVE AND DISPOSE OF EXISTING POST AND FOUNDATION
- REMOVE AND DISPOSE OF EXISTING ATHLETIC LIGHT POLE, FOUNDATION, AND ASSOCIATED CONDUIT/WIRING
- GEOPROBE LOCATION — ST-X/STF-X
- TEST BORING — HA-X
- CLEAR GRUB
- PULVERIZE IN PLACE EXISTING ASPHALT AND BLEND INTO BASE
- REMOVE AND DISPOSE OF ASPHALT PAVEMENT
- CLEAN SAWCUT
- EXISTING TREE REMOVAL
- STRIP AND STOCKPILE TOPSOIL

SITE PREPARATION NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY LANDTECH INC., LOCATED AT 515 GROTON ROAD, WESTFORD, MA, AND DATED JULY 2, 2021.
2. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS, SPECIFICATIONS, AND ACTUAL CONDITIONS TO THE LANDSCAPE ARCHITECT/CIVIL ENGINEER FOR CLARIFICATION AND RESOLUTION PRIOR TO STARTING WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS TO REMAIN THAT ARE DUE TO CONTRACTOR OPERATIONS.
4. ALL ITEMS TO BE REMOVED THAT ARE NOT STOCKPILED FOR LATER REUSE ON THE PROJECT OR FOR DELIVERY TO THE OWNER SHALL BE LEGALLY DISPOSED OF OFF SITE BY THE CONTRACTOR.
5. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED ON THE SURVEY REFERENCED. THE CONTRACTOR SHALL CONTACT DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS EFFORTS OF THE DEMOLITION WITH ALL TRADES.
7. THE CONTRACTOR SHALL COORDINATE ALL ADJUSTMENTS OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
8. THE CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADE (AS NECESSARY) ALL UTILITY AND SITE STRUCTURES SUCH AS MANHOLES, CATCH BASINS, ETC. FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED OR DIRECTED BY THE LANDSCAPE ARCHITECT.
9. THE CONTRACTOR SHALL INSTALL CONSTRUCTION FENCING PER THE PLANS AND SPECIFICATIONS. CONTRACTOR MUST TAKE APPROPRIATE MEASURES TO MAINTAIN A SECURE SITE THROUGHOUT THE PROJECT.
10. CONTRACTOR SHALL INSTALL ALL EROSION CONTROL MEASURES AROUND THE OUTSIDE PERIMETER (LIMIT OF WORK) PRIOR TO COMMENCING DEMOLITION AND EARTHWORK OPERATIONS.
11. CONTRACTOR SHALL CONFIRM BENCHMARKS AND NORTHINGS AND EASTINGS IN FIELD PRIOR TO DEMOLITION.
12. EXISTING DRAINAGE SYSTEM BASINS SHALL REMAIN OPERATIONAL AS LONG AS POSSIBLE. UPON REMOVAL OF EXISTING BASINS, CONTRACTOR SHALL PROVIDE TEMPORARY INFILTRATION AREAS TO INFILTRATE CONSTRUCTION RUNOFF. CONTRACTOR SHALL FOCUS ON GETTING PROPOSED DRAINAGE SYSTEMS OPERATIONAL AS SOON AS POSSIBLE. CONTRACTOR SHALL ENSURE ALL STORMWATER FLOWING TO NEW BASINS IS TREATED STORMWATER THAT WILL NOT NEGATIVELY AFFECT THE FINAL SYSTEMS.



CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-SP1.2-SP_PLAN.dwg
DRAWN:	MJD
CHECKED:	JJC

SEAL:

COMMONWEALTH OF MASSACHUSETTS
MEGAN E. BUCZYNSKI
CIVIL
No. 47382
REGISTERED PROFESSIONAL ENGINEER
11-12-21

SHEET TITLE:

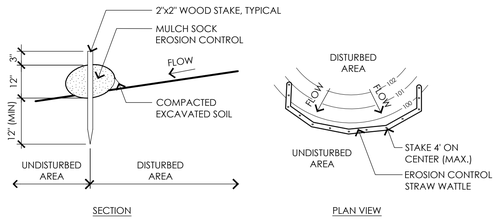
SITE PREPARATION PLAN
SHEET II

SHEET NO:

SP1.2

NOTES:

1. PLACE EROSION CONTROL MULCH SOCK ON LEVEL GRADE. EXTEND BOTH ENDS OF THE TUBE AT LEAST 8'-0" UPSLOPE AT 45 DEGREES TO THE MAIN ALIGNMENT.
2. REMOVE DEPOSITS WHEN SEDIMENT ACCUMULATION IS ONE THIRD THE HEIGHT OF THE EXPOSED EROSION CONTROL MULCH SOCK.
3. EROSION CONTROL STRAW WATTLE SHALL REMAIN IN WORKING ORDER UNTIL THE SITE IS STABILIZED. ADDITIONAL EROSION CONTROLS SHALL BE INSTALLED AS NEEDED TO PREVENT SILT FROM LEAVING THE SITE AT NO ADDITIONAL COST TO THE OWNER.
4. ALL CONTROLS SHALL BE SET 5' FROM BOTTOM TOE OF SLOPE

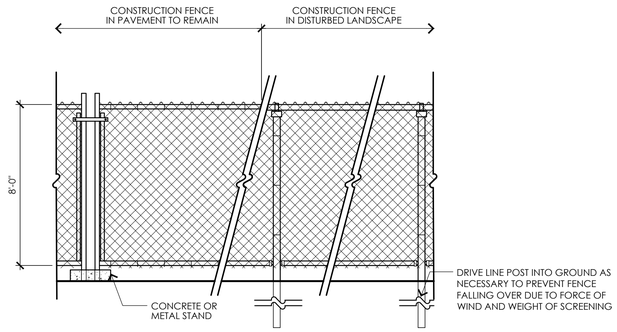


1 EROSION CONTROL STRAW WATTLE

NOT TO SCALE

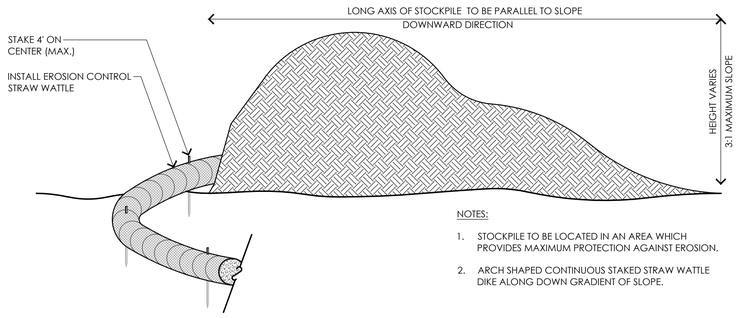
NOTES:

1. TEMPORARY CONSTRUCTION FENCE SHALL BE PROVIDED AT PROJECT LIMITS AS SHOWN AND SPECIFIED.



2 TEMPORARY CONSTRUCTION FENCE

NOT TO SCALE

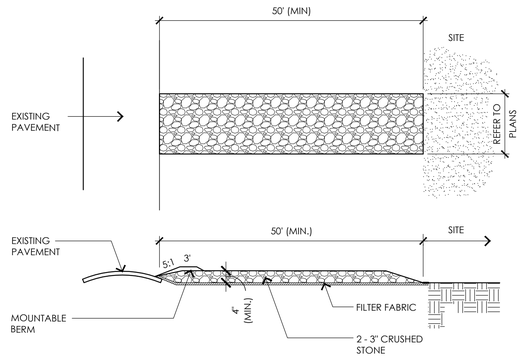


NOTES:

1. STOCKPILE TO BE LOCATED IN AN AREA WHICH PROVIDES MAXIMUM PROTECTION AGAINST EROSION.
2. ARCH SHAPED CONTINUOUS STAKED STRAW WATTLE DIKE ALONG DOWN GRADIENT OF SLOPE.

3 TEMPORARY MATERIAL STOCKPILE

NOT TO SCALE



NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT INTO THE STREET. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED AND/OR TRACKED ONTO PUBLIC RIGHTS-OF-WAYS MUST BE REMOVED IMMEDIATELY. MOUNTABLE BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED.
2. CONTRACTOR SHALL WASH WHEELS OF VEHICLES AT CONSTRUCTION ENTRANCE PRIOR TO VEHICLES EXITING SITE TO PREVENT SOIL MATERIAL FROM BEING TRACKED FROM THE SITE.
3. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED BY CONTRACTOR.

4 TEMPORARY CONSTRUCTION ENTRANCE

NOT TO SCALE

CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL
Ayer, Massachusetts
NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-SP1.3-SP_DET.dwg
DRAWN:	MJD
CHECKED:	JJC

SEAL:

SHEET TITLE:

SITE PREPARATION DETAILS

SHEET NO:

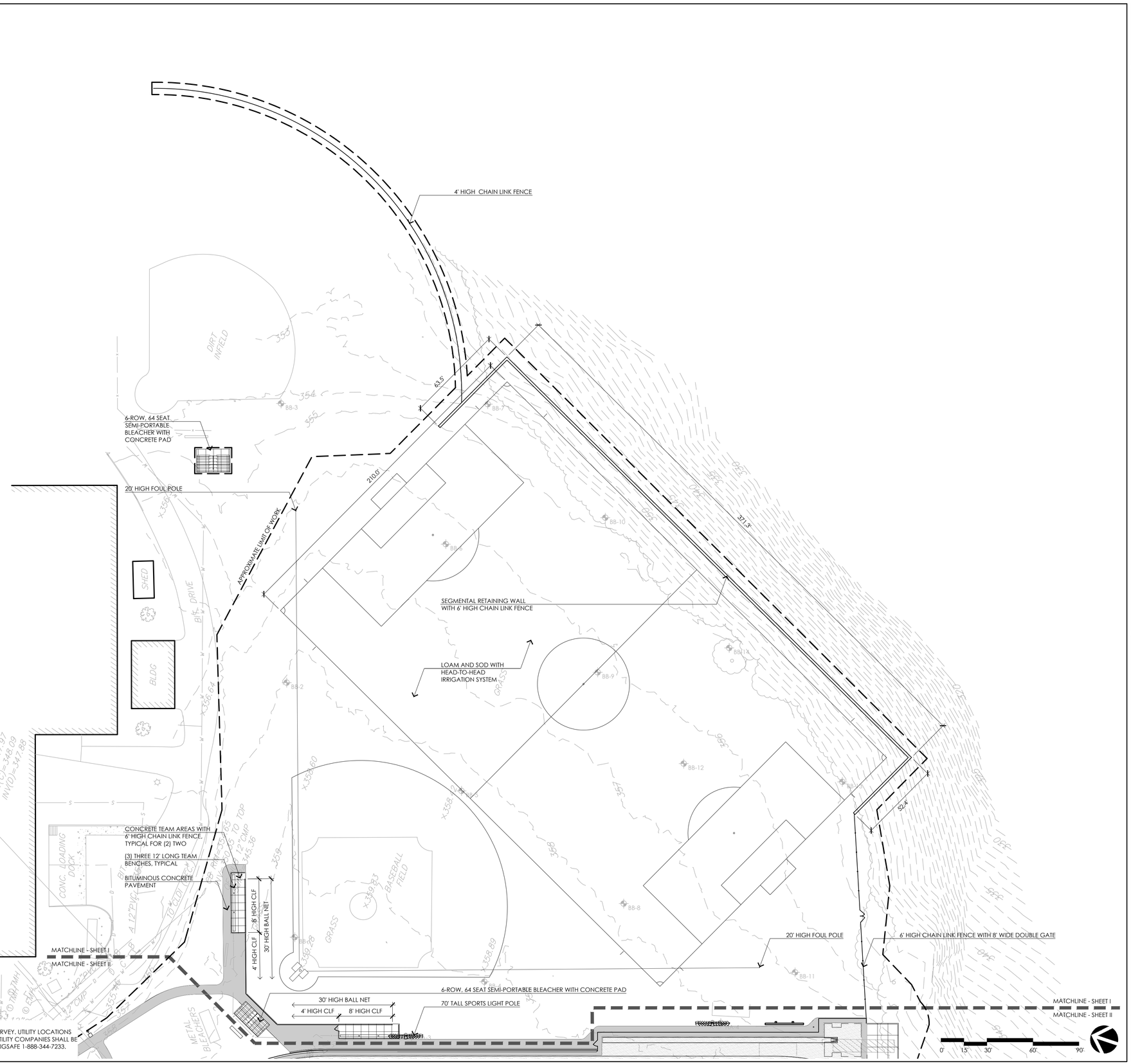
SP1.3

LAYOUT AND MATERIALS NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY LANDTECH INC., LOCATED AT 515 GROTON ROAD, WESTFORD, MA, AND DATED JULY 2, 2021.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR(S) SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS, AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
4. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS, AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
5. WHILE THE CONTRACTOR MAY USE THE ELECTRONIC DRAWINGS FOR LAYOUT PURPOSES, IT IS HIS RESPONSIBILITY TO CHECK ALL LAYOUT IN THE FIELD TO CONFIRM CONFORMITY WITH THE PROJECT DRAWINGS, SPECIFICATIONS, AND APPROVED SHOP DRAWINGS AND SUBMITTALS. USE OF ONLY THE ELECTRONIC DRAWINGS WITHOUT A SITE CHECK OF LAYOUT IS NOT ACCEPTABLE.

LAYOUT AND MATERIALS LEGEND

- APPROXIMATE LIMIT OF WORK
- CHAIN LINK FENCE
- BITUMINOUS CONCRETE PAVEMENT
- CEMENT CONCRETE PAVEMENT
- ATHLETIC LIGHTING
- PEDESTRIAN SITE LIGHTING



CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER -
HALEY & ALDRICH

ELECTRICAL ENGINEER -
NV5

ARCHITECT-
OCO ARCHITECTURE :: DESIGN

SURVEY -
LANDTECH

IRRIGATION -
IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-L1.1-LM_PLAN.dwg
DRAWN:	MJD
CHECKED:	JJC

SEAL:

SHEET TITLE:

LAYOUT AND MATERIALS PLAN SHEET I

SHEET NO:

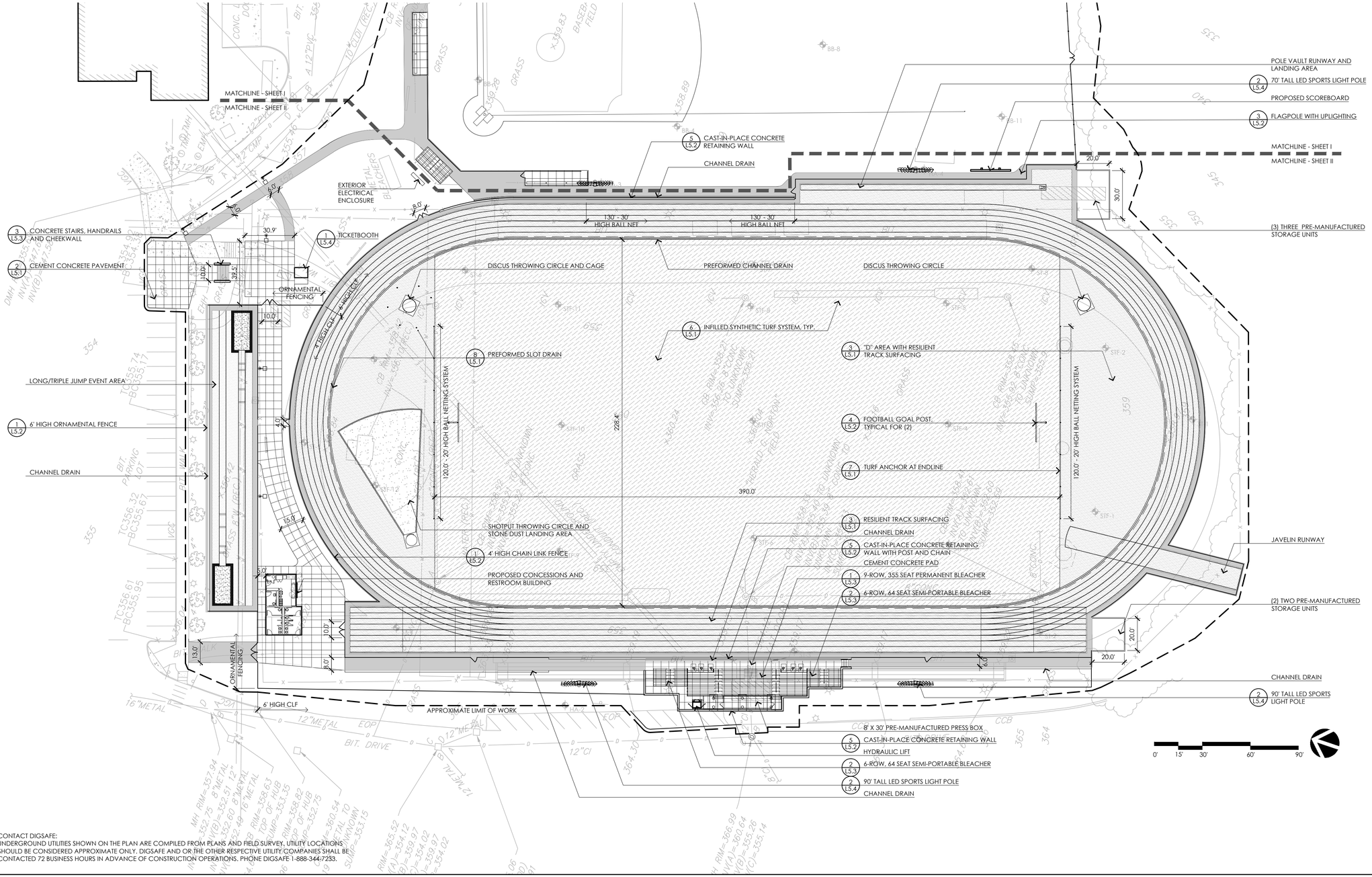
L1.1

LAYOUT AND MATERIALS LEGEND

- APPROXIMATE LIMIT OF WORK
- CHAIN LINK FENCE
- BITUMINOUS CONCRETE PAVEMENT
- CEMENT CONCRETE PAVEMENT
- ATHLETIC LIGHTING
- PEDESTRIAN SITE LIGHTING

LAYOUT AND MATERIALS NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY LANDTECH INC., LOCATED AT 515 GROTON ROAD, WESTFORD, MA, AND DATED JULY 2, 2021.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR(S) SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS, AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
4. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS, AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
5. WHILE THE CONTRACTOR MAY USE THE ELECTRONIC DRAWINGS FOR LAYOUT PURPOSES, IT IS HIS RESPONSIBILITY TO CHECK ALL LAYOUT IN THE FIELD TO CONFIRM CONFORMITY WITH THE PROJECT DRAWINGS, SPECIFICATIONS, AND APPROVED SHOP DRAWINGS AND SUBMITTALS. USE OF ONLY THE ELECTRONIC DRAWINGS WITHOUT A SITE CHECK OF LAYOUT IS NOT ACCEPTABLE.



CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY, UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

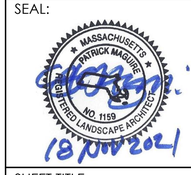
Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-L1.2-LM_PLAN.dwg
DRAWN:	MJD
CHECKED:	JJC

SEAL:



SHEET TITLE:

LAYOUT AND MATERIALS PLAN SHEET II

SHEET NO:

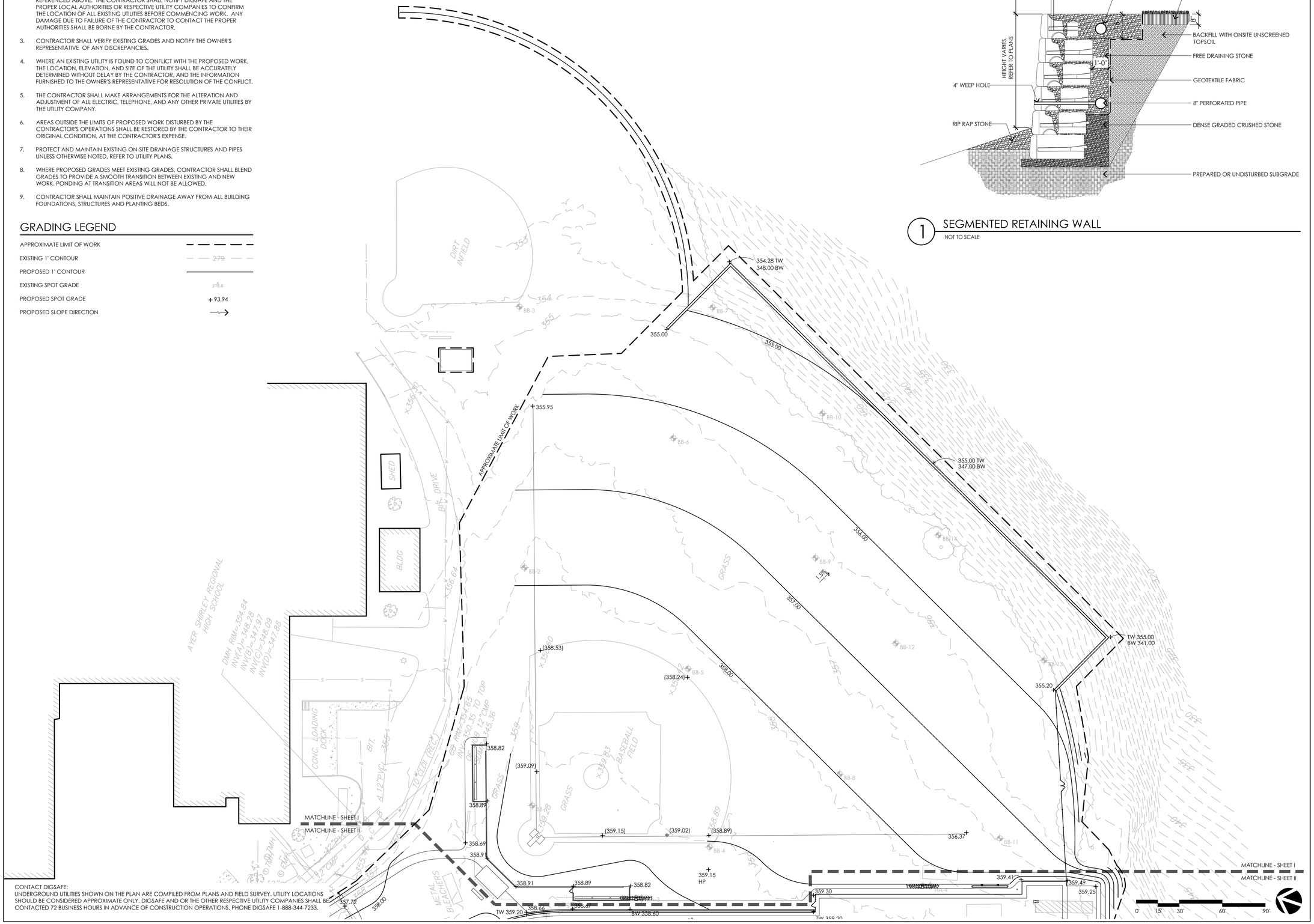
L1.2

GRADING NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY LANDTECH INC., LOCATED AT 515 GROTON ROAD, WESTFORD, MA, AND DATED JULY 2, 2021.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR SHALL VERIFY EXISTING GRADES AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.
4. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
5. THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ALL ELECTRIC, TELEPHONE, AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANY.
6. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION, AT THE CONTRACTOR'S EXPENSE.
7. PROTECT AND MAINTAIN EXISTING ON-SITE DRAINAGE STRUCTURES AND PIPES UNLESS OTHERWISE NOTED, REFER TO UTILITY PLANS.
8. WHERE PROPOSED GRADES MEET EXISTING GRADES, CONTRACTOR SHALL BLEND GRADES TO PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW WORK. PONDING AT TRANSITION AREAS WILL NOT BE ALLOWED.
9. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS, STRUCTURES AND PLANTING BEDS.

GRADING LEGEND

APPROXIMATE LIMIT OF WORK	
EXISTING 1' CONTOUR	279
PROPOSED 1' CONTOUR	
EXISTING SPOT GRADE	278.6
PROPOSED SPOT GRADE	+93.94
PROPOSED SLOPE DIRECTION	



CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

1 SEGMENTED RETAINING WALL
NOT TO SCALE

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH
ELECTRICAL ENGINEER - NV5
ARCHITECT- OCO ARCHITECTURE :: DESIGN
SURVEY - LANDTECH
IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	X"=X'-X"
PROJECT NO.:	21025.00
FILE:	00000.00-LX.X-G_PLAN.dwg
DRAWN:	XXX
CHECKED:	JJC

SEAL:

SHEET TITLE:

GRADING PLAN
SHEET I

SHEET NO:

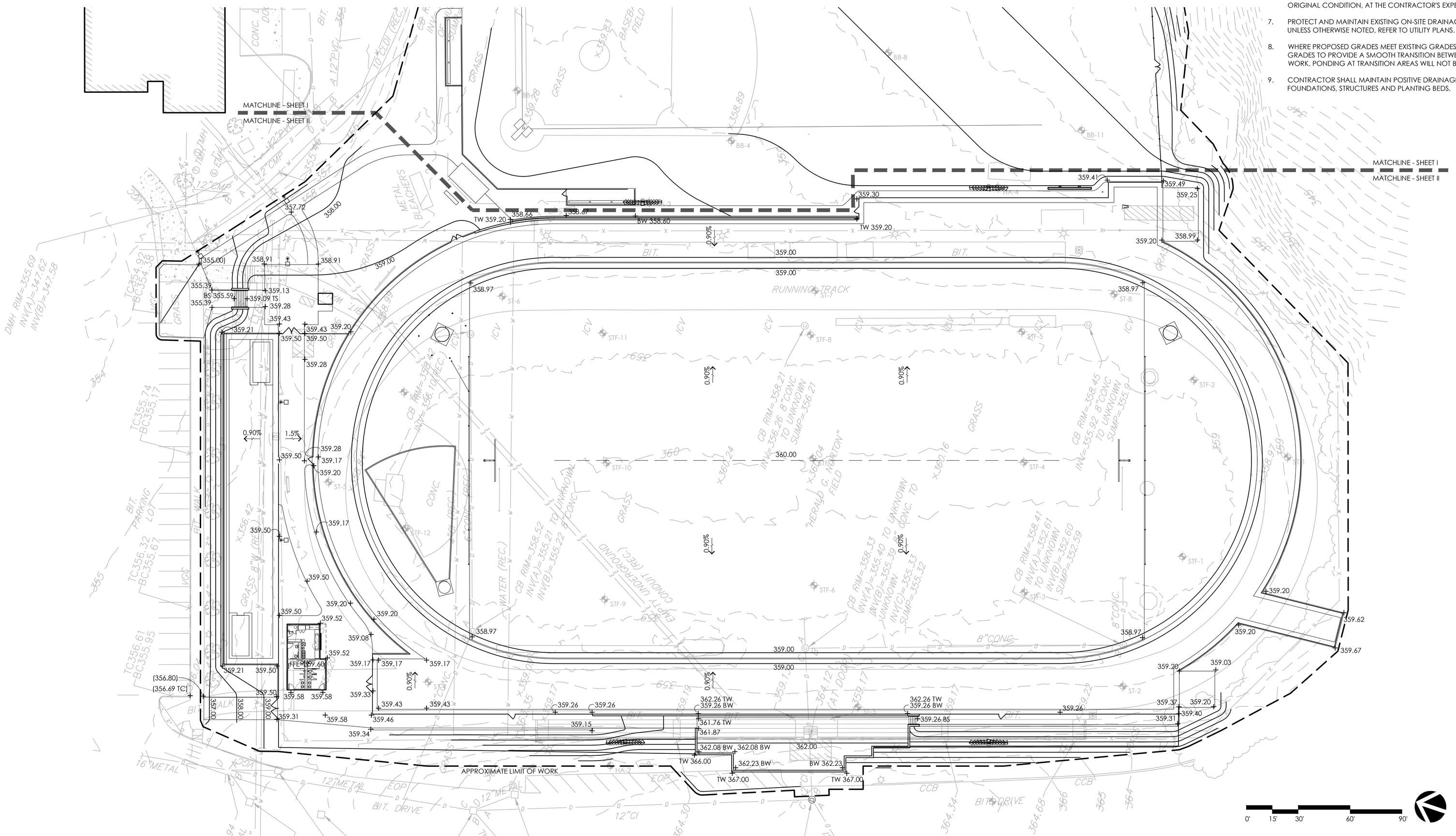
L2.1

GRADING LEGEND

APPROXIMATE LIMIT OF WORK	
EXISTING 1' CONTOUR	279
PROPOSED 1' CONTOUR	
EXISTING SPOT GRADE	278.6
PROPOSED SPOT GRADE	+93.94
PROPOSED SLOPE DIRECTION	

GRADING NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY LANDTECH INC., LOCATED AT 515 GROTON ROAD, WESTFORD, MA, AND DATED JULY 2, 2021.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR SHALL VERIFY EXISTING GRADES AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.
4. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
5. THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ALL ELECTRIC, TELEPHONE, AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANY.
6. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION, AT THE CONTRACTOR'S EXPENSE.
7. PROTECT AND MAINTAIN EXISTING ON-SITE DRAINAGE STRUCTURES AND PIPES UNLESS OTHERWISE NOTED, REFER TO UTILITY PLANS.
8. WHERE PROPOSED GRADES MEET EXISTING GRADES, CONTRACTOR SHALL BLEND GRADES TO PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW WORK. PONDING AT TRANSITION AREAS WILL NOT BE ALLOWED.
9. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS, STRUCTURES AND PLANTING BEDS.



CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	X"=X'-X"
PROJECT NO.:	21025.00
FILE:	00000.00-LX.X-G_PLAN.dwg
DRAWN:	XXX
CHECKED:	JJC

SEAL:

MASSACHUSETTS · PATRICK MAGUIRE · REGISTERED LANDSCAPE ARCHITECT · NO. 1159

18 NOV 2021

SHEET TITLE:

GRADING PLAN
SHEET II

SHEET NO:

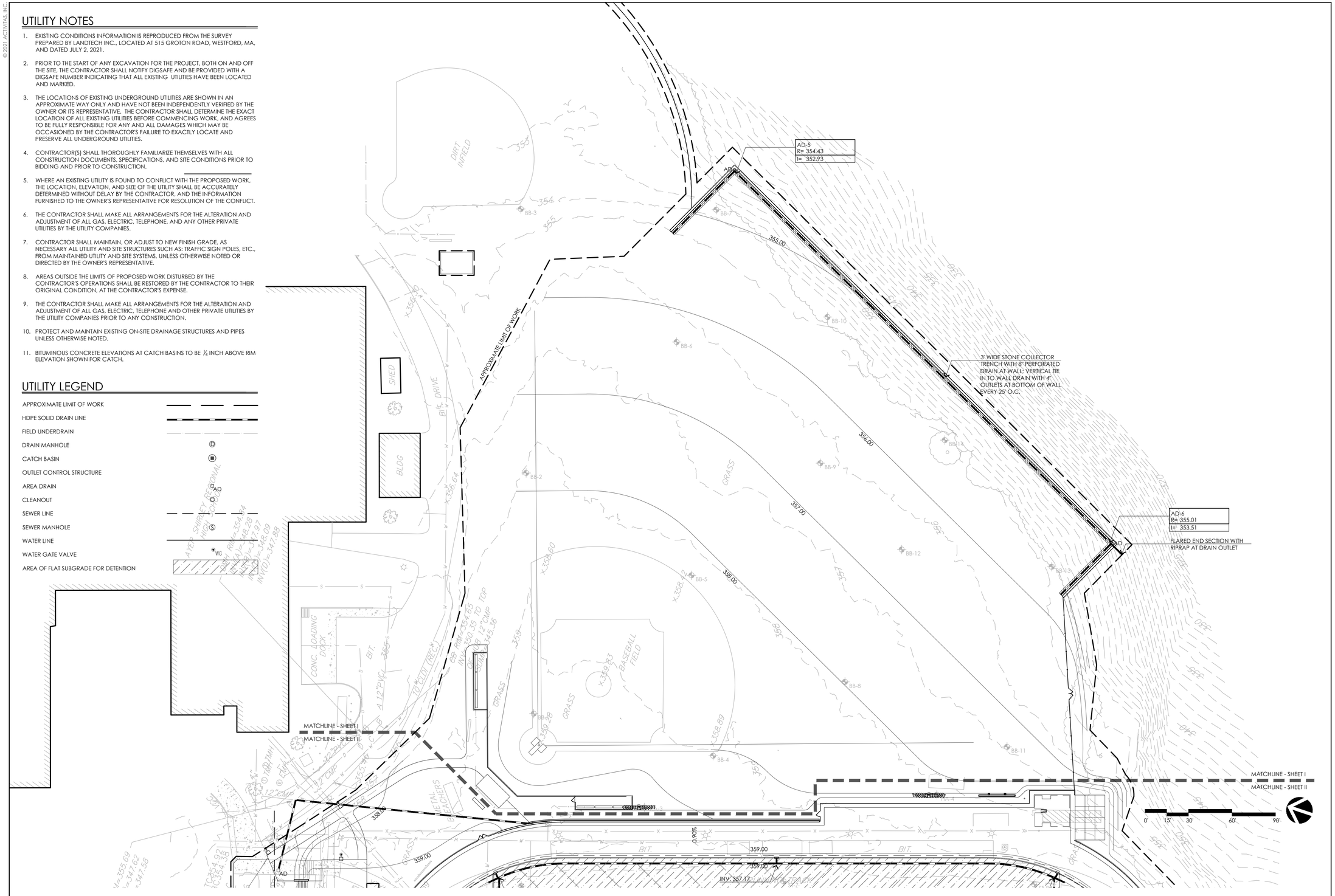
L2.2

UTILITY NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY LANDTECH INC., LOCATED AT 515 GROTON ROAD, WESTFORD, MA, AND DATED JULY 2, 2021.
2. PRIOR TO THE START OF ANY EXCAVATION FOR THE PROJECT, BOTH ON AND OFF THE SITE, THE CONTRACTOR SHALL NOTIFY DIGSAFE AND BE PROVIDED WITH A DIGSAFE NUMBER INDICATING THAT ALL EXISTING UTILITIES HAVE BEEN LOCATED AND MARKED.
3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UNDERGROUND UTILITIES.
4. CONTRACTOR(S) SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS, AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
5. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
6. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ALL GAS, ELECTRIC, TELEPHONE, AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
7. CONTRACTOR SHALL MAINTAIN, OR ADJUST TO NEW FINISH GRADE, AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS: TRAFFIC SIGN POLES, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS, UNLESS OTHERWISE NOTED OR DIRECTED BY THE OWNER'S REPRESENTATIVE.
8. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION, AT THE CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ALL GAS, ELECTRIC, TELEPHONE AND OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION.
10. PROTECT AND MAINTAIN EXISTING ON-SITE DRAINAGE STRUCTURES AND PIPES UNLESS OTHERWISE NOTED.
11. BITUMINOUS CONCRETE ELEVATIONS AT CATCH BASINS TO BE ¼ INCH ABOVE RIM ELEVATION SHOWN FOR CATCH.

UTILITY LEGEND

- APPROXIMATE LIMIT OF WORK
- HDPE SOLID DRAIN LINE
- FIELD UNDERDRAIN
- DRAIN MANHOLE
- CATCH BASIN
- OUTLET CONTROL STRUCTURE
- AREA DRAIN
- CLEANOUT
- SEWER LINE
- SEWER MANHOLE
- WATER LINE
- WATER GATE VALVE
- AREA OF FLAT SUBGRADE FOR DETENTION



CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

ARCHITECT -
OCO ARCHITECTURE :: DESIGN

GEOTECHNICAL ENGINEER -
HALEY & ALDICH

ELECTRICAL ENGINEER -
NV5

SURVEY -
LANDTECH CONSULTANTS

IRRIGATION -
IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-L1.3-UT_PLAN.dwg
DRAWN:	MEB
CHECKED:	JJC

SEAL:

COMMONWEALTH OF MASSACHUSETTS
MEGAN E. BUCZYNSKI
CIVIL
No. 47382
REGISTERED PROFESSIONAL ENGINEER
11-15-21

SHEET TITLE:

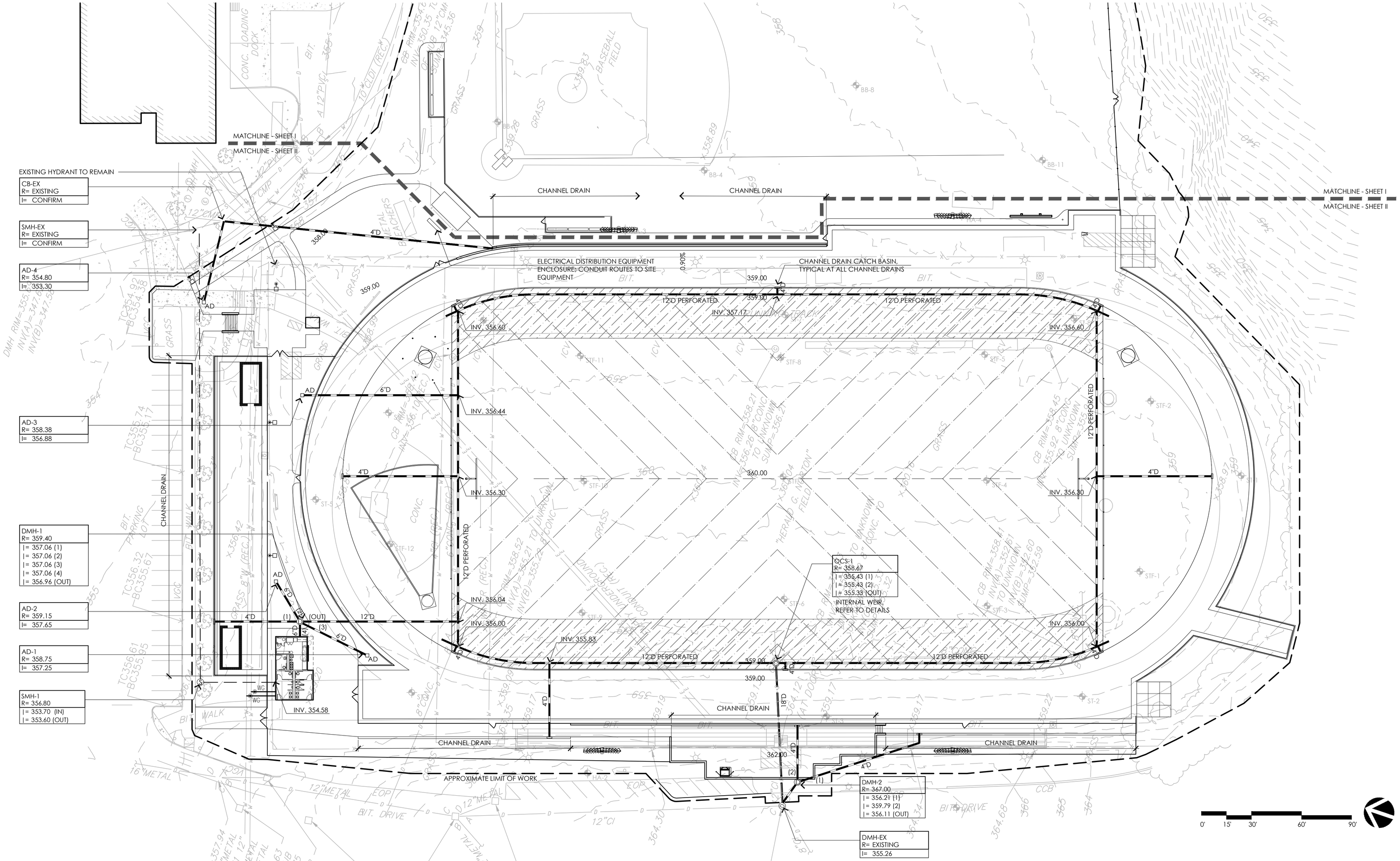
UTILITY PLAN SHEET I

SHEET NO:

L3.1

UTILITY LEGEND

APPROXIMATE LIMIT OF WORK		SEWER LINE	
HDPE SOLID DRAIN LINE		SEWER MANHOLE	S
FIELD UNDERDRAIN		WATER LINE	
DRAIN MANHOLE	D	WATER GATE VALVE	WG
CATCH BASIN		AREA OF FLAT SUBGRADE FOR DETENTION	
OUTLET CONTROL STRUCTURE			
AREA DRAIN	AD		
CLEANOUT	C		



CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

ARCHITECT -
OCO ARCHITECTURE :: DESIGN

GEOTECHNICAL ENGINEER -
HALEY & ALDICH

ELECTRICAL ENGINEER -
NV5

SURVEY -
LANDTECH CONSULTANTS

IRRIGATION -
IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-L1.3-UT_PLAN.dwg
DRAWN:	MEB
CHECKED:	JJC

SEAL:

COMMONWEALTH OF MASSACHUSETTS
MEGAN E. BUCZYNSKI
CIVIL
No. 47362
REGISTERED PROFESSIONAL ENGINEER
11-18-21

SHEET TITLE:

UTILITY PLAN SHEET II

SHEET NO:

L3.2

PLANTING NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY LANDTECH INC., LOCATED AT 515 GROTON ROAD, WESTFORD, MA, AND DATED JULY 2, 2021.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR SHALL BEGIN MAINTENANCE IMMEDIATELY AFTER PLANTING AND WILL CONTINUE UNTIL FINAL WRITTEN ACCEPTANCE OF PLANT MATERIAL.
4. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM PROPOSED BUILDING, STRUCTURES, AND PLANTING BEDS.
5. THE LANDSCAPE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE ALL PLANTINGS SHOWN ON THIS DRAWING.
6. ALL MATERIALS SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.
7. ALL PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS TO ORIGINAL GRADES BEFORE DIGGING.
8. FINAL LAYOUT OF PLANTINGS WILL BE IN THE FIELD PER THE DIRECTION OF THE LANDSCAPE ARCHITECT, PROVIDE A MINIMUM FORTY-EIGHT (48) HOURS NOTICE PRIOR TO BEGINNING FINAL LAYOUT AND PLANTING OPERATIONS.
9. ALL PLANTS TO BE BALLED IN BURLAP OR CONTAINERIZED.
10. ALL PLANTED AREAS TO BE EDGED AND MULCHED WITH AGED PINE BARK: PARTIALLY DECOMPOSED, JET BLACK IN COLOR AND FREE OF WOOD CHIPS THICKER THAN 1/4 INCH.
11. LANDSCAPE ISLAND PLANTING SOIL MIX: UTILIZE EXISTING SITE LOAM FROM STOCKPILES. THOROUGHLY INCORPORATE WITH COMPOST AS NEEDED PER SOILS ANALYSIS. FERTILIZE PER RECOMMENDED RATES IN SOIL ANALYSIS.
12. TREE PIT PLANTING SOIL MIX: REFER TO SPECIFICATIONS FOR CU STRUCTURAL SOIL.
13. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR ONE (1) FULL YEAR FROM DATE OF ACCEPTANCE.
14. ALL PLANT MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT, AT THE NURSERY, AND AT THE SITE.
15. ALL AREAS OF THE SITE WHICH HAVE BEEN DISTURBED AND NOT OTHERWISE DEVELOPED SHALL BE LOAMED AND SEEDED WITH A MINIMUM DEPTH OF 12" DEPTH TOPSOIL UNLESS OTHERWISE NOTED.
16. SLOPES 3:1 AND GREATER SHALL RECEIVE STRAW BLANKET PRIOR TO SEEDING.

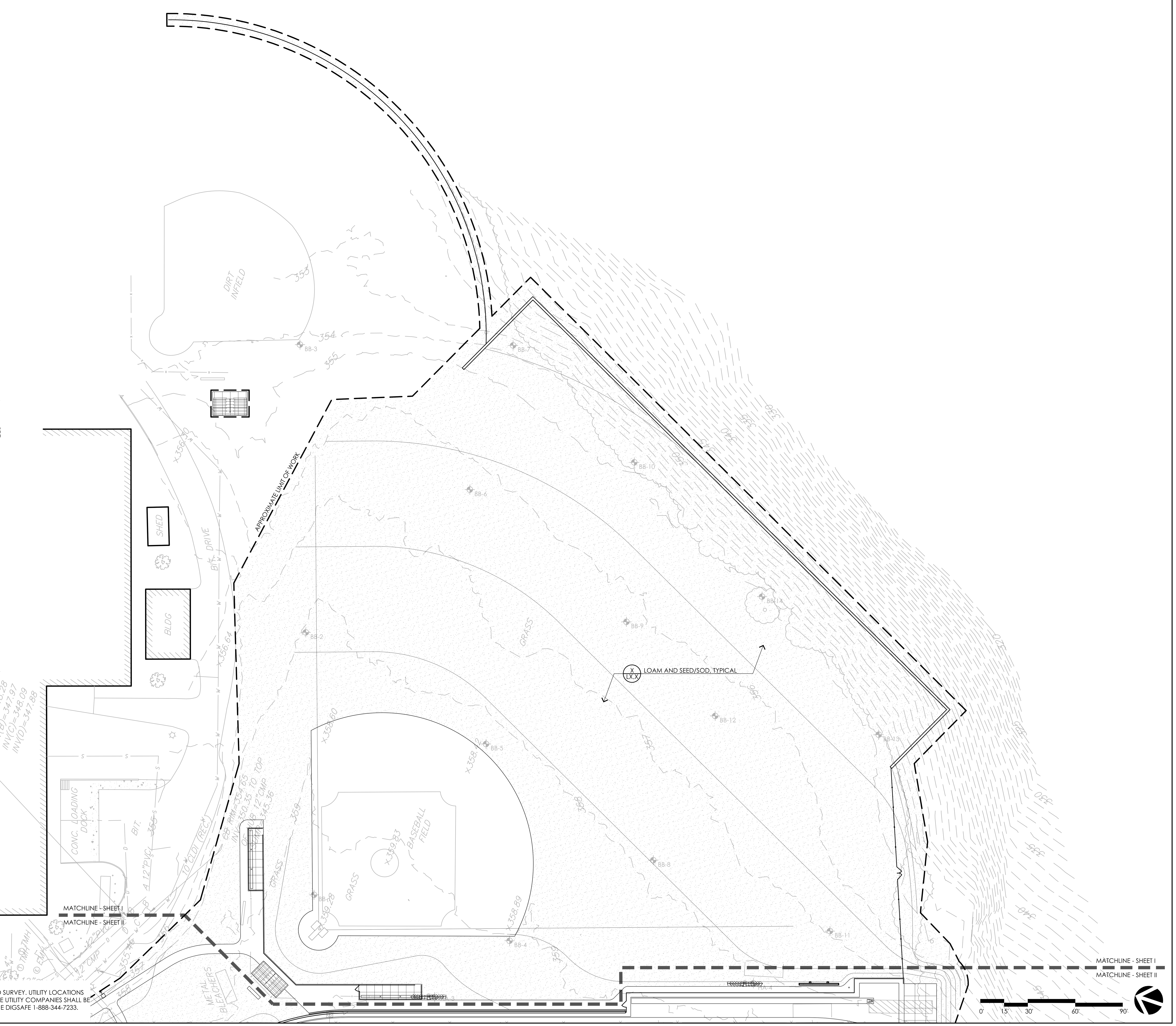
PLANTING LEGEND

APPROXIMATE LIMIT OF WORK

PROPOSED 1' CONTOURS

PERENNIALS, GROUNDCOVER, AND GRASSES

LOAM AND SEED/SOD



CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS, PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-L4.1-P_PLAN.dwg
DRAWN:	KH
CHECKED:	JJC

SEAL:

MASSACHUSETTS PATRICK MAGUIRE REGISTERED LANDSCAPE ARCHITECT NO. 1159

18 NOV 2021

SHEET TITLE:

PLANTING PLAN
SHEET I

SHEET NO:

L4.1

PLANTING LEGEND

APPROXIMATE LIMIT OF WORK

PROPOSED 1' CONTOURS

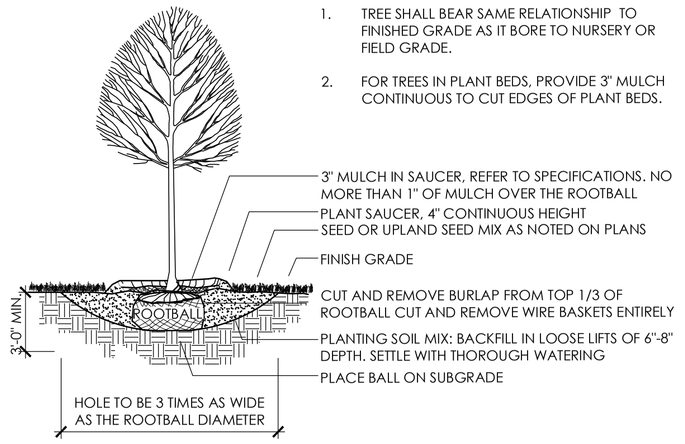
PERENNIALS, GROUNDCOVER, AND GRASSES

LOAM AND SEED/SOD

DECIDUOUS TREE PLANTING

NOTES:

1. TREE SHALL BEAR SAME RELATIONSHIP TO FINISHED GRADE AS IT BORE TO NURSERY OR FIELD GRADE.
2. FOR TREES IN PLANT BEDS, PROVIDE 3" MULCH CONTINUOUS TO CUT EDGES OF PLANT BEDS.

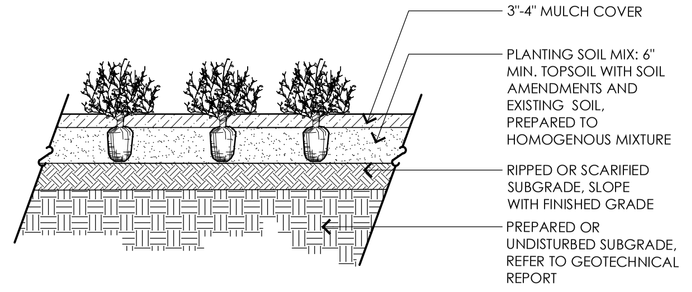


1 DECIDUOUS TREE PLANTING

NOT TO SCALE

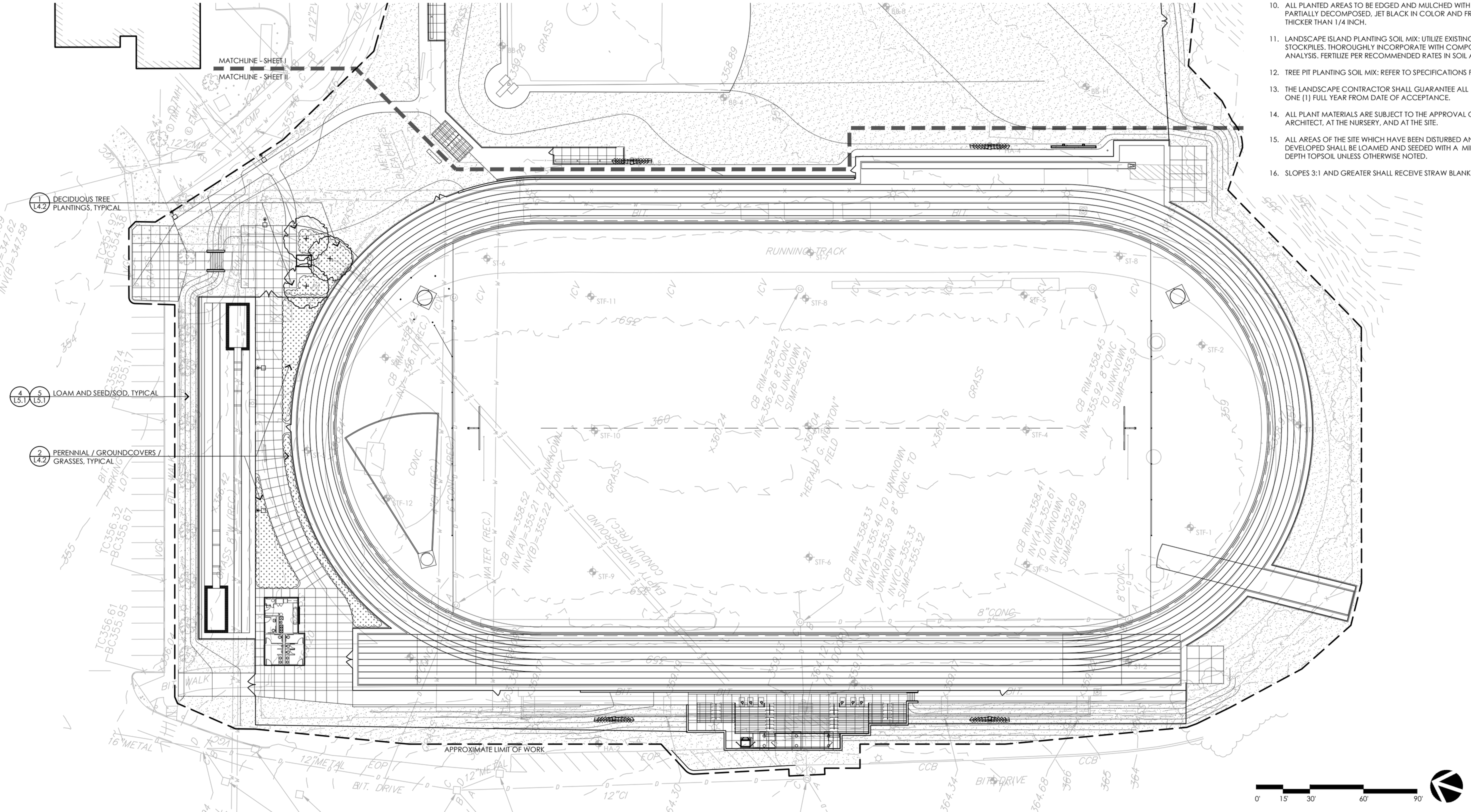
NOTE:

REFER TO PLANTING SCHEDULE FOR SPACING REQUIREMENTS.



2 PERENNIALS/GROUNDCOVERS/GRASSES

NOT TO SCALE



CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

PLANTING NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY LANDTECH INC., LOCATED AT 515 GROTON ROAD, WESTFORD, MA, AND DATED JULY 2, 2021.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR SHALL BEGIN MAINTENANCE IMMEDIATELY AFTER PLANTING AND WILL CONTINUE UNTIL FINAL WRITTEN ACCEPTANCE OF PLANT MATERIAL.
4. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM PROPOSED BUILDING, STRUCTURES, AND PLANTING BEDS.
5. THE LANDSCAPE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE ALL PLANTINGS SHOWN ON THIS DRAWING.
6. ALL MATERIALS SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.
7. ALL PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS TO ORIGINAL GRADES BEFORE DIGGING.
8. FINAL LAYOUT OF PLANTINGS WILL BE IN THE FIELD PER THE DIRECTION OF THE LANDSCAPE ARCHITECT. PROVIDE A MINIMUM FORTY-EIGHT (48) HOURS NOTICE PRIOR TO BEGINNING FINAL LAYOUT AND PLANTING OPERATIONS.
9. ALL PLANTS TO BE BALLED IN BURLAP OR CONTAINERIZED.
10. ALL PLANTED AREAS TO BE EDGED AND MULCHED WITH AGED PINE BARK; PARTIALLY DECOMPOSED, JET BLACK IN COLOR AND FREE OF WOOD CHIPS THICKER THAN 1/4 INCH.
11. LANDSCAPE ISLAND PLANTING SOIL MIX: UTILIZE EXISTING SITE LOAM FROM STOCKPILES, THOROUGHLY INCORPORATE WITH COMPOST AS NEEDED PER SOILS ANALYSIS. FERTILIZE PER RECOMMENDED RATES IN SOIL ANALYSIS.
12. TREE PIT PLANTING SOIL MIX: REFER TO SPECIFICATIONS FOR CU STRUCTURAL SOIL.
13. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR ONE (1) FULL YEAR FROM DATE OF ACCEPTANCE.
14. ALL PLANT MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT, AT THE NURSERY, AND AT THE SITE.
15. ALL AREAS OF THE SITE WHICH HAVE BEEN DISTURBED AND NOT OTHERWISE DEVELOPED SHALL BE LOAMED AND SEEDED WITH A MINIMUM DEPTH OF 12" DEPTH TOPSOIL UNLESS OTHERWISE NOTED.
16. SLOPES 3:1 AND GREATER SHALL RECEIVE STRAW BLANKET PRIOR TO SEEDING.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL
Ayer, Massachusetts
NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-4.2-P_PLAN.dwg
DRAWN:	KH
CHECKED:	JJC

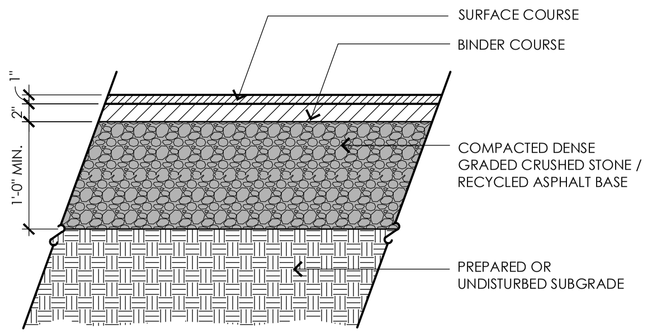
SEAL:

SHEET TITLE:

PLANTING PLAN
SHEET II

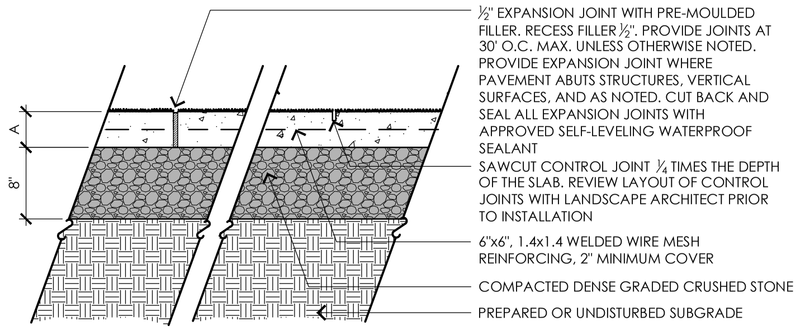
SHEET NO:

L4.2

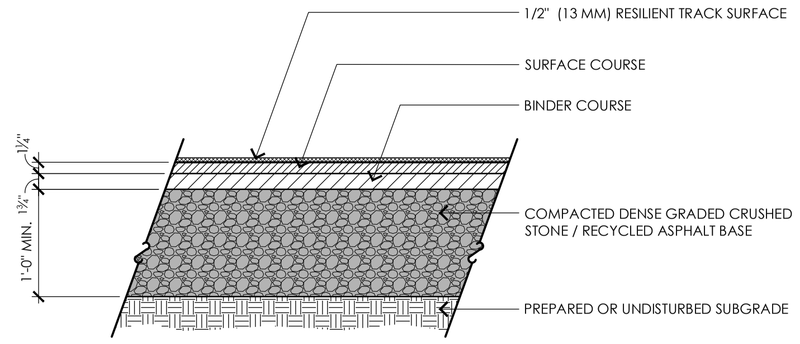


1 BITUMINOUS CONCRETE PAVEMENT
NOT TO SCALE

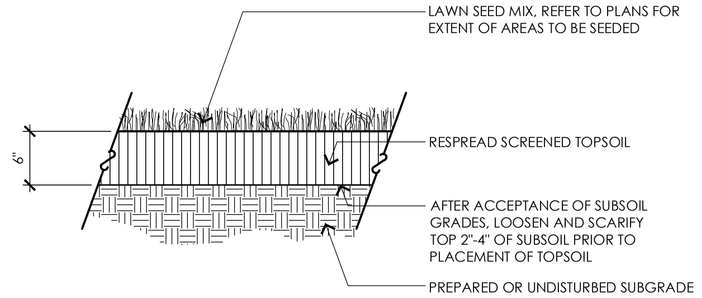
	A
WALKWAYS	4"
BLEACHERS	6"



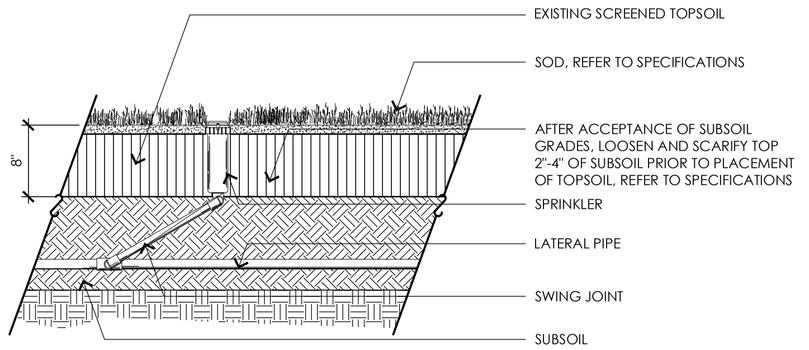
2 CEMENT CONCRETE PAVEMENT
NOT TO SCALE



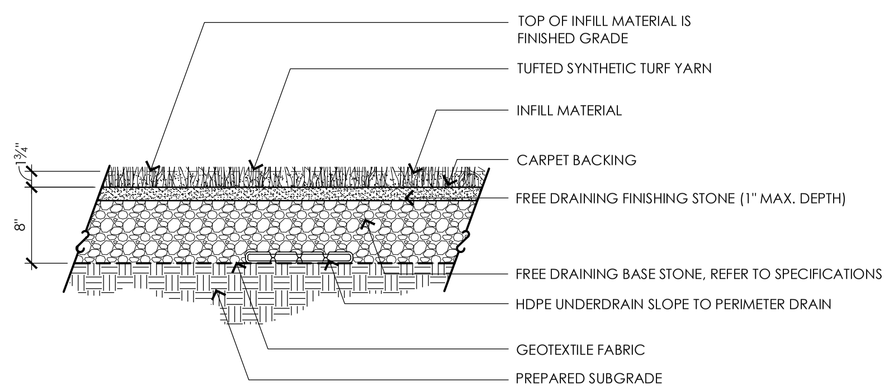
3 RESILIENT TRACK SURFACING
NOT TO SCALE



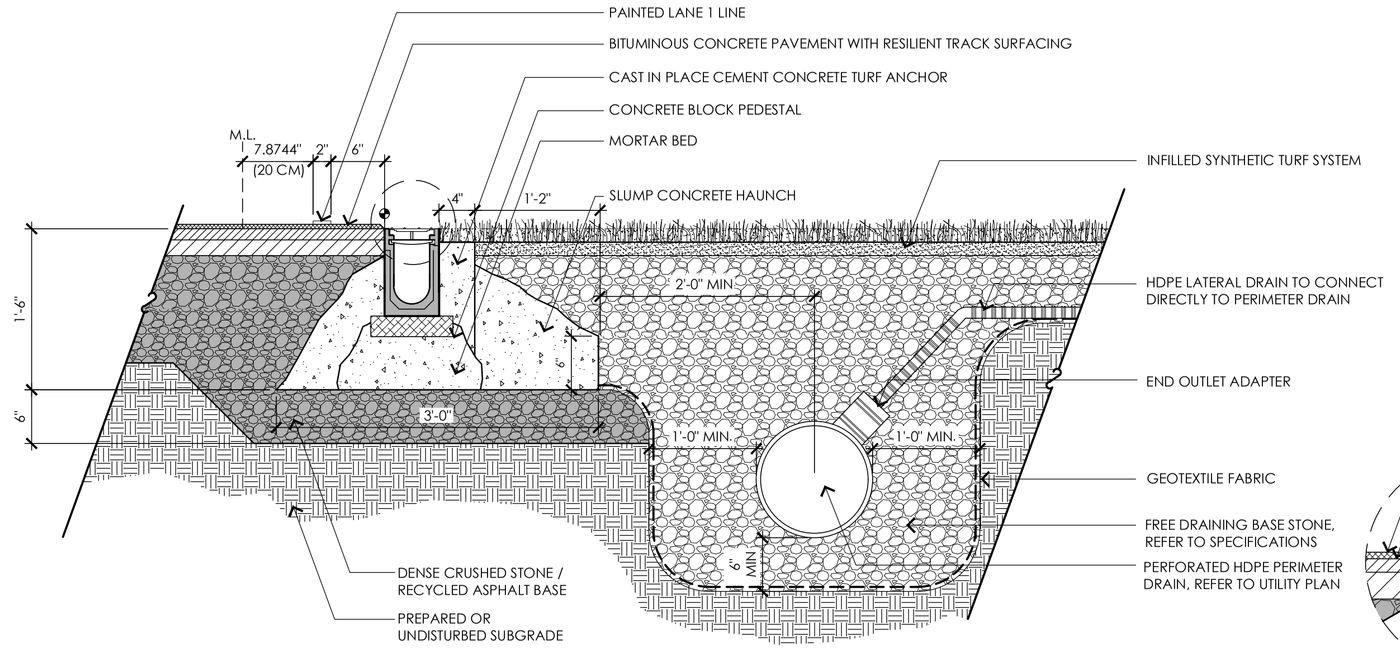
4 LOAM AND SEED
NOT TO SCALE



5 LOAM AND SOD
NOT TO SCALE



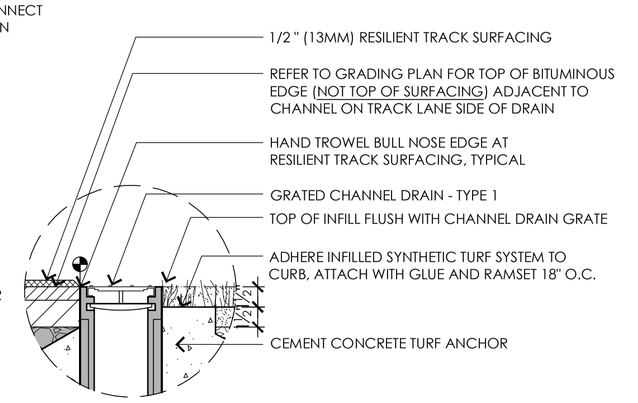
6 INFILLED SYNTHETIC TURF SYSTEM
NOT TO SCALE



7 CHANNEL DRAIN AND CEMENT CONCRETE TURF ANCHOR AT FIELD SIDELINE
NOT TO SCALE

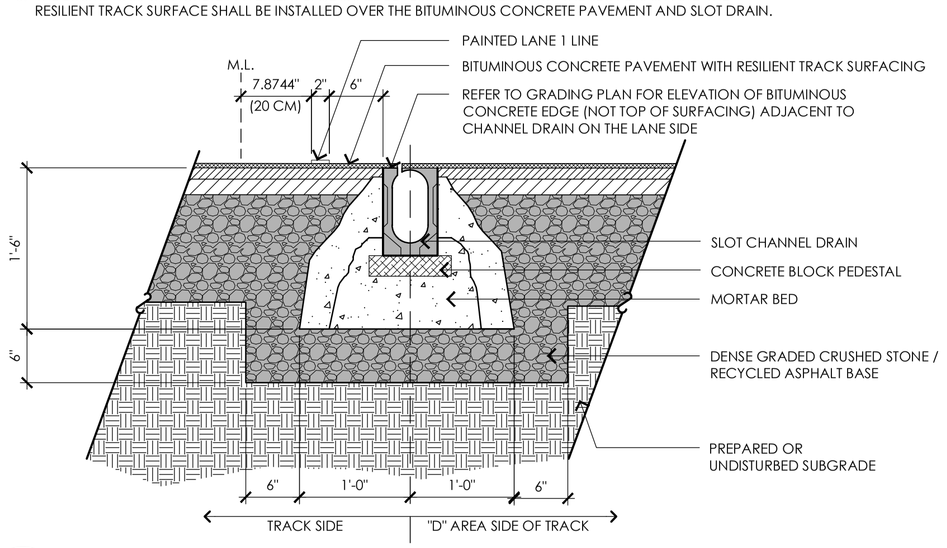
NOTES:

1. REFER TO SITE PREPARATION PLAN (SP1.2) FOR RECYCLED ASPHALT BASE.
2. DESIGN OF CHANNEL DRAINS VARY PER MANUFACTURER, CHANNEL DRAIN SHOWN FOR GRAPHIC AND INSTALLATION INTENT ONLY. REFER TO SPECIFICATIONS FOR ACCEPTABLE MANUFACTURERS,
3. THE BITUMINOUS CONCRETE PAVEMENT BASE SHALL BE FLUSH WITH THE TOP OF THE CHANNEL DRAIN AND THE RESILIENT TRACK SURFACE SHALL HAVE A HAND TROWELED BULL-NOSE EDGE AT THE CHANNEL DRAIN,
4. REFER TO GRADING AND UTILITY PLANS AND SPECIFICATIONS FOR MATERIAL AND INSTALLATION REQUIREMENT FOR HDPE PERIMETER DRAIN,

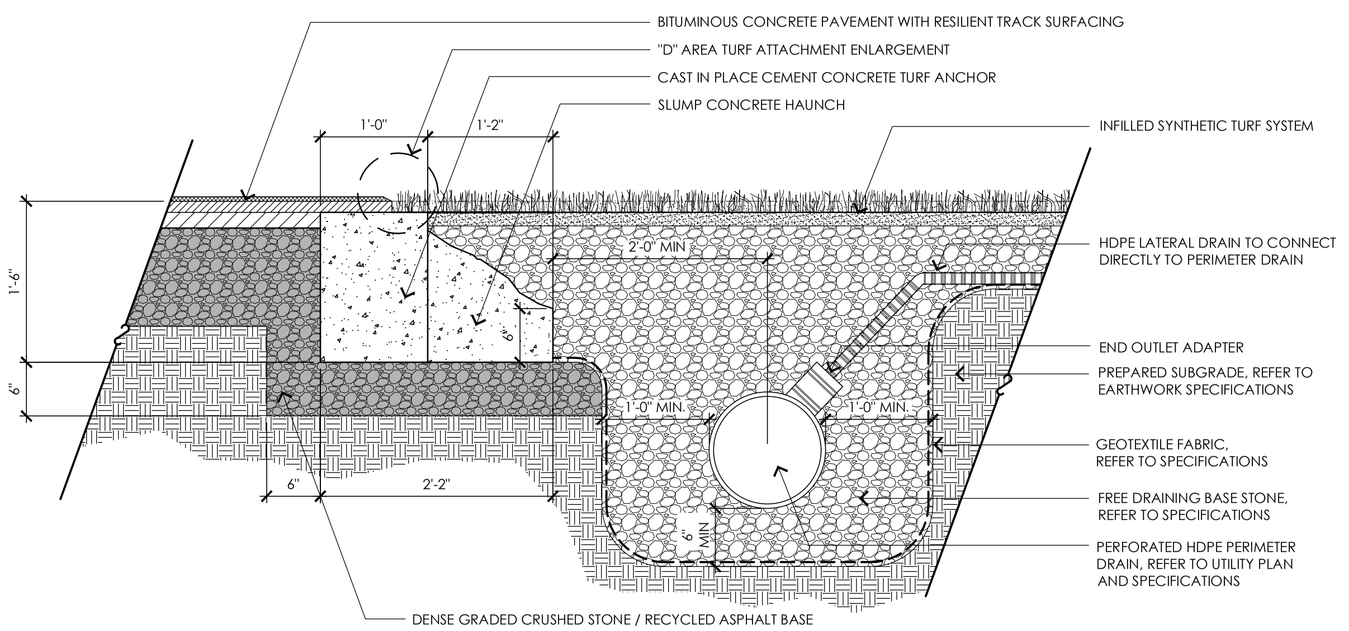


NOTES:

1. REFER TO SITE PREPARATION PLAN (SP1.1) AND SPECIFICATIONS FOR RECYCLED ASPHALT BASE.
2. DESIGN OF SLOT DRAINS VARY PER MANUFACTURER, SLOT DRAIN SHOWN FOR GRAPHIC AND INSTALLATION INTENT ONLY. REFER TO SPECIFICATIONS FOR ACCEPTABLE MANUFACTURERS.
3. THE BITUMINOUS CONCRETE PAVEMENT BASE SHALL BE FLUSH WITH THE TOP OF THE SLOT DRAIN AND THE RESILIENT TRACK SURFACE SHALL BE INSTALLED OVER THE BITUMINOUS CONCRETE PAVEMENT AND SLOT DRAIN.



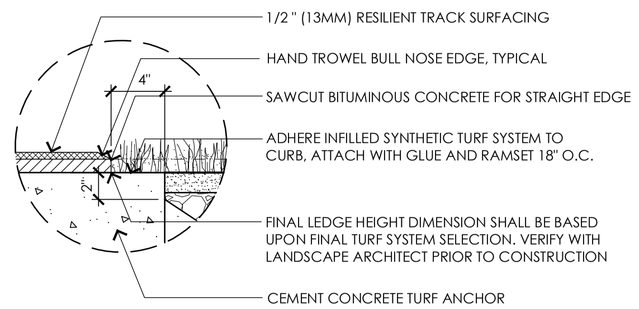
8 SLOT CHANNEL DRAIN AT "D" AREA
NOT TO SCALE



9 CEMENT CONCRETE TURF ANCHOR AT "D" AREA
NOT TO SCALE

NOTES:

1. REFER TO GRADING AND UTILITY PLANS AND SPECIFICATIONS FOR MATERIAL AND INSTALLATION REQUIREMENT FOR HDPE LATERAL PIPE.



"D" AREA TURF ATTACHMENT ENLARGEMENT

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL
Ayer, Massachusetts
NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

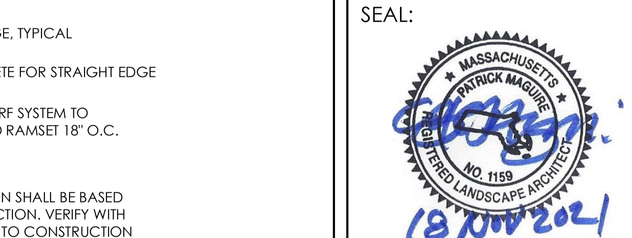
Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	AS NOTED
PROJECT NO.:	21025.00
FILE:	21025.00-L5.1-DET_1.dwg
DRAWN:	MJD
CHECKED:	JJC

SEAL:

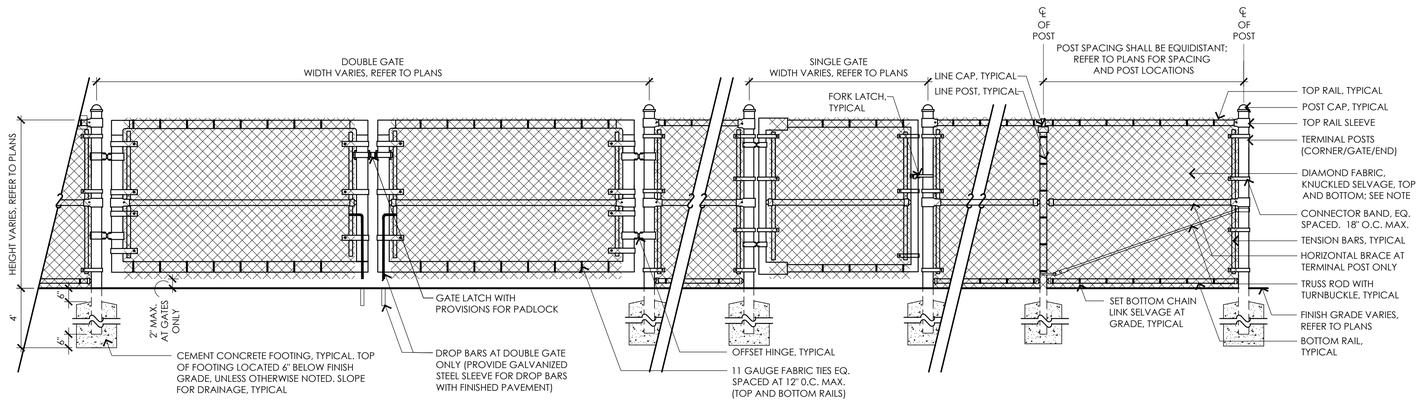


SHEET TITLE:

DETAIL SHEET I

SHEET NO:

L5.1



NOTES:

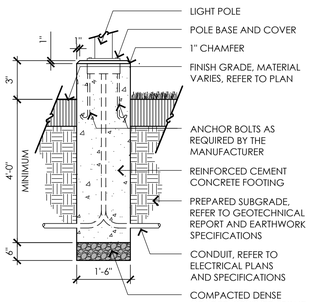
1. FENCE FABRIC TOP SHALL BE EVEN WITH TOP OF TOP RAIL.
2. TOP OF CONCRETE FENCE POST FOOTING TO HAVE SLOPE TO PROMOTE POSITIVE DRAINAGE.
3. GATES SHALL SWING 180° DEGREES SO THAT WHEN FULLY OPEN GATE PANELS SHALL BE PARALLEL TO CHAIN LINK FENCE.
4. REFER TO SPECIFICATIONS FOR MATERIAL GAUGE.

CONCRETE FOOTING DEPTH X WIDTH

	H
TERMINAL	48"x18"
LINE	48"x15"

	H		
	3'-6"	4'-0"	6'-0"
TERMINAL POSTS	2.375	2.375	2.375
LINE POSTS	1.90	1.90	1.90
TOP RAIL	1.660	1.660	1.660
BOTTOM RAIL	1.660	1.660	1.660
CENTER RAIL	N/A	N/A	N/A
HORIZONTAL BRACE	N/A	N/A	1.660
TRUSS ROD	N/A	N/A	5/16"

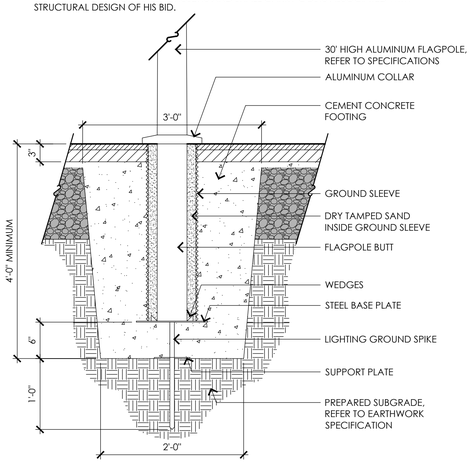
1 CHAIN LINK FENCE AND GATES
NOT TO SCALE



2 SITE LIGHT POLE FOOTING
NOT TO SCALE

NOTES:

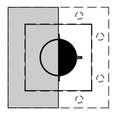
1. CONCRETE FOOTING DEPTH AND WIDTH FOR 30' HIGH ALUMINUM FLAGPOLE. ALTERNATE FLAGPOLE HEIGHT MAY REQUIRE DIFFERENT SIZE FOOTING, REFER TO SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS
2. FLAGPOLE FOOTING SHOWN FOR INTENT ONLY. CONTRACTOR SHALL PROVIDE (AT HIS OWN COST) STRUCTURAL DESIGN OF THE FOUNDATIONS BY A STRUCTURAL ENGINEER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS AND SHALL CARRY COSTS ASSOCIATED WITH STRUCTURAL DESIGN OF HIS BID.



3 FLAGPOLE WITH UPLIGHTS
NOT TO SCALE

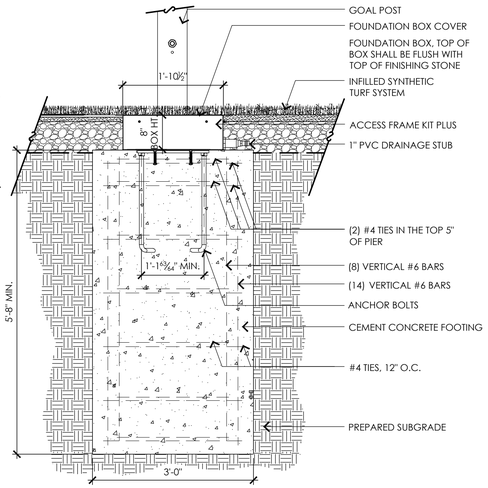
NOTES:

1. SIZE OF FOOTBALL GOAL POST FOOTING IS SHOWN FOR INTENT ONLY. CONTRACTOR SHALL PROVIDE (AT HIS OWN COST) STRUCTURAL DESIGN OF THE FOUNDATIONS BY A STRUCTURAL ENGINEER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS AND SHALL CARRY COSTS ASSOCIATED WITH THE INSTALLATION OF THE STRUCTURAL DESIGN IN HIS BID.
2. REBAR SHOWN FOR INTENT ONLY. MUST BE PROVIDED IN SHOP DRAWINGS NOTED ABOVE.

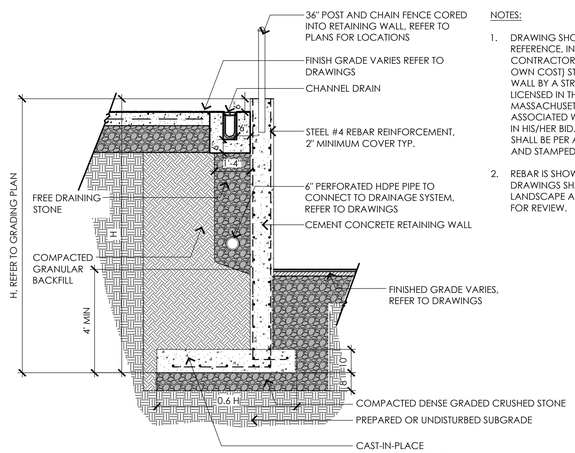


PROVIDE HALF PATCH COVERS (2)

PROVIDE FULL PATCH COVER



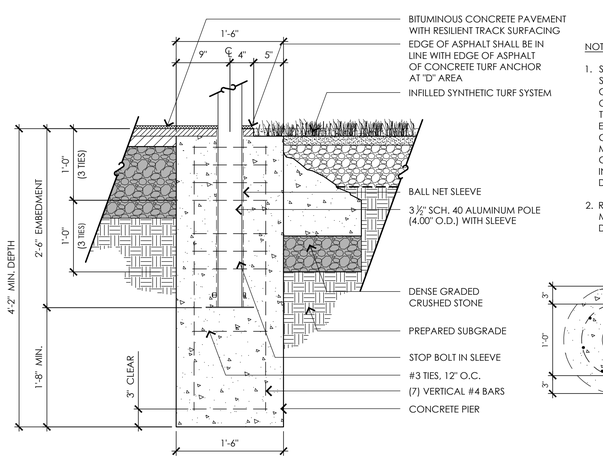
4 GOAL POST FOOTING
NOT TO SCALE



NOTES:

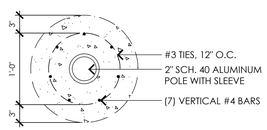
1. DRAWING SHOWN FOR GENERAL REFERENCE, INTENT, AND PRICING ONLY. CONTRACTOR SHALL PROVIDE (AT HIS/HER OWN COST) STRUCTURAL DESIGN OF THE WALL BY A STRUCTURAL ENGINEER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS AND SHALL CARRY COSTS ASSOCIATED WITH THE STRUCTURAL DESIGN IN HIS/HER BID. FINAL LAYOUT AND DETAILS SHALL BE PER APPROVED SHOP DRAWINGS AND STAMPED STRUCTURAL DRAWINGS.
2. REBAR IS SHOWN FOR INTENT ONLY. SHOP DRAWINGS SHALL BE PROVIDED TO LANDSCAPE ARCHITECT/CIVIL ENGINEER FOR REVIEW.

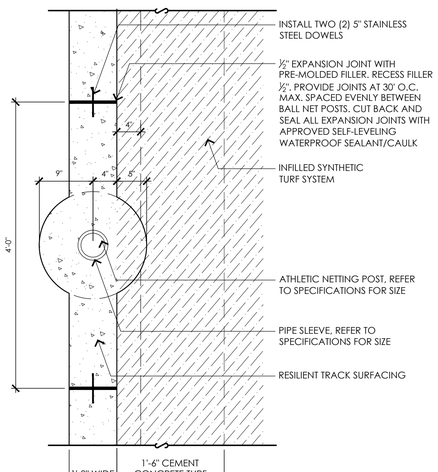
5 CAST-IN-PLACE CONCRETE RETAINING WALL AT TRACK BLEACHERS
NOT TO SCALE



NOTES:

1. SIZE OF BALL NET POST FOOTING IS SHOWN FOR INTENT ONLY. CONTRACTOR SHALL PROVIDE (AT HIS OWN COST) STRUCTURAL DESIGN OF THE FOUNDATIONS BY A STRUCTURAL ENGINEER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS AND SHALL CARRY COSTS ASSOCIATED WITH THE INSTALLATION OF THE STRUCTURAL DESIGN IN HIS BID.
2. REBAR SHOWN FOR INTENT ONLY. MUST BE PROVIDED IN SHOP DRAWINGS NOTED ABOVE.





PLAN

6 BALL NETTING IN "D" AREA TURF ANCHOR
NOT TO SCALE

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL
Ayer, Massachusetts
NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	AS NOTED
PROJECT NO.:	21025.00
FILE:	21025.00-L5.2-DET_2.dwg
DRAWN:	MJD
CHECKED:	JJC

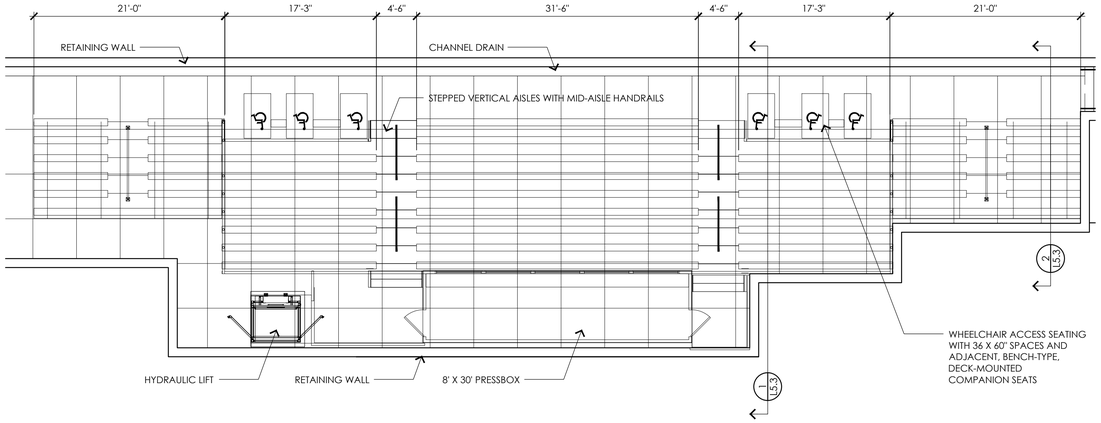
SEAL:

SHEET TITLE:

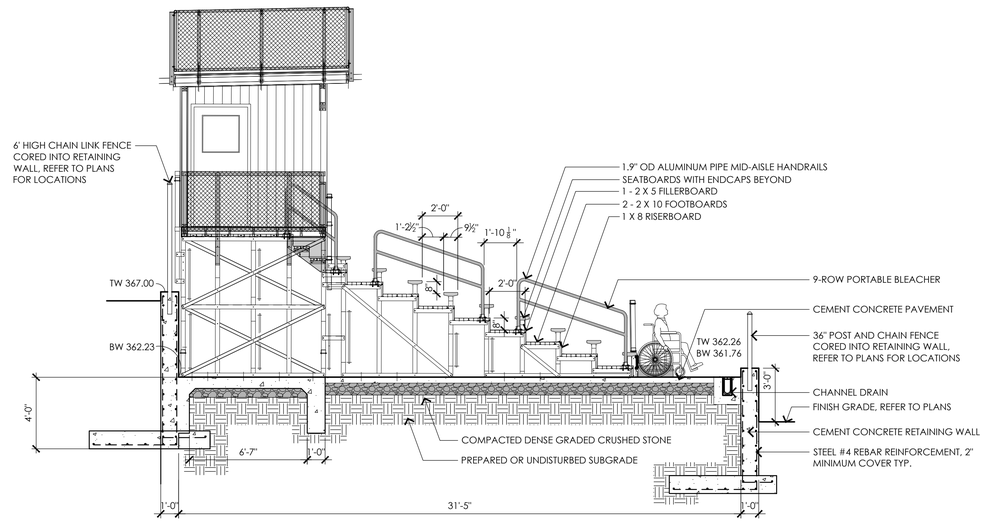
DETAIL SHEET II

SHEET NO:

L5.2



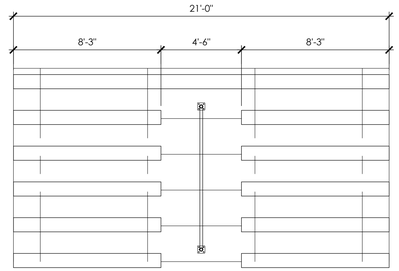
PLAN VIEW



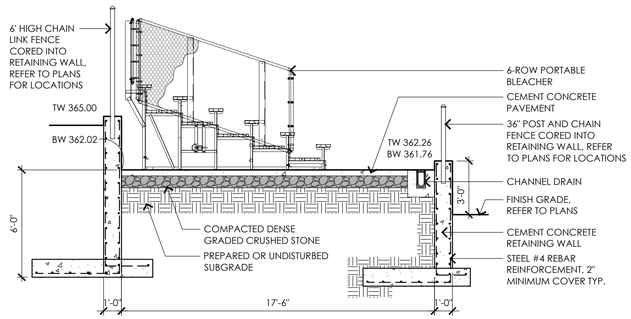
SECTION

1 PERMANENT 9-ROW 355 SEAT BLEACHER, PRESS BOX AND LIFT LAYOUT AND SECTION

NOT TO SCALE



PLAN VIEW



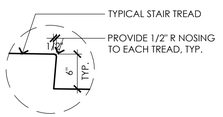
SECTION

2 6-ROW, 64 SEAT SEMI-PORTABLE BLEACHER LAYOUT AND SECTION

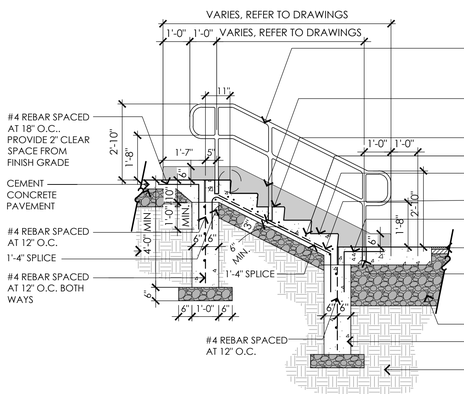
NOT TO SCALE

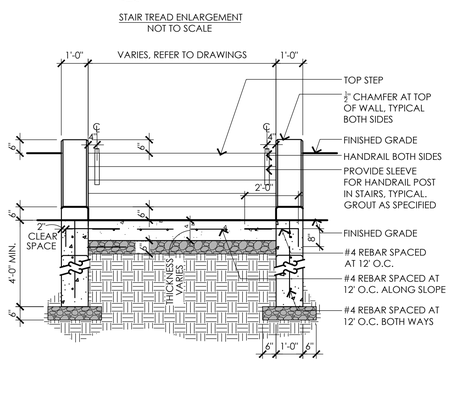
NOTES:

1. DRAWING SHOWN FOR GENERAL REFERENCE, INTENT, AND PRICING ONLY. CONTRACTOR SHALL PROVIDE (AT HIS/HER OWN COST) STRUCTURAL DESIGN OF THE WALL BY A STRUCTURAL ENGINEER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS AND SHALL CARRY COSTS ASSOCIATED WITH THE STRUCTURAL DESIGN IN HIS/HER BID. FINAL LAYOUT AND DETAILS SHALL BE PER APPROVED SHOP DRAWINGS AND STAMPED STRUCTURAL DRAWINGS.
2. REBAR IS SHOWN FOR INTENT ONLY. SHOP DRAWINGS SHALL BE PROVIDED TO LANDSCAPE ARCHITECT/CIVIL ENGINEER FOR REVIEW.



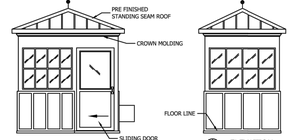
STAIR TREAD ENLARGEMENT
NOT TO SCALE



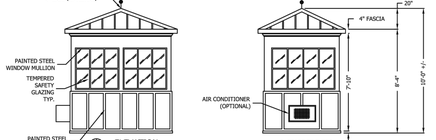


3 CONCRETE STAIRS AND HANDRAIL

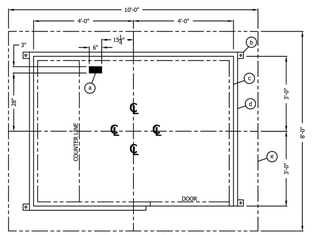
NOT TO SCALE



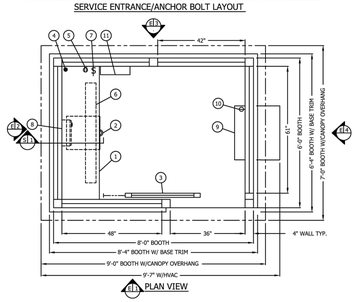
41a ELEVATION 41a ELEVATION



41a ELEVATION 41a ELEVATION



SERVICE ENTRANCE/ANCHOR BOLT LAYOUT



41b PLAN VIEW

a. SLOT IN FLOOR FOR ELECTRICAL SERVICE ENTRANCE TO C.B. PANEL.
b. 2" X 2" X ¼"(MIN) STEEL ANCHOR CLIP WITH A ¾" ANCHOR BOLT HOLE, 4-REQ'D. ONE EACH CORNER. ANCHOR BUILDING AFTER FINAL LOCATION. ANCHOR BOLTS NOT INCLUDED.
c. OUTER EDGE OF BUILDING.
d. OUTER EDGE OF TRIM
e. SUGGESTED MINIMUM FOUNDATION/SLAB.

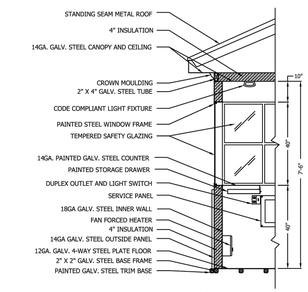
GENERAL SITE INSTALLED ITEMS PROVIDED BY OTHERS

1. PROVIDE 120V/240V, SINGLE PHASE, 3-WIRE SERVICE WITH GROUND.
2. CONCRETE FOUNDATION/SLAB MINIMUM 6" DEEP, 3,000 PSI MINIMUM (28 DAY ACI 318). THE FOUNDATION/SLAB SHOULD BE A MINIMUM OF 24" WIDER THAN THE BUILDING FOOT PRINT DIMENSIONS. THIS IS TO PROVIDE A 12" CONCRETE BORDER ON EACH SIDE OF THE BUILDING.
3. ADEQUATE SIZE DRILLED ANCHOR BOLTS. SUGGESTED SIZE: ⅝" X 4½" POWER FASTENERS "POWER STUD" CATALOG #7332.

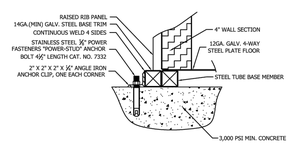
1. COUNTER - 18" DEEP PAINTED GALVANIZED STEEL, MOUNTED AT SILL.
2. PAINTED STORAGE DRAWER.
3. DOOR- 36" WIDE SLIDING STEEL WITH WEATHER-STRIPPING, BALL BEARING HANGERS, HEAVY DUTY TRACK, SAFETY GLAZING, HOOK BOLT LOCK AND HARDWARE.
4. 2" DIAMETER HOLE IN COUNTER FOR DROP CORDS.
5. DUPLEX OUTLET MOUNTED BELOW COUNTER.
6. INTERIOR LIGHT - CODE COMPLIANT LIGHT FIXTURE.
7. WALL SWITCH FOR INTERIOR LIGHT MOUNTED ABOVE COUNTER.
8. HEATER- WALL MOUNTED WITH INTEGRAL THERMOSTAT CONTROL.
9. OPTIONAL WALL MOUNTED AIR CONDITIONER.
10. RECEPTACLE FOR OPTIONAL WALL MOUNTED A.C. UNIT.
11. CIRCUIT BREAKER, PANEL- 12 SPACE, 120/240V, 1 Ø-3 WIRE WITH GROUND. 100 AMP MAIN BREAKER INCLUDED. ALL BRANCH BREAKERS FOR FACTORY INSTALLED DEVICES PROVIDED.

NOTE: PAR-KUT BOOTHS ARE OF SINGLE UNIT WELDED STEEL CONSTRUCTION, FACTORY ASSEMBLED AND DELIVERED FULLY UP. FAILURE TO SECURELY ANCHOR BOOTH MAY RESULT IN OVERTURNING OF UNIT AND SERIOUS INJURY TO OCCUPANT.

A. GLAZING - TEMPERED SAFETY GLAZING SET IN PAINTED STEEL WINDOW FRAMES WITH REMOVABLE ALUMINUM INTERIOR STOPS, AND 1" STEEL MULLIONS.
B. PAINT- FINISH SHALL BE SINGLE COLOR OF CHOICE, IMRON POLYURETHANE HIGH GLOSS INDUSTRIAL COATING. SHALL BE APPLIED TO ALL EXPOSED METAL SURFACES. THIS EXCLUDES FLOOR, ROOF SURFACE, ANY STAINLESS STEEL COMPONENTS (IF USED).
C. ELECTRICAL - ALL WIRING BY PAR-KUT TO BE #12(MIN) STRANDED COPPER, THHN ENCLOSED IN ½"(MIN) E.M.T. PER NATIONAL ELECTRIC CODE. ALL ELECTRICAL EQUIPMENT WILL BE LISTED BY U.L. OR EQUIVALENT RECOGNIZED NATIONAL TESTING LABORATORY. ALL WIRING TO TERMINATE AT C.B. PANEL. ALL CIRCUITS HAVE GREEN GROUND WIRE.
D. BOOTH WILL HAVE A 6" CANOPY OVERHANG ON ALL SIDES.
E. LIFTING RING(S) ARE OPTIONAL.
F. NO DRAIN PROVIDED. WATER TO RUN OFF ROOF. EXCEPT FOR EXPANDED METAL ROOF.
G. OPTIONAL PAINTED THREADED SPINDLE WITH A 4" FINAL BALL.
H. EXTERIOR WALL PANELS HAVE RAISED STEEL RIBS.
I. BOOTH WILL HAVE CROWN MOLDING ABOVE ALL WINDOW FRAMES.
J. NO ON SITE WORK BY PAR-KUT.
K. ACTUAL LOCATION OF ELECTRICAL DEVICES MAY VARY DUE TO INSTALLATION CONSTRAINTS, SHIPPING RESTRICTIONS, OR FOR PROPER PLACEMENT TO SATISFY CODES.



41b SECTION
NO SCALE



FIELD DRILLED ANCHOR BOLT DETAIL
NO SCALE

THIS DRAWING IS FOR REFERENCE PURPOSES ONLY. PAR-KUT BUILDINGS MUST BE SECURELY ANCHORED IN PLACE AND MUST BE PROPERLY GROUNDED. ADEQUATE SIZED ANCHOR BOLTS SHALL BE USED. THE SIZE AND DEPTH OF THE ANCHORS SHOULD BE OF SUFFICIENT DESIGN TO WITHSTAND THE HIGHEST RECORDED WIND SPEEDS/SEISMIC DESIGN CATEGORY IN THE AREA OF INSTALLATION. CONSULT A PROFESSIONAL ENGINEER FAMILIAR WITH THE WEATHER CONDITIONS IN THE AREA.

4 TICKET BOOTH

NOT TO SCALE

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	AS NOTED
PROJECT NO.:	21025.00
FILE:	21025.00-L5.3-DET_3.dwg
DRAWN:	MJD
CHECKED:	JJC

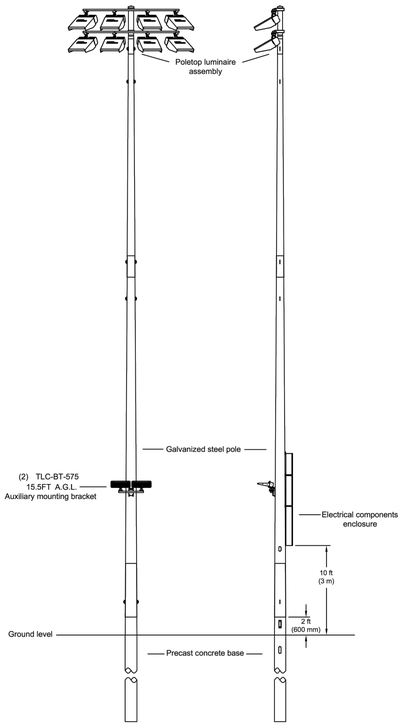
SEAL:

SHEET TITLE:

DETAIL SHEET III

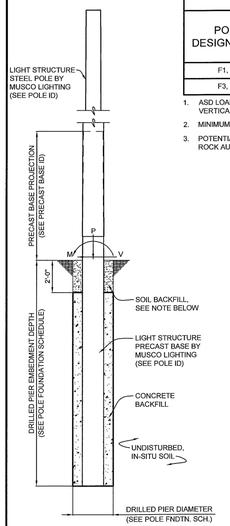
SHEET NO:

L5.3



1 SPORTS LIGHT POLE

NOT TO SCALE



POLE FOUNDATION ELEV.

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 FOUNDATION SCHEDULE

POLE DESIGNATION	FORCES (1.)			DRILLED PIER		
	MOMENT (M) FT-LBS	SHEAR (V) LBS	VERTICAL (P) LBS	DIAMETER INCHES	EMBEDMENT DEPTH (3.)	CONCRETE BACKFILL YD^3 (2.)
F1, F2	84,251	1,857	2,349	30	14'-0"	1.6
F3, F4	161,521	2,866	4,228	36	18'-0"	2.9

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. POTENTIAL FOR ENCOUNTERING ROCK BEFORE REACHING EMBEDMENT DEPTH. ROCK AUGERING EQUIPMENT MAY BE REQUIRED.

PRECAST BASE IDENTIFICATION

PRECAST BASE TYPE	PRECAST BASE WEIGHT	PRECAST BASE LENGTH	PROJECTION ABOVE GRADE	STANDARD EMBEDMENT	OUTSIDE DIAMETER
4B	3,490 LBS	22'-0"	8'-0"	14'-0"	15.75"
6B	6,930 LBS	26'-1"	8'-1"	18'-0"	20.56"

POLE IDENTIFICATION

POLE DESIGNATION	POLE TYPE	PRECAST BASE TYPE	FIXTURE CONFIGURATION (FIX. PER XARM)	FIXTURE AND ACCESSORIES EPA (FT^2)
F1, F2	LSS70C	4B	11 (5+4)	22.3
F3, F4	LSS90B	6B	14 (6+5) / (1)	29.1

- POLES F1 & F2 HAVE (2) MUSCO LED FIXTURES AT 15'-6" AGL INCLUDED ABOVE.
- POLES F3 & F4 HAVE (2) MUSCO LED FIXTURES AT 20'-6" AGL INCLUDED ABOVE.

DESIGN NOTES

DESIGN PARAMETERS:
WIND: V_{ult} = 122 MPH, V_{asd} = 95 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: 4.0 KSF
LATERAL SOIL RESISTANCE PARAMETERS:
AS PROVIDED IN SOIL REPORT, PAGE 4 FOR SPORT LIGHTING
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 SOILS AND FOUNDATION REPORT, FILE NO. 201576-000, PREPARED BY HALEY & ALDRICH, INC.; BOSTON, MA.

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

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

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

CONCRETE:
CONCRETE SHALL BE AIR-ENTRAINED AND HAVE A MINIMUM COMPRESSIVE DESIGN STRENGTH AT 28 DAYS OF 3,000 PSI. 3,000 PSI CONCRETE SPECIFIED FOR EARLY POLE ERECTION, ACTUAL REQUIRED MINIMUM ALLOWABLE CONCRETE STRENGTH IS 1,000 PSI. ALL PIERS AND CONCRETE BACKFILL MUST BEAR ON AND AGAINST FIRM UNDISTURBED SOIL.

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
10-29-21

AYER SHIRLEY REGIONAL HS
FOOTBALL FIELD LIGHTING
AYER, MA

MUSCO Lighting
CORPORATE HQ 100 1st AVE. WEST OSKALOOSA, IOWA 52577 (800) 825-6030

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

DRAWING TITLE: POLE AND FOUNDATION
SCALE: SEE PLAN
NOTES: SCAN #198453D

PROJECT NUMBER 198453
DATE 29 OCTOBER 2021
DRAWING NUMBER C1
OF ONE

2 TYPICAL SPORTS LIGHT POLE PRECAST CONCRETE FOUNDATION DETAIL

NOT TO SCALE

POLE IDENTIFICATION AND RESULTANT FORCES

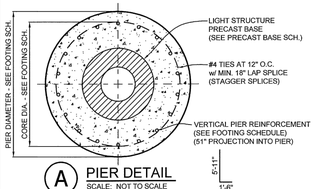
POLE DESIGNATION	POLE TYPE	PRECAST BASE TYPE	FIXTURE CONFIGURATION (FIX. PER XARM)	FIXTURE AND ACCESSORIES EPA (FT²)	FORCES (1.)		
					MOMENT (M) FT-LBS	SHEAR (V) LBS	VERTICAL (P) LBS
F1, F2	LSS70C	4B	11 (5+4)	22.3	84,251	1,857	2,349
F3, F4	LSS90B	6B	14 (6+5) / (1)	29.1	161,521	2,866	4,228

1. ASD LOAD COMBINATION D + 0.6W.
   VERTICAL FORCE IS WEIGHT OF DRESSED POLE.
2. POLES F1 & F2 HAVE (2) MUSCO LED FIXTURES AT 15'-6" AGL INCLUDED ABOVE.
   POLES F3 & F4 HAVE (2) MUSCO LED FIXTURES AT 20'-6" AGL INCLUDED ABOVE.

PRECAST BASE ID FOR SPREAD FOOTING

PRECAST BASE TYPE	PRECAST BASE WEIGHT (1.)	PRECAST BASE LENGTH (1.)	PROJECTION ABOVE TOP OF PIER	STANDARD EMBEDMENT (1.)	OUTSIDE DIAMETER	CUT LENGTH OFF BOTTOM (2.)	EMBEDMENT INTO PIER & FOOTING (3.)
4B	3,490 LBS	22'-0"	8'-0"	14'-0"	15.75"	8'-0"	6'-0"
6B	6,930 LBS	26'-1"	8'-1"	18'-0"	20.56"	12'-0"	6'-0"

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



A PIER DETAIL

SCALE: NOT TO SCALE

CONCRETE/REINFORCEMENT NOTES

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

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

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

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

DESIGN NOTES

DESIGN PARAMETERS:
WIND: V_{ult} = 122 MPH, V_{asd} = 95 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: 4.0 KSF
IN ACCORDANCE WITH MASSACHUSETTS STATE BUILDING CODE - 780 CMR, 9TH EDITION, CHAPTER 18.

OVER EXCAVATE ANY EXISTING FILL BELOW THE BOTTOM OF THE SPREAD FOOTING UNTIL SUITABLE NATIVE GLACIAL DEPOSITS OR BEDROCK SUBGRADE IS EXPOSED. REPLACE THE OVER EXCAVATED AREA WITH COMPACTED STRUCTURAL FILL. THE STRUCTURAL FILL SHOULD BE A CLEAN, GRANULAR MATERIAL, COMPACTED TO 95% OF MDD PER MODIFIED PROCTOR TESTING (ASTM D1557).

DESIGN SOIL PARAMETERS ARE AS NOTED. ACTUAL ALLOWABLE SOIL PARAMETERS MUST BE VERIFIED ON SITE. REFERENCE SOILS AND FOUNDATION REPORT, FILE NO. 201576-000, PREPARED BY HALEY & ALDRICH, INC.; BOSTON, MA.

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

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

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

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

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

COMMONWEALTH OF MASSACHUSETTS
KYLE G. LACINA
STRUCTURAL
No. 46148
REGISTERED PROFESSIONAL ENGINEER
10-29-21

AYER SHIRLEY REGIONAL HS
FOOTBALL FIELD LIGHTING
AYER, MA

MUSCO Lighting
CORPORATE HQ 100 1st AVE. WEST OSKALOOSA, IOWA 52577 (800) 825-6030

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

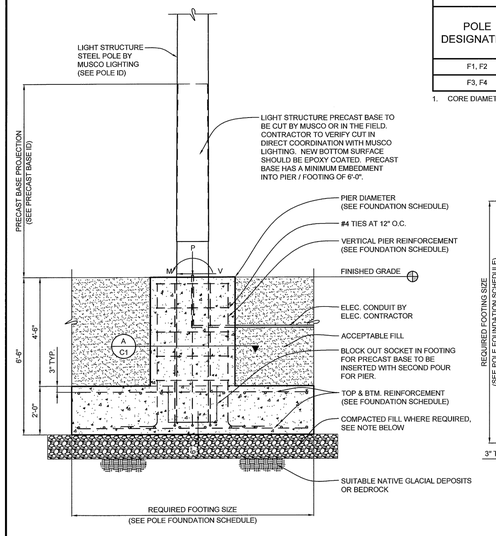
DRAWING TITLE: POLE AND FOUNDATION
SCALE: SEE PLAN
NOTES: SCAN #198453D

PROJECT NUMBER 198453
DATE 05 NOVEMBER 2021
DRAWING NUMBER C1-SF
OF TWO

POLE FOUNDATION SCHEDULE

POLE DESIGNATION	FOOTING			PIER			
	SIZE	THICKNESS	REINFORCEMENT TOP & BOTTOM (TOTAL) QUANTITY - SIZE	DIAMETER INCHES	CORE DIA. INCHES (1.)	VERTICAL REINFORCING	HORIZONTAL TIES
F1, F2	9'-0" x 9'-0"	2'-0"	(32) 8 - #7's EACH WAY	42	35	16 - #7	#4 @ 12"
F3, F4	11'-0" x 11'-0"	2'-0"	(40) 10 - #7's EACH WAY	48	41	18 - #7	#4 @ 12"

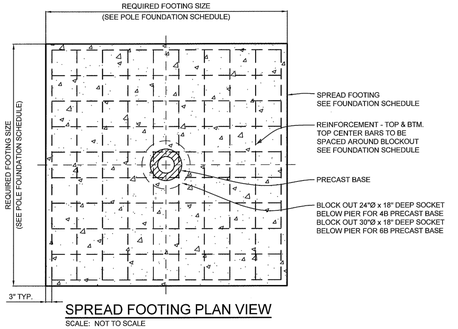
1. CORE DIAMETER EQUAL TO INSIDE DIAMETER OF TIES.



POLE FOUNDATION ELEVATION

SCALE: NOT TO SCALE

NOTE:
OVER EXCAVATE ANY EXISTING FILL BELOW THE BOTTOM OF THE SPREAD FOOTING UNTIL SUITABLE NATIVE GLACIAL DEPOSITS OR BEDROCK SUBGRADE IS EXPOSED. REPLACE THE OVER EXCAVATED AREA WITH COMPACTED STRUCTURAL FILL. THE STRUCTURAL FILL SHOULD BE A CLEAN, GRANULAR MATERIAL, COMPACTED TO 95% OF MDD PER MODIFIED PROCTOR TESTING (ASTM D1557).



SPREAD FOOTING PLAN VIEW

SCALE: NOT TO SCALE

AYER SHIRLEY REGIONAL HS
FOOTBALL FIELD LIGHTING
AYER, MA

MUSCO Lighting
CORPORATE HQ 100 1st AVE. WEST OSKALOOSA, IOWA 52577 (800) 825-6030

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

DRAWING TITLE: POLE AND FOUNDATION
SCALE: AS NOTED
NOTES: SCAN #198453D

PROJECT NUMBER 198453
DATE 05 NOVEMBER 2021
DRAWING NUMBER C2-SF
OF TWO

3 SPORTS POLE SPREAD FOOTING DETAIL

NOT TO SCALE

CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER -
HALEY & ALDRICH

ELECTRICAL ENGINEER -
NV5

ARCHITECT-
OCO ARCHITECTURE :: DESIGN

SURVEY -
LANDTECH

IRRIGATION -
IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL
Ayer, Massachusetts
NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE: AS NOTED
PROJECT NO.: 21025.00
FILE: 21025.00-L5.4-DET_4.dwg
DRAWN: MJD
CHECKED: JJC

SEAL:

SHEET TITLE:
DETAIL SHEET IV

SHEET NO:
L5.4

NOTES:

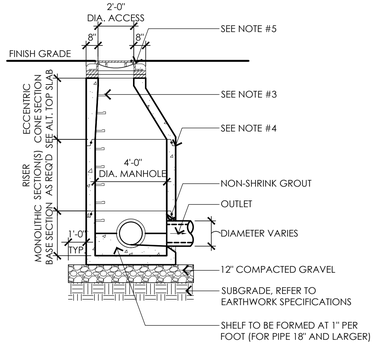
1. ALL SECTION SHALL BE DESIGNED FOR HS-20 LOADING.

2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.

3. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.

4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.

5. DRAIN MANHOLE FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES MINIMUM 5 BRICK COURSES MAXIMUM).



1 DRAIN MANHOLE

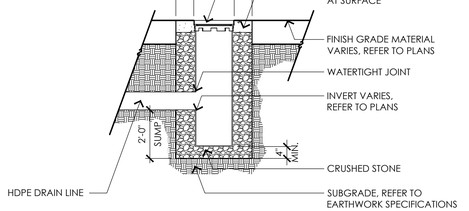
NOT TO SCALE

NOTES:

1. GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.

2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.

3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE.

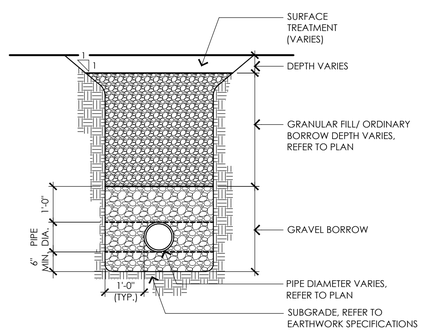


4 AREA DRAIN

NOT TO SCALE

NOTES:

1. PROVIDE APPROPRIATE CAUTION TAPE AS REQUIRED PER CODE



5 UTILITY TRENCH

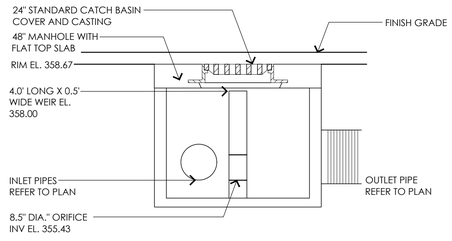
NOT TO SCALE

NOTES:

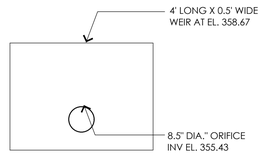
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.

2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.

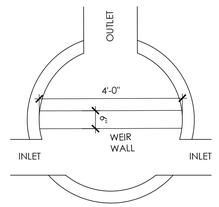
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.



SECTION



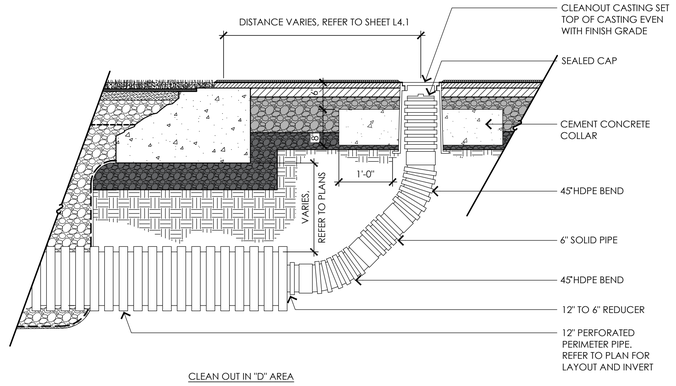
FACE OF WEIR WALL



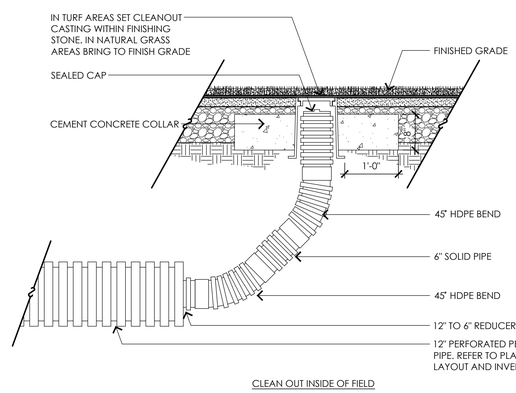
PLAN

2 OUTLET CONTROL STRUCTURE

NOT TO SCALE



CLEAN OUT IN "D" AREA



CLEAN OUT INSIDE OF FIELD

3 CLEANOUT

NOT TO SCALE

NOTES:

1. BASE SECTION SHALL BE MONOLITHIC WITH A 48" INSIDE DIAMETER.

2. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.

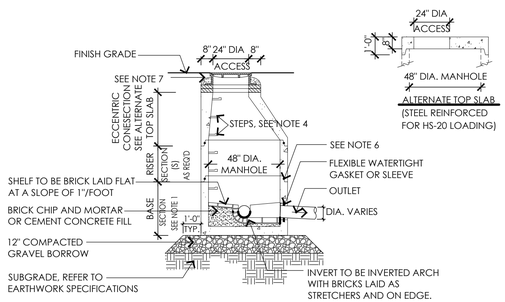
3. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI CONCRETE.

4. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.

5. ALL EXTERIOR SURFACES SHALL BE GIVEN TWO COATS OF BITUMINOUS WATER-PROOFING MATERIAL.

6. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.

7. STANDARD SEWER MANHOLE FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM).



6 SEWER MANHOLE

NOT TO SCALE

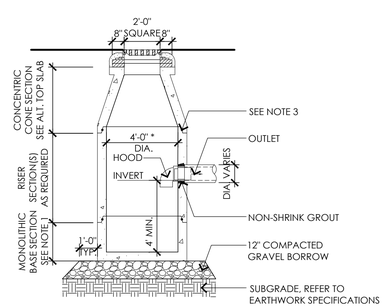
NOTES:

1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.

2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.

3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.

4. CATCH BASIN FRAME SHALL BE SET IN FULL MORTAR BED ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES MINIMUM 5 BRICK COURSES MAXIMUM)



7 CATCH BASIN

NOT TO SCALE

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL
Ayer, Massachusetts
NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	AS NOTED
PROJECT NO.:	21025.00
FILE:	21025.00-L5.5-DET_5.dwg
DRAWN:	MJD
CHECKED:	JJC

SEAL:

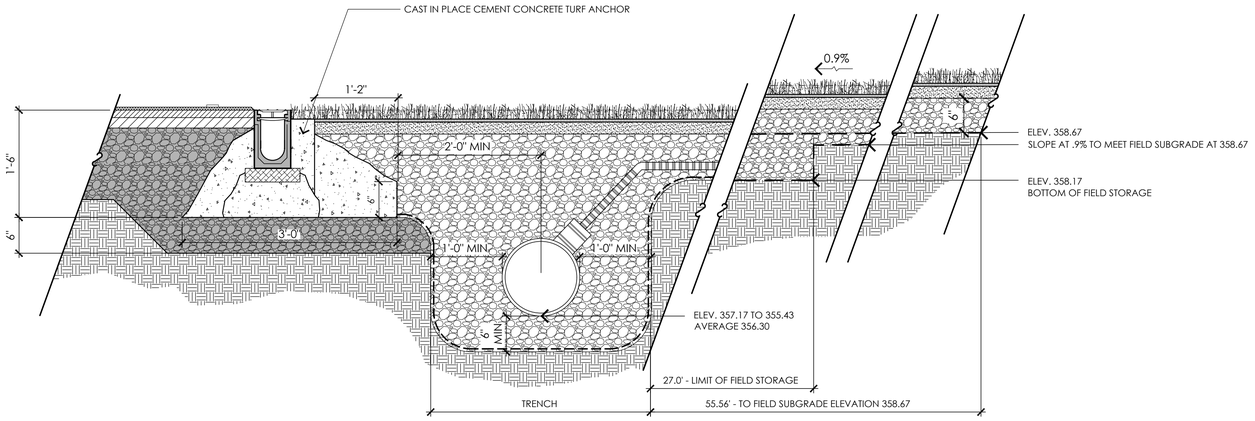
COMMONWEALTH OF MASSACHUSETTS
MEGAN E. BUCZYNSKI
CIVIL
No. 47382
REGISTERED PROFESSIONAL ENGINEER
11-18-21

SHEET TITLE:

DETAIL SHEET V

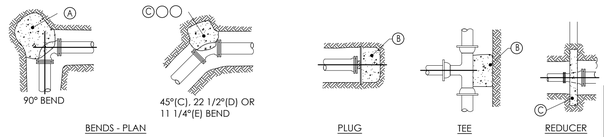
SHEET NO:

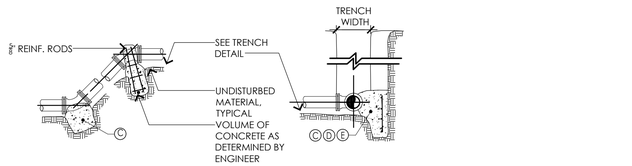
L5.5



1 DETENTION DETAIL (PLACEHOLDER)

NOT TO SCALE





THRUST BLOCK SCHEDULE SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL												
REACTION TYPE	PIPE SIZE											
	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"
Ⓐ	1.78	4.38	7.84	11.14	16.52	21.82	30.82	36.04	48.12	69.28	107.66	154.78
Ⓑ	1.30	3.10	5.52	8.38	12.18	16.74	21.78	27.74	34.02	48.98	76.12	109.44
Ⓒ	0.96	2.38	4.24	6.02	9.32	11.82	16.68	19.42	26.04	37.50	58.26	83.76
Ⓓ	0.50	1.2	2.16	3.08	4.74	6.02	8.50	9.94	13.28	19.12	29.70	42.70
Ⓔ	0.26	0.60	1.08	1.54	2.38	3.04	4.24	5.02	6.66	9.58	14.90	21.42
OTHER TEST PRESSURES FOR THE ABOVE REACTIONS	ABOVE DIMENSIONS ARE MINIMUM THRUST BLOCK SIZES. THEY HAVE BEEN CALCULATED USING A PRESSURE OF 200 PSI. TEST PRESSURE TO BE 150 PSI MIN, OR AS REQUIRED BY BWSC. SQUARE FEET OF CONCRETE THRUST BLOCKING FOR OTHER TEST PRESSURES IS DIRECTLY PROPORTION TO THE ABOVE TABLE. FOR INSTANCE, AT 225 PSI TEST PRESSURE ABOVE NUMBERS SHOULD BE MULTIPLIED BY 1.125 (225 PSI / 200 PSI = 1.125).											

NOTES:

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE SOLID CONCRETE BLOCKS IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCK.
4. REQUIREMENTS OF THE ABOVE TABLE PRESUME MINIMUM SOIL BEARING OF 1 TON PER SQUARE FOOT, AND MAY BE VARIED BY THE ENGINEER TO MEET OTHER CONDITIONS ENCOUNTERED.
5. MEGA-LUG RETAINER GLANDS ARE REQUIRED FOR ALL MECHANICAL JOINTS. THESE GLANDS DO NOT REDUCE THE REQUIREMENTS FOR THRUST RESTRAINT.
6. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE OR BUILDING PAPER PRIOR TO INSTALLATION OF CONCRETE RESTRAINT.
7. THREADED ROD SHALL BE ANSI A242 FY50 PIPE RESTRAINT NUTS TO MATCH AWWA C111. THREADED RODS AND NUTS TO BE FIELD COATED WITH BITUMINOUS PAINT.
8. THRUST RESTRAINT IS REQUIRED FOR ALL TEES, BENDS, REDUCERS, CAPS, PLUGS, OR CROSSES.
9. INSTALL LIFT HOOKS INTO THRUST BLOCKS AT END CAPS AND PLUGS.

2 THRUST BLOCKS

NOT TO SCALE

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER - HALEY & ALDRICH

ELECTRICAL ENGINEER - NV5

ARCHITECT- OCO ARCHITECTURE :: DESIGN

SURVEY - LANDTECH

IRRIGATION - IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL
Ayer, Massachusetts
NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	AS NOTED
PROJECT NO.:	21025.00
FILE:	21025.00-L5.6-DET_6.dwg
DRAWN:	MJD
CHECKED:	JJC

SEAL:

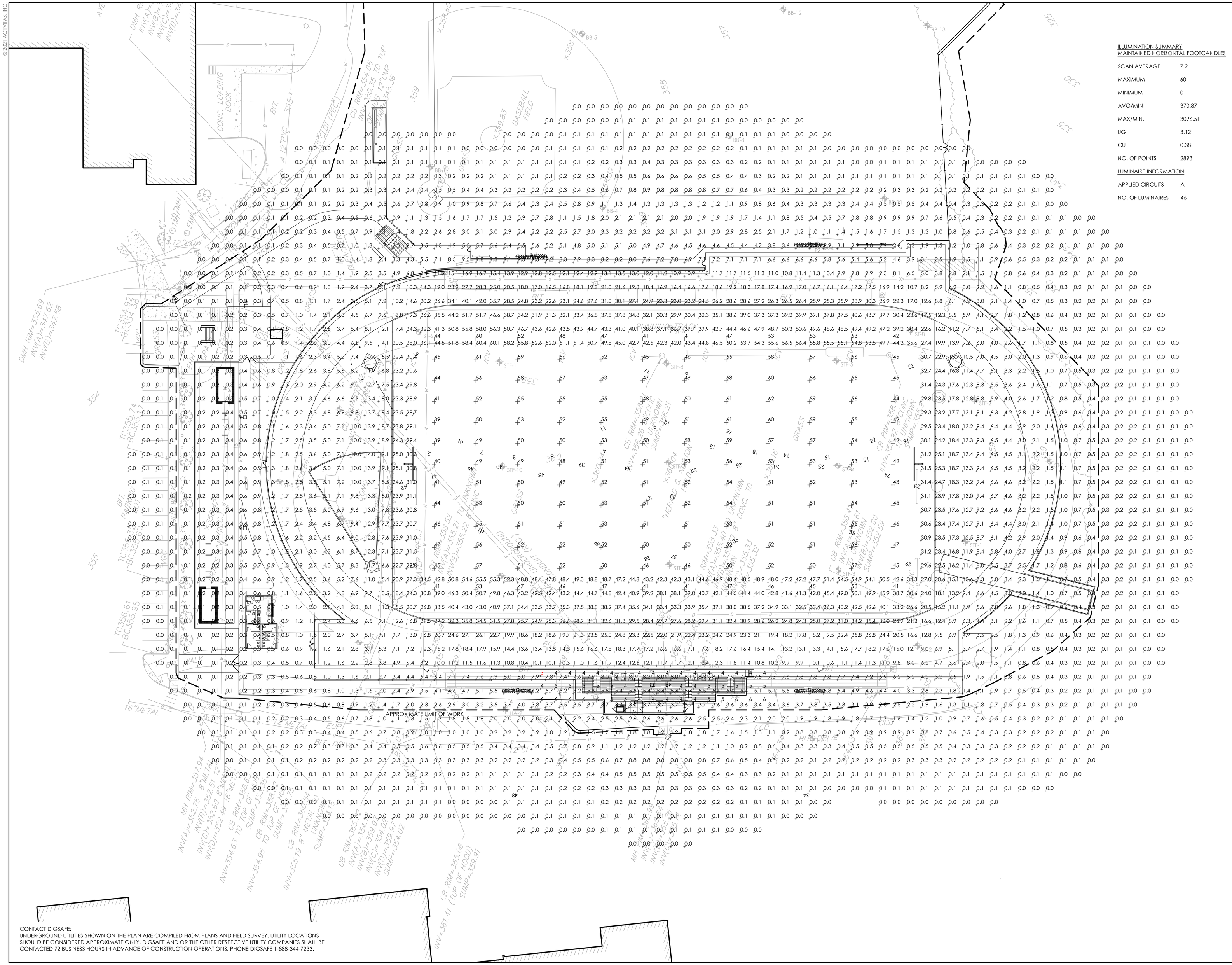
COMMONWEALTH OF MASSACHUSETTS
MEGAN E. BUCZYNSKI
CIVIL
No. 47392
REGISTERED
PROFESSIONAL ENGINEER
11-18-21

SHEET TITLE:

DETAIL SHEET VI

SHEET NO:

L5.6



ILLUMINATION SUMMARY
MAINTAINED HORIZONTAL FOOTCANDLES

SCAN AVERAGE	7.2
MAXIMUM	60
MINIMUM	0
AVG/MIN	370.87
MAX/MIN.	3096.51
UG	3.12
CU	0.38
NO. OF POINTS	2893

LUMINAIRE INFORMATION

APPLIED CIRCUITS	A
NO. OF LUMINAIRES	46

CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER -
HALEY & ALDRICH

ELECTRICAL ENGINEER -
NV5

ARCHITECT-
OCO ARCHITECTURE :: DESIGN

SURVEY -
LANDTECH

IRRIGATION -
IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=30'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-L6.1-PHOTOMETRIC_PLAN.dwg
DRAWN:	MJD
CHECKED:	JJC

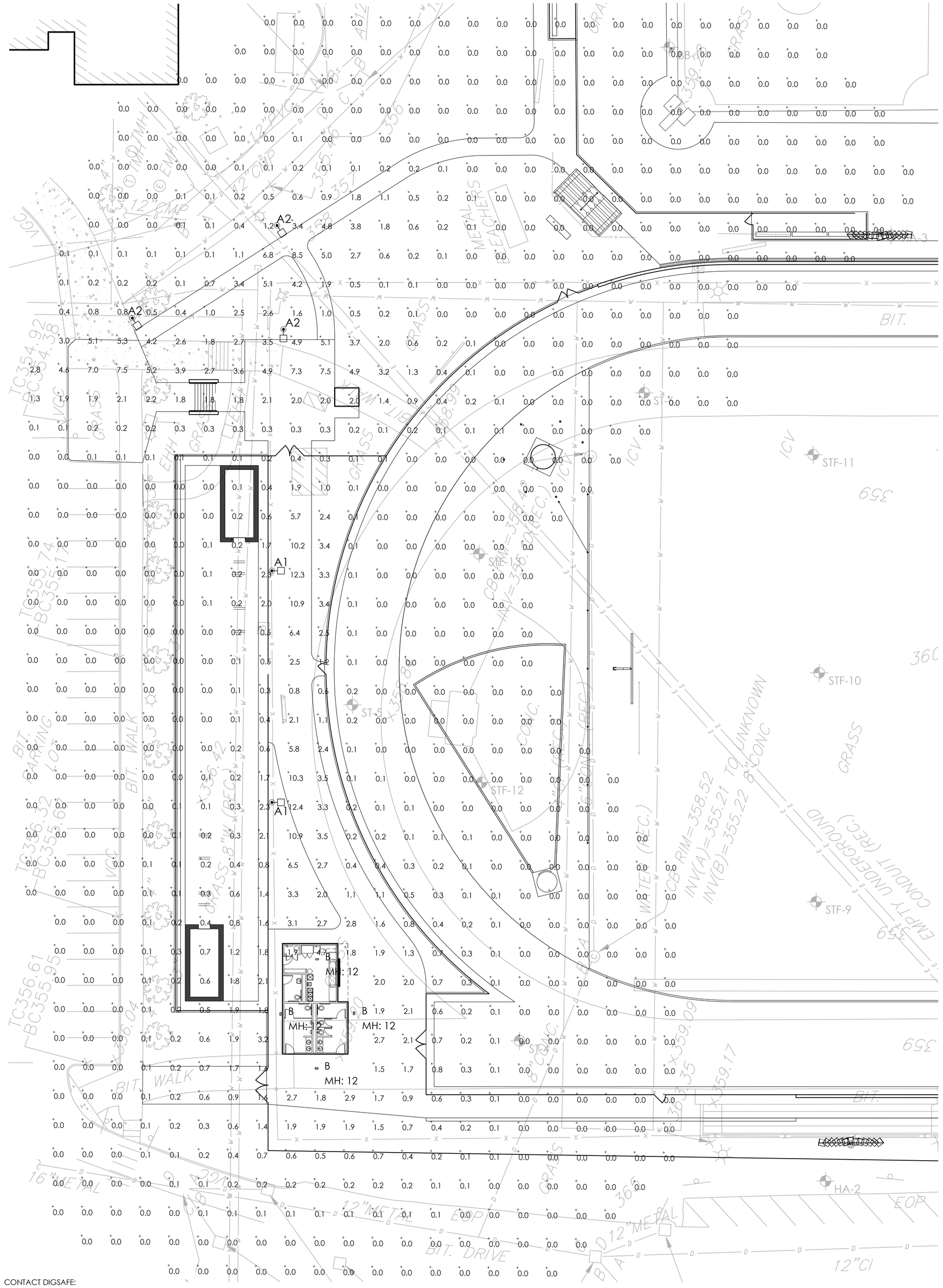
SEAL:

SHEET TITLE:

PHOTOMETRIC PLAN - TRACK & FIELD

SHEET NO:

L6.1



Luminaire Schedule					
Qty	Label	Lum. Watts	Arrangement	LLF	Description
2	A1	69	SINGLE	0.900	WPSS2-54L-405-4K7-2
3	A2	69	SINGLE	0.900	WPSS2-54L-405-4K7-3

Calculation Summary						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
SITE	Fc	0.50	12.4	0.0	N.A.	N.A.

CONTACT DIGSAFE:
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

GEOTECHNICAL ENGINEER -
HALEY & ALDRICH

ELECTRICAL ENGINEER -
NV5

ARCHITECT-
OCO ARCHITECTURE :: DESIGN

SURVEY -
LANDTECH

IRRIGATION -
IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1"=20'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-L6.1-PHOTOMETRIC_PLAN.dwg
DRAWN:	MJD
CHECKED:	JJC

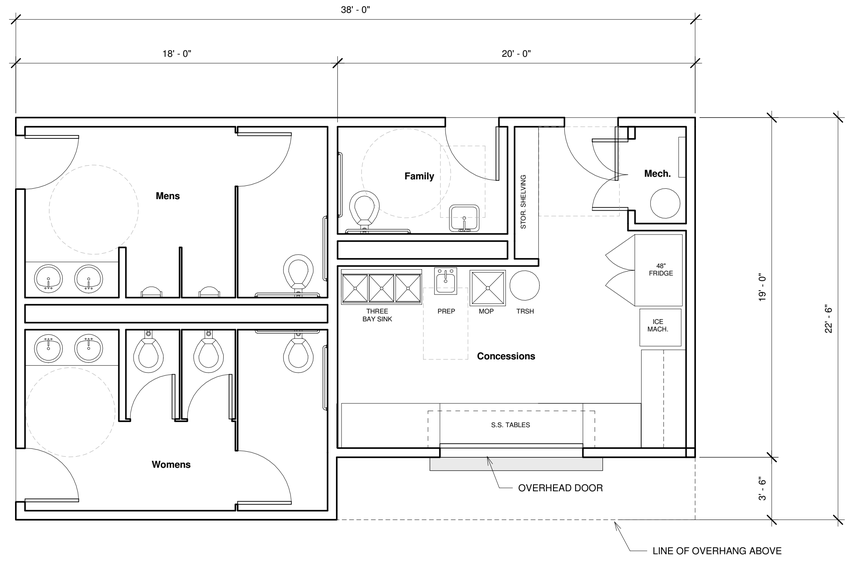
SEAL:

SHEET TITLE:

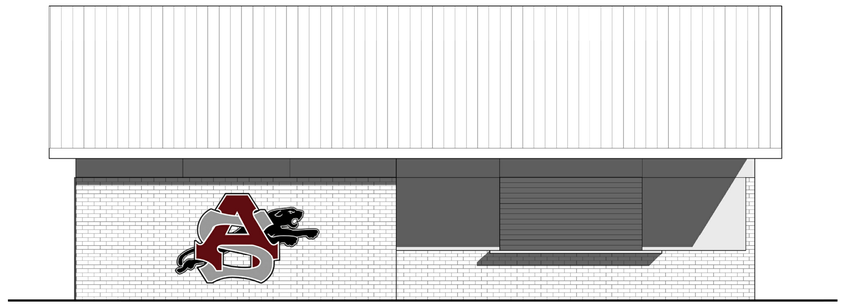
PHOTOMETRIC PLAN - PEDESTRIAN WALKWAYS

SHEET NO:

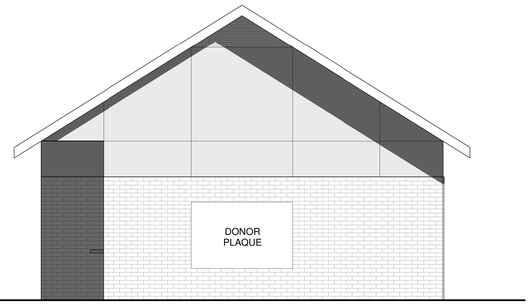
L6.2



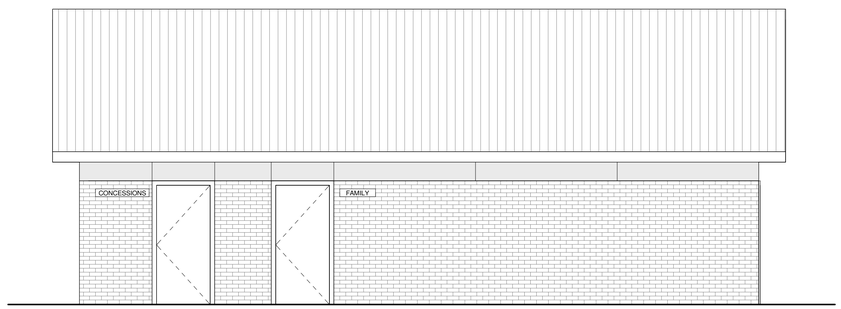
1 Level 1
1/4" = 1'-0"



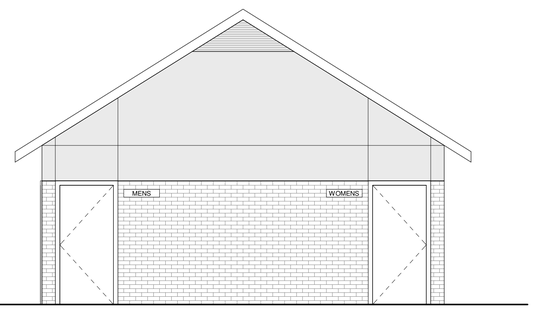
2 South Elevation - Concessions Facing Track
1/4" = 1'-0"



3 East Elevation - Wall Visible From Facility Entrance
1/4" = 1'-0"



4 North Elevation - Concessions Facing Parking Lot
1/4" = 1'-0"



5 West Elevation - Restroom Doors Facing Page Hilltop
1/4" = 1'-0"

ACTIVITAS
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

CONSULTANTS

ARCHITECT -
OCO ARCHITECTURE :: DESIGN

GEOTECHNICAL ENGINEER -
HALEY & ALDICH

ELECTRICAL ENGINEER -
NV5

SURVEY -
LANDTECH CONSULTANTS

IRRIGATION -
IRRIGATION CONSULTING

AYER SHIRLEY REGIONAL HIGH SCHOOL

Ayer, Massachusetts

NORTON FIELD, TRACK AND BASEBALL FIELD RENOVATIONS

Site Plan Approval
November 18, 2021

REVISIONS:

NO.	DATE	DESCRIPTION

SCALE:	1/4" = 1'-0"
PROJECT NO.:	21025.00
FILE:	21025.00-L1.1-LM_PLAN.dwg
DRAWN:	PSO
CHECKED:	JJC

SEAL

REGISTERED ARCHITECT
PAULETTE S. O'CONNELL
No. 31009
SCITUATE
MA
COMMONWEALTH OF MASSACHUSETTS

SHEET TITLE:

CONCESSIONS BUILDING PLAN & ELEVATIONS

SHEET NO:

A1.0

TOWN OF AYER

REQUEST FOR CERTIFIED LIST OF ABUTTERS

THE FEE FOR PREPARING THE LIST IS $25.00

Applicant: Jonathan Charwick Name of Firm: Activitas, Inc.
Address: 70 Milton Street, Dedham, MA 02026
Contact Phone #: (781) 355-7046

Request abutters list for:

Owner Name: Ayer Shirley Regional High School, Town of Ayer

Property Location: 115 Washington Street

Parcel ID: 20-1

Date you need the list by: Site Plan Filing on Nov. 18

The Assessors' Office will generate & certify the requested **abutters list**, for the appropriate boards. Please check the appropriate departments.

Planning Board	X	Ch 40A Sec 11 (300 feet)
" "		Ch 41 Sec 81T (anr) (applicant & abutters)
Board of Appeals		Ch 40A Sec 11 (300 feet)
Conservation Comm		Ch 131 Sec 40 (300 feet)
Board of Selectmen		Ch 138 Sec 12, 15A (abutters & 500 ft if Within school, church or hosp)
Board of Health		Ch 40A Sec 11 (300 feet) (aquifer protection)
Other		

Mailing labels will be provided.

Board of Assessors
Town Hall
1 Main Street
Ayer, MA 01432

Tel: (978) 772-8220 ext. 140
Email: assessor@ayer.ma.us

October 20, 2021

ABUTTERS LIST FOR PARCEL(s): 20-1 - 115 Washington Street
OWNER(s): Ayer-Shirley Regional High School

#	Parcel ID	Stno	Stno2	Property Location	Owners Name1	Owners Name2	Address1	Address2	City/Town	State	Zip Code
1	13-11	0		WASHINGTON ST REAR	COWFIELD REALTY TRUST II	CALVIN E MOORE - TRUSTEE	39 MAIN STREET	SUITE 204	AYER	MA	01432
2	13-12	0		WASHINGTON STREET	AYER DEVELOPMENT LLC		159-1 PROSPECT STREET		ACTON	MA	01720
3	13-14	0		WASHINGTON STREET	AYER DEVELOPMENT LLC		159-1 PROSPECT STREET		ACTON	MA	01720
4	13-15	128		WASHINGTON STREET	NORTHEAST SITE DEVELOPMENT LLC		159-1 PROSPECT STREET		ACTON	MA	01720
5	13-16	132		WASHINGTON STREET	GENEAU BEVERLY A - TE	VINCENT J GENEAU	132 WASHINGTON STREET		AYER	MA	01432
6	13-17	134		WASHINGTON STREET	FERDAUS FARHAD M - TE	NELL G FERDAUS	134 WASHINGTON STREET		AYER	MA	01432
7	13-18	0		WASHINGTON STREET	NEW ENGLAND POWER CO		PROPERTY TAX DEPT	40 SYLVAN ROAD	WALTHAM	MA	02451
8	13-19	0		WASHINGTON STREET	FLAGG MARY C		152 WASHINGTON ST		AYER	MA	01432
9	13-24	4		MOORE DRIVE	BERGQUIST ERIC	JULIE A PALAMIA	4 MOORE DRIVE		AYER	MA	01432
10	13-25	2		MOORE DRIVE	PAUL N KUDLICH -TR	KUDLICH & MEAD INVESTMENT TRUST	2 MOORE DRIVE		AYER	MA	01432
11	13-26	142		WASHINGTON STREET	WOODS DARREN T	SHARON E WOODS	142 WASHINGTON STREET		AYER	MA	01432
12	13-29	5		MOORE DRIVE	EBERLE MATTHEW W - TE	MICHELLE L EBERLE	5 MOORE DRIVE		AYER	MA	01432
13	13-3	0		GROTON HARVARD ROAD	TOWN OF AYER		1 MAIN ST		AYER	MA	01432
14	13-30	3		MOORE DRIVE	MADIGAN BERNARD W		3 MOORE DRIVE		AYER	MA	01432
15	13-31	1		MOORE DRIVE	LAUREN FRANCESCHI 2014 REV TRUST	LAUREN FRANCESCHI - TRUSTEE	1 MOORE DRIVE		AYER	MA	01432
16	13-32	148		WASHINGTON STREET	BOLTON PHILLIP S		148 WASHINGTON STREET		AYER	MA	01432
17	13-33	150		WASHINGTON STREET	KILBRETH MERIAM P		150 WASHINGTON STREET		AYER	MA	01432
18	13-34	152		WASHINGTON STREET	FLAGG MARY C		152 WASHINGTON STREET		AYER	MA	01432
19	13-35	154		WASHINGTON STREET	PAGANI JONES	TALITA PAGANI	154 WASHINGTON STREET		AYER	MA	01432
20	13-36	156		WASHINGTON STREET	DECOURCEY JOHN		156 WASHINGTON STREET		AYER	MA	01432
21	13-6	0		GROTON HARVARD ROAD	NEW ENGLAND POWER CO		PROPERTY TAX DEPT	40 SYLVAN ROAD	WALTHAM	MA	02451
22	13-8	0		GROTON HARVARD ROAD	BURNHAM ANDREW W - TE	PAULINE BURNHAM	52 FLETCHER STREET		AYER	MA	01432
23	14-3	0		GROTON HARVARD ROAD	TOWN OF AYER		1 MAIN ST		AYER	MA	01432
24	20-10	112		WASHINGTON STREET	WILLEMSEN JORGE A	REBECCA M GORDON	112 WASHINGTON STREET		AYER	MA	01432
25	20-11	116		WASHINGTON STREET	POWERS MITSU		116 WASHINGTON STREET		AYER	MA	01432
26	20-12	122		WASHINGTON STREET	REYNOLDS JAMES M		122 WASHINGTON STREET		AYER	MA	01432
27	20-14	95		WASHINGTON STREET	MURPHY MATTHEW P -TE	ANDREA R MURPHY	95 WASHINGTON STREET		AYER	MA	01432
28	20-15	101		WASHINGTON STREET	TSINIDIS CONSTANTINE - TR	LCNC 2019 TRUST	101 WASHINGTON STREET		AYER	MA	01432
29	20-16	103		WASHINGTON STREET	REARDON ELIZABETH		103 WASHINGTON STREET		AYER	MA	01432
30	20-17	50		NORWOOD AVENUE	WOODARD JUSTIN	BRIAN P SCHREMSER	50 NORWOOD AVENUE		AYER	MA	01432
31	20-18	49		NORWOOD AVENUE	JOHNSON CHRISTOPHER D		49 NORWOOD AVENUE		AYER	MA	01432
32	20-21	45		NORWOOD AVENUE	HUMBERSTONE IAN		45 NORWOOD AVENUE		AYER	MA	01432
33	20-22	0	REAR	HIGHLAND AVENUE	TOWN OF AYER		1 MAIN ST		AYER	MA	01432
34	20-3	51		GROTON HARVARD ROAD	WESLEY JOHN H	LINDA J WESLEY	41 GROTON HARVARD RD		AYER	MA	01432
35	20-4	5		MOUNTAIN AVENUE	SERHAN KAMAL	MARLENA J SERHAN	5 MOUNTAIN AVENUE		AYER	MA	01432
36	20-40	0		OAK RIDGE DRIVE	WESLEY LINDA J - TE	JOHN H WESLEY	41 GROTON HARVARD ROAD		AYER	MA	01432
37	20-48	0		WASHINGTON STREET	COWFIELD REALTY TRUST II	CALVIN E MOORE - TRUSTEE	39 MAIN STREET	SUITE 204	AYER	MA	01432
38	20-49	45		GROTON HARVARD ROAD	BRODEUR NORMAND	FIVE GIRLS TRUST	45 GROTON HARVARD RD		AYER	MA	01432
39	20-50	0		WASHINGTON STREET	TOWN OF AYER		1 MAIN ST		AYER	MA	01432
40	20-51	49		LINCOLN STREET	ADAMSON WILLIAM		49 LINCOLN ST		AYER	MA	01432
41	20-53	47		NORWOOD AVENUE	PORTER JOHN S - TE	ALISON J PORTER	47 NORWOOD AVENUE		AYER	MA	01432

Board of Assessors
Town Hall
1 Main Street
Ayer, MA 01432

Tel: (978) 772-8220 ext. 140
Email: assessor@ayer.ma.us

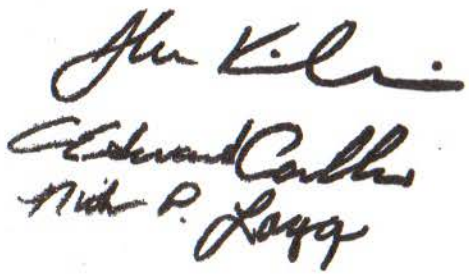
October 20, 2021

ABUTTERS LIST FOR PARCEL(s): 20-1 - 115 Washington Street
OWNER(s): Ayer-Shirley Regional High School

#	Parcel ID	Stno	Stno2	Property Location	Owners Name1	Owners Name2	Address1	Address2	City/Town	State	Zip Code
42	20-56	4		BRILAINA COURT	NONIS GREGORY G - TR	GREGORY G NONIS 2018 TRUST	4 BRIILAINA COURT		AYER	MA	01432
43	20-59	54		GROTON HARVARD ROAD	GILLES RICHARD D - TE	RAYELLEN K GILLES	54 GROTON HARVARD ROAD		AYER	MA	01432
44	20-6	98		WASHINGTON STREET	TRASK JUDY M		98 WASHINGTON STREET		AYER	MA	01432
45	20-60	56		GROTON HARVARD ROAD	TORRICE JILL A	DANIEL G TORRICE	56 GROTON HARVARD ROAD		AYER	MA	01432
46	20-61	58		GROTON HARVARD ROAD	CHAPIN BRADFORD G	CATHERINE A PRATT	58 GROTON HARVARD ROAD		AYER	MA	01432
47	20-62	5		BRILAINA COURT	CORENZWIT JULIA A		5 BRILAINA COURT		AYER	MA	01432
48	20-63	3		BRILAINA COURT	MALETTE CHRISTINE M		3 BRILAINA COURT		AYER	MA	01432
49	20-64	1		BRILAINA COURT	PROVIDAKES JANET K		1 BRILAINA COURT		AYER	MA	01432
50	20-66	42		HIGHLAND AVENUE	SHAW KEITH B - TE	LYNN E SHAW	42 HIGHLAND AVENUE		AYER	MA	01432
51	20-69	43		NORWOOD AVENUE	KOUAGHEU JEAN MARIMEE - TE	SEVERINE P KOUAGHEU	43 NORWOOD AVENUE		AYER	MA	01432
52	20-7	100		WASHINGTON STREET	COTTONWOOD REALTY LLC		325 AYER ROAD		HARVARD	MA	01451
53	20-75	42		NORWOOD AVENUE	ADUSUMALLI PRATHIMA - TE	VIJAY SANKAR PIDIKITI	42 NORWOOD AVENUE		AYER	MA	01432
54	20-76	46		NORWOOD AVENUE	CAMPISI MICHAEL C - TE	JULIE E CAMPISI	46 NORWOOD AVENUE		AYER	MA	01432
55	20-77	44		NORWOOD AVENUE	LEBLANC CHARLES R - TR	LEBLANC INVESTMENT TRUST	44 NORWOOD AVENUE		AYER	MA	01432
56	20-78	48		NORWOOD AVENUE	NABULSI ZAKERIAH	LINDA NGUYEN	48 NORWOOD AVENUE		AYER	MA	01432
57	20-79	110		WASHINGTON STREET	DOUCETTE JOHN M		110 WASHINGTON STREET		AYER	MA	01432
58	4-9	0		OLD GROTON ROAD	ELIADES DAVID J	BARBARA L ELIADES	199 OLD GROTON ROAD		AYER	MA	01432

of the records as of September 30, 2021 in the Town of Ayer
known names and addresses of owners of land abutting the
:t to MGL Chapter 40A Sec. 11 (300 feet)

Certified: Board of Assessors



Ayer Planning Board
Stormwater Management Permit Application

1. LOCATION OF PROPERTY

Street Address 141 Washington Street, Ayer, MA

Registry Middlesex South Book 8135 Page 81

Assessor's Map 20 Parcel 20-1

Zoning District (including Overlay if applicable):

A1

2. OWNER INFORMATION

Name Ayer-Shirley Regional School District

Address 115 Washington Street, Ayer, MA

Telephone 978-772-8600

3. ENGINEER INFORMATION

Name Activitas Inc., c/o Megan Buczynski, PE

Address 70 Milton Street, Dedham, MA 02026

Email meb@activitas.com

Telephone 781-355-7040

4. PROJECT TYPE (CHECK ALL THAT APPLY)

☐ **Minor Project:**

- ☐ Land disturbance of an area greater than 20,000 sq. ft. but less than 40,000 sq. ft.
- ☐ Land disturbance of a volume of earth greater than 1,500 cubic yards but less than 2,200 cubic yards
- ☐ Land disturbance of an area of land 1,000 sq. ft. to 10,000 sq. ft.
  - ☐ If the slope is 15% or greater; or
  - ☐ If the soil cut or filled exceeds four (4) feet in vertical depth at its deepest point as measured from the natural ground level. This requirement may be waived for septic system installation
- ☐ Land disturbance that meets or exceeds 2,000 square feet of area and is less than 5,000 square feet of area within a Critical Area or where stormwater discharge is directly or indirectly to an Impaired Waterbody or its tributaries

☒ **Major Project:**

- ☒ Land disturbance of an area of greater than 40,000 sq. ft.
- ☒ Land disturbance of a volume of earth resulting in a total quantity greater than 2,200 cubic yards
- ☐ Land disturbance of an area of land greater than 10,000 sq. ft.
  - ☐ If the slope is 15% or greater; or
  - ☐ If the soil cut or filled exceeds four (4) feet in vertical depth at its deepest point as measured from the natural ground level.
- ☐ Land disturbance that meets or exceeds 5,000 square feet of area within a Critical Area or where stormwater discharge is directly or indirectly to an Impaired Waterbody or its tributaries
- ☐ Land disturbance resulting in a net increase of 30% or more of impervious area on a parcel of land having more than 5,000 square feet of existing impervious area

☐ **Modification of Permit # _____** ☐ **Extension of Permit # _____**

5. **Other Jurisdiction**

Conservation Commission

Board of Health

Building Permit

Other: Planning Board - Site Plan Review

6. **REQUIRED SUBMITTALS**

- **Completed Stormwater Management Permit Application**
- **Written Authorization Signed by the Owner(s), if submitted by another individual**
- **Stormwater Management Erosion and Sedimentation Control Plan ("Stormwater Plan")**
- **Operation and Maintenance Plan ("O&M Plan")**
- **Certified List of Abutters (300 Feet) (Major Projects Only)**
- Waived - Town Project **Application Fee $150.00**
- Waived - Town Project **Engineering or Consultant Review Fee (if applicable)**
  - **DPW Review Fee**
    - **Minor Project = $100.00**
    - **Major Project = $200 plus $0.005 per square foot of land area that will be disturbed by activities authorized by the Stormwater Management Permit**
  - **Outside Consultant Review Fee**
    - **Minor and Major Project = To Be Determined by Planning Board as obtained from its consultant**
- Waived - Town Project **Advertising Fee (cost to be determined and borne by the applicant)**

DEPARTMENT OF PUBLIC WORKS
Water, Wastewater, Highway & Solid Waste Divisions

Dan Van Schalkwyk, P.E., Director
Pam Martin, Business Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

November 17, 2021

Town of Ayer
1 Main Street
Ayer, MA 01432

Re: ASRSD Track & Field Renovation Authorization for Submittal

To Whom it May Concern:

Activitas, Inc. of Dedham, MA is authorized to submit the Stormwater Management Permit Application on behalf of the Ayer-Shirley Regional School District in regards to the ASRSD Track & Field Renovation project located at 141 Washington Street, Ayer, MA.

Sincerely,

Dan Van Schalkwyk, PE.
Town of Ayer
Director Public Works

Stormwater Report

ASRSD Track and Field Renovations

Ayer-Shirley High School
141 Washington Street
Ayer, MA 01432

Owner:
Ayer Shirley Regional
School District
115 Washington Street
Ayer, MA 01432

Submitted To:
Town of Ayer
Planning Board
1 Main Street
Ayer, MA 01432

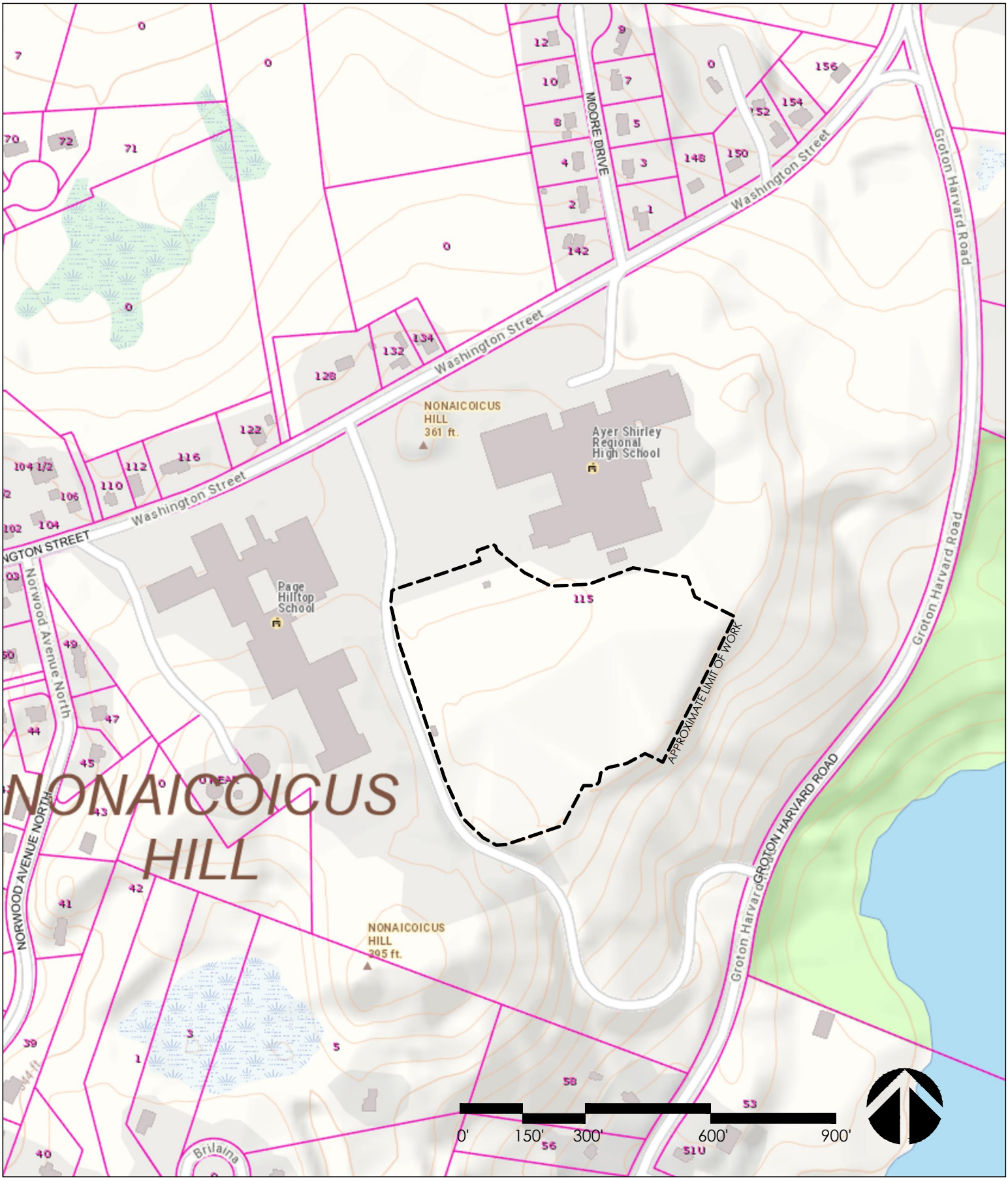
Civil Engineer/ Landscape Architect:
Activitas, Inc.
70 Milton Street
Dedham, MA 02026
(781) 326-2600

Electrical Engineer:
NV5
200 Brickstone Square
Andover, MA 01810
(978) 296-6232

Geotechnical Engineer:
Haley & Aldrich
465 Medford Street #2200
Charlestown, MA 02129
(617) 886-7400

Surveyor:
Landtech Consultants
515 Groton Road
Westford, MA 01886
(978) 692-6100

November 18, 2021



ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

AYER SHIRLEY REGIONAL SCHOOL DISTRICT

Ayer, MA

LOCUS MAP

PROJECT NO.: 21025.00
REFERENCE SHEET:
PHASE: STORMWATER REPORT
DATE: 15 NOVEMBER 2021
SCALE: 1"=300'-0"

SKETCH NO. 1

Executive Summary

The Ayer Shirley Regional School District proposes to renovate the existing track and field, baseball field, and support amenities at the High School. The project scope includes a renovated track, a new synthetic turf field, a new restrooms/concession building, new spectator seating and pressbox, new ADA walkways and site access, an expanded natural grass baseball field, and various site amenities to support the track and field areas.

Construction of the proposed project is subject to the Town of Ayer Stormwater Regulations and will comply with these regulations and the Massachusetts Department of Environmental Protection Stormwater Management Policy (January 2008).

The site is divided into two (2) discharge points. The first, DP-1, is the existing stormwater infrastructure on-site. DP-2 is the wooded area to the south of the field areas.

The following report was created in accordance with the "Massachusetts Stormwater Handbook" dated January 2008 and the Town of Ayer Stormwater Regulations, revised August 2021. The Report is organized into sections that correspond to the categories listed in the "Massachusetts Stormwater Report Checklist".

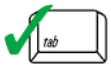
Massachusetts Stormwater Report Checklist

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

11/18/2021

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☒ Other (describe): Use of field profile for detention/infiltration

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Table of Contents

Table of Tables

1.0 Project Type

The area to be renovated is located at the existing athletic field behind the Ayer Shirley High School. The proposed Limit of Work is approximately 8.3-acres, but the project Area of Analysis (AOA) is approximately 10.9-acres to adequately delineate drainage areas. The proposed project consists of:

- Renovating and expanding the existing running track;
- Renovating the existing natural grass field within the track to an infilled synthetic turf playing surface;
- Installation of turf drainage system and subgrade for stormwater detention;
- Installation of a new athletic lighting system at the track and field;
- Installation of new spectator seating and pressbox;
- Installation of new ADA walkways and entrance;
- Renovation and expansion of the existing natural grass baseball field

The project has been designed in accordance with the "Massachusetts Stormwater Handbook" dated January 2008 and the Town of Ayer Stormwater Regulations, updated August 2021.

2.0 LID Measures

Key features of Low Impact Development (LID) stormwater management systems include implementing practices that maintain a site's existing hydrology, using decentralized practices to manage stormwater close to the source of generation, and maximizing on-site infiltration to reduce runoff and landscape watering requirements.

The following LID techniques Best Management Practices are specified in the proposed development program to mitigate the increase in stormwater runoff from the site.

BMPs Used:

- No disturbance to resource areas
- Use of "country drainage" and overland flow in areas of the site
- Utilizing field subgrade for stormwater storage and recharge

3.0 Standard 1 – No New Untreated Discharges

The MA Stormwater Handbook requires that the project demonstrate that there are no new, untreated discharges and that new discharges will not cause erosion or scour to downstream wetlands or waters of the Commonwealth.

The computations and strategies for Standards 4 through 6 in this report demonstrate that there will be no new untreated discharges from the site.

4.0 Standard 2 – Peak Rate Attenuation

Standard 2 and the local Ordinance requires that peak rates of flow be attenuated for the proposed condition for the 2-, 10-, 25-, and 100-year storms using the TR-55 rainfall rates. Peak flows will be at or below existing condition rates. The following section outlines the procedure for determining the peak rates for the existing condition as well as the methods for attenuating the peak flows in the proposed condition.

4.1 Soil Conditions

The NRCS Soil Report shows the area of work within Udorthents Soils, which was likely fill to level the site when the high school and fields were originally built. However adjacent soils vary from D soils to A soils. Geotechnical explorations were completed at the site and found the Fill materials generally consisted of yellow brown poorly graded sand with varying amounts of gravel and the glacial deposits layer below the fill consisting of poorly graded sand with varying amounts of gravel as well as areas of silty sand.

Based on the geotechnical explorations, the soils are being considered as B-soils. While the sand material could potentially fall into the A-soil category, carrying the soils as B will ensure the system is appropriately sized and if there is potential for additional infiltration the profiles will allow that to happen.

Table 1: NRCS Soil Types

Map Designation	Soil Name	Soil Group Rating
654	Udorthents	-
104C	Hollis-Rock outcrop- Charlton complex, 15 to 25 percent slopes	D
424D	Canton fine sandy loam, 15 to 25 percent slopes, extremely bouldery	A

4.2 Existing Conditions

The existing conditions consist of the existing track and field, the baseball field and the adjacent landscape and paved drive areas. The Area of Analysis (AOA) is broken into four (4) subcatchment areas flowing to two (2) Discharge Points. Discharge Point 1 (DP-1) is the existing storm drainage system that flows through the adjacent parking area. Discharge Point 2 (DP-2) is the wooded area beyond the baseball outfield area.

4.2.1 Existing Conditions Drainage Areas

EX-1A is 3.8-acres and consists of the existing track and field area and supporting walkways and landscape areas. Runoff flows to existing drainage infrastructure at the track and field, which connects to the infrastructure within the existing parking lot area. EX-1B is 1.9-acres and consists of the area to the north of the track and field. Runoff flows down to the drainage infrastructure within the parking lot area. The drainage infrastructure is considered DP-1.

EX-2A is 4.6-acres and consists of the majority of the baseball field area to the east of the track and field. EX-2B is 0.6-acres and consists of a small portion of the softball field to the east of the baseball field. Runoff flows overland to the wooded area to the south of the field, which is considered DP-2.

4.2.2 Existing Drainage Area Summary

Figure 2 shows a map of the existing drainage areas.

Table 2 summarizes the existing drainage areas, including the pertinent information used for hydrologic analysis.

Table 2: Existing Characteristics Summary

Drainage Area	Area		Curve Number*	Tc**
	Square Feet (SF)	Acres (AC)		
EX-1A	165,395	3.8	72	8.4
EX-1B	83,702	1.9	73	8.9
EX-2A	202,337	4.6	61	10.8
EX-2B	24,988	0.6	63	7.0

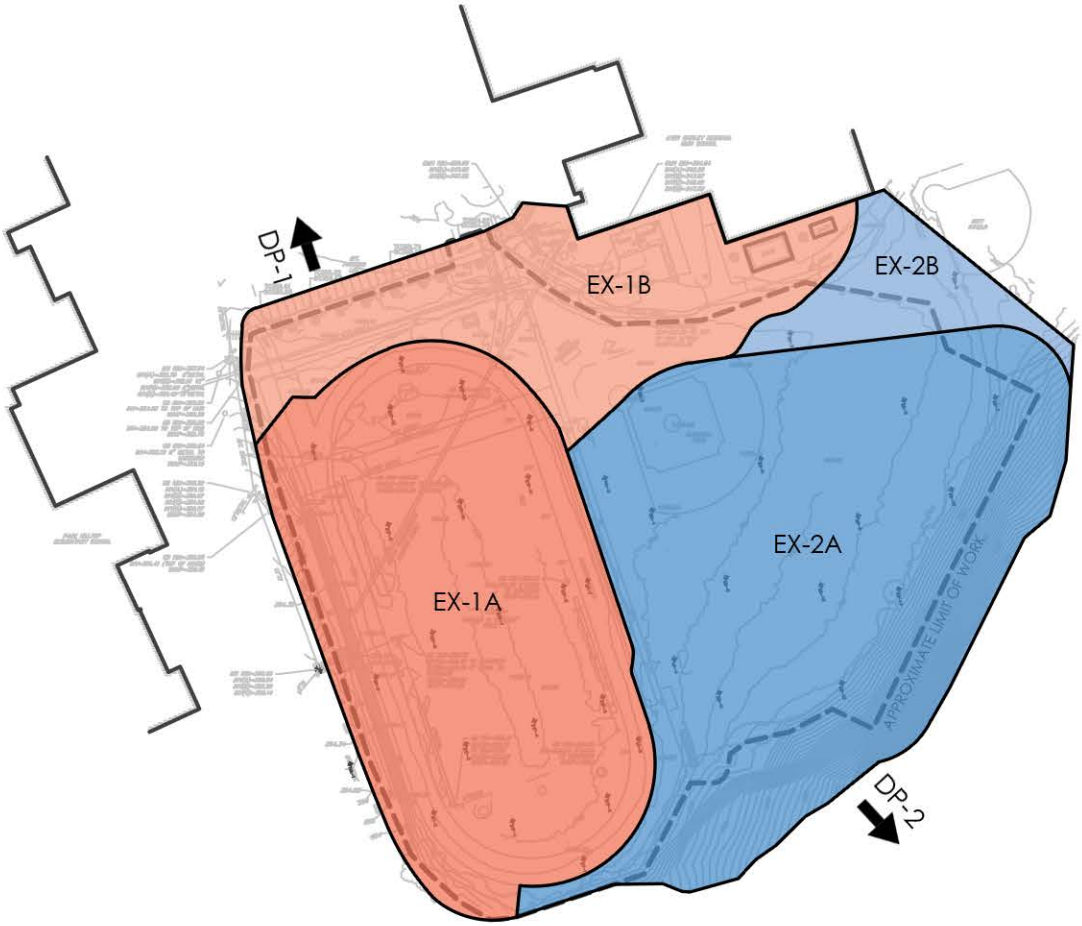
*Reference Attachment Section 13: HydroCAD Data – Existing Conditions, CN of each drainage area.
**Reference Attachment Section 13: HydroCAD Data – Existing Conditions, Tc of each drainage area.

LEGEND

DRAINAGE AREA EX-01

DRAINAGE AREA EX-02

DISCHARGE POINT DP-X



0' 100' 200' 400' 600'

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

AYER SHIRLEY REGIONAL SCHOOL DISTRICT

Ayer, MA

PRE-DEVELOPMENT PLAN

PROJECT NO.: 21025.00
REFERENCE SHEET:
PHASE: STORMWATER REPORT
DATE: 15 NOVEMBER 2021
SCALE: 1"=200'-0"

SKETCH NO. 2

4.3 Proposed Conditions

The proposed project consists of the expansion and renovation of the existing track, renovation of the existing infield area to synthetic turf, renovation of the existing baseball field to improve field playability, and upgrades to spectator seating, pressbox, ADA walkways and associated support areas. The AOA is broken up into six (6) subcatchment areas flowing to discharge points DP-1 and DP-2.

4.3.1 Proposed Drainage Areas

PR-1A is 0.4-acres and consists of the areas at the spectator seating area to the west of the track. Runoff from this area flows undetained to the drainage infrastructure, which ties into the existing infrastructure in the parking area to the west of the site (DP-1).

PR-1B is 3.6-acres and consists of the track and synthetic turf field area. Runoff from the track flows to a new channel drain at the interior edge of the track, which ties into the field drainage system. Runoff from the synthetic turf field drains vertically into the subsurface drainage system. The subsurface system is used for detention by allowing runoff that doesn't infiltrate while flowing over the subsurface to be detained in the stone base and using an outlet control structure to restrict the flow from the field area. This detention is modeled as Pond 1P in the HydroCAD model. The detention system connects to the existing drainage system to the west of the track in the parking lot area (DP-1). Refer to the appendix for the field storage calculations and for information regarding the Synthetic Turf Curve Number used.

PR-1C is 0.5-acres and consists of the area to the north of the track which includes the long/triple jump area, support building and the landscape and hardscape area within that area. Runoff flows to new drainage infrastructure within that area which ties back into the field detention system, and eventually flows to DP-1.

PR-1D is 1.7-acres and consists of the area to the north of long/triple jump area where runoff flows undetained down to the parking drainage infrastructure (DP-1).

PR-2A is 4.2-acres and consists of the majority of the baseball field and the wooded area to the south of the baseball field. Runoff flows overland on the baseball field where it is then collected in a stone trench which outlets through the drainage blanket behind and then through the new site retaining wall. This water flows undetained to the existing wooded area to he south (DP-2).

PR-2B is 0.6-acres and consists of a portion of the softball field to the east of the baseball field. Runoff flows overland at the softball field and towards the wooded area to the south (DP-2).

4.3.2 Proposed Drainage Area Summary

Figure 3 shows a map of the proposed drainage areas and respective discharge points.

Table 3 summarizes the proposed drainage areas, including the pertinent information used for hydrologic analysis.

Table 3: Proposed Conditions Drainage Area Characteristics Summary

Drainage Area	Area		Curve Number*	Tc**
	Square Feet (SF)	Acres (AC)		
PR-1A	16,567	0.4	69	6.0
PR-1B	152,849	3.5	76	6.0
PR-1C	22,398	0.5	87	6.0
PR-1D	74,919	1.7	77	6.0
PR-2A	181,638	4.2	61	10.3
PR-2B	28,053	0.6	63	7.3

*Reference Attachment HydroCAD Data for CN of each drainage area.

**Reference Attachment HydroCAD Data for Tc of each drainage area.

LEGEND

DRAINAGE AREA EX-01

DRAINAGE AREA EX-02

DISCHARGE POINT DP-X

0' 100' 200' 400' 600'

ACTIVITAS
landscape architecture | civil engineering
70 Milton Street | Dedham, MA 02026-2915
(781) 326-2600 | activitas.com

AYER SHIRLEY REGIONAL SCHOOL DISTRICT

Ayer, MA

POST-DEVELOPMENT PLAN

PROJECT NO.: 21025.00
REFERENCE SHEET:
PHASE: STORMWATER REPORT
DATE: 15 NOVEMBER 2021
SCALE: 1"=200'-0"

SKETCH NO. 3

4.4 Peak Discharge Runoff Rates and Volumes

The peak flows were calculated for the 2-, 10-, 25- and 100-year storm events under proposed conditions to compare to the existing runoff rates. As shown in Table 5, all proposed rates are below the existing conditions rates.

Table 4: Existing and Proposed Peak Rates of Runoff

Discharge Point	Runoff Rates (cfs)							
	2-Year		10-Year		25-Year		100-Year	
	EX	PR	EX	PR	EX	PR	EX	PR
DP-1	4.66	4.52	11.01	10.06	14.49	13.09	20.06	18.3
DP-2	1.11	1.05	4.87	4.6	7.19	6.78	11.11	10.49

cfs- Cubic feet per second

4.5 Methodology and Design Criteria

4.5.1 Hydrologic Model Description

The drainage analysis was performed using the Soil Conservation Service (SCS) TR-55 and TR-20 methodologies and the computer program HydroCAD 10.00-22 by HydroCAD software Solutions, LLC.

4.5.2 Design Storms

The analysis was performed on the 2-, 10-, 25- and 100-year frequency rainfall events. The events were based on the 24-hour Type-III duration storm.

4.5.3 Time of Concentration

Time of concentration (Tc) values were calculated using Average Velocities for Overland Flow, found in SCS TR-55 Urban Hydrology for Small Watersheds. The minimum Tc used was six (6) minutes.

4.5.4 Curve Numbers

Curve numbers were developed for each of the different use categories and hydrologic soil group types within each sub-area. The curve numbers were based on the SCS TR-55 methodology and are included in the HydroCAD input and output found in the Attachments Section.

4.5.5 Rainfall Depth

Rainfall depths were acquired from TR-55 rainfall data. Rainfall events for the 2-, 10-, 25- and 100-year storms were analyzed.

The following rainfall depths were used in the calculations:

Storm Event	**Rainfall Depth**
2-Year	3.02 inches
10-Year	4.48 inches
25-Year	5.20 inches
100-Year	6.30 inches

5.0 Standard 3 – Recharge

The intent of this standard is to ensure that the infiltration volume of precipitation into the ground under post-development conditions is at least as much as the infiltration volume under pre-development conditions. Standard 3 requires the restoration of recharge, using infiltration measures and careful site design. Through judicious use of low impact development techniques and other approaches that minimize impervious surfaces and mimic natural conditions, new developments can approximate pre-development recharge for most storms.

Based on review of the NRCS soil surveys and Geotechnical information (refer to Attachments section), the site is located in Hydrologic Soil Group B soils.

Calculations used to demonstrate compliance with Standard 3 used the Static method as outlined in the MA DEP Stormwater Management Handbook. The required recharge volume is determined by:

$$R_v = F * impervious\ area$$

Where:

F = Target Depth Factor associated with each Hydrologic Soil Group (0.35-inch for Soil Type B)

5.1 Recharge

The drainage areas that flow to DP-1 have a net increase of 39,873sf of impervious surface. The drainage areas that flow to DP-2 have a net decrease of impervious surface and therefore no formal recharge is required for the areas flowing to DP-2.

Recharge at the site to account for the increase in impervious flowing to DP-1 will occur at the subsurface detention within the turf field area (Pond 1P).

DP-1 Recharge Calculation:

$$Total\ Increase\ in\ Impervious\ Area = 39{,}873sf$$

$$R_v = \left(0.35\ in\ x\ \frac{1ft}{12in}\ x\ 39{,}873\ sf\right)$$

$$R_v = 1{,}162\ cf$$

$$Recharge\ Factor = \frac{114{,}965}{79{,}534} = 1.45$$

$$Adjusted\ Required\ Recharge\ Volume = R_v * Recharge\ Factor = 1{,}681\ cf$$

As shown on the plan there is an area of flat detention under the field area that extends about 27ft into the field on both sides of the field. This area provides more than enough stone voids to allow for the exfiltration of the required recharge volume:

Surface Area of flat detention = 27 ft x 774 ft = 20,898 sf

Required Recharge Volume = 1,681 cf

Stone Required = 1,681cf / 40% = 4,203cf stone needed

Depth of Stone Needed = 4,203cf / 20,898sf = 0.2ft = 2.41 inches of stone needed

Since the depth of stone is 6" these is more than enough stone to allow for the required recharge volume to exfiltrate.

5.2 Drawdown Time

The Massachusetts Stormwater Handbook requires that recharge volume have a drawdown time of 72 hours or less. The drawdown time is determined by:

$$Time_{drawdown} = \frac{R_v\ cf}{(K)\ x\ (Bottom\ Area)}$$

Where:

K= Rawls Rate (0.52 in/hr for Type B Loam)

5.2.1 Drawdown Time of Pond 1P

The drawdown time for the detention system associated with Infiltration Basin 1 (Pond 2P)

$$Time_{drawdown} = \frac{1{,}681\ cf}{\left(\frac{0.52\ in}{hr}\right) x\ (20{,}898\ sf)}$$

$$Time_{drawdown} = \frac{1{,}681\ cf}{\left(\frac{0.52 in}{hr}\right) x\ \left(\frac{1\ ft}{12\ in}\right) x\ \left(\frac{1\ hr}{60\ mins}\right) x\ (20{,}898\ sf)}$$

$$Time_{drawdown} = 111.4\ \ mins = 1.86\ hrs$$

The basin meet the drawdown time requirements.

6.0 Standard 4 – Water Quality

Per the Town of Ayer Stormwater Regulations, the stormwater management system will be designed to: (1) Retain the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the site and/or (2) Remove 90% of the average annual load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site and 60% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site.

Based on how the impervious surfaces in this project will be used, the site will not generate TSS like a typical development site, which would include parking lots, winter treatments, etc. that would generated TSS loads. As a track and field facility with ADA walkways that will not be maintained in the winter, typical BMPs are not required to treat stormwater running off of the impervious surface. While the Stormwater Standards don't account for this type of project, from an engineering standpoint we consider the runoff from these surfaces to be equivalent to having come from a surface with 10% efficiency with street sweeping and having run through a sediment forebay. Following this on the site the majority of the runoff will flow through deep sump and hooded catch basins and then into the infiltration basin. This leads to a TSS removal rate of 90%. Similarly, the proposed impervious areas will generate little to no phosphorus and for the intents and purposes of this standard the 60% reduction in Phosphorous is met.

7.0 Standard 5 – Land Uses with Higher Potential Pollutant Loads

The proposed project site is not considered a land use with Higher Potential Pollutant loads and therefore Standard 5 is not applicable to this project.

8.0 Standard 6 – Critical Areas

Stormwater discharges within critical areas require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such area, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors.

The runoff from the project site does not discharge to any critical areas and therefore is not subject to additional treatment required by Standard 6.

9.0 Standard 7 – Redevelopment

The project increases impervious surface and therefore is not considered a redevelopment project.

10.0 Standard 8 – Construction Period Pollution Prevention and Erosion & Sedimentation Control

Construction period pollution prevention and erosion and sedimentation control measures will be implemented at the project site to control construction related impacts during construction and land disturbance activities.

The general contractor for the project will be responsible for the implementation of the construction period controls.

The project scope will disturb approximately 8.3-acres of land during the construction process and will require a NPDES Construction General Permit issued by the Environmental Protection Agency. As a result, a stormwater pollution prevention plan (SWPPP) will be required. The SWPPP document will satisfy the requirements of the Construction General Permit and the construction period erosion, sedimentation and pollution prevention plan requirements outlined in Standard 9 of the Massachusetts Stormwater Handbook. A SWPPP will be developed by the awarded General Contractor and provided to the Civil Engineer for review. A copy can be provided to the Town for review as well if desired. A copy of the final SWPPP will be kept on-site during project construction.

11.0 Standard 9 – Operation and Maintenance Plan

The goal of the Operation and Maintenance Plan is not only to protect resources on-site or nearby, but also to protect resources in the region that may be affected by the activities at the site. For the proposed water quality treatment measures and the implementation of Best Management Practices (BMPs) refer to Section 6.0, Standard 4—Water Quality.

The Ayer-Shirley Regional School District will own the stormwater management system and they will be responsible for operation and maintenance. The Post Construction Operation and Maintenance Plan is included in the Attachments Section.

12.0 Standard 10 – Prohibition of Illicit Discharges

Standard 10 of the Massachusetts Stormwater Handbook prohibits illicit discharges to stormwater management systems. As stated in the handbook, "The stormwater management system is the system for conveying, treating, and infiltrating stormwater on-site, including stormwater best management practices and any pipes intended to transport stormwater to the groundwater, a surface water, or municipal separate storm sewer system. Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater."

It is fully understood that the Storm Water Pollution Prevention Plan (SWPPP) will include procedures to prevent illicit discharges to the stormwater management system.

Standard 10 also states that "The Illicit Discharge Compliance Statement must be accompanied by a site map that is drawn to scale and that identifies the location of any systems for conveying stormwater on the site and shows that these systems do not allow the entry of any illicit discharges into the stormwater management system. The site map shall identify the location of any systems for conveying wastewater and/or groundwater on the site and show that there are no connections between the stormwater and wastewater management systems and the location of any measures taken to prevent the entry of illicit discharges into the stormwater management system." Included with the Stormwater Report is a Utility Plan that displays the location of all of the stormwater management components as well as other utilities (existing and proposed) on the project site and conforms to requirements of a "site map" to accompany the Illicit Discharge Compliance Statement.

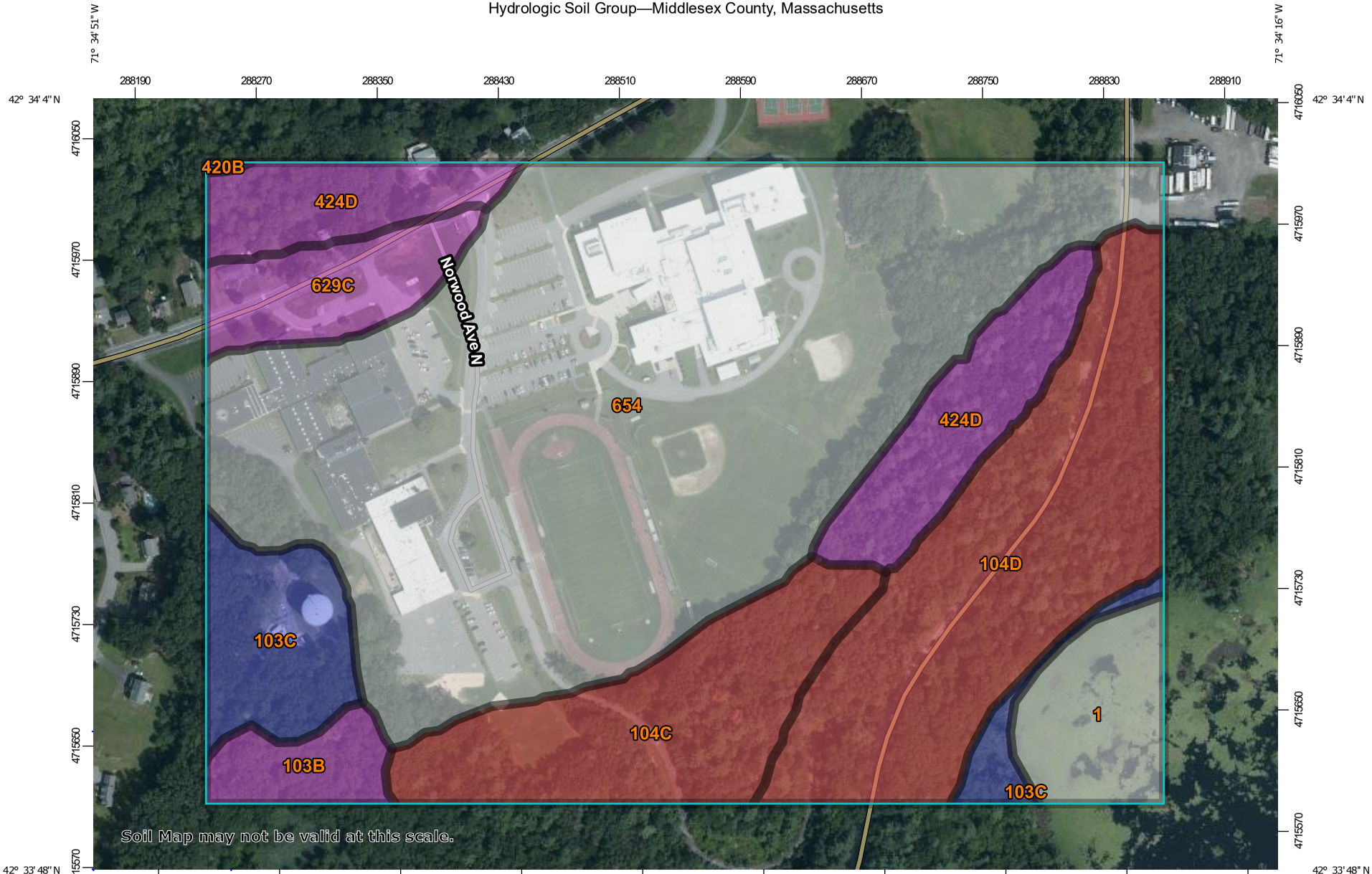
Illicit Discharge Compliance Statement

Per the requirements of Standard 10 of the Massachusetts Stormwater Management Standards it shall be stated that <u>No Illicit Discharges exist</u> on the ASRSD Track and Field Renovation project site at 141 Washington Street, Ayer, Massachusetts.

13.0 Attachments

Soil Map and Test Pit Results
Field Storage Calculations
Synthetic Turf Curve Number Information
HydroCAD Data 2-, 10-, 25-, and 100-year Storms
TSS Removal Calculation
Operation and Maintenance Plan (Bound Separately)

Soil Map and Test Pit Results



Map Scale: 1:3,580 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 21, Sep 2, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 12, 2019—Sep 29, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		2.7	4.1%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	A	1.5	2.2%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	B	3.7	5.6%
104C	Hollis-Rock outcrop-Charlton complex, 0 to 15 percent slopes	D	6.3	9.4%
104D	Hollis-Rock outcrop-Charlton complex, 15 to 25 percent slopes	D	10.7	16.1%
420B	Canton fine sandy loam, 3 to 8 percent slopes	B	0.0	0.1%
424D	Canton fine sandy loam, 15 to 25 percent slopes, extremely bouldery	A	5.6	8.5%
629C	Canton-Charlton-Urban land complex, 3 to 15 percent slopes	A	2.5	3.8%
654	Udorthents, loamy		33.4	50.3%
Totals for Area of Interest			**66.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Field Storage Calculations

Infiltration Basin 1 (Pond 1P)

Trench:West/North/East Perimeter Drain (Run 1)

Givens		
Invert 1 Elevation	357.167	ft
Invert 2 Elevation	355.43	ft
Top of Trench Elevation	358.17	ft
Diameter of Pipe	1	ft
Length of Pipe	589	ft
Width of Trench	3	ft
Voids	40	%
Calculations		
Average Pipe Elevation	356.3	ft
Height of Stone	1.87	ft
Cross-Sectional Area of Trench	5.6	ft^2
Cross-Sectional Area of Pipe	0.79	ft^2
Cross-Sectional Area of Stone	4.81	ft^2
Cross-Sectional Area of Voids (including pipe)	2.71	ft^2
Volume	1594.92	ft^3

Trench: West/South/East Perimter Drain (Run 2)

Givens		
Invert 1 Elevation	357.167	ft
Invert 2 Elevation	355.43	ft
Top of Trench Elevation	358.17	ft
Diameter of Pipe	1	ft
Length of Pipe	591	ft
Width of Trench	3	ft
Voids	40	%
Calculations		
Average Pipe Elevation	356.3	ft
Height of Stone	1.87	ft
Cross-Sectional Area of Trench	5.6	ft^2
Cross-Sectional Area of Pipe	0.79	ft^2
Cross-Sectional Area of Stone	4.81	ft^2
Cross-Sectional Area of Voids (including pipe)	2.71	ft^2
Volume	1600.80	ft^3

Field Storage (following subgrade)

Givens		
Top of Stone Elevation	358.67	ft
Depth of Stone	0.5	ft
Bottom of Stone at Edge of Field	358.17	ft
Length of Storage (includes both sides of field)	774.00	ft
Subgrade Slope	0.009	ft/ft
Voids	40	%
Calculations		
Width of Field Storage (both sides)	55.56	ft
Height of Triangular Field Storage Area	0.50	ft
Volume of Field Storage	4300	ft^3

Field Storage (extra area)

Givens		
Top of Stone Elevation	358.41	ft
Depth of Stone	0.243	ft
Bottom of Stone at Edge of Field	358.17	ft
Length of Storage (includes both sides of field)	774.00	ft
Subgrade Slope	0.009	ft/ft
Voids	40	%
Calculations		
Width of Field Storage (both sides)	27.00	ft
Height of Triangular Field Storage Area	0.24	ft
Volume of Field Storage	1015.64	ft^3

Total Volumes of Storage (voids)

Calculations		
Total Volume of Trenches	3195.72	ft^3
Total Volume of Field Storage	5315.6428	ft^3
Cumulative Storage	8511.36	ft^3

Synthetic Turf Curve Number Information

ACTIVITAS
landscape architecture | civil engineering

MEMORANDUM

Subject: Synthetic Turf Curve Number in Hydrologic Analysis

Project: **ASRSD Track & Field Renovation**
Project No. 21025.00

The following is an explanation why we (Activitas) model synthetic turf similar to a good grass as opposed to an impervious surface.

Neither a curve number nor a runoff coefficient for synthetic turf formally exists. This means that an engineer must use his/her best judgment in completing calculations based on previous experience, existing site conditions, and the known profile of the synthetic turf system. In our opinion and experience, a turf field should not be considered a large catch basin, but rather an area of surfacing with good drainage characteristics like a well-maintained natural grass athletic field with good drainage characteristics. The difference between natural grass and synthetic turf is that the top surface can withstand high volumes of use without degrading the surface, whereas the natural grass counterpart needs to be rested in order to maintain the uniform grass growth and therefore maintain its low volume of runoff associated with a "good" grass with >75% grass cover.

Synthetic turf drains vertically and therefore there is no actual surface runoff, which means it would have a very low CN. However, that runoff is now flowing subsurface laterally through compacted stone and over the subsurface soils resulting in infiltration of some of that runoff based on the existing soil type. We typically will use a curve number that is similar to good grass over whatever soil type the soils maps and/or a test pit show. Curve Numbers account for saturation of the ground surface soils prior to creation of runoff. To avoid accounting for this action by the soil material twice, we do not account for infiltration over the entire field.

In most of our synthetic turf field projects, we use portions of the stone drainage profile as a detention area and model this in HydroCAD as a "pond". Given that our fields typically have a slight crown with a matching surface and subgrade, we only use the portion of stone available with the highest elevation equal to ~2" lower than the lowest field surface elevation for available storage. This creates a "wedge" of available storage depending on the thickness of the profile. In this scenario, we do account for exfiltration over the footprint of the stone available for storage based on soil type. We do not consider accounting for exfiltration and a low curve number to be accounting for soil saturation twice. During a storm event, the subgrade soils will still need to saturate with the initial runoff prior to the "pond" collecting water and beginning to fill up. Once the pond begins to collect water, the model then accounts for the exfiltration from

ACTIVITAS

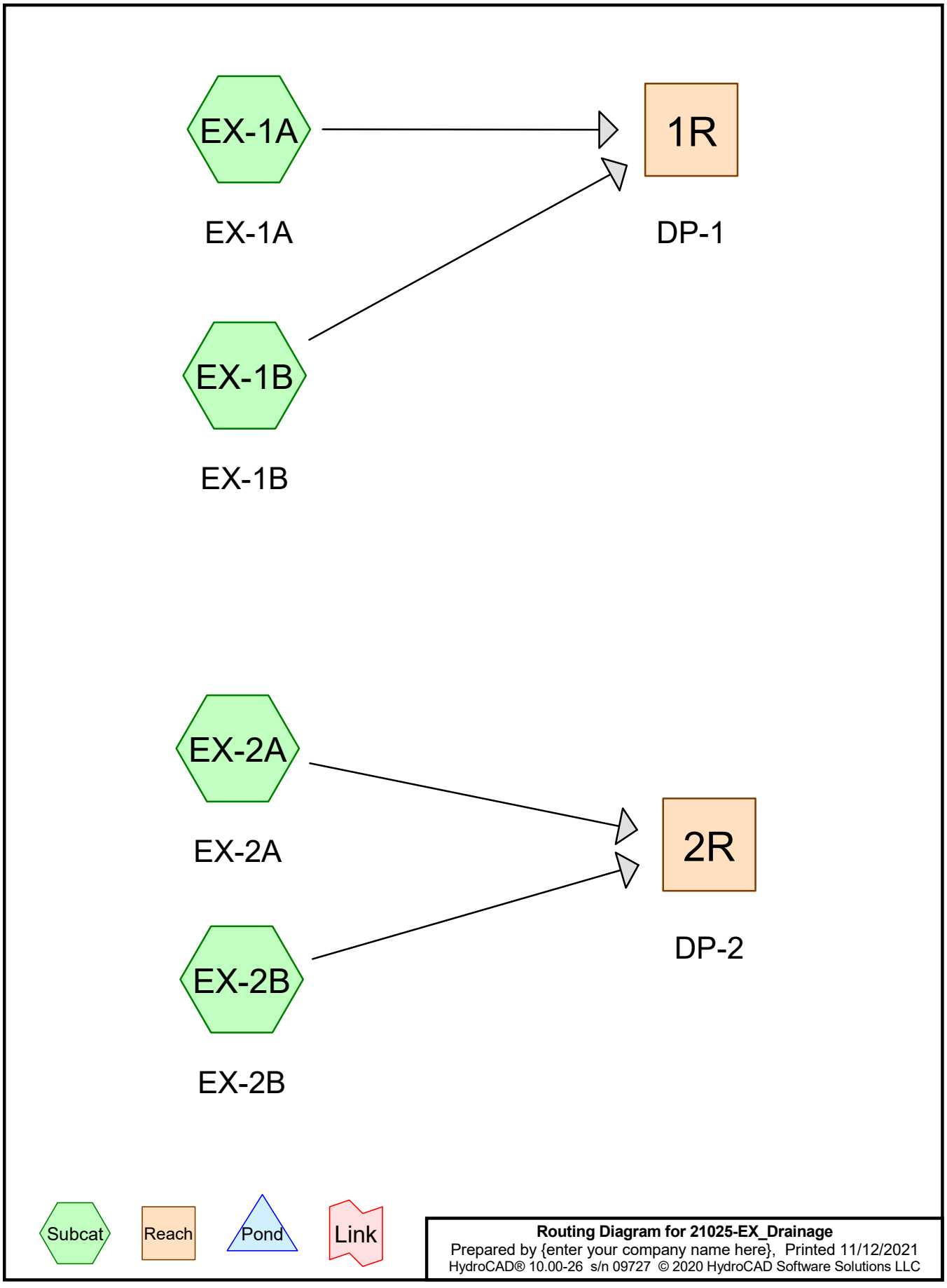
the pond.

We have been using this modeling precedent for the last 15 years without any reports of flooding conditions or unusable field conditions. In previous projects, if this modeling was not satisfactory, we would expect to see fields flood out the top of the field and have drainage issues on the field surface. With the opportunity to work with repeat clients overtime, we have had the opportunity to evaluate our existing designs over time. There has not been a single instance where we have seen these types of drainage problems, and therefore are confident the design approach is appropriate. We also have not had reports that a synthetic field has caused downstream flooding. In fact, there have been projects where we have received feedback that neighboring properties have actually seen less volume of runoff flowing towards them, implying the design approach is in fact conservative. We understand that other engineers may model a synthetic turf system differently. We contend that there is not one correct way to model this system, but we are very comfortable that the modeling is appropriately conservative and realistic to actual conditions at the site and propose system.

Over the years our projects have been peer reviewed on many occasions where we have used similar CNs and used the turf base as detention and exfiltration. The following is a list of those projects where reviews have been completed:

- Weston High School Track and Field, Nitsch Engineering
- Scituate High School Athletic Complex, Merrill Engineering
- Carver High School Track and Field, Fuss & O'Neill
- Gonzalez Field in Dedham, MA, reviewed internally by Engineering Department
- Springfield College Baseball Field, reviewed by City Engineering Department
- Southborough Youth Soccer Field, reviewed by Fuss & O'Neill

HydroCAD Data – 2, 10, 25, 100-year Storms



Routing Diagram for 21025-EX_Drainage
Prepared by {enter your company name here}, Printed 11/12/2021

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1A: EX-1A Runoff Area=165,396 sf 29.04% Impervious Runoff Depth>0.82"
Flow Length=180' Tc=8.4 min CN=72 Runoff=3.04 cfs 11,276 cf

Subcatchment EX-1B: EX-1B Runoff Area=83,702 sf 32.33% Impervious Runoff Depth>0.87"
Flow Length=205' Tc=8.9 min CN=73 Runoff=1.63 cfs 6,051 cf

Subcatchment EX-2A: EX-2A Runoff Area=202,337 sf 1.14% Impervious Runoff Depth>0.37"
Flow Length=435' Tc=10.8 min CN=61 Runoff=0.96 cfs 6,258 cf

Subcatchment EX-2B: EX-2B Runoff Area=24,777 sf 4.53% Impervious Runoff Depth>0.44"
Flow Length=230' Slope=0.0200 '/' Tc=7.0 min CN=63 Runoff=0.19 cfs 909 cf

Reach 1R: DP-1 Inflow=4.66 cfs 17,327 cf
Outflow=4.66 cfs 17,327 cf

Reach 2R: DP-2 Inflow=1.11 cfs 7,167 cf
Outflow=1.11 cfs 7,167 cf

Total Runoff Area = 476,212 sf Runoff Volume = 24,493 cf Average Runoff Depth = 0.62"
83.51% Pervious = 397,683 sf 16.49% Impervious = 78,529 sf

Summary for Subcatchment EX-1A: EX-1A

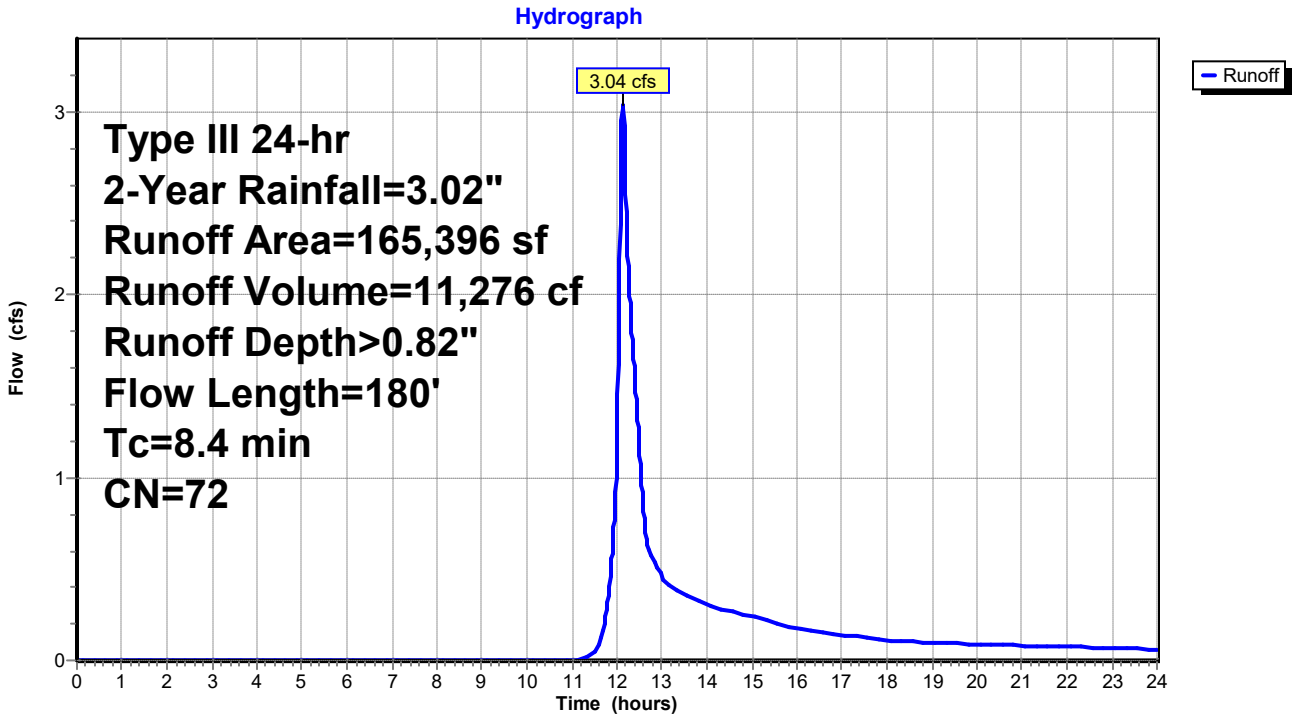
Runoff = 3.04 cfs @ 12.13 hrs, Volume= 11,276 cf, Depth> 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

Area (sf)	CN	Description
48,027	98	Paved parking, HSG B
113,039	61	>75% Grass cover, Good, HSG B
4,330	55	Woods, Good, HSG B
165,396	72	Weighted Average
117,369		70.96% Pervious Area
48,027		29.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0125	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.5	130	0.0080	1.44		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.4	180	Total			

Subcatchment EX-1A: EX-1A



Summary for Subcatchment EX-1B: EX-1B

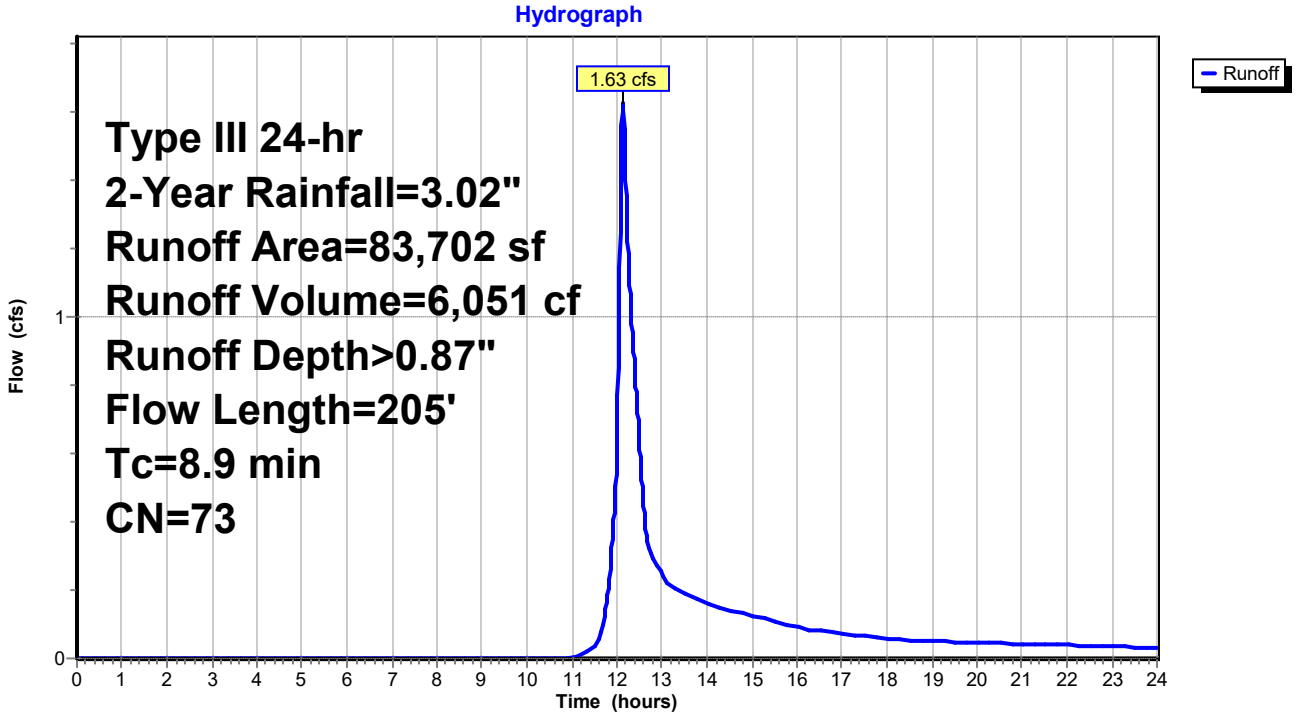
Runoff = 1.63 cfs @ 12.14 hrs, Volume= 6,051 cf, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

Area (sf)	CN	Description
27,064	98	Paved parking, HSG B
332	86	Fallow, bare soil, HSG B
56,306	61	>75% Grass cover, Good, HSG B
83,702	73	Weighted Average
56,638		67.67% Pervious Area
27,064		32.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.4	155	0.0130	1.84		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.9	205	Total			

Subcatchment EX-1B: EX-1B



Summary for Subcatchment EX-2A: EX-2A

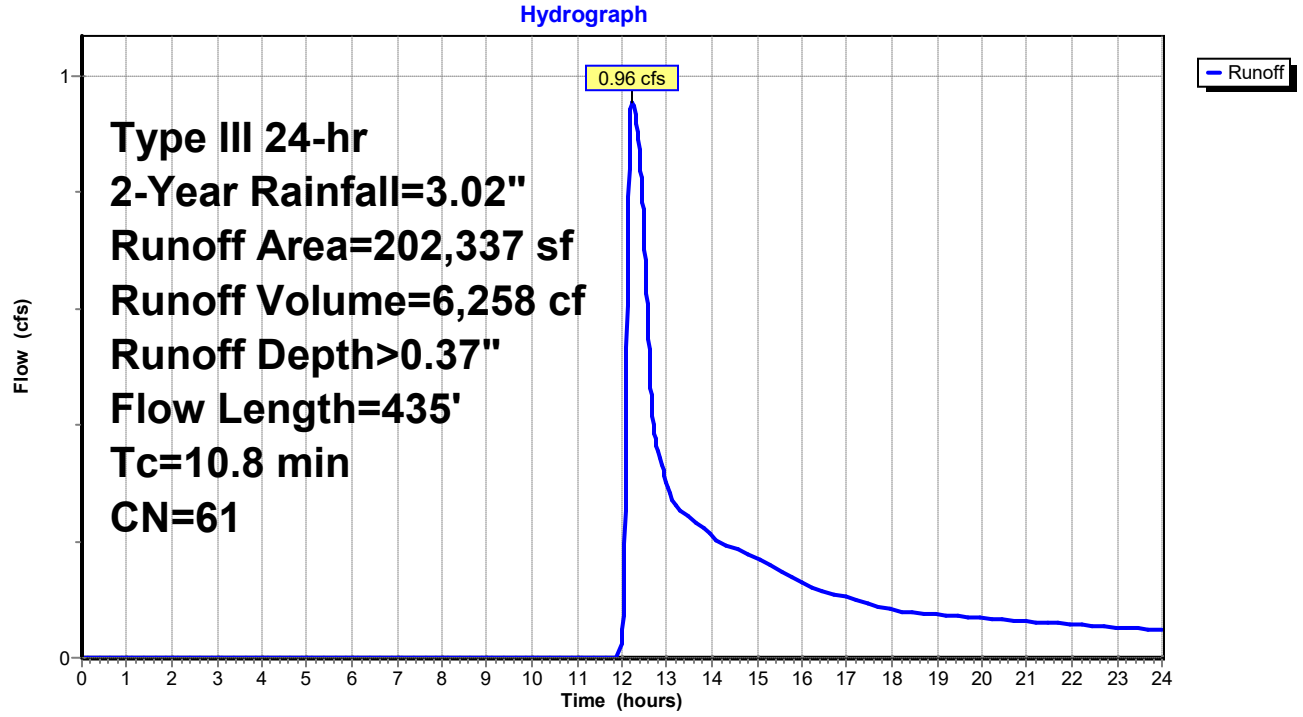
Runoff = 0.96 cfs @ 12.23 hrs, Volume= 6,258 cf, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

	Area (sf)	CN	Description
	2,316	98	Paved parking, HSG B
*	10,803	86	Fallow, bare soil, HSG B
	123,010	61	>75% Grass cover, Good, HSG B
	66,208	55	Woods, Good, HSG B
	202,337	61	Weighted Average
	200,021		98.86% Pervious Area
	2,316		1.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
3.1	300	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	85	0.3000	8.82		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.8	435	Total			

Subcatchment EX-2A: EX-2A



Summary for Subcatchment EX-2B: EX-2B

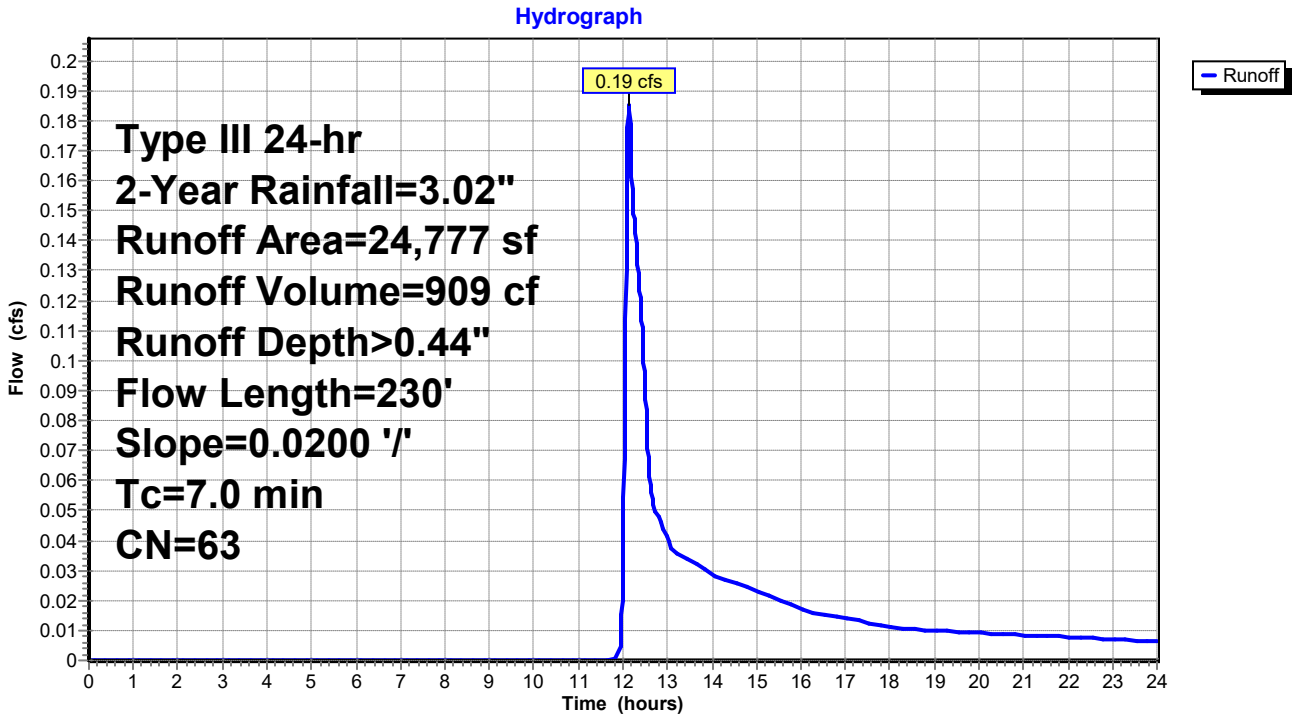
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 909 cf, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

	Area (sf)	CN	Description
	1,122	98	Paved parking, HSG B
*	520	86	Fallow, bare soil, HSG B
	23,135	61	>75% Grass cover, Good, HSG B
	24,777	63	Weighted Average
	23,655		95.47% Pervious Area
	1,122		4.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.3	180	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	230	Total			

Subcatchment EX-2B: EX-2B

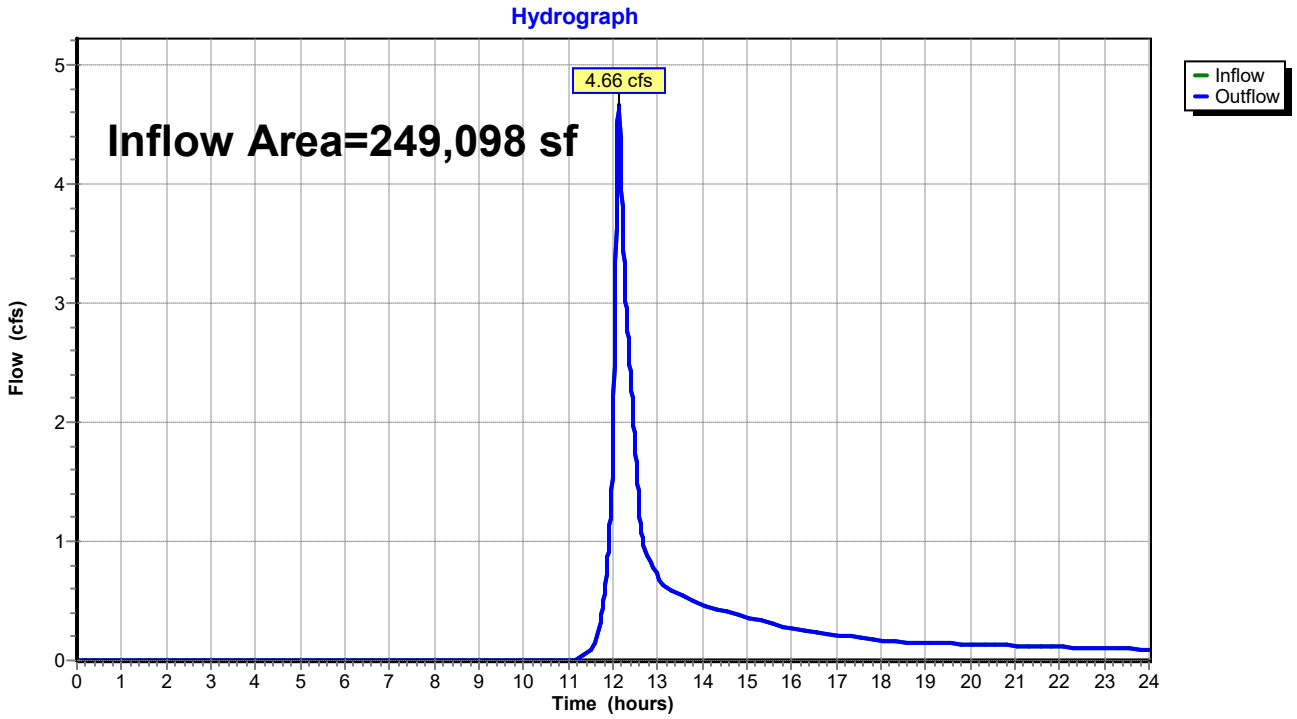


Summary for Reach 1R: DP-1

Inflow Area = 249,098 sf, 30.15% Impervious, Inflow Depth > 0.83" for 2-Year event
Inflow = 4.66 cfs @ 12.13 hrs, Volume= 17,327 cf
Outflow = 4.66 cfs @ 12.13 hrs, Volume= 17,327 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 1R: DP-1

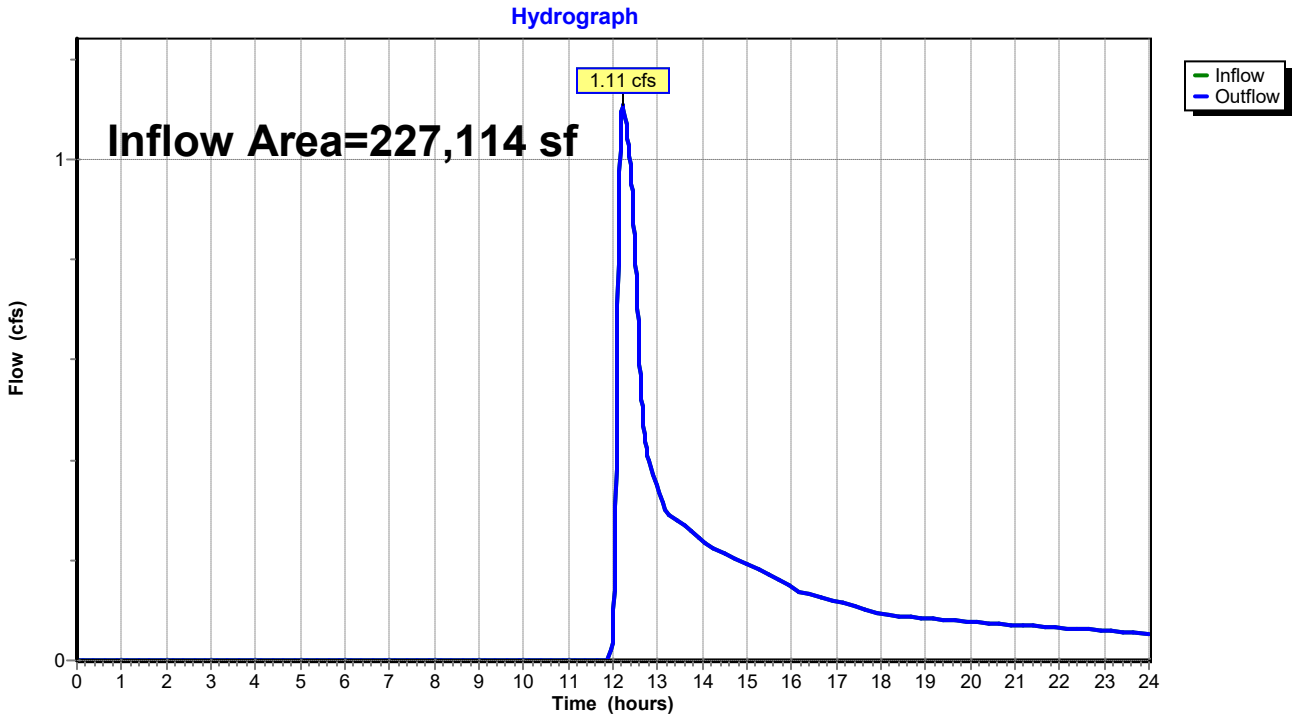


Summary for Reach 2R: DP-2

Inflow Area = 227,114 sf, 1.51% Impervious, Inflow Depth > 0.38" for 2-Year event
Inflow = 1.11 cfs @ 12.22 hrs, Volume= 7,167 cf
Outflow = 1.11 cfs @ 12.22 hrs, Volume= 7,167 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 2R: DP-2



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1A: EX-1A Runoff Area=165,396 sf 29.04% Impervious Runoff Depth>1.80"
Flow Length=180' Tc=8.4 min CN=72 Runoff=7.25 cfs 24,838 cf

Subcatchment EX-1B: EX-1B Runoff Area=83,702 sf 32.33% Impervious Runoff Depth>1.88"
Flow Length=205' Tc=8.9 min CN=73 Runoff=3.77 cfs 13,091 cf

Subcatchment EX-2A: EX-2A Runoff Area=202,337 sf 1.14% Impervious Runoff Depth>1.06"
Flow Length=435' Tc=10.8 min CN=61 Runoff=4.27 cfs 17,952 cf

Subcatchment EX-2B: EX-2B Runoff Area=24,777 sf 4.53% Impervious Runoff Depth>1.19"
Flow Length=230' Slope=0.0200 '/' Tc=7.0 min CN=63 Runoff=0.69 cfs 2,453 cf

Reach 1R: DP-1 Inflow=11.01 cfs 37,928 cf
Outflow=11.01 cfs 37,928 cf

Reach 2R: DP-2 Inflow=4.87 cfs 20,405 cf
Outflow=4.87 cfs 20,405 cf

Total Runoff Area = 476,212 sf Runoff Volume = 58,333 cf Average Runoff Depth = 1.47"
83.51% Pervious = 397,683 sf 16.49% Impervious = 78,529 sf

Summary for Subcatchment EX-1A: EX-1A

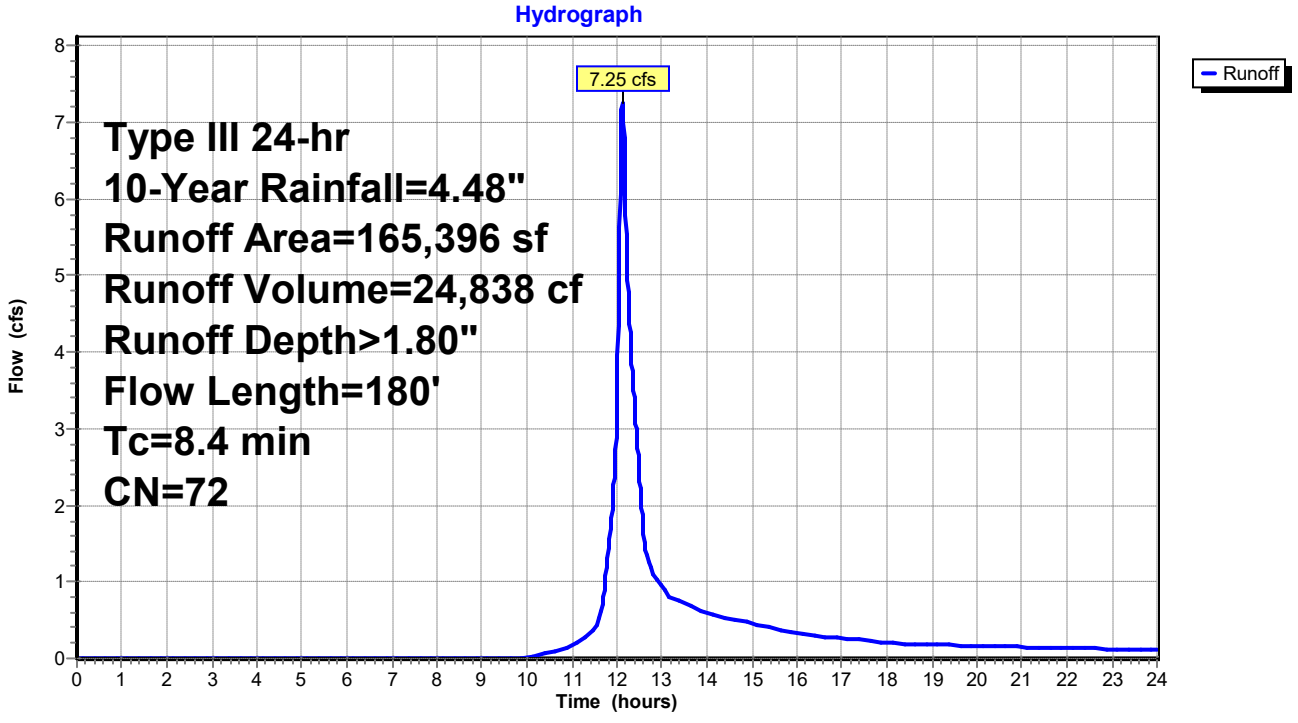
Runoff = 7.25 cfs @ 12.12 hrs, Volume= 24,838 cf, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

Area (sf)	CN	Description
48,027	98	Paved parking, HSG B
113,039	61	>75% Grass cover, Good, HSG B
4,330	55	Woods, Good, HSG B
165,396	72	Weighted Average
117,369		70.96% Pervious Area
48,027		29.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0125	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.5	130	0.0080	1.44		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.4	180	Total			

Subcatchment EX-1A: EX-1A



Summary for Subcatchment EX-1B: EX-1B

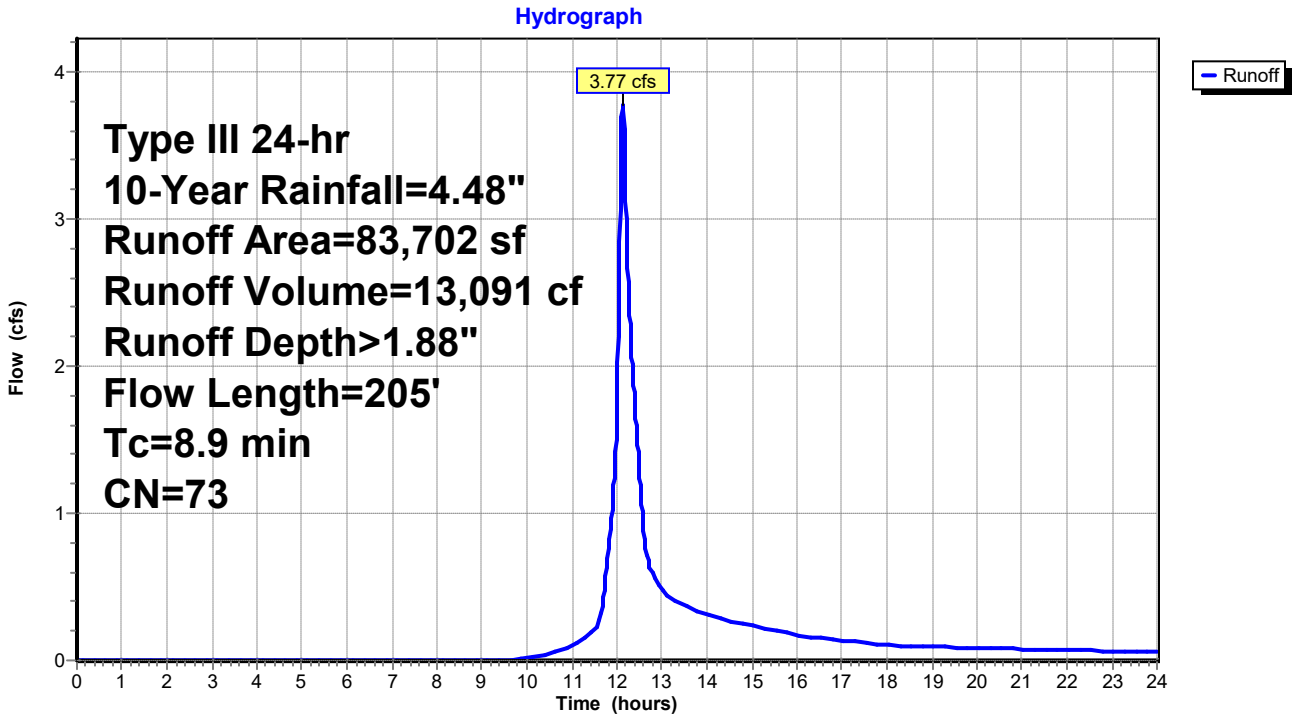
Runoff = 3.77 cfs @ 12.13 hrs, Volume= 13,091 cf, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

Area (sf)	CN	Description
27,064	98	Paved parking, HSG B
332	86	Fallow, bare soil, HSG B
56,306	61	>75% Grass cover, Good, HSG B
83,702	73	Weighted Average
56,638		67.67% Pervious Area
27,064		32.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.4	155	0.0130	1.84		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.9	205	Total			

Subcatchment EX-1B: EX-1B



Summary for Subcatchment EX-2A: EX-2A

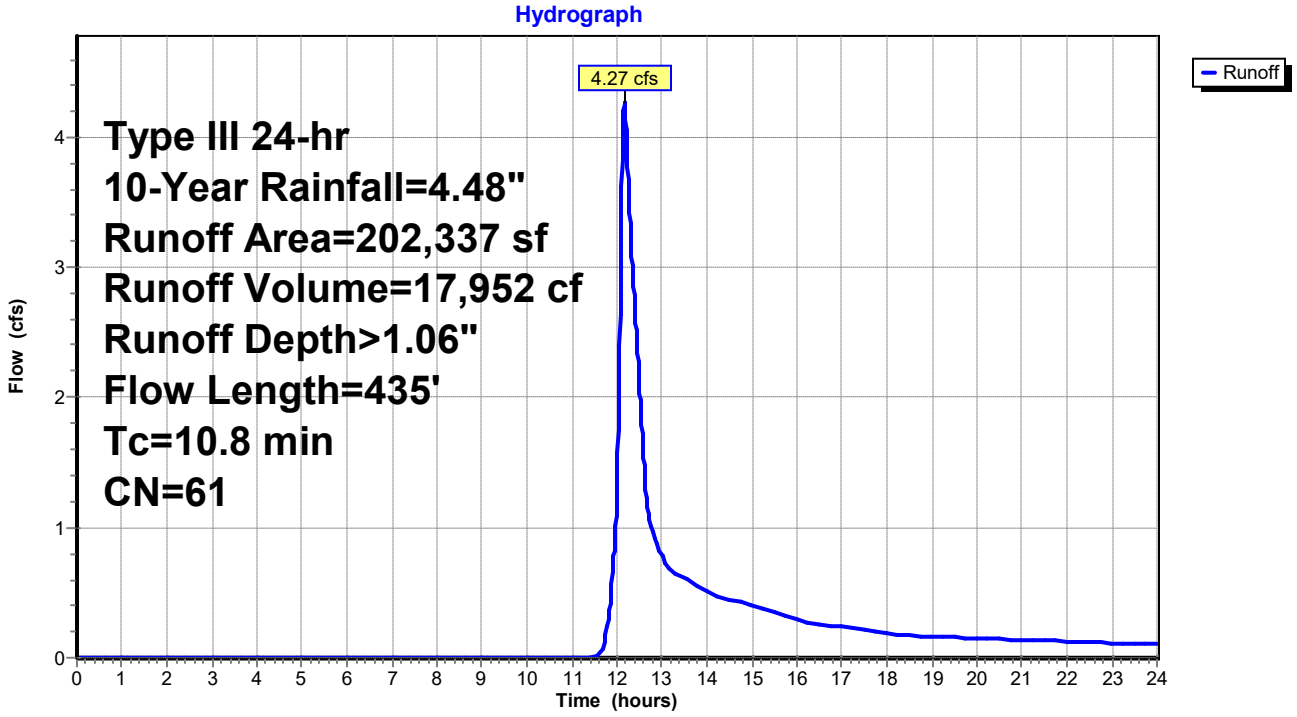
Runoff = 4.27 cfs @ 12.17 hrs, Volume= 17,952 cf, Depth> 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

	Area (sf)	CN	Description
	2,316	98	Paved parking, HSG B
*	10,803	86	Fallow, bare soil, HSG B
	123,010	61	>75% Grass cover, Good, HSG B
	66,208	55	Woods, Good, HSG B
	202,337	61	Weighted Average
	200,021		98.86% Pervious Area
	2,316		1.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
3.1	300	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	85	0.3000	8.82		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.8	435	Total			

Subcatchment EX-2A: EX-2A



Summary for Subcatchment EX-2B: EX-2B

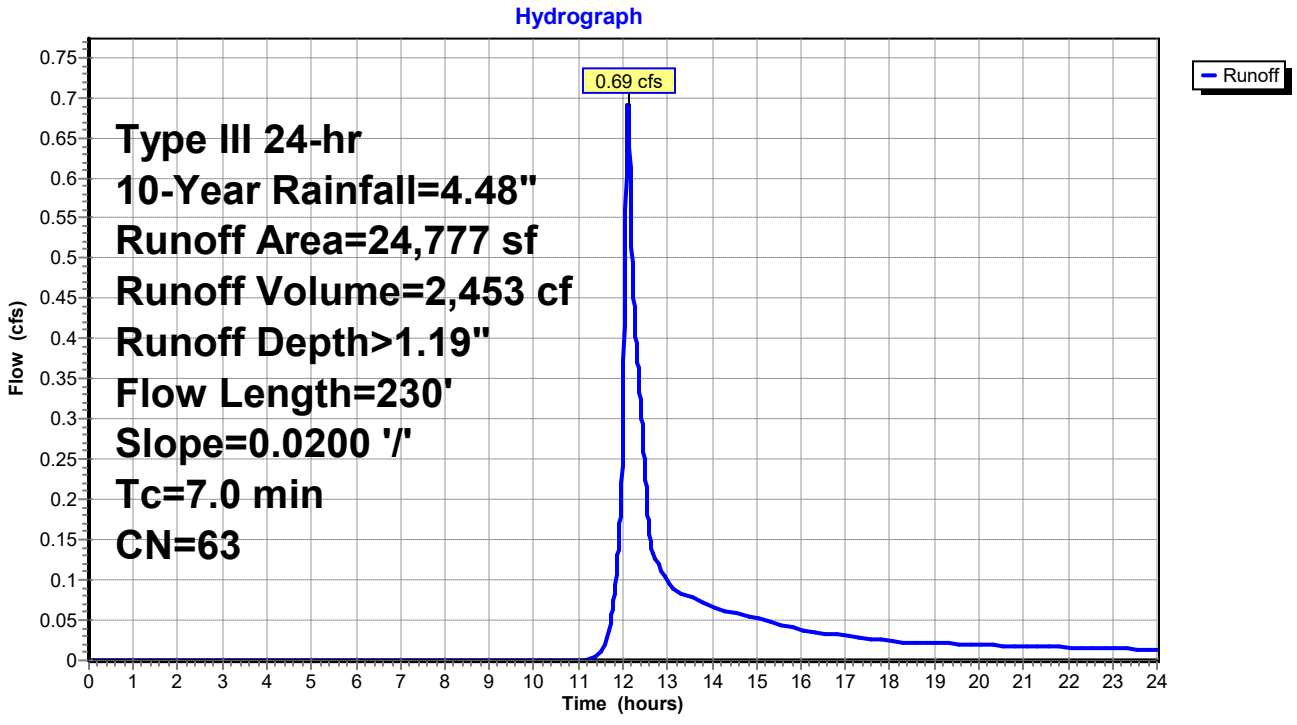
Runoff = 0.69 cfs @ 12.11 hrs, Volume= 2,453 cf, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

	Area (sf)	CN	Description
	1,122	98	Paved parking, HSG B
*	520	86	Fallow, bare soil, HSG B
	23,135	61	>75% Grass cover, Good, HSG B
	24,777	63	Weighted Average
	23,655		95.47% Pervious Area
	1,122		4.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.3	180	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	230	Total			

Subcatchment EX-2B: EX-2B

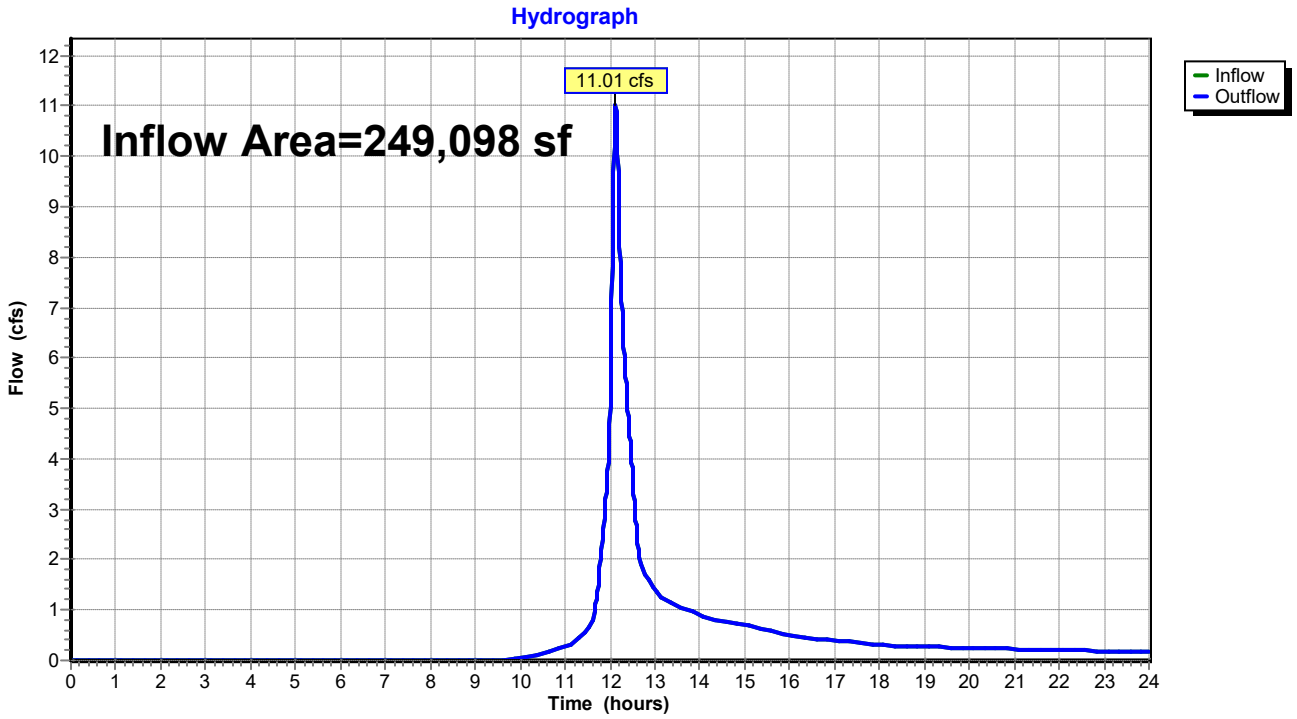


Summary for Reach 1R: DP-1

Inflow Area = 249,098 sf, 30.15% Impervious, Inflow Depth > 1.83" for 10-Year event
Inflow = 11.01 cfs @ 12.13 hrs, Volume= 37,928 cf
Outflow = 11.01 cfs @ 12.13 hrs, Volume= 37,928 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 1R: DP-1

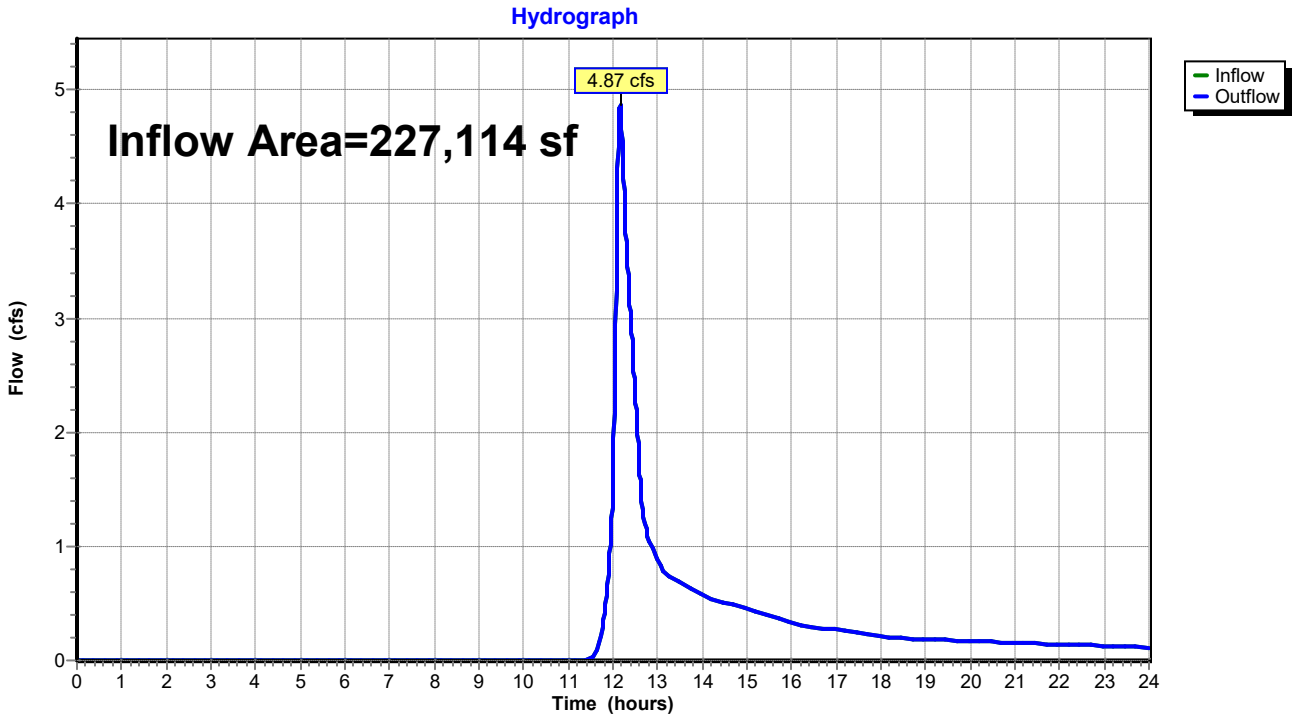


Summary for Reach 2R: DP-2

Inflow Area = 227,114 sf, 1.51% Impervious, Inflow Depth > 1.08" for 10-Year event
Inflow = 4.87 cfs @ 12.16 hrs, Volume= 20,405 cf
Outflow = 4.87 cfs @ 12.16 hrs, Volume= 20,405 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 2R: DP-2



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1A: EX-1A Runoff Area=165,396 sf 29.04% Impervious Runoff Depth>2.35"
Flow Length=180' Tc=8.4 min CN=72 Runoff=9.56 cfs 32,371 cf

Subcatchment EX-1B: EX-1B Runoff Area=83,702 sf 32.33% Impervious Runoff Depth>2.43"
Flow Length=205' Tc=8.9 min CN=73 Runoff=4.94 cfs 16,975 cf

Subcatchment EX-2A: EX-2A Runoff Area=202,337 sf 1.14% Impervious Runoff Depth>1.49"
Flow Length=435' Tc=10.8 min CN=61 Runoff=6.32 cfs 25,061 cf

Subcatchment EX-2B: EX-2B Runoff Area=24,777 sf 4.53% Impervious Runoff Depth>1.63"
Flow Length=230' Slope=0.0200 '/' Tc=7.0 min CN=63 Runoff=0.99 cfs 3,374 cf

Reach 1R: DP-1 Inflow=14.49 cfs 49,346 cf
Outflow=14.49 cfs 49,346 cf

Reach 2R: DP-2 Inflow=7.19 cfs 28,435 cf
Outflow=7.19 cfs 28,435 cf

Total Runoff Area = 476,212 sf Runoff Volume = 77,781 cf Average Runoff Depth = 1.96"
83.51% Pervious = 397,683 sf 16.49% Impervious = 78,529 sf

Summary for Subcatchment EX-1A: EX-1A

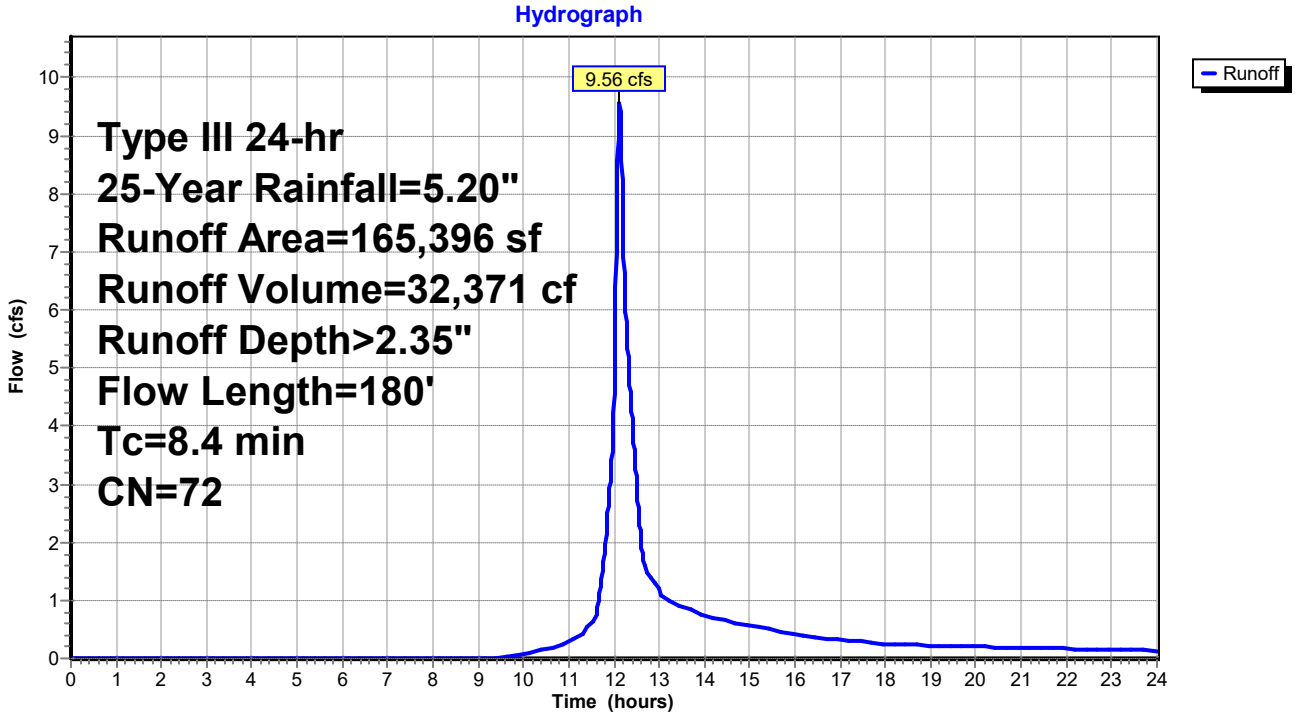
Runoff = 9.56 cfs @ 12.12 hrs, Volume= 32,371 cf, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

Area (sf)	CN	Description
48,027	98	Paved parking, HSG B
113,039	61	>75% Grass cover, Good, HSG B
4,330	55	Woods, Good, HSG B
165,396	72	Weighted Average
117,369		70.96% Pervious Area
48,027		29.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0125	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.5	130	0.0080	1.44		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.4	180	Total			

Subcatchment EX-1A: EX-1A



Summary for Subcatchment EX-1B: EX-1B

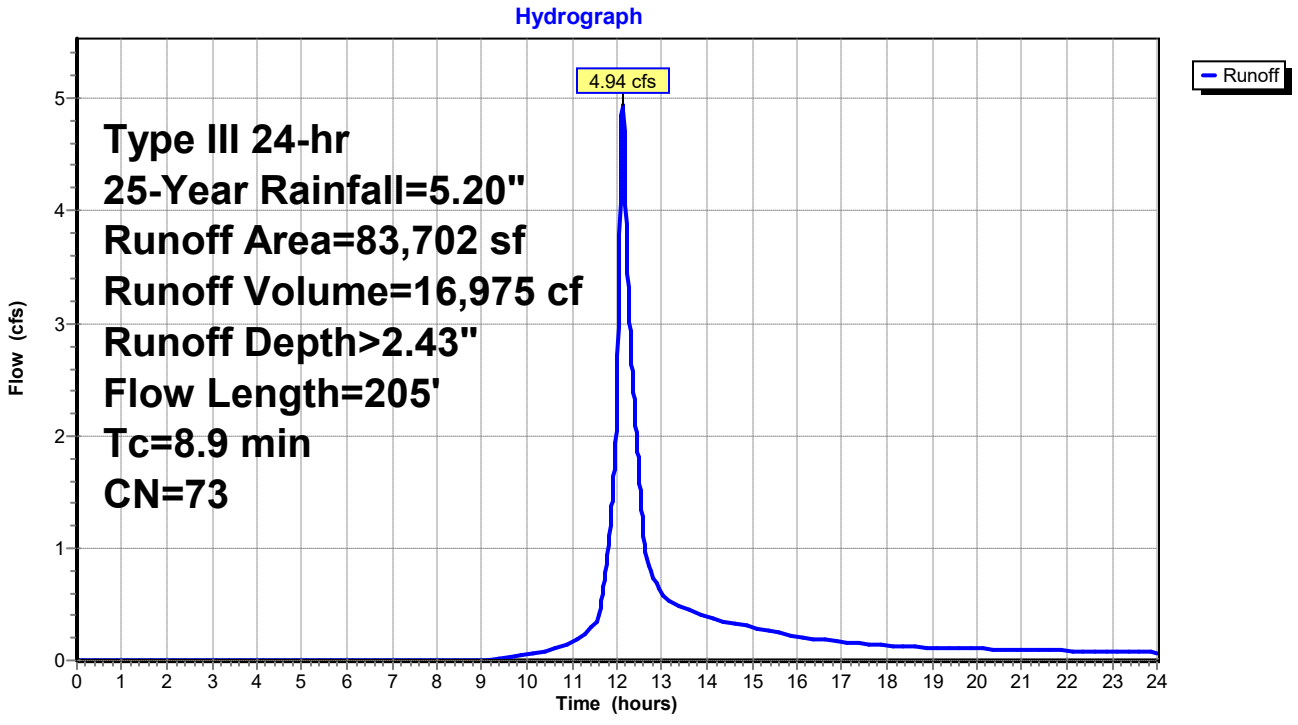
Runoff = 4.94 cfs @ 12.13 hrs, Volume= 16,975 cf, Depth> 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

Area (sf)	CN	Description
27,064	98	Paved parking, HSG B
332	86	Fallow, bare soil, HSG B
56,306	61	>75% Grass cover, Good, HSG B
83,702	73	Weighted Average
56,638		67.67% Pervious Area
27,064		32.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.4	155	0.0130	1.84		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.9	205	Total			

Subcatchment EX-1B: EX-1B



Summary for Subcatchment EX-2A: EX-2A

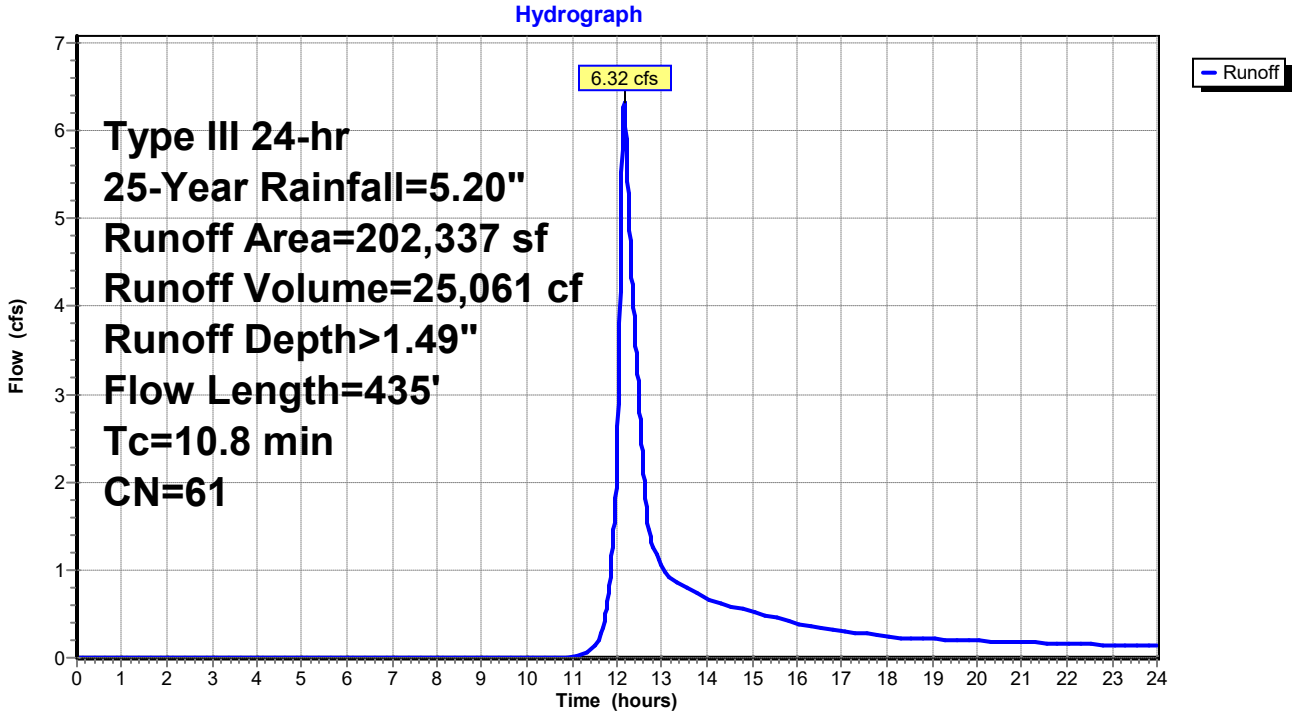
Runoff = 6.32 cfs @ 12.16 hrs, Volume= 25,061 cf, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

	Area (sf)	CN	Description
	2,316	98	Paved parking, HSG B
*	10,803	86	Fallow, bare soil, HSG B
	123,010	61	>75% Grass cover, Good, HSG B
	66,208	55	Woods, Good, HSG B
	202,337	61	Weighted Average
	200,021		98.86% Pervious Area
	2,316		1.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
3.1	300	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	85	0.3000	8.82		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.8	435	Total			

Subcatchment EX-2A: EX-2A



Summary for Subcatchment EX-2B: EX-2B

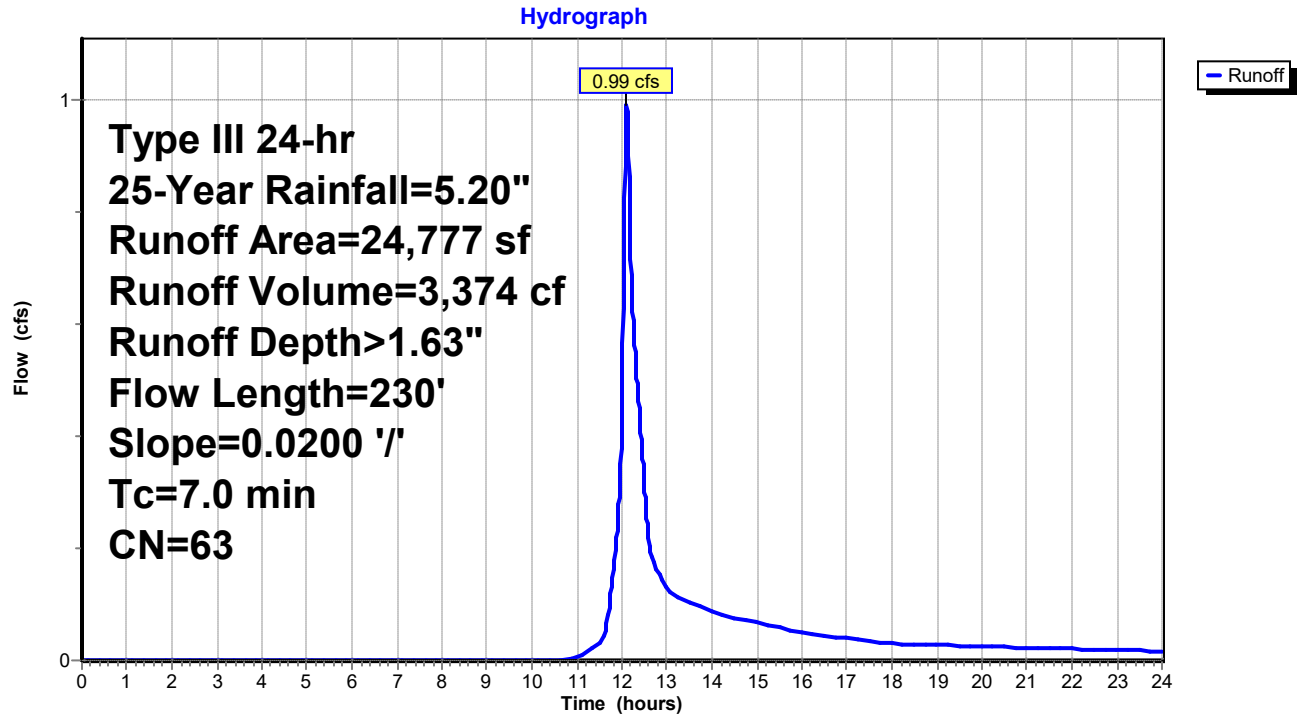
Runoff = 0.99 cfs @ 12.11 hrs, Volume= 3,374 cf, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

	Area (sf)	CN	Description
	1,122	98	Paved parking, HSG B
*	520	86	Fallow, bare soil, HSG B
	23,135	61	>75% Grass cover, Good, HSG B
	24,777	63	Weighted Average
	23,655		95.47% Pervious Area
	1,122		4.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.3	180	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	230	Total			

Subcatchment EX-2B: EX-2B

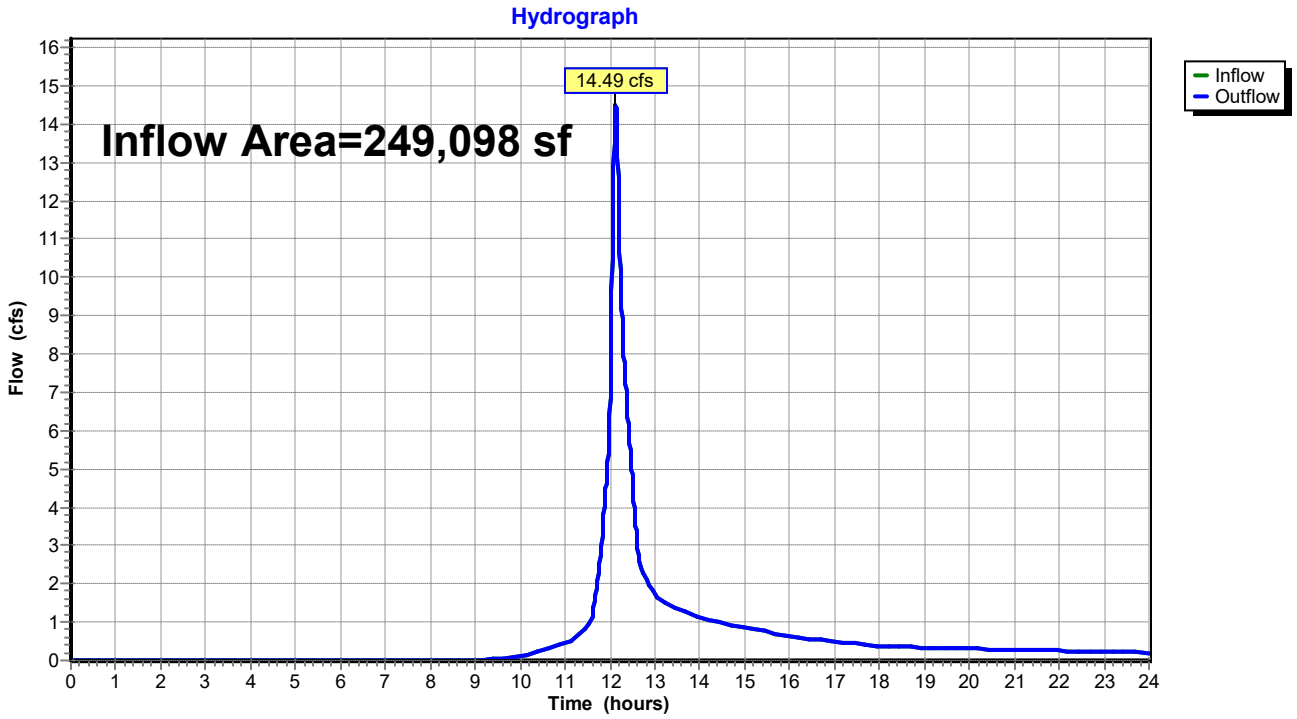


Summary for Reach 1R: DP-1

Inflow Area = 249,098 sf, 30.15% Impervious, Inflow Depth > 2.38" for 25-Year event
Inflow = 14.49 cfs @ 12.12 hrs, Volume= 49,346 cf
Outflow = 14.49 cfs @ 12.12 hrs, Volume= 49,346 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 1R: DP-1

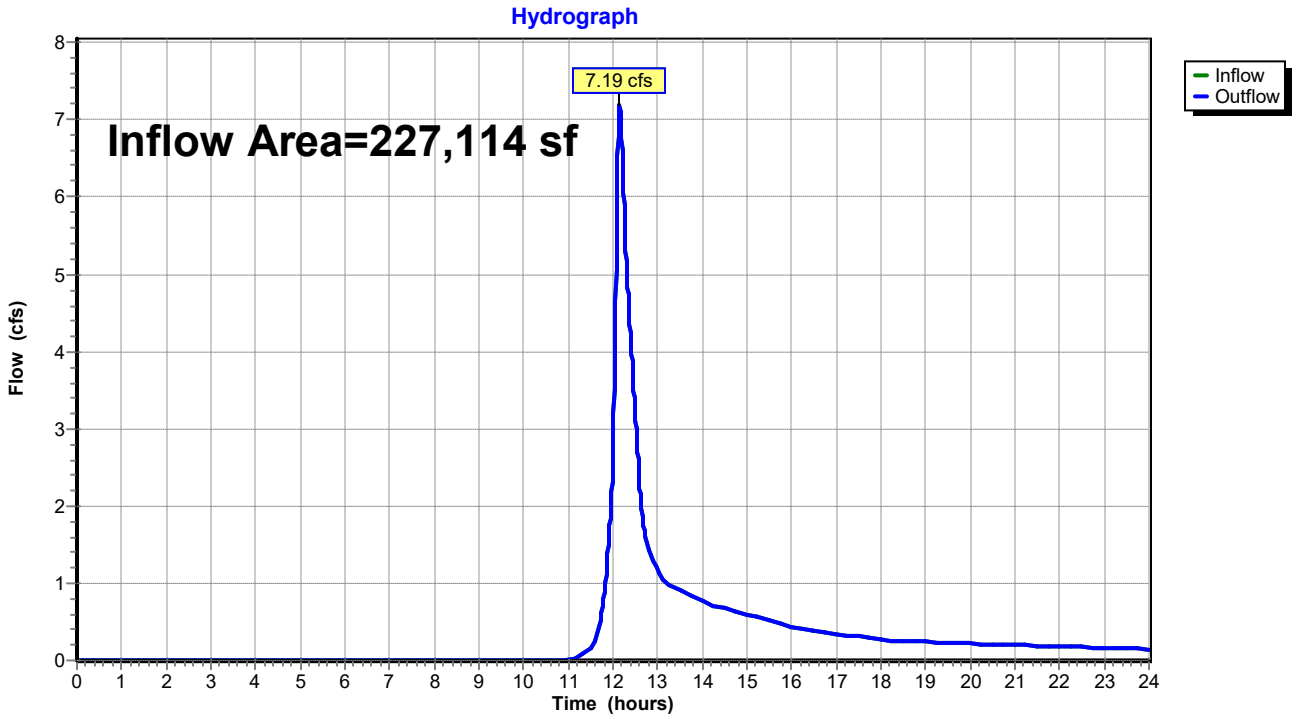


Summary for Reach 2R: DP-2

Inflow Area = 227,114 sf, 1.51% Impervious, Inflow Depth > 1.50" for 25-Year event
Inflow = 7.19 cfs @ 12.16 hrs, Volume= 28,435 cf
Outflow = 7.19 cfs @ 12.16 hrs, Volume= 28,435 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 2R: DP-2



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1A: EX-1A Runoff Area=165,396 sf 29.04% Impervious Runoff Depth>3.23"
Flow Length=180' Tc=8.4 min CN=72 Runoff=13.26 cfs 44,584 cf

Subcatchment EX-1B: EX-1B Runoff Area=83,702 sf 32.33% Impervious Runoff Depth>3.33"
Flow Length=205' Tc=8.9 min CN=73 Runoff=6.81 cfs 23,249 cf

Subcatchment EX-2A: EX-2A Runoff Area=202,337 sf 1.14% Impervious Runoff Depth>2.20"
Flow Length=435' Tc=10.8 min CN=61 Runoff=9.81 cfs 37,143 cf

Subcatchment EX-2B: EX-2B Runoff Area=24,777 sf 4.53% Impervious Runoff Depth>2.38"
Flow Length=230' Slope=0.0200 '/' Tc=7.0 min CN=63 Runoff=1.50 cfs 4,923 cf

Reach 1R: DP-1 Inflow=20.06 cfs 67,833 cf
Outflow=20.06 cfs 67,833 cf

Reach 2R: DP-2 Inflow=11.11 cfs 42,066 cf
Outflow=11.11 cfs 42,066 cf

Total Runoff Area = 476,212 sf Runoff Volume = 109,899 cf Average Runoff Depth = 2.77"
83.51% Pervious = 397,683 sf 16.49% Impervious = 78,529 sf

Summary for Subcatchment EX-1A: EX-1A

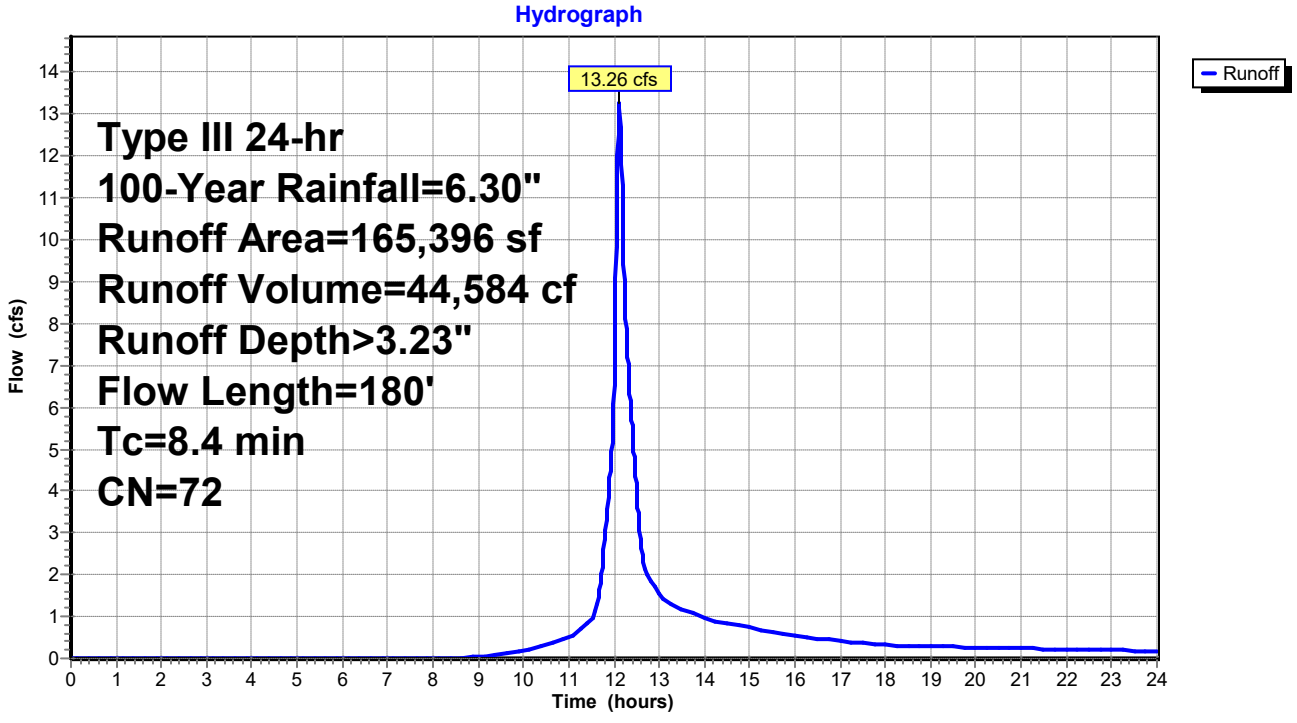
Runoff = 13.26 cfs @ 12.12 hrs, Volume= 44,584 cf, Depth> 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

Area (sf)	CN	Description
48,027	98	Paved parking, HSG B
113,039	61	>75% Grass cover, Good, HSG B
4,330	55	Woods, Good, HSG B
165,396	72	Weighted Average
117,369		70.96% Pervious Area
48,027		29.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0125	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.5	130	0.0080	1.44		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.4	180	Total			

Subcatchment EX-1A: EX-1A



Summary for Subcatchment EX-1B: EX-1B

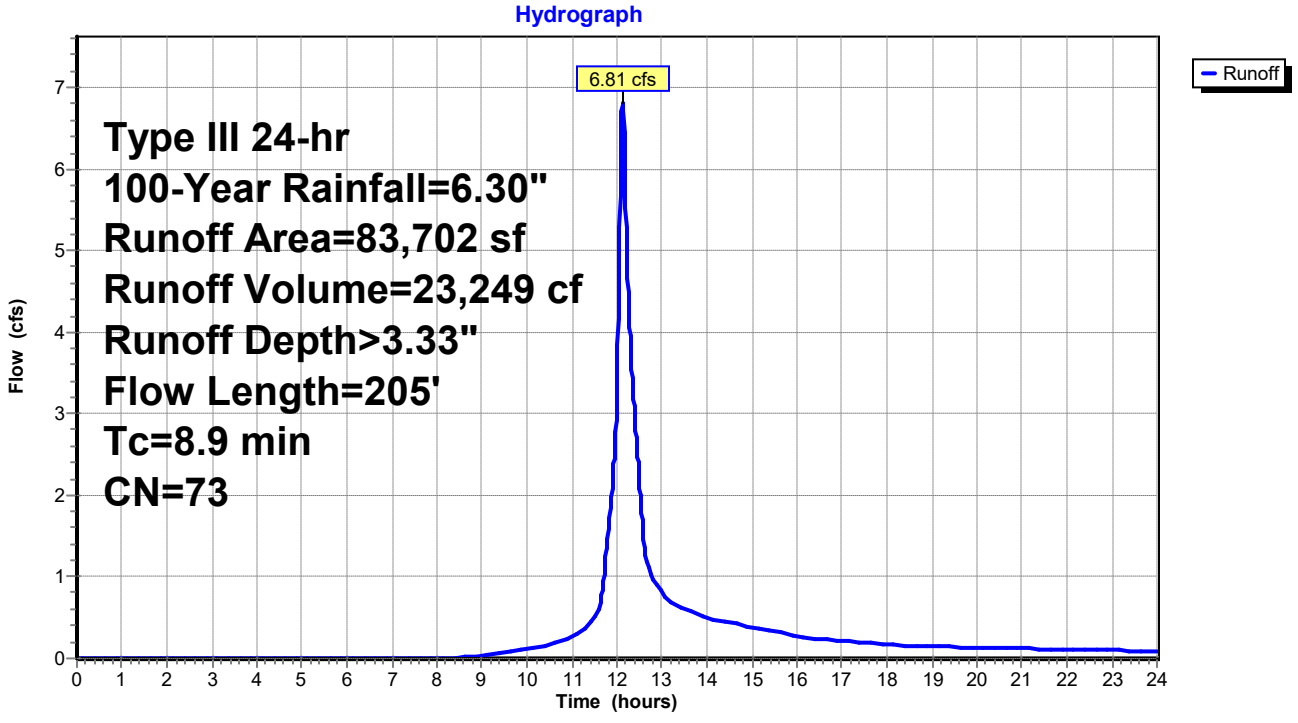
Runoff = 6.81 cfs @ 12.13 hrs, Volume= 23,249 cf, Depth> 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

Area (sf)	CN	Description
27,064	98	Paved parking, HSG B
332	86	Fallow, bare soil, HSG B
56,306	61	>75% Grass cover, Good, HSG B
83,702	73	Weighted Average
56,638		67.67% Pervious Area
27,064		32.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.4	155	0.0130	1.84		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.9	205	Total			

Subcatchment EX-1B: EX-1B



Summary for Subcatchment EX-2A: EX-2A

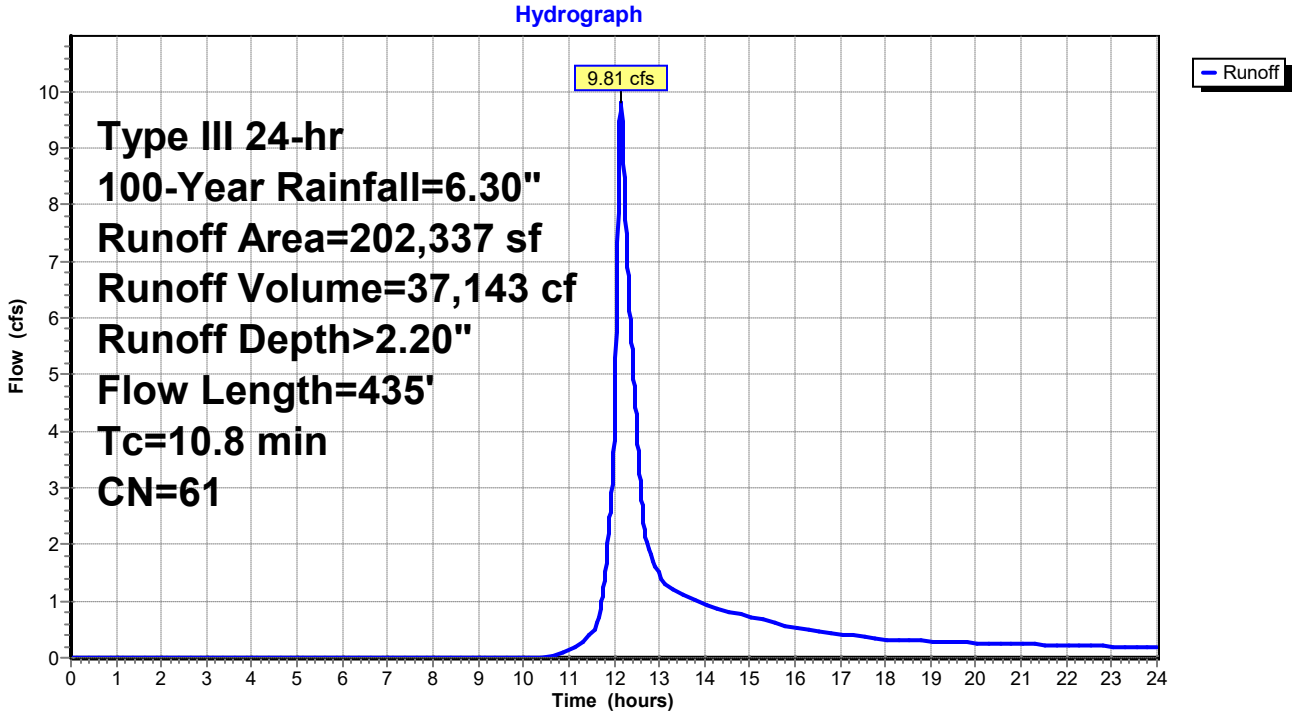
Runoff = 9.81 cfs @ 12.16 hrs, Volume= 37,143 cf, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

	Area (sf)	CN	Description
	2,316	98	Paved parking, HSG B
*	10,803	86	Fallow, bare soil, HSG B
	123,010	61	>75% Grass cover, Good, HSG B
	66,208	55	Woods, Good, HSG B
	202,337	61	Weighted Average
	200,021		98.86% Pervious Area
	2,316		1.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
3.1	300	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	85	0.3000	8.82		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.8	435	Total			

Subcatchment EX-2A: EX-2A



Summary for Subcatchment EX-2B: EX-2B

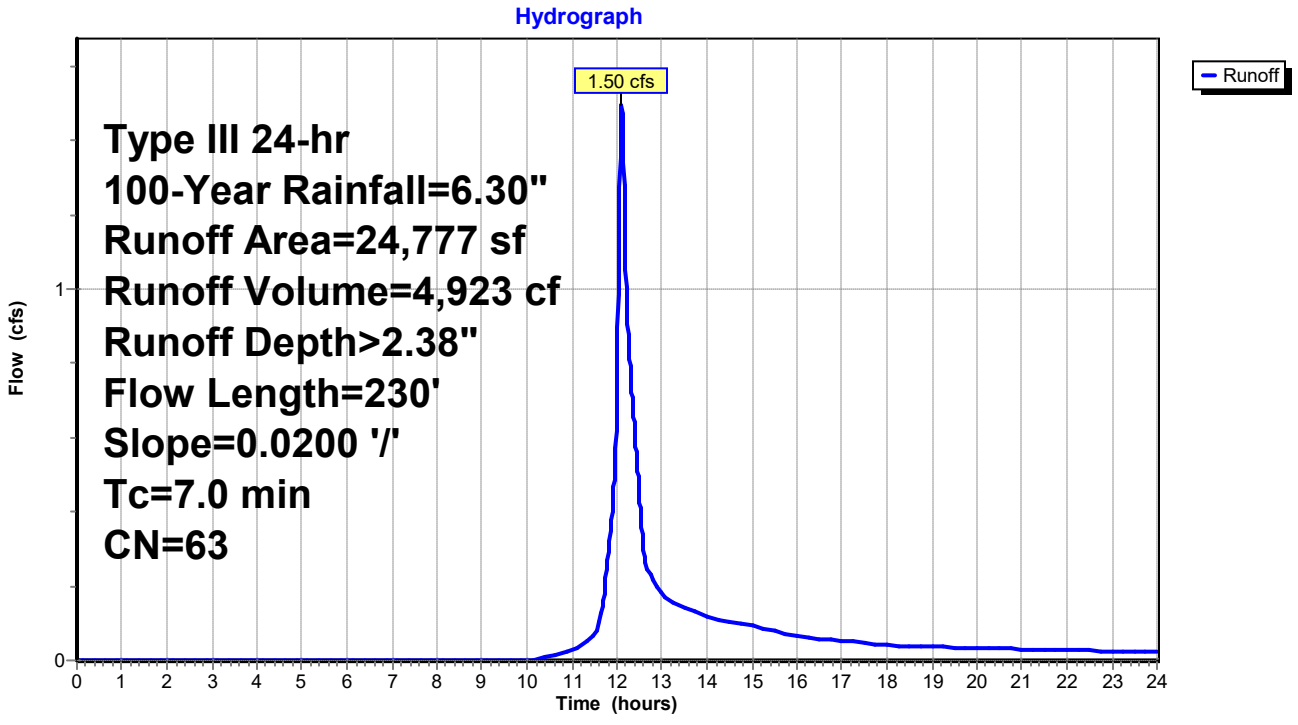
Runoff = 1.50 cfs @ 12.11 hrs, Volume= 4,923 cf, Depth> 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

	Area (sf)	CN	Description
	1,122	98	Paved parking, HSG B
*	520	86	Fallow, bare soil, HSG B
	23,135	61	>75% Grass cover, Good, HSG B
	24,777	63	Weighted Average
	23,655		95.47% Pervious Area
	1,122		4.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.3	180	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	230	Total			

Subcatchment EX-2B: EX-2B

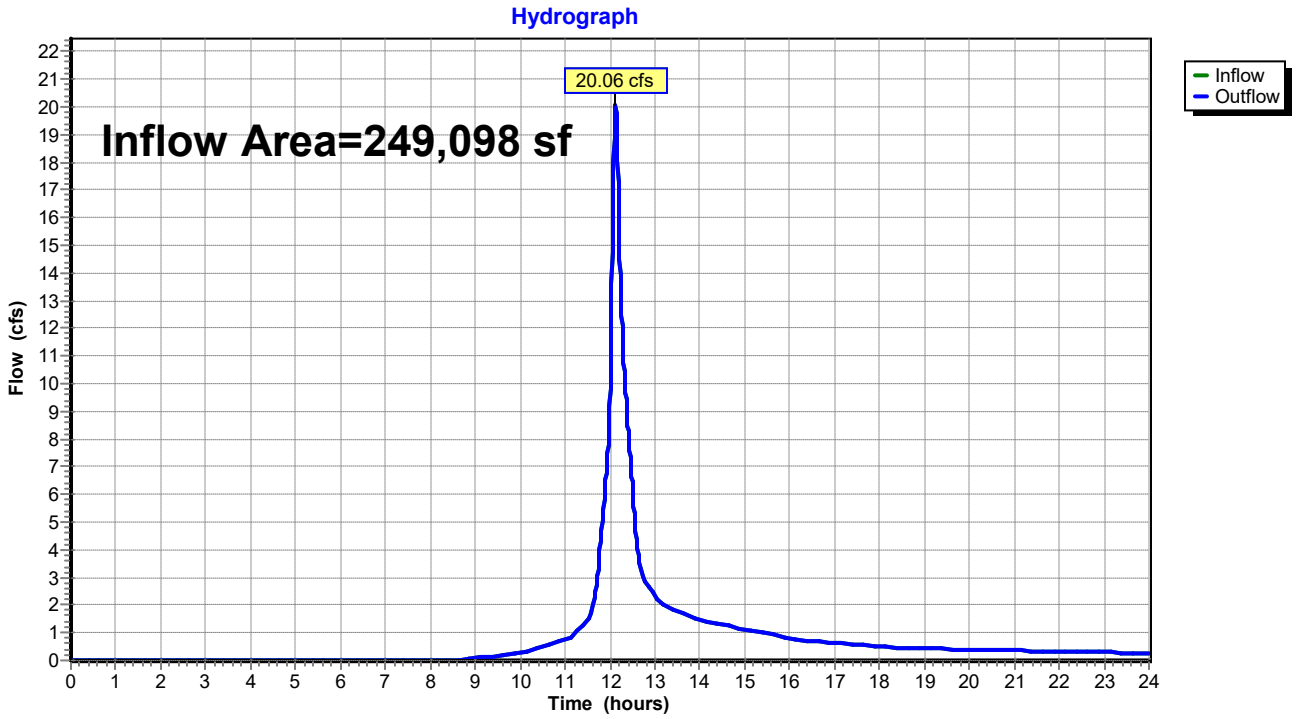


Summary for Reach 1R: DP-1

Inflow Area = 249,098 sf, 30.15% Impervious, Inflow Depth > 3.27" for 100-Year event
Inflow = 20.06 cfs @ 12.12 hrs, Volume= 67,833 cf
Outflow = 20.06 cfs @ 12.12 hrs, Volume= 67,833 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 1R: DP-1

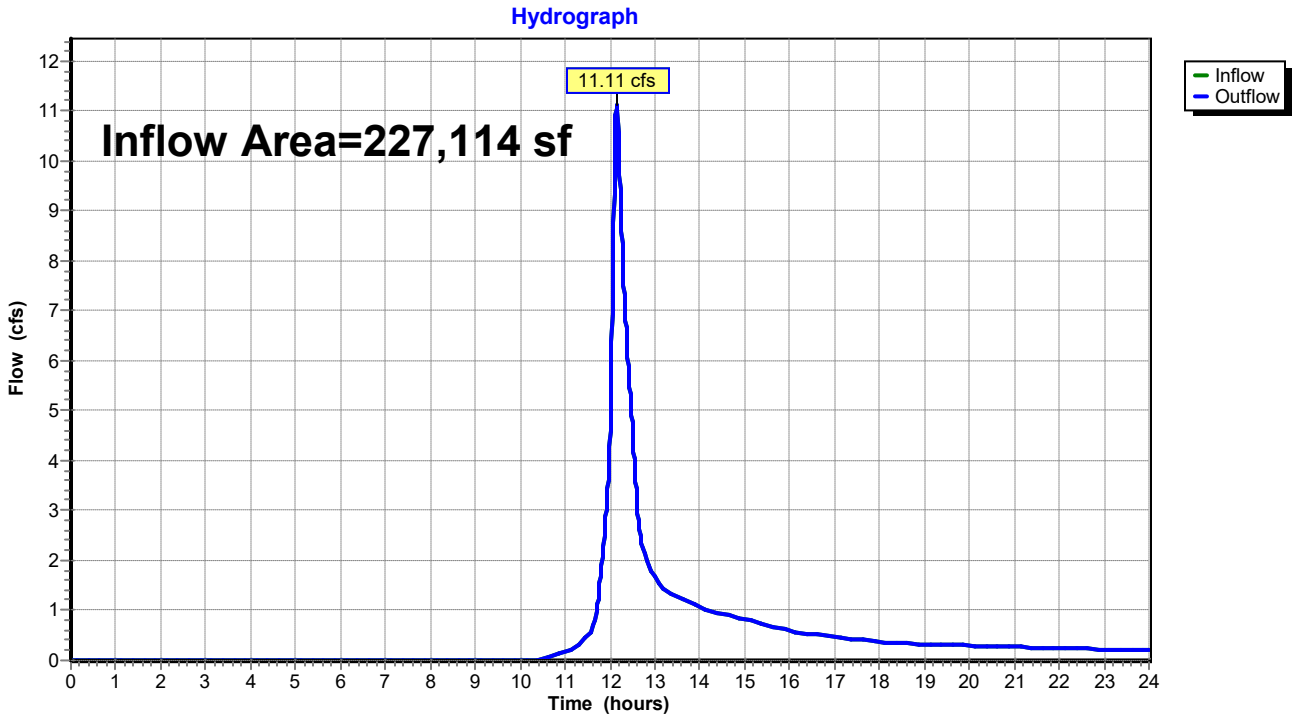


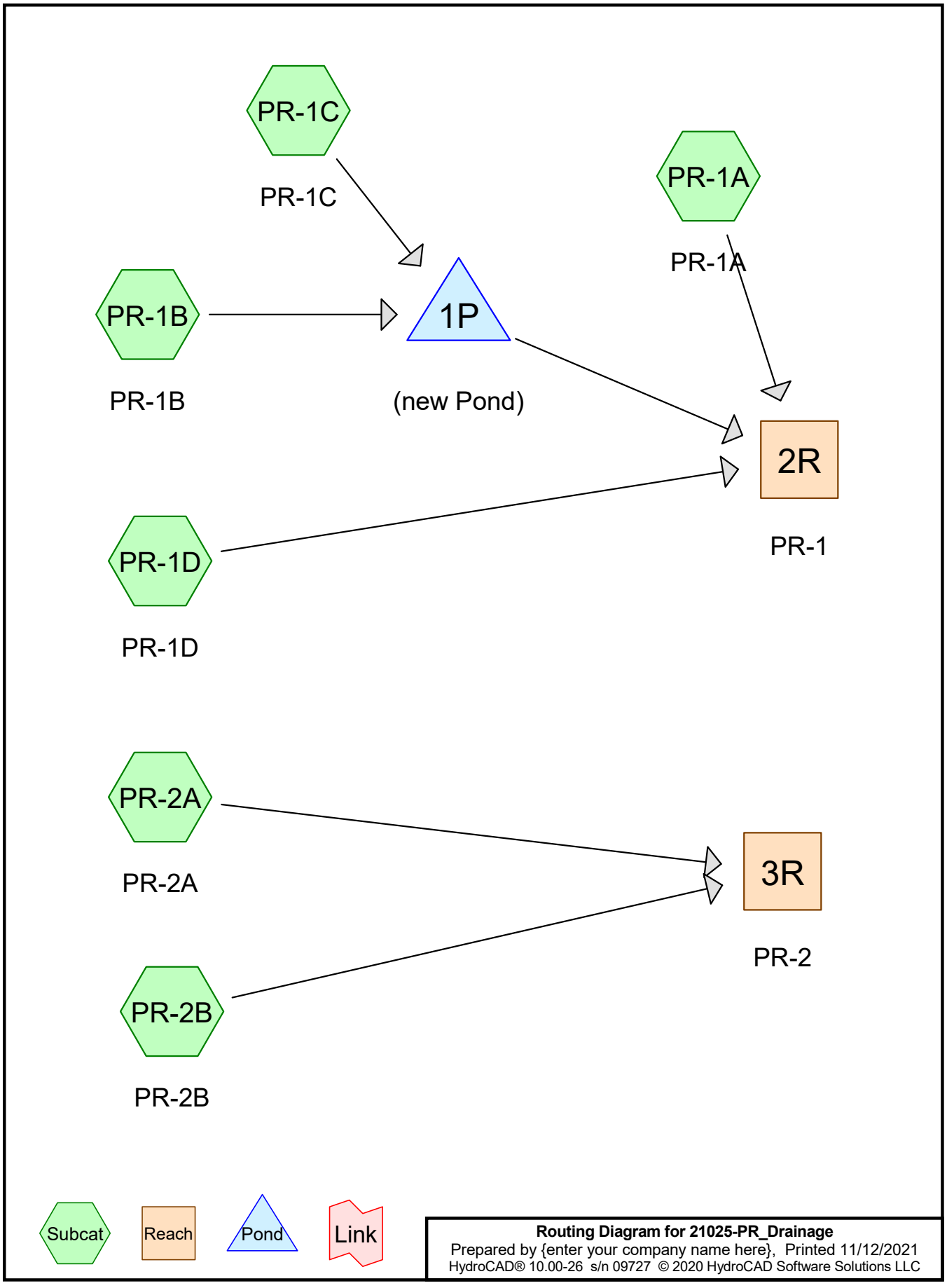
Summary for Reach 2R: DP-2

Inflow Area = 227,114 sf, 1.51% Impervious, Inflow Depth > 2.22" for 100-Year event
Inflow = 11.11 cfs @ 12.15 hrs, Volume= 42,066 cf
Outflow = 11.11 cfs @ 12.15 hrs, Volume= 42,066 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 2R: DP-2





Routing Diagram for 21025-PR_Drainage
Prepared by {enter your company name here}, Printed 11/12/2021

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1A: PR-1A Runoff Area=16,567 sf 22.86% Impervious Runoff Depth>0.68"
Tc=6.0 min CN=69 Runoff=0.26 cfs 938 cf

Subcatchment PR-1B: PR-1B Runoff Area=152,848 sf 41.61% Impervious Runoff Depth>1.03"
Tc=6.0 min CN=76 Runoff=4.05 cfs 13,081 cf

Subcatchment PR-1C: PR-1C Runoff Area=22,398 sf 71.14% Impervious Runoff Depth>1.75"
Tc=6.0 min CN=87 Runoff=1.06 cfs 3,275 cf

Subcatchment PR-1D: PR-1D Runoff Area=74,918 sf 42.24% Impervious Runoff Depth>1.08"
Tc=6.0 min CN=77 Runoff=2.11 cfs 6,763 cf

Subcatchment PR-2A: PR-2A Runoff Area=181,639 sf 1.18% Impervious Runoff Depth>0.37"
Flow Length=435' Tc=10.3 min CN=61 Runoff=0.87 cfs 5,619 cf

Subcatchment PR-2B: PR-2B Runoff Area=28,053 sf 4.00% Impervious Runoff Depth>0.44"
Flow Length=270' Slope=0.0200 '/' Tc=7.3 min CN=63 Runoff=0.21 cfs 1,029 cf

Reach 2R: PR-1 Inflow=4.52 cfs 23,887 cf
Outflow=4.52 cfs 23,887 cf

Reach 3R: PR-2 Inflow=1.05 cfs 6,648 cf
Outflow=1.05 cfs 6,648 cf

Pond 1P: (new Pond) Peak Elev=357.65' Storage=2,590 cf Inflow=5.11 cfs 16,356 cf
Outflow=2.59 cfs 16,186 cf

Total Runoff Area = 476,423 sf Runoff Volume = 30,705 cf Average Runoff Depth = 0.77"
75.18% Pervious = 358,185 sf 24.82% Impervious = 118,238 sf

Summary for Subcatchment PR-1A: PR-1A

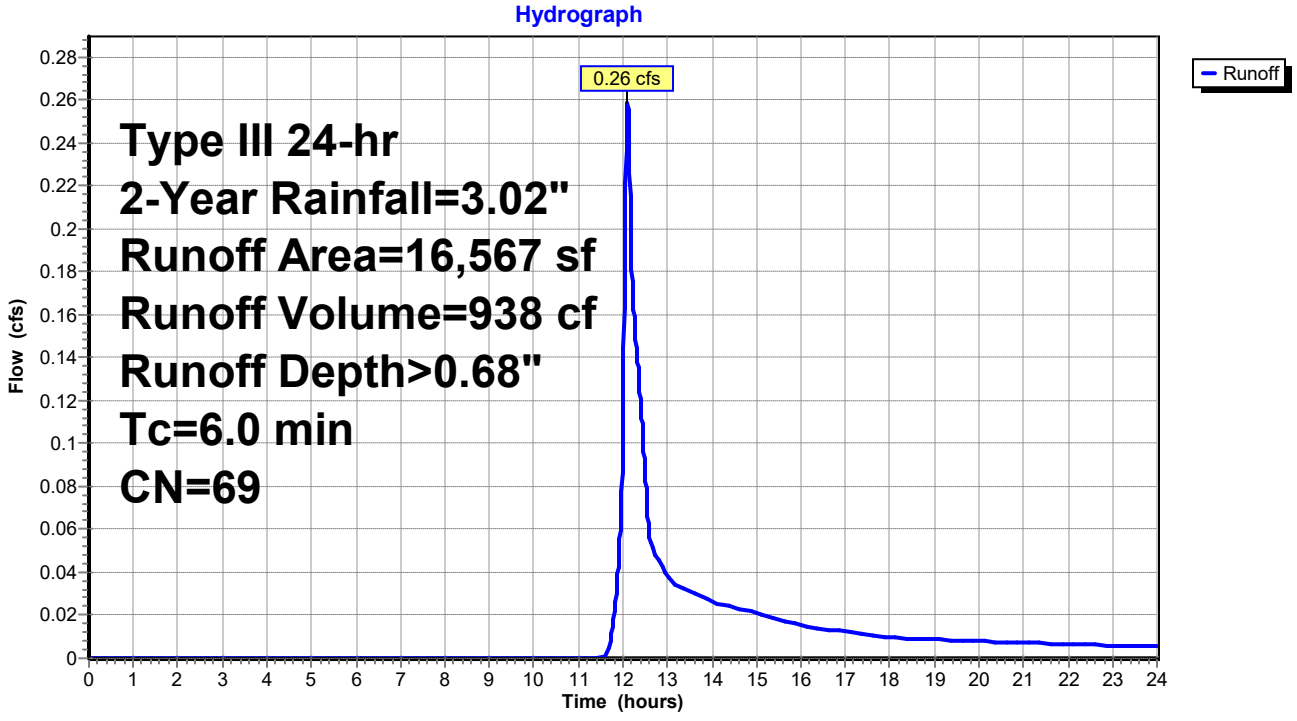
Runoff = 0.26 cfs @ 12.10 hrs, Volume= 938 cf, Depth> 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

Area (sf)	CN	Description
3,787	98	Paved parking, HSG B
10,314	61	>75% Grass cover, Good, HSG B
2,466	55	Woods, Good, HSG B
16,567	69	Weighted Average
12,780		77.14% Pervious Area
3,787		22.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1A: PR-1A



Summary for Subcatchment PR-1B: PR-1B

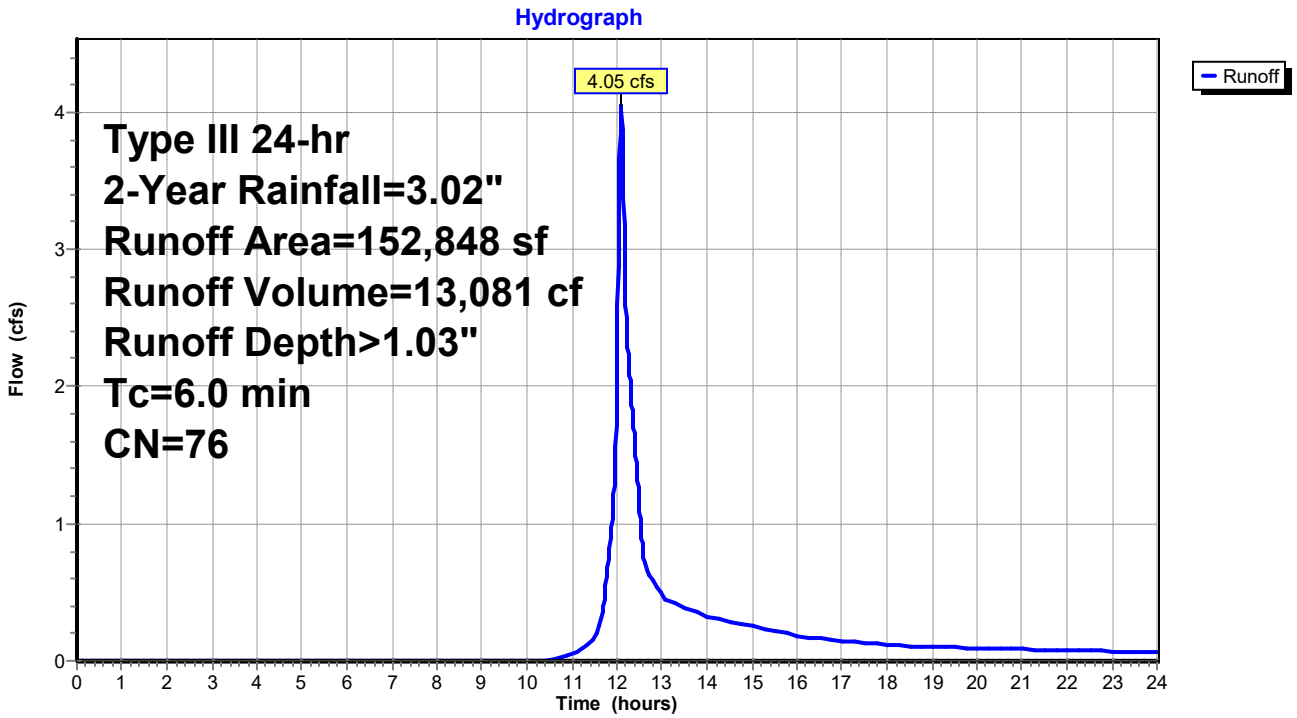
Runoff = 4.05 cfs @ 12.09 hrs, Volume= 13,081 cf, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

Area (sf)	CN	Description
63,599	98	Paved parking, HSG B
88,344	61	>75% Grass cover, Good, HSG B
609	61	>75% Grass cover, Good, HSG B
296	55	Woods, Good, HSG B
152,848	76	Weighted Average
89,249		58.39% Pervious Area
63,599		41.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1B: PR-1B



Summary for Subcatchment PR-1C: PR-1C

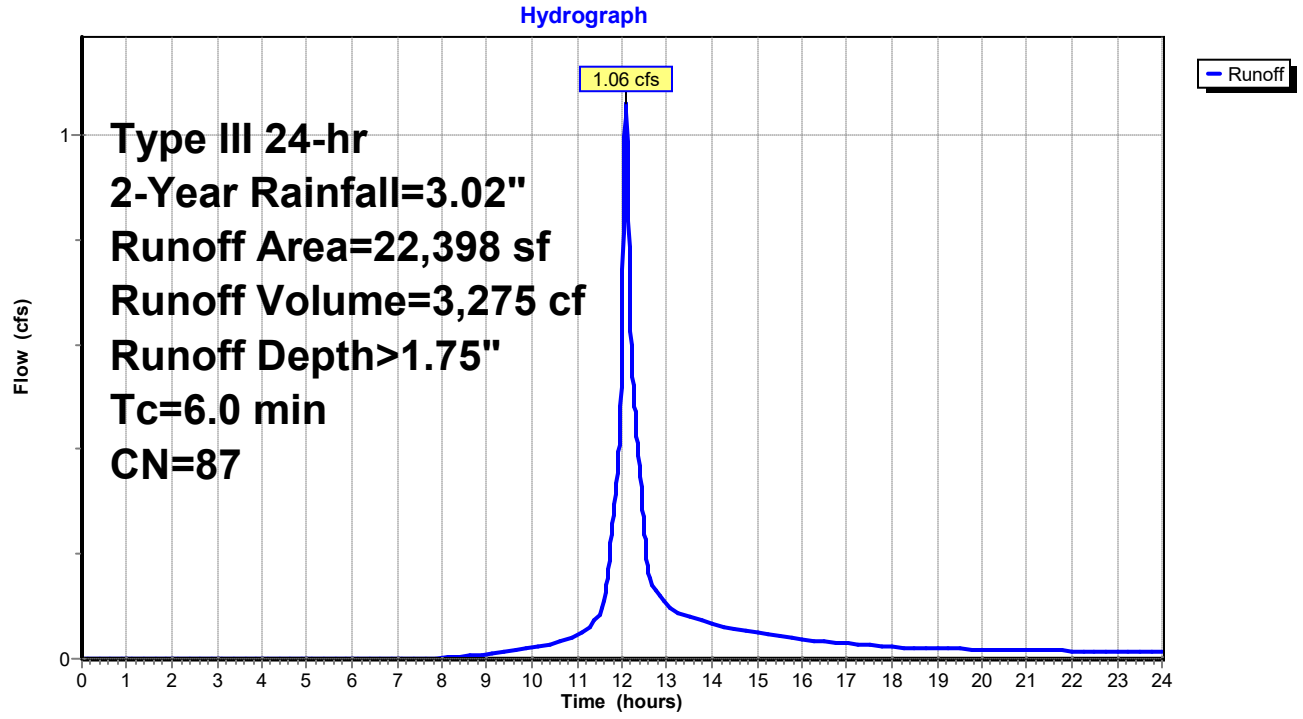
Runoff = 1.06 cfs @ 12.09 hrs, Volume= 3,275 cf, Depth> 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

Area (sf)	CN	Description
6,463	61	>75% Grass cover, Good, HSG B
15,935	98	Paved parking, HSG B
22,398	87	Weighted Average
6,463		28.86% Pervious Area
15,935		71.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1C: PR-1C



Summary for Subcatchment PR-1D: PR-1D

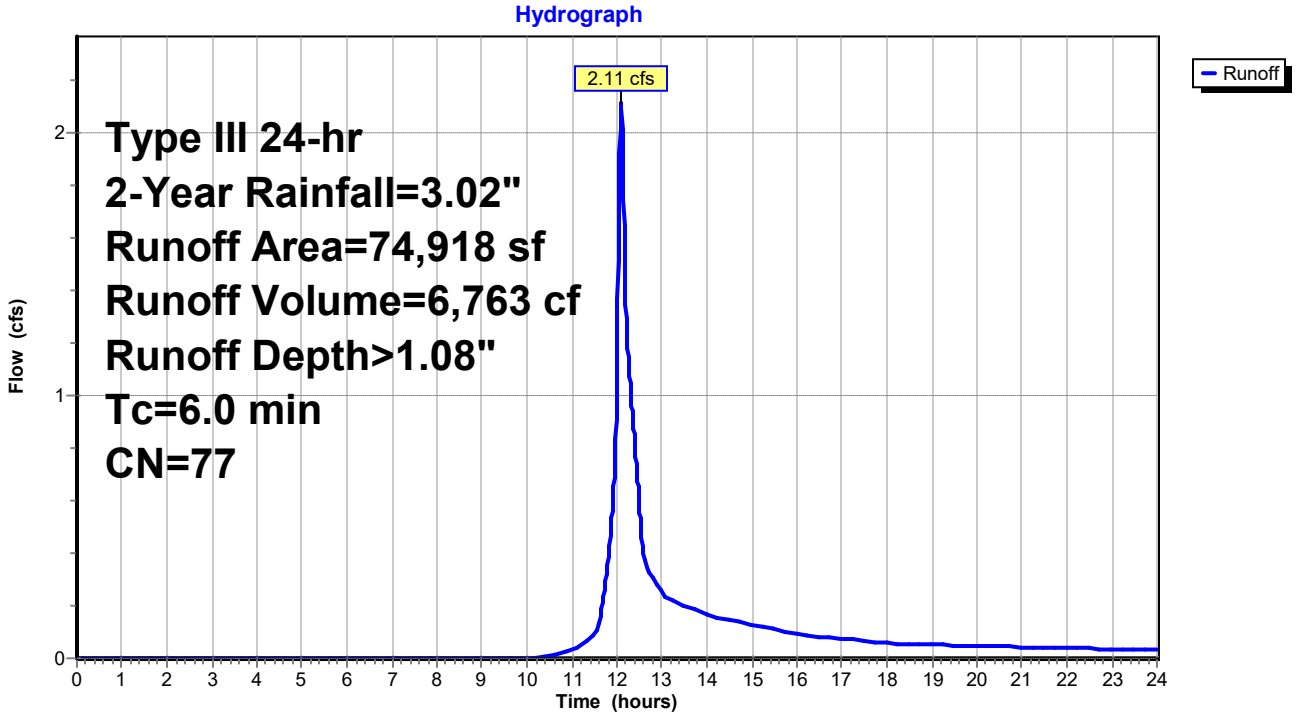
Runoff = 2.11 cfs @ 12.09 hrs, Volume= 6,763 cf, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

	Area (sf)	CN	Description
	31,644	98	Paved parking, HSG B
*	1,233	86	Fallow, bare soil, HSG B
	42,041	61	>75% Grass cover, Good, HSG B
	74,918	77	Weighted Average
	43,274		57.76% Pervious Area
	31,644		42.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1D: PR-1D



Summary for Subcatchment PR-2A: PR-2A

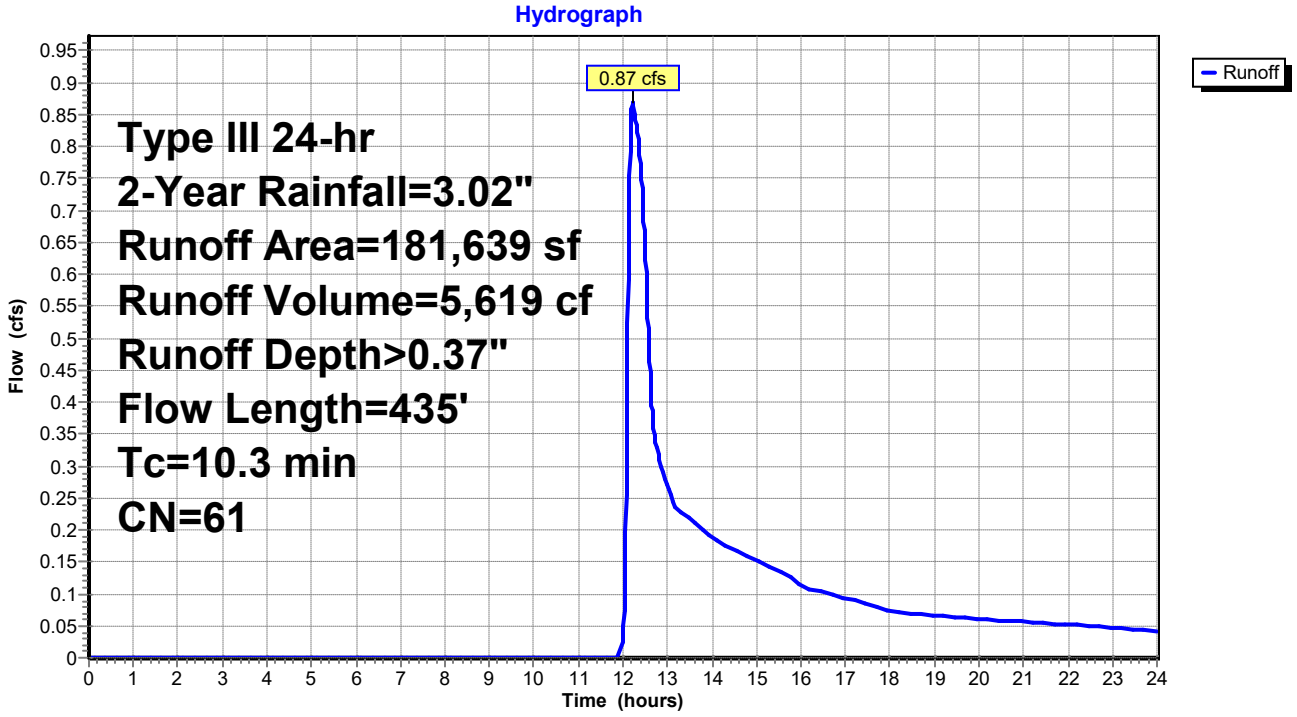
Runoff = 0.87 cfs @ 12.21 hrs, Volume= 5,619 cf, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

Area (sf)	CN	Description
2,151	98	Paved parking, HSG B
9,906	86	Fallow, bare soil, HSG B
52,789	55	Woods, Good, HSG B
116,793	61	>75% Grass cover, Good, HSG B
181,639	61	Weighted Average
179,488		98.82% Pervious Area
2,151		1.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
2.7	325	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	60	0.3000	8.82		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.3	435	Total			

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

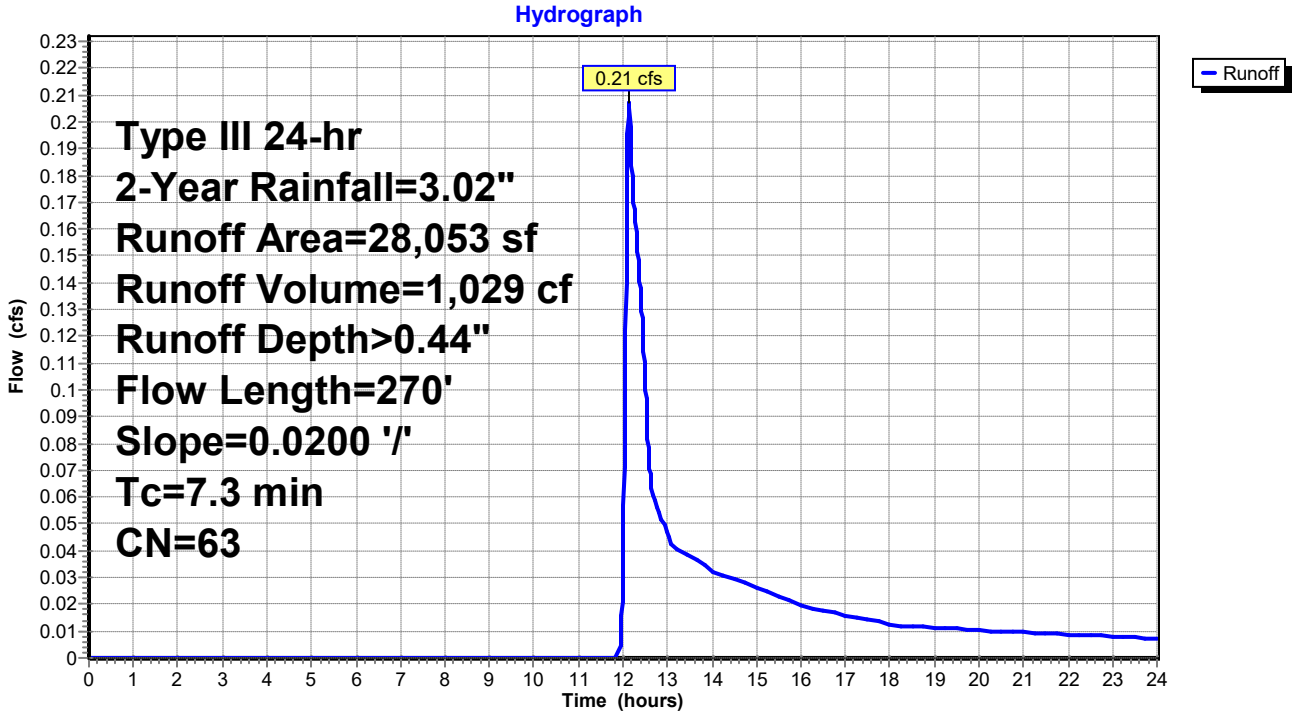
Runoff = 0.21 cfs @ 12.14 hrs, Volume= 1,029 cf, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.02"

Area (sf)	CN	Description
1,122	98	Paved parking, HSG B
516	86	Fallow, bare soil, HSG B
896	55	Woods, Good, HSG B
25,519	61	>75% Grass cover, Good, HSG B
28,053	63	Weighted Average
26,931		96.00% Pervious Area
1,122		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.6	220	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	270	Total			

Subcatchment PR-2B: PR-2B

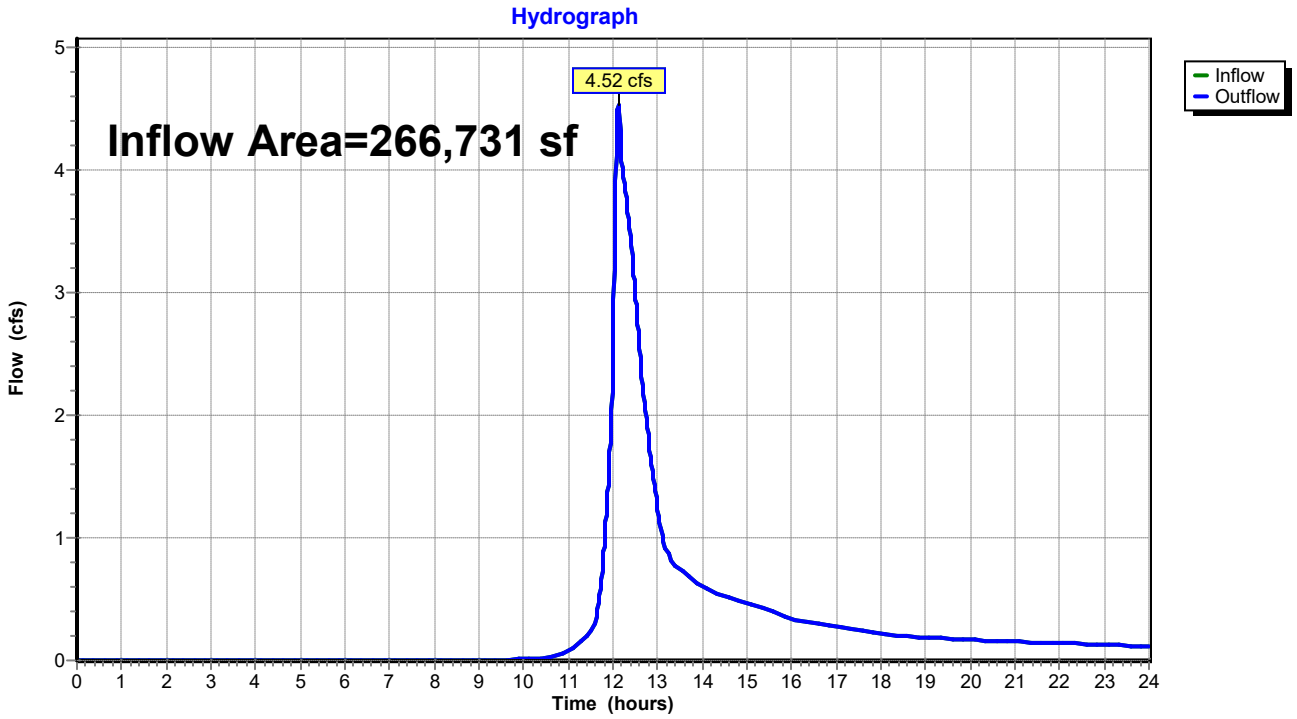


Summary for Reach 2R: PR-1

Inflow Area = 266,731 sf, 43.10% Impervious, Inflow Depth > 1.07" for 2-Year event
Inflow = 4.52 cfs @ 12.12 hrs, Volume= 23,887 cf
Outflow = 4.52 cfs @ 12.12 hrs, Volume= 23,887 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 2R: PR-1

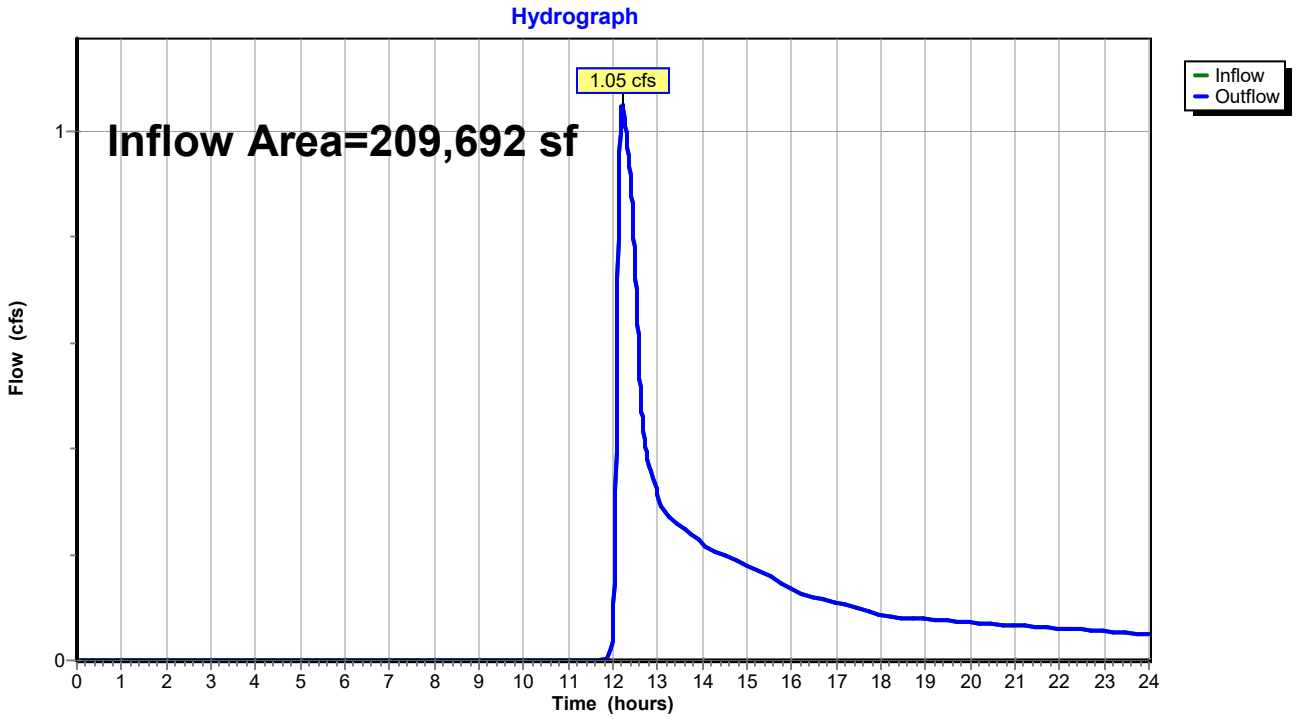


Summary for Reach 3R: PR-2

Inflow Area = 209,692 sf, 1.56% Impervious, Inflow Depth > 0.38" for 2-Year event
Inflow = 1.05 cfs @ 12.21 hrs, Volume= 6,648 cf
Outflow = 1.05 cfs @ 12.21 hrs, Volume= 6,648 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 3R: PR-2



Summary for Pond 1P: (new Pond)

Inflow Area = 175,246 sf, 45.38% Impervious, Inflow Depth > 1.12" for 2-Year event
Inflow = 5.11 cfs @ 12.09 hrs, Volume= 16,356 cf
Outflow = 2.59 cfs @ 12.28 hrs, Volume= 16,186 cf, Atten= 49%, Lag= 10.9 min
Primary = 2.59 cfs @ 12.28 hrs, Volume= 16,186 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 357.65' @ 12.28 hrs Surf.Area= 0 sf Storage= 2,590 cf

Plug-Flow detention time= 19.0 min calculated for 16,186 cf (99% of inflow)
Center-of-Mass det. time= 13.0 min (863.7 - 850.7)

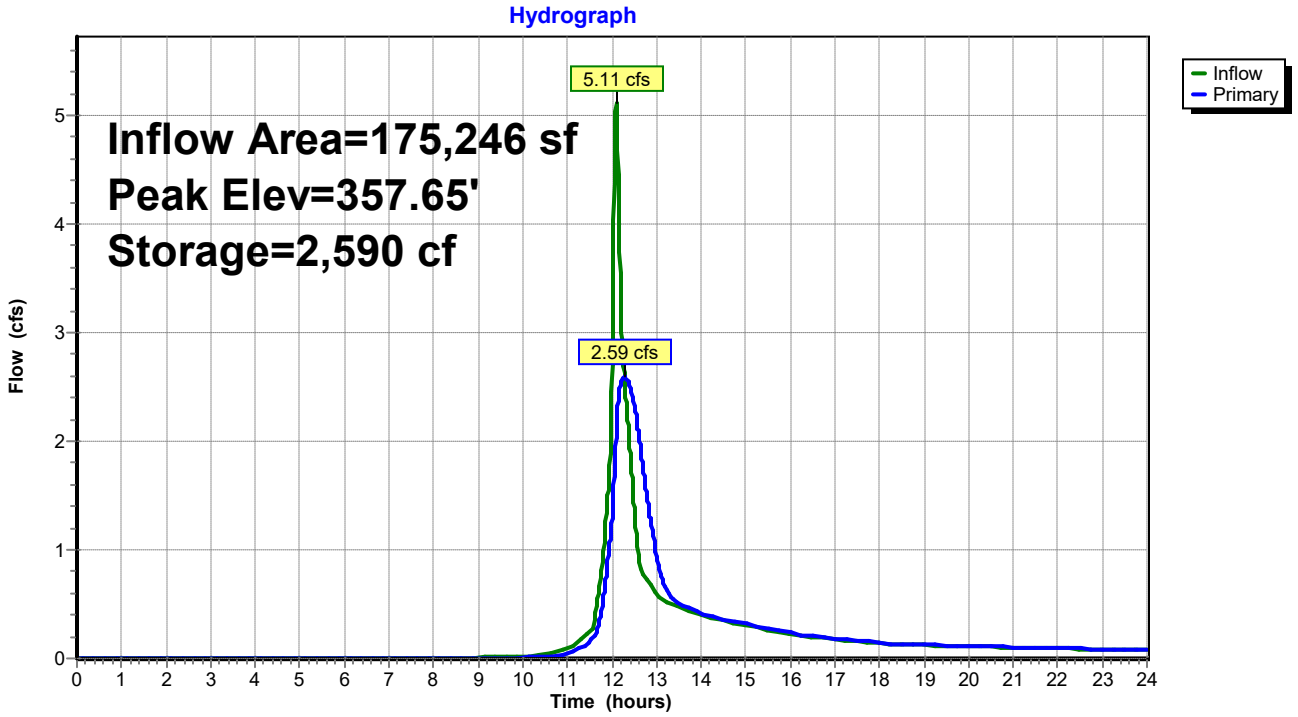
Volume	Invert	Avail.Storage	Storage Description
#1	355.43'	8,511 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
355.43	0
358.17	3,196
358.67	8,511

Device	Routing	Invert	Outlet Devices
#1	Primary	355.43'	**8.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	358.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=2.59 cfs @ 12.28 hrs HW=357.65' (Free Discharge)
↑ **1=Orifice/Grate** (Orifice Controls 2.59 cfs @ 6.58 fps)
└ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: (new Pond)



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1A: PR-1A Runoff Area=16,567 sf 22.86% Impervious Runoff Depth>1.59"
Tc=6.0 min CN=69 Runoff=0.68 cfs 2,190 cf

Subcatchment PR-1B: PR-1B Runoff Area=152,848 sf 41.61% Impervious Runoff Depth>2.11"
Tc=6.0 min CN=76 Runoff=8.66 cfs 26,891 cf

Subcatchment PR-1C: PR-1C Runoff Area=22,398 sf 71.14% Impervious Runoff Depth>3.08"
Tc=6.0 min CN=87 Runoff=1.83 cfs 5,744 cf

Subcatchment PR-1D: PR-1D Runoff Area=74,918 sf 42.24% Impervious Runoff Depth>2.19"
Tc=6.0 min CN=77 Runoff=4.41 cfs 13,683 cf

Subcatchment PR-2A: PR-2A Runoff Area=181,639 sf 1.18% Impervious Runoff Depth>1.06"
Flow Length=435' Tc=10.3 min CN=61 Runoff=3.89 cfs 16,118 cf

Subcatchment PR-2B: PR-2B Runoff Area=28,053 sf 4.00% Impervious Runoff Depth>1.19"
Flow Length=270' Slope=0.0200 '/' Tc=7.3 min CN=63 Runoff=0.77 cfs 2,777 cf

Reach 2R: PR-1 Inflow=10.06 cfs 48,281 cf
Outflow=10.06 cfs 48,281 cf

Reach 3R: PR-2 Inflow=4.60 cfs 18,895 cf
Outflow=4.60 cfs 18,895 cf

Pond 1P: (new Pond) Peak Elev=358.36' Storage=5,198 cf Inflow=10.49 cfs 32,634 cf
Outflow=6.04 cfs 32,408 cf

Total Runoff Area = 476,423 sf Runoff Volume = 67,402 cf Average Runoff Depth = 1.70"
75.18% Pervious = 358,185 sf 24.82% Impervious = 118,238 sf

Summary for Subcatchment PR-1A: PR-1A

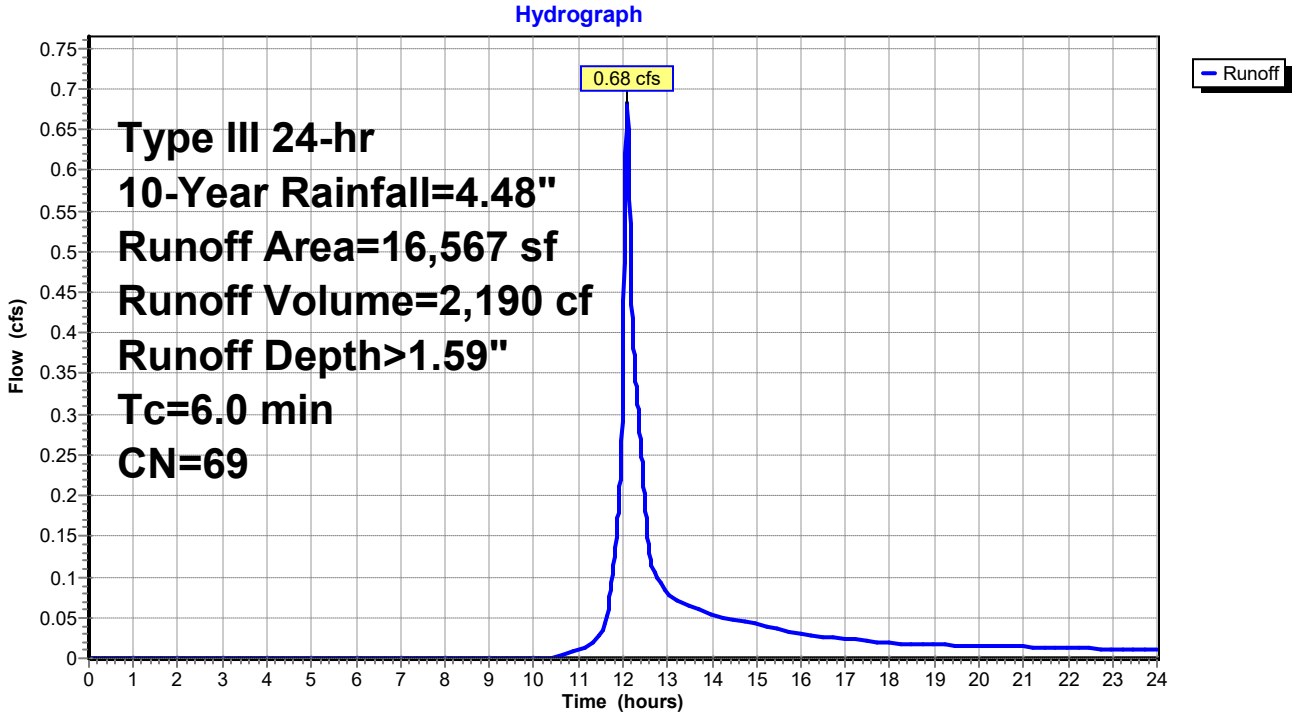
Runoff = 0.68 cfs @ 12.09 hrs, Volume= 2,190 cf, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

Area (sf)	CN	Description
3,787	98	Paved parking, HSG B
10,314	61	>75% Grass cover, Good, HSG B
2,466	55	Woods, Good, HSG B
16,567	69	Weighted Average
12,780		77.14% Pervious Area
3,787		22.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1A: PR-1A



Summary for Subcatchment PR-1B: PR-1B

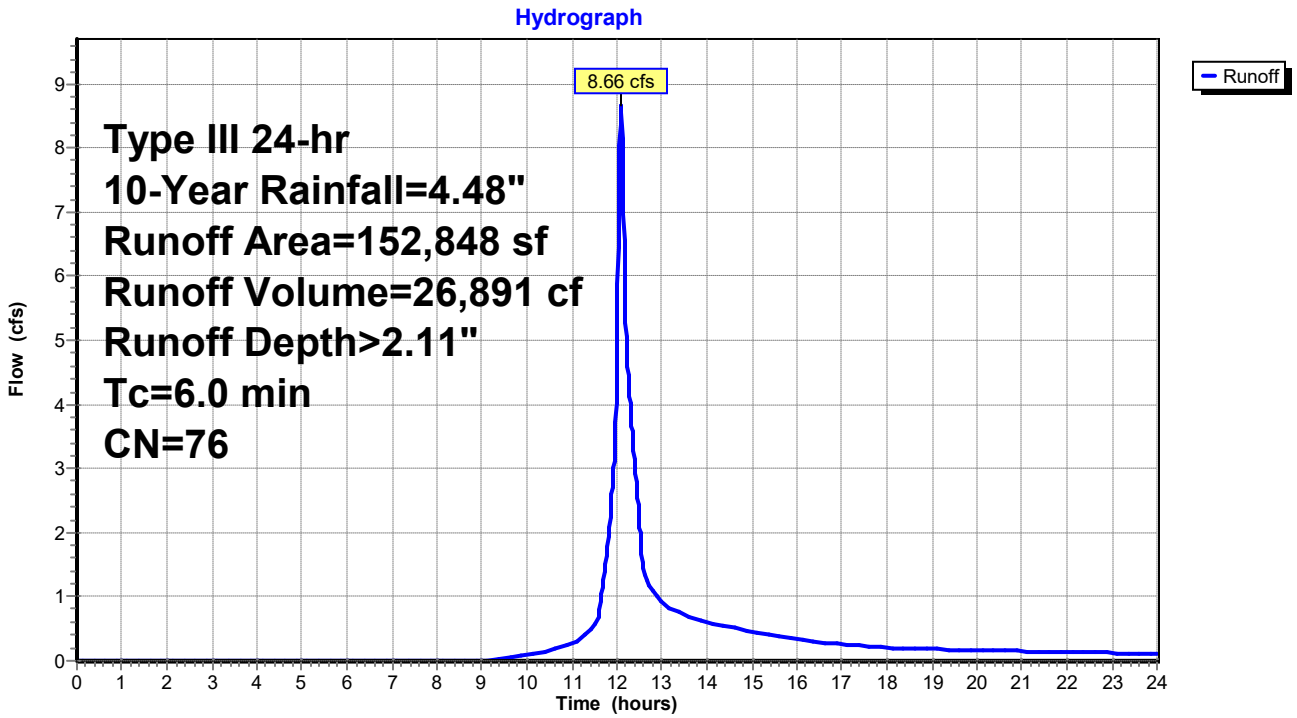
Runoff = 8.66 cfs @ 12.09 hrs, Volume= 26,891 cf, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

Area (sf)	CN	Description
63,599	98	Paved parking, HSG B
88,344	61	>75% Grass cover, Good, HSG B
609	61	>75% Grass cover, Good, HSG B
296	55	Woods, Good, HSG B
152,848	76	Weighted Average
89,249		58.39% Pervious Area
63,599		41.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1B: PR-1B



Summary for Subcatchment PR-1C: PR-1C

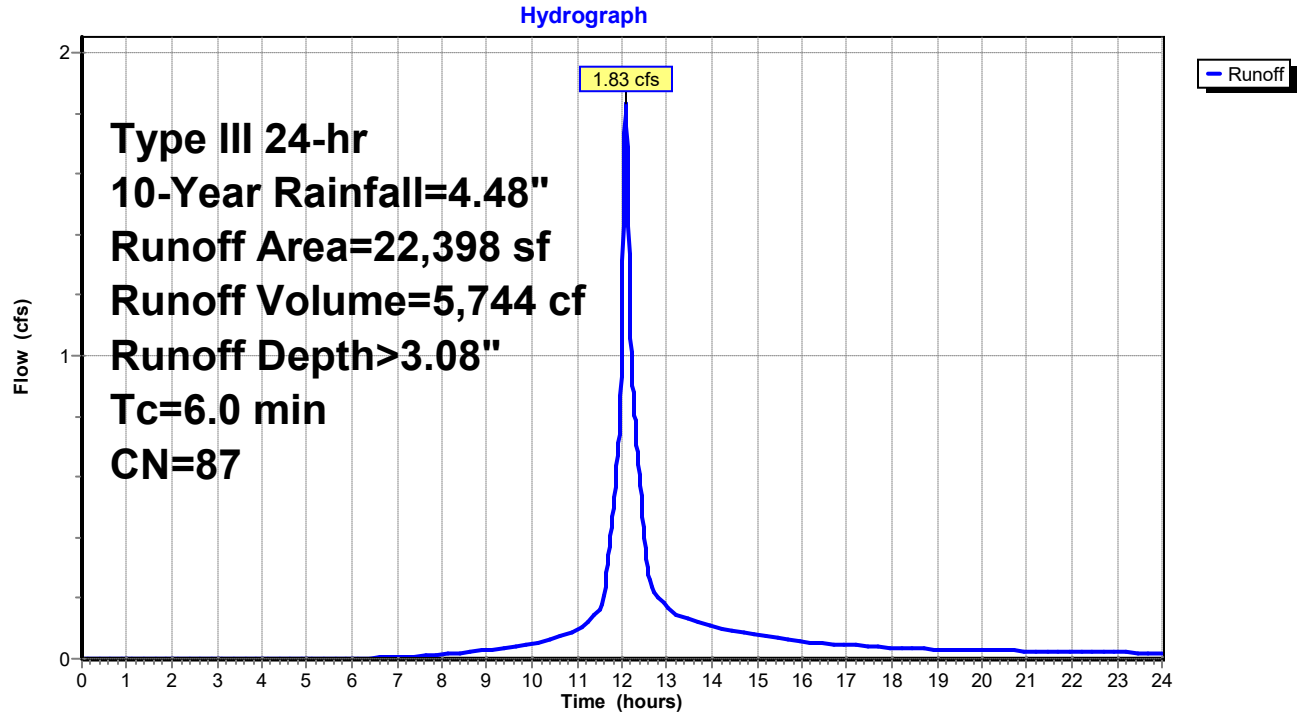
Runoff = 1.83 cfs @ 12.09 hrs, Volume= 5,744 cf, Depth> 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

Area (sf)	CN	Description
6,463	61	>75% Grass cover, Good, HSG B
15,935	98	Paved parking, HSG B
22,398	87	Weighted Average
6,463		28.86% Pervious Area
15,935		71.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1C: PR-1C



Summary for Subcatchment PR-1D: PR-1D

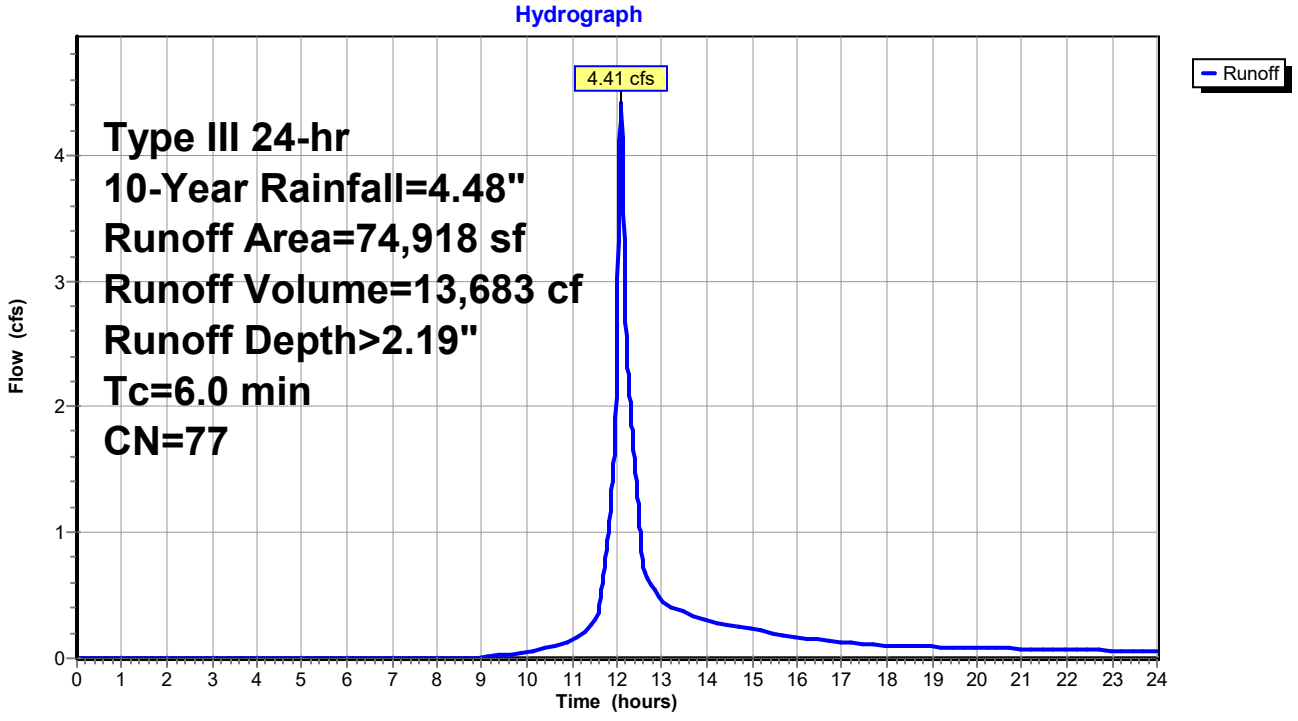
Runoff = 4.41 cfs @ 12.09 hrs, Volume= 13,683 cf, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

	Area (sf)	CN	Description
	31,644	98	Paved parking, HSG B
*	1,233	86	Fallow, bare soil, HSG B
	42,041	61	>75% Grass cover, Good, HSG B
	74,918	77	Weighted Average
	43,274		57.76% Pervious Area
	31,644		42.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1D: PR-1D



Summary for Subcatchment PR-2A: PR-2A

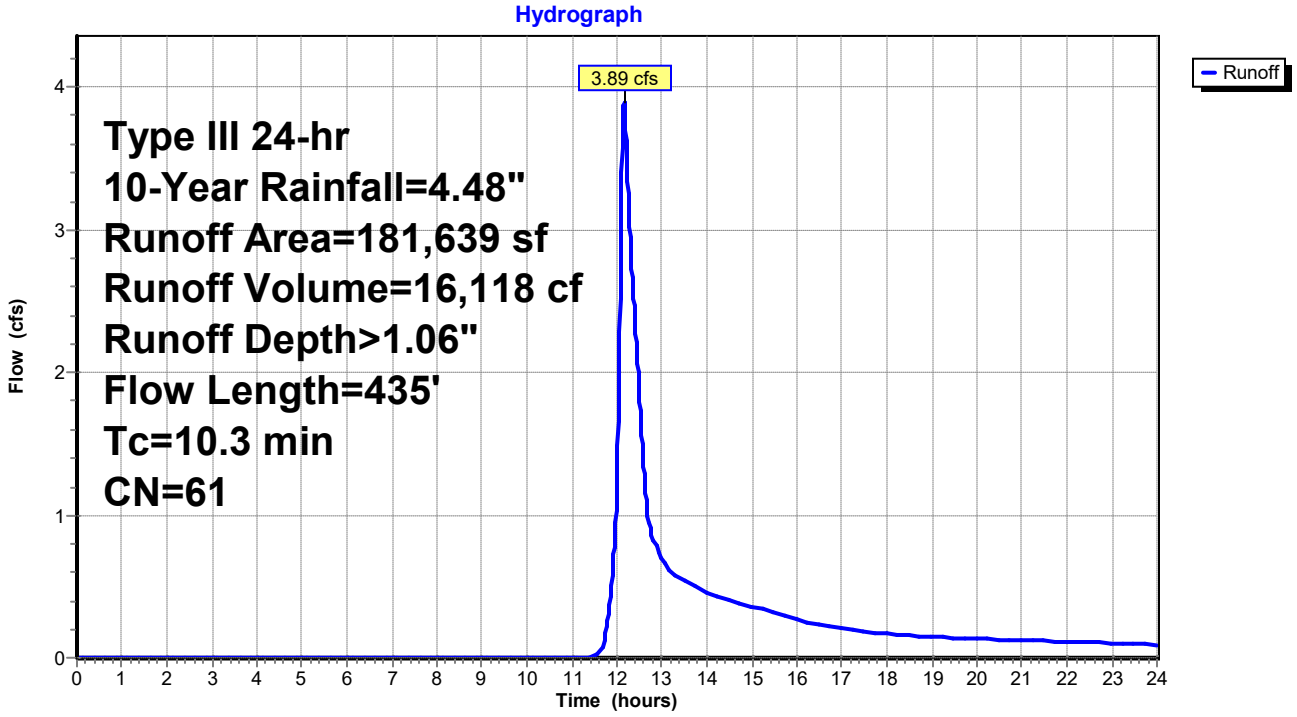
Runoff = 3.89 cfs @ 12.16 hrs, Volume= 16,118 cf, Depth> 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

Area (sf)	CN	Description
2,151	98	Paved parking, HSG B
9,906	86	Fallow, bare soil, HSG B
52,789	55	Woods, Good, HSG B
116,793	61	>75% Grass cover, Good, HSG B
181,639	61	Weighted Average
179,488		98.82% Pervious Area
2,151		1.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
2.7	325	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	60	0.3000	8.82		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.3	435	Total			

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

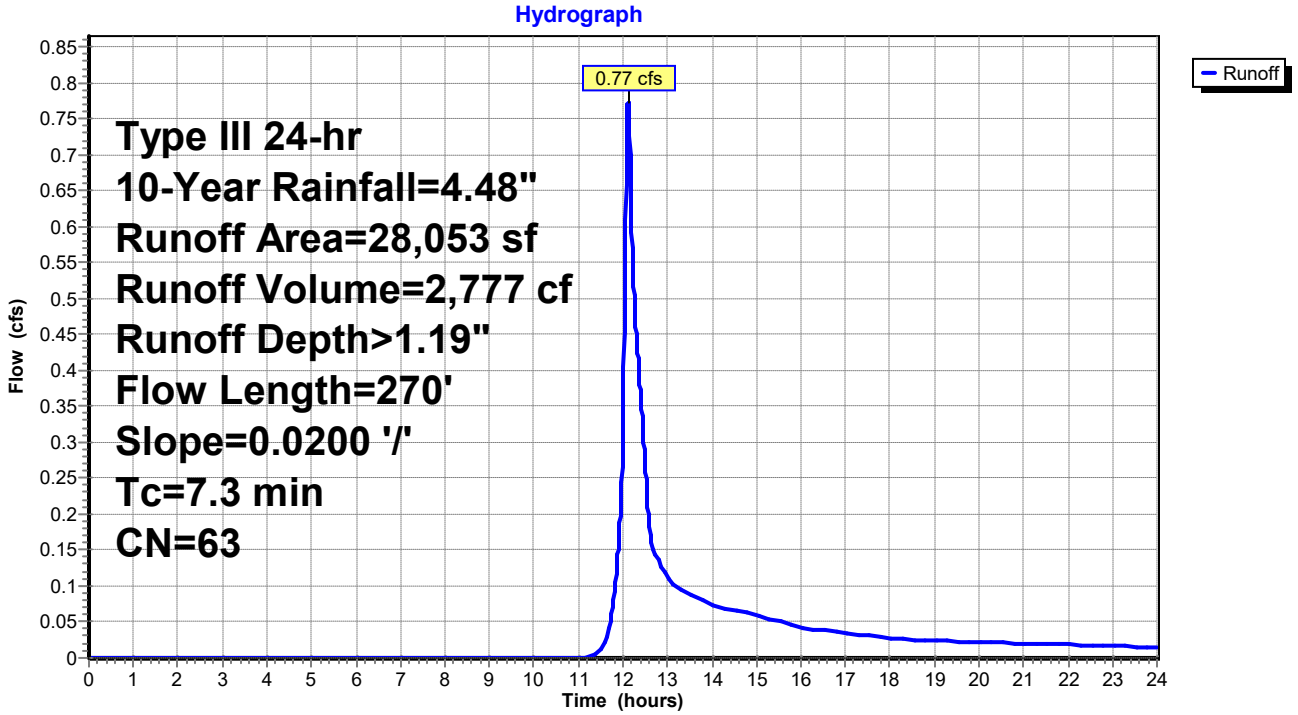
Runoff = 0.77 cfs @ 12.12 hrs, Volume= 2,777 cf, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.48"

Area (sf)	CN	Description
1,122	98	Paved parking, HSG B
516	86	Fallow, bare soil, HSG B
896	55	Woods, Good, HSG B
25,519	61	>75% Grass cover, Good, HSG B
28,053	63	Weighted Average
26,931		96.00% Pervious Area
1,122		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.6	220	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	270	Total			

Subcatchment PR-2B: PR-2B

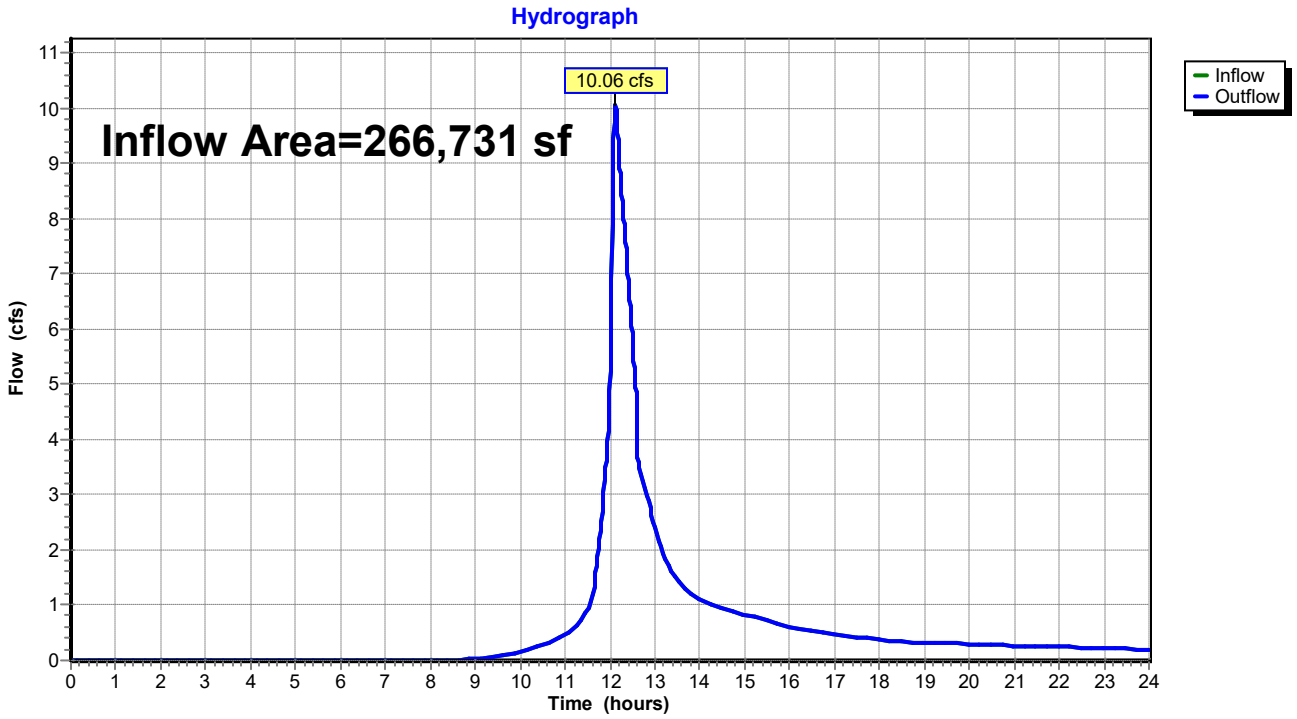


Summary for Reach 2R: PR-1

Inflow Area = 266,731 sf, 43.10% Impervious, Inflow Depth > 2.17" for 10-Year event
Inflow = 10.06 cfs @ 12.12 hrs, Volume= 48,281 cf
Outflow = 10.06 cfs @ 12.12 hrs, Volume= 48,281 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 2R: PR-1

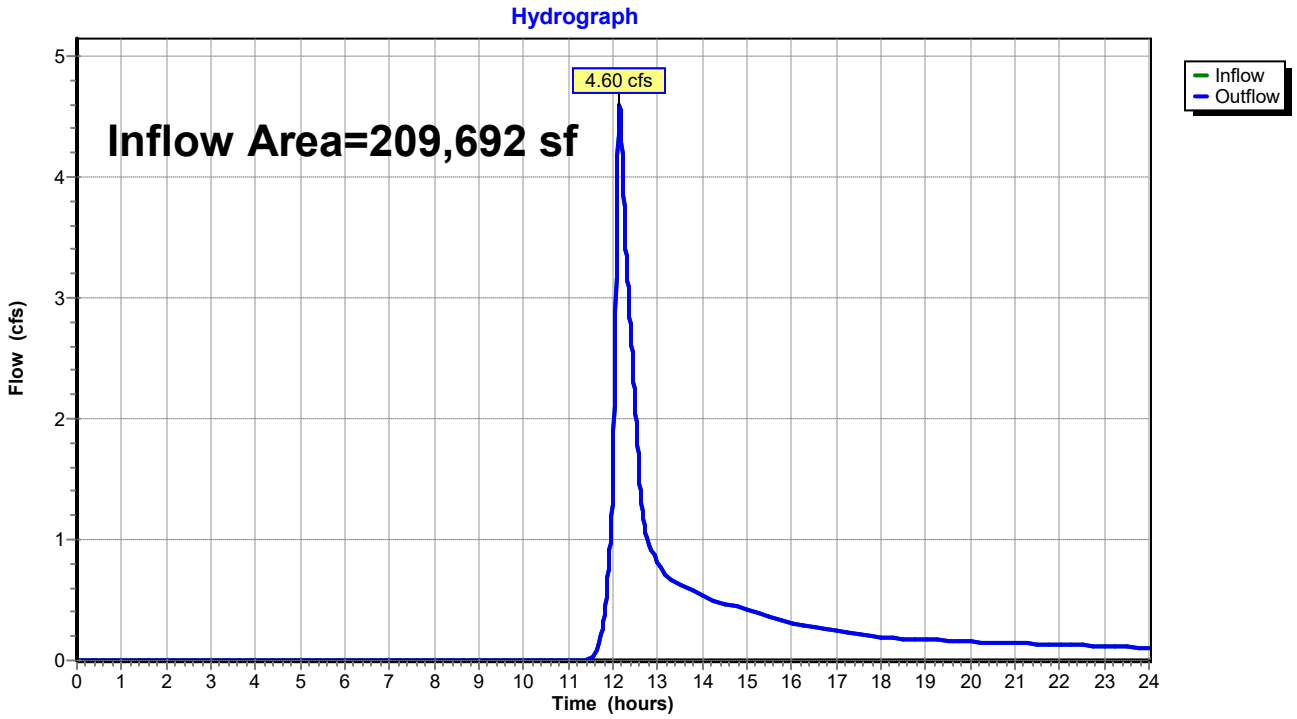


Summary for Reach 3R: PR-2

Inflow Area = 209,692 sf, 1.56% Impervious, Inflow Depth > 1.08" for 10-Year event
Inflow = 4.60 cfs @ 12.15 hrs, Volume= 18,895 cf
Outflow = 4.60 cfs @ 12.15 hrs, Volume= 18,895 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 3R: PR-2



Summary for Pond 1P: (new Pond)

Inflow Area = 175,246 sf, 45.38% Impervious, Inflow Depth > 2.23" for 10-Year event
Inflow = 10.49 cfs @ 12.09 hrs, Volume= 32,634 cf
Outflow = 6.04 cfs @ 12.21 hrs, Volume= 32,408 cf, Atten= 42%, Lag= 7.3 min
Primary = 6.04 cfs @ 12.21 hrs, Volume= 32,408 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 358.36' @ 12.21 hrs Surf.Area= 0 sf Storage= 5,198 cf

Plug-Flow detention time= 16.3 min calculated for 32,395 cf (99% of inflow)
Center-of-Mass det. time= 12.2 min (843.4 - 831.2)

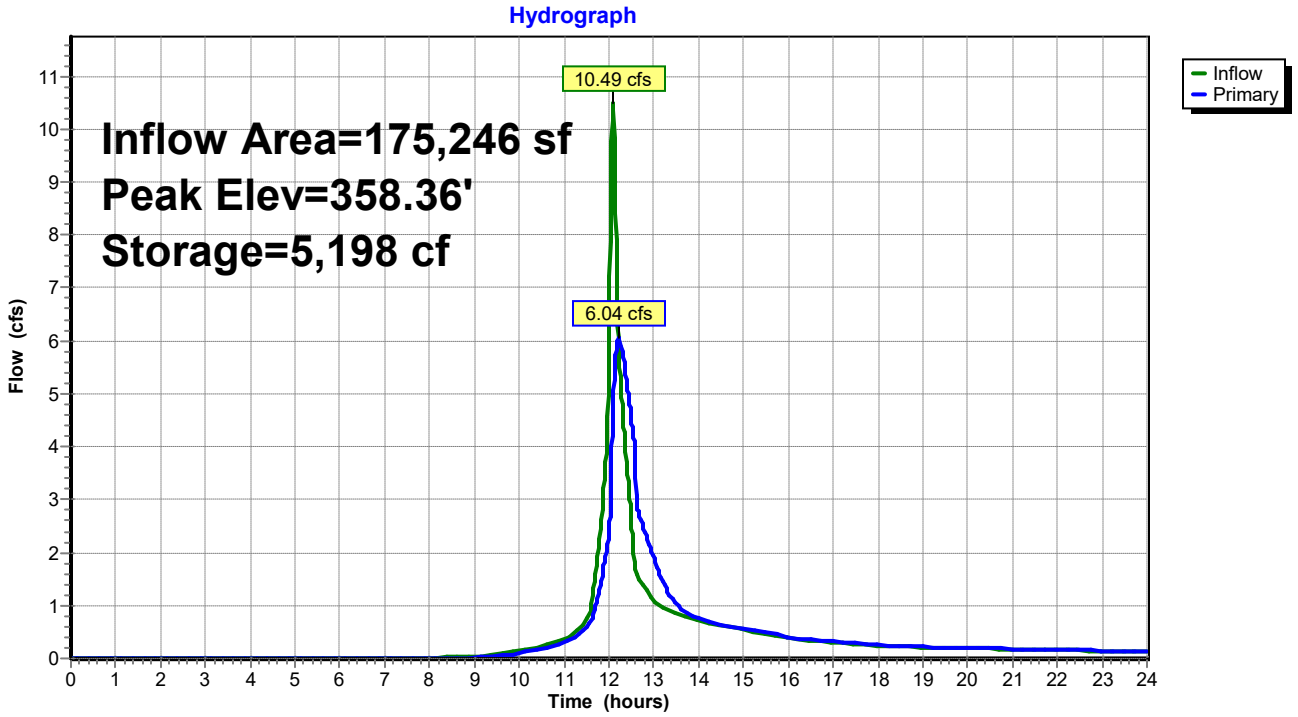
Volume	Invert	Avail.Storage	Storage Description
#1	355.43'	8,511 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
355.43	0
358.17	3,196
358.67	8,511

Device	Routing	Invert	Outlet Devices
#1	Primary	355.43'	**8.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	358.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=6.04 cfs @ 12.21 hrs HW=358.36' (Free Discharge)
1=Orifice/Grate (Orifice Controls 3.04 cfs @ 7.73 fps)
2=Sharp-Crested Rectangular Weir (Weir Controls 3.00 cfs @ 2.13 fps)

Pond 1P: (new Pond)



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1A: PR-1A Runoff Area=16,567 sf 22.86% Impervious Runoff Depth>2.10"
Tc=6.0 min CN=69 Runoff=0.92 cfs 2,901 cf

Subcatchment PR-1B: PR-1B Runoff Area=152,848 sf 41.61% Impervious Runoff Depth>2.70"
Tc=6.0 min CN=76 Runoff=11.11 cfs 34,365 cf

Subcatchment PR-1C: PR-1C Runoff Area=22,398 sf 71.14% Impervious Runoff Depth>3.75"
Tc=6.0 min CN=87 Runoff=2.22 cfs 7,004 cf

Subcatchment PR-1D: PR-1D Runoff Area=74,918 sf 42.24% Impervious Runoff Depth>2.79"
Tc=6.0 min CN=77 Runoff=5.63 cfs 17,405 cf

Subcatchment PR-2A: PR-2A Runoff Area=181,639 sf 1.18% Impervious Runoff Depth>1.49"
Flow Length=435' Tc=10.3 min CN=61 Runoff=5.77 cfs 22,501 cf

Subcatchment PR-2B: PR-2B Runoff Area=28,053 sf 4.00% Impervious Runoff Depth>1.63"
Flow Length=270' Slope=0.0200 '/' Tc=7.3 min CN=63 Runoff=1.11 cfs 3,820 cf

Reach 2R: PR-1 Inflow=13.09 cfs 61,425 cf
Outflow=13.09 cfs 61,425 cf

Reach 3R: PR-2 Inflow=6.78 cfs 26,320 cf
Outflow=6.78 cfs 26,320 cf

Pond 1P: (new Pond) Peak Elev=358.49' Storage=6,559 cf Inflow=13.33 cfs 41,369 cf
Outflow=7.97 cfs 41,119 cf

Total Runoff Area = 476,423 sf Runoff Volume = 87,995 cf Average Runoff Depth = 2.22"
75.18% Pervious = 358,185 sf 24.82% Impervious = 118,238 sf

Summary for Subcatchment PR-1A: PR-1A

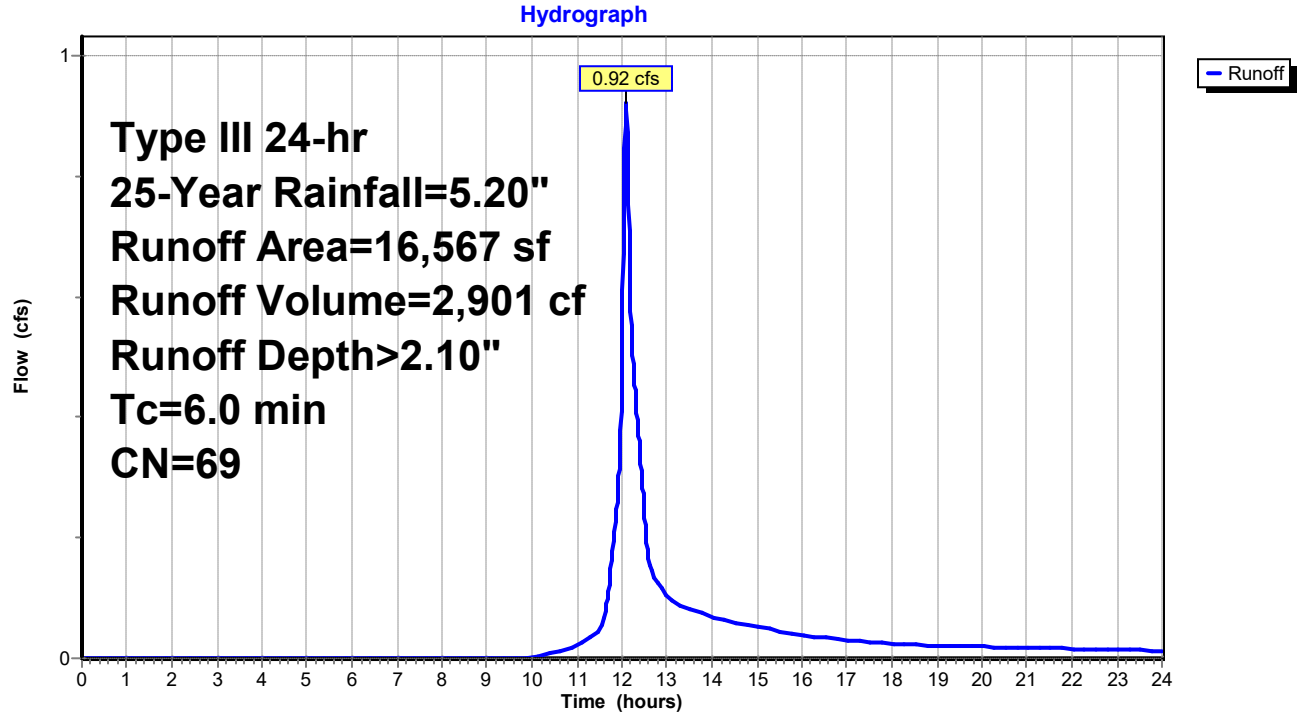
Runoff = 0.92 cfs @ 12.09 hrs, Volume= 2,901 cf, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

Area (sf)	CN	Description
3,787	98	Paved parking, HSG B
10,314	61	>75% Grass cover, Good, HSG B
2,466	55	Woods, Good, HSG B
16,567	69	Weighted Average
12,780		77.14% Pervious Area
3,787		22.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1A: PR-1A



Summary for Subcatchment PR-1B: PR-1B

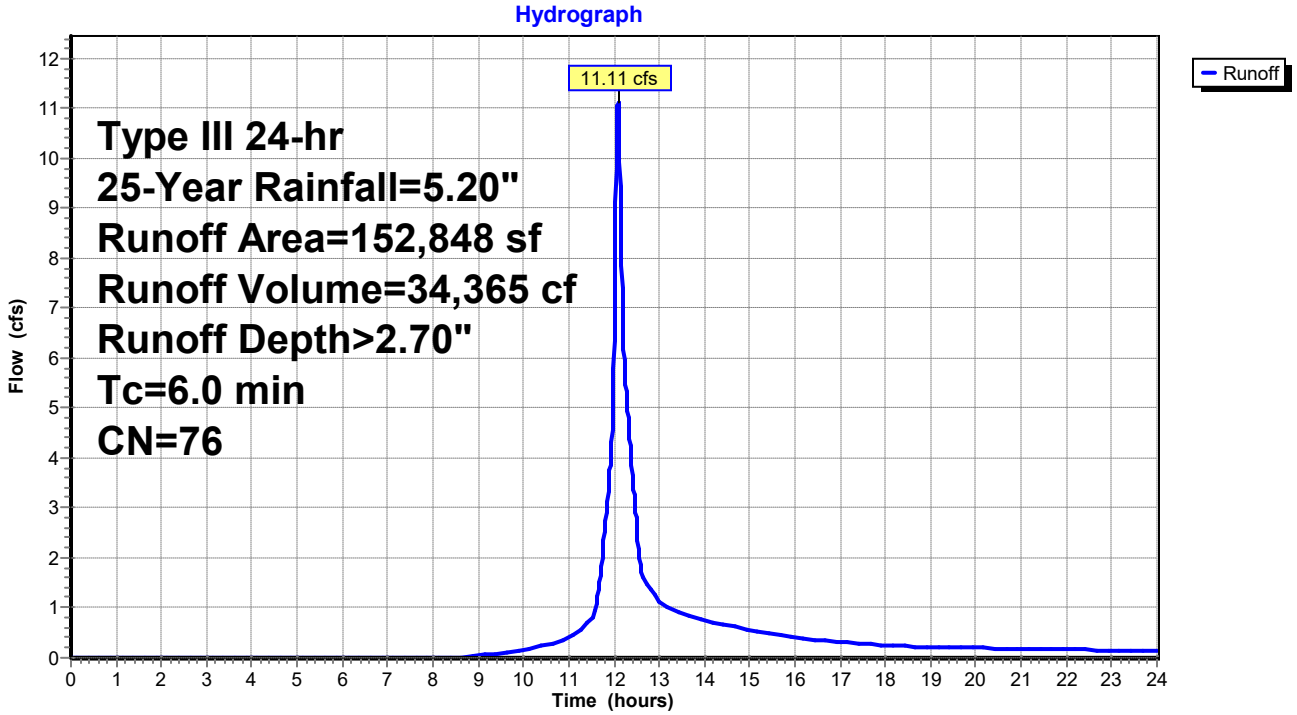
Runoff = 11.11 cfs @ 12.09 hrs, Volume= 34,365 cf, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

Area (sf)	CN	Description
63,599	98	Paved parking, HSG B
88,344	61	>75% Grass cover, Good, HSG B
609	61	>75% Grass cover, Good, HSG B
296	55	Woods, Good, HSG B
152,848	76	Weighted Average
89,249		58.39% Pervious Area
63,599		41.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1B: PR-1B



Summary for Subcatchment PR-1C: PR-1C

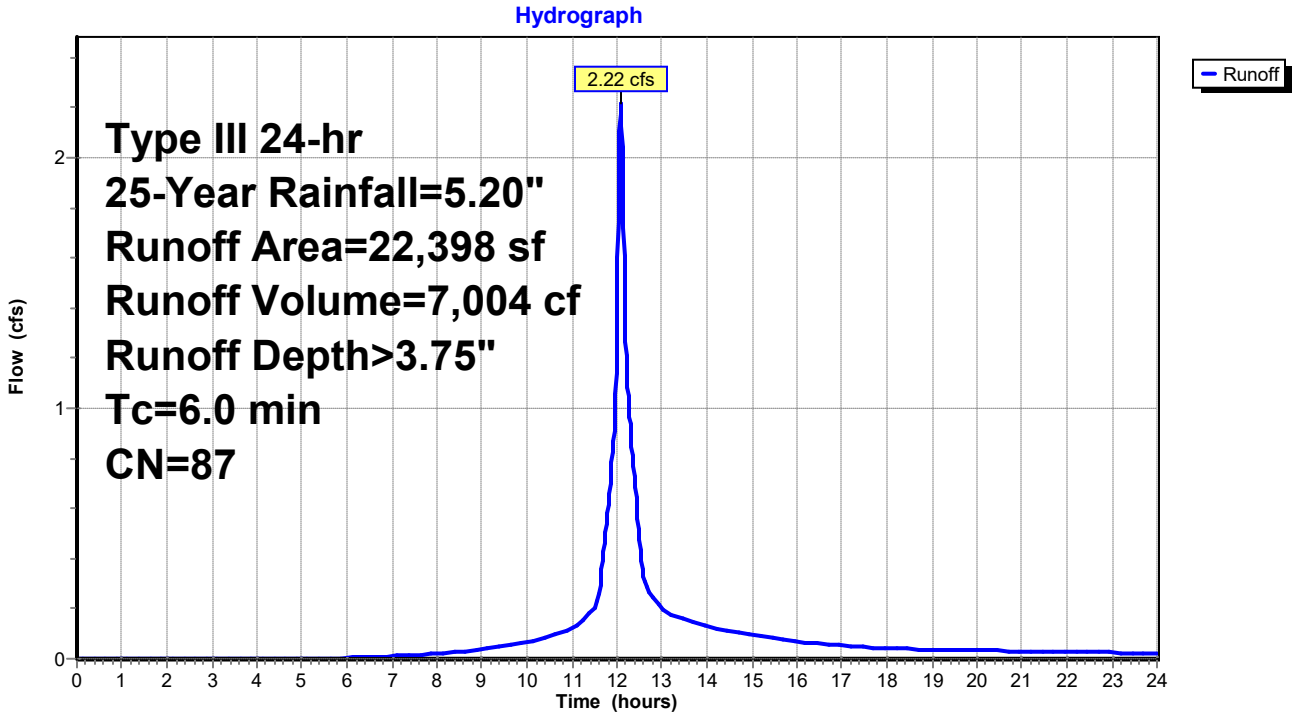
Runoff = 2.22 cfs @ 12.09 hrs, Volume= 7,004 cf, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

Area (sf)	CN	Description
6,463	61	>75% Grass cover, Good, HSG B
15,935	98	Paved parking, HSG B
22,398	87	Weighted Average
6,463		28.86% Pervious Area
15,935		71.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1C: PR-1C



Summary for Subcatchment PR-1D: PR-1D

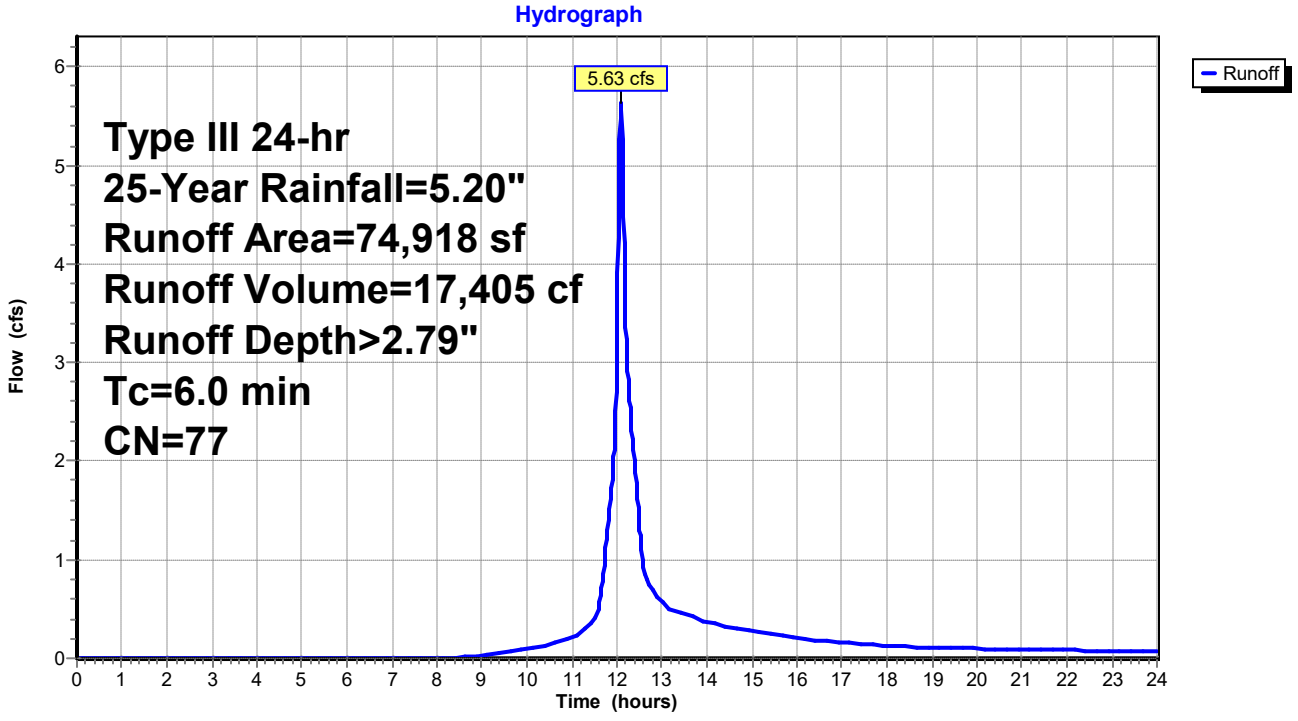
Runoff = 5.63 cfs @ 12.09 hrs, Volume= 17,405 cf, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

	Area (sf)	CN	Description
	31,644	98	Paved parking, HSG B
*	1,233	86	Fallow, bare soil, HSG B
	42,041	61	>75% Grass cover, Good, HSG B
	74,918	77	Weighted Average
	43,274		57.76% Pervious Area
	31,644		42.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1D: PR-1D



Summary for Subcatchment PR-2A: PR-2A

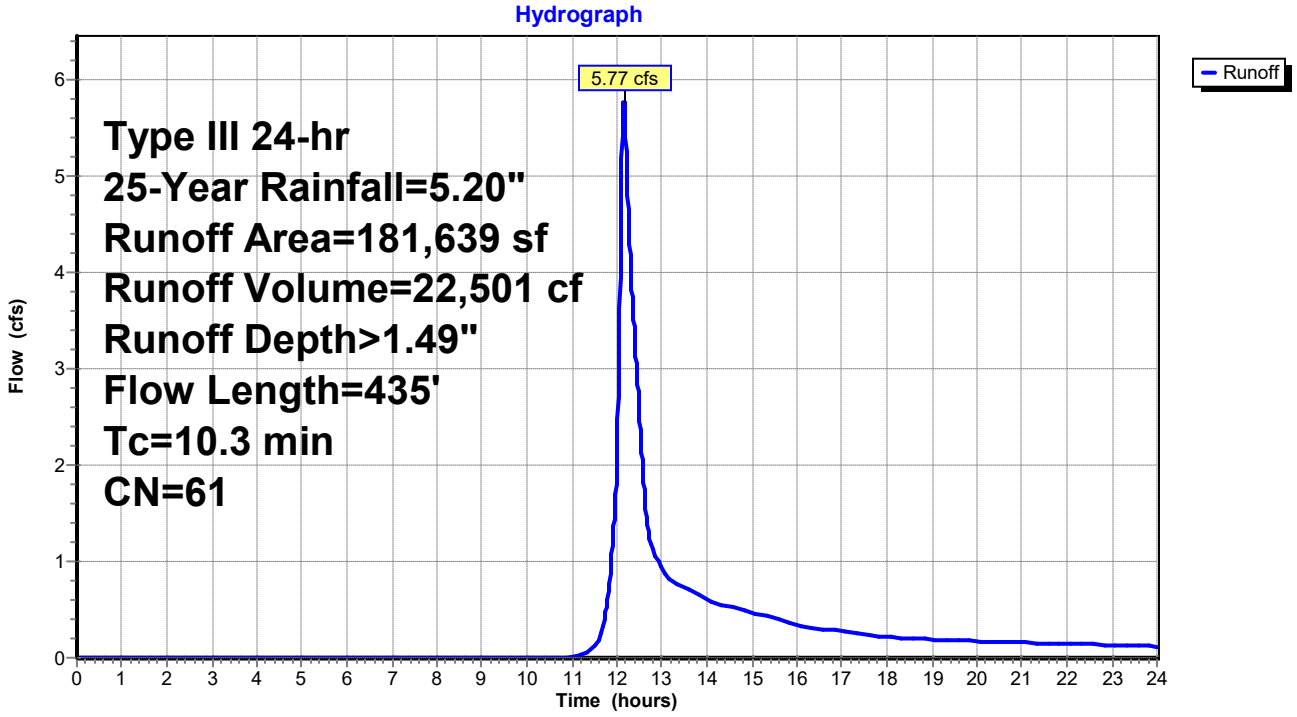
Runoff = 5.77 cfs @ 12.16 hrs, Volume= 22,501 cf, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

Area (sf)	CN	Description
2,151	98	Paved parking, HSG B
9,906	86	Fallow, bare soil, HSG B
52,789	55	Woods, Good, HSG B
116,793	61	>75% Grass cover, Good, HSG B
181,639	61	Weighted Average
179,488		98.82% Pervious Area
2,151		1.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
2.7	325	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	60	0.3000	8.82		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.3	435	Total			

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

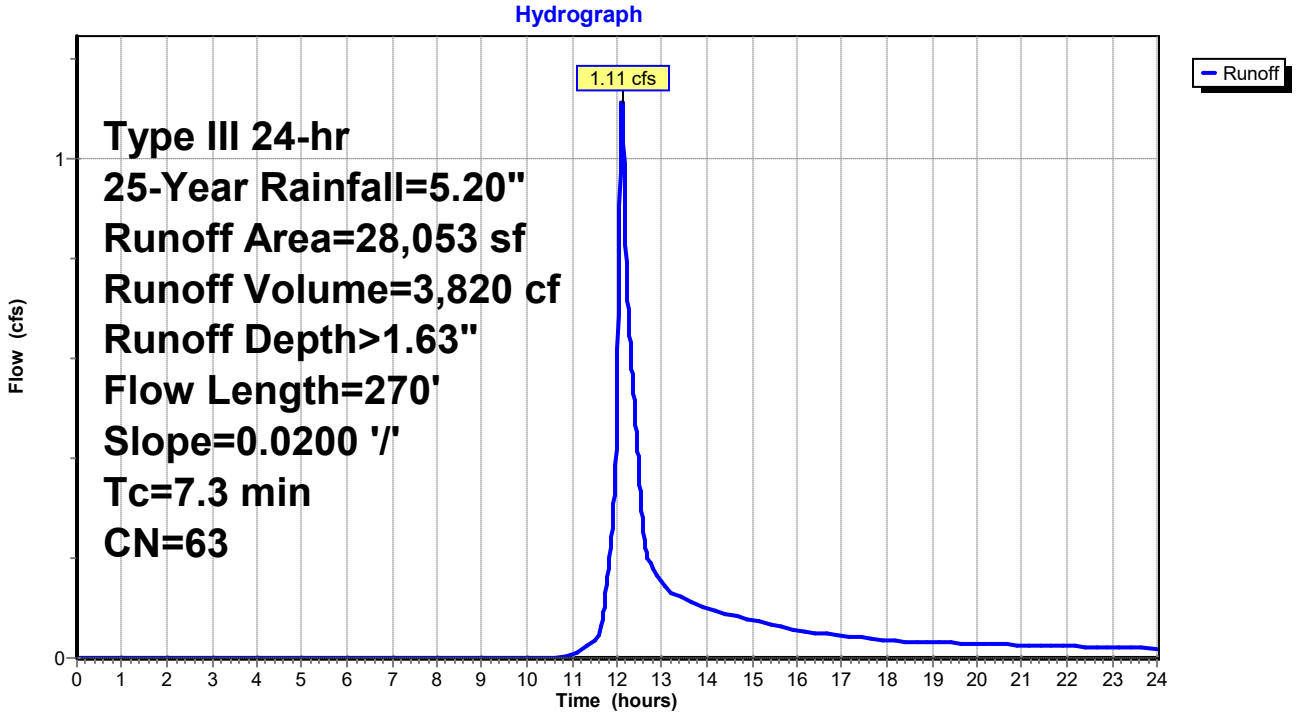
Runoff = 1.11 cfs @ 12.11 hrs, Volume= 3,820 cf, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

Area (sf)	CN	Description
1,122	98	Paved parking, HSG B
516	86	Fallow, bare soil, HSG B
896	55	Woods, Good, HSG B
25,519	61	>75% Grass cover, Good, HSG B
28,053	63	Weighted Average
26,931		96.00% Pervious Area
1,122		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.6	220	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	270	Total			

Subcatchment PR-2B: PR-2B

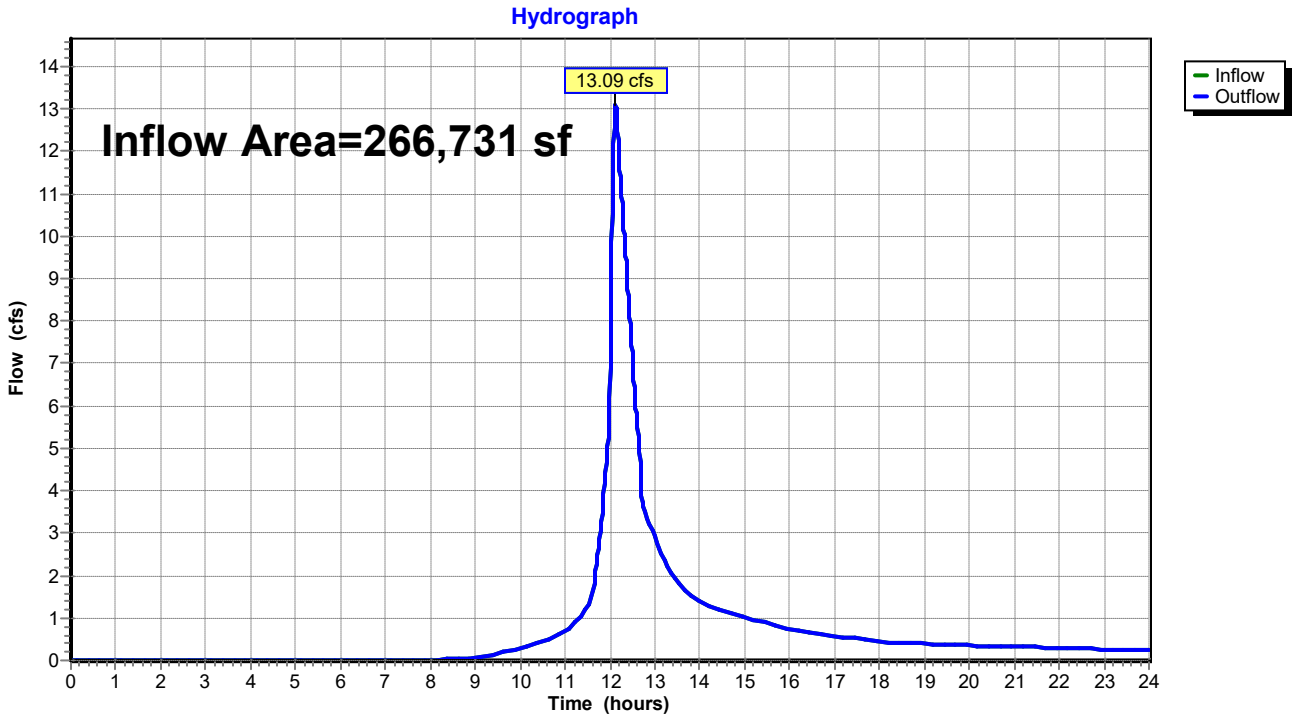


Summary for Reach 2R: PR-1

Inflow Area = 266,731 sf, 43.10% Impervious, Inflow Depth > 2.76" for 25-Year event
Inflow = 13.09 cfs @ 12.12 hrs, Volume= 61,425 cf
Outflow = 13.09 cfs @ 12.12 hrs, Volume= 61,425 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 2R: PR-1

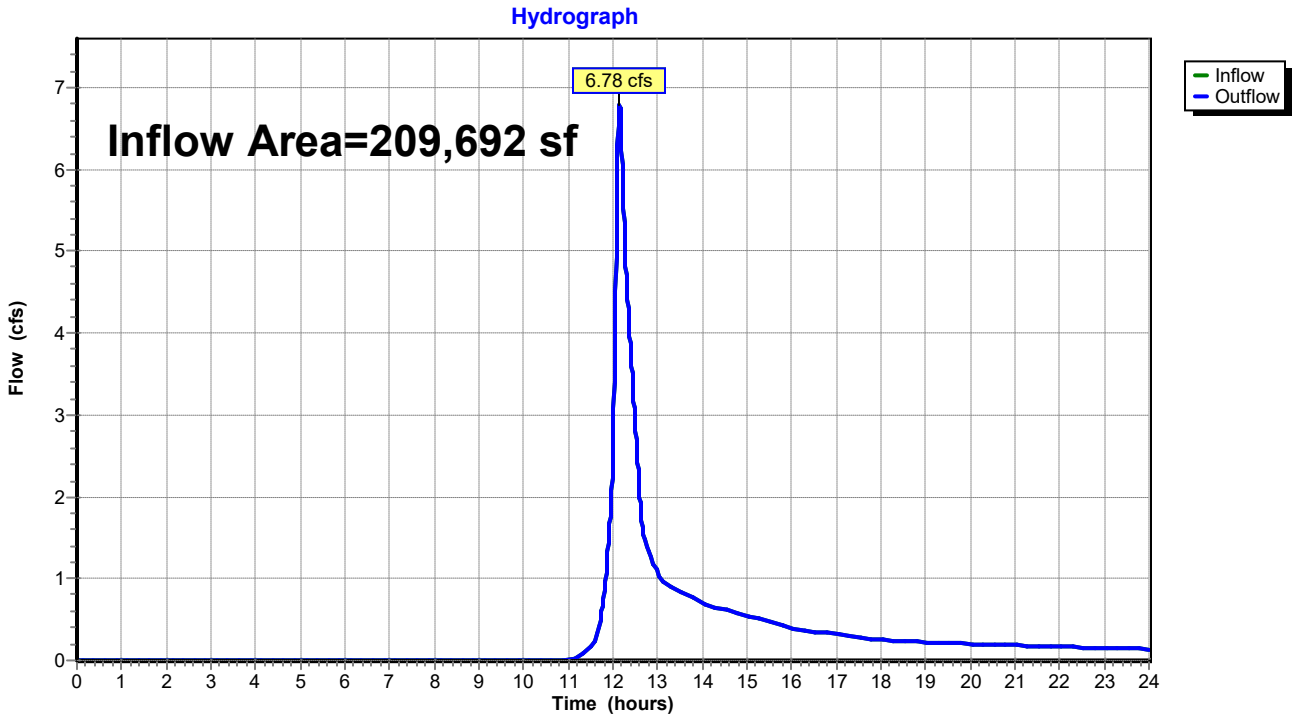


Summary for Reach 3R: PR-2

Inflow Area = 209,692 sf, 1.56% Impervious, Inflow Depth > 1.51" for 25-Year event
Inflow = 6.78 cfs @ 12.15 hrs, Volume= 26,320 cf
Outflow = 6.78 cfs @ 12.15 hrs, Volume= 26,320 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 3R: PR-2



Summary for Pond 1P: (new Pond)

Inflow Area = 175,246 sf, 45.38% Impervious, Inflow Depth > 2.83" for 25-Year event
Inflow = 13.33 cfs @ 12.09 hrs, Volume= 41,369 cf
Outflow = 7.97 cfs @ 12.20 hrs, Volume= 41,119 cf, Atten= 40%, Lag= 6.7 min
Primary = 7.97 cfs @ 12.20 hrs, Volume= 41,119 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 358.49' @ 12.20 hrs Surf.Area= 0 sf Storage= 6,559 cf

Plug-Flow detention time= 15.7 min calculated for 41,102 cf (99% of inflow)
Center-of-Mass det. time= 12.0 min (836.6 - 824.6)

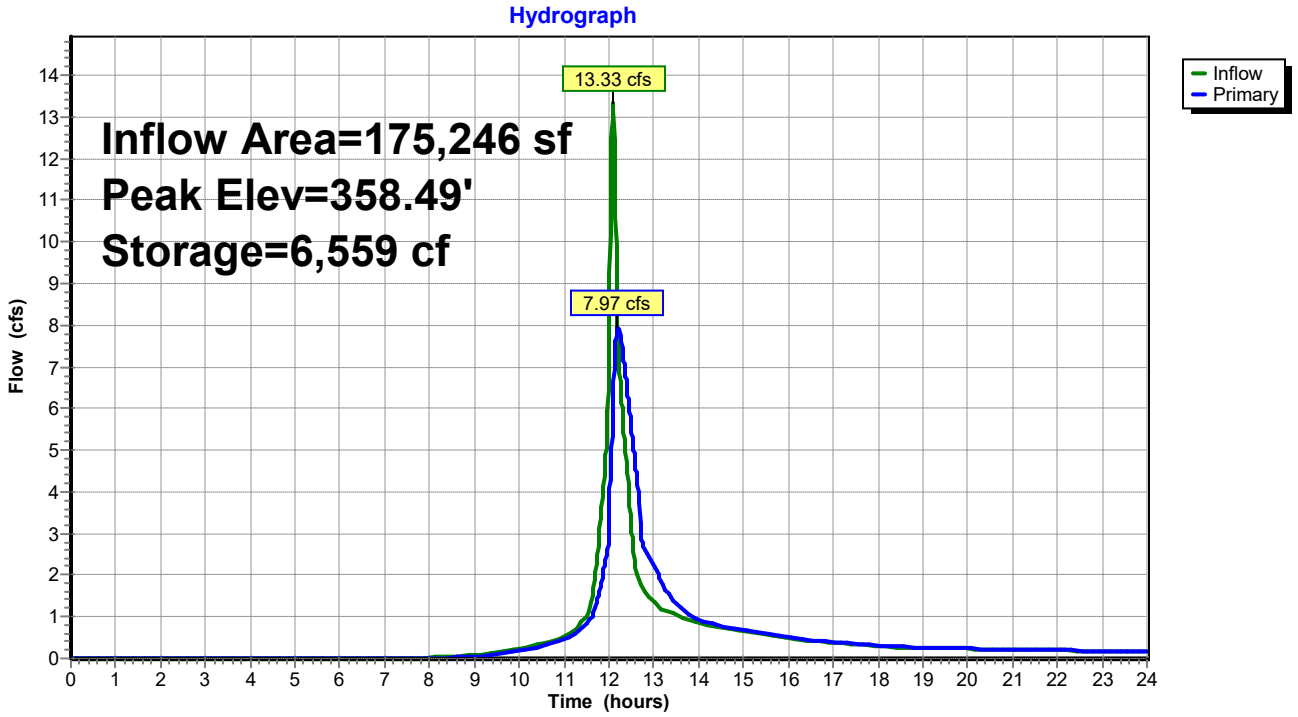
Volume	Invert	Avail.Storage	Storage Description
#1	355.43'	8,511 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
355.43	0
358.17	3,196
358.67	8,511

Device	Routing	Invert	Outlet Devices
#1	Primary	355.43'	**8.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	358.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=7.96 cfs @ 12.20 hrs HW=358.49' (Free Discharge)
1=Orifice/Grate (Orifice Controls 3.12 cfs @ 7.92 fps)
2=Sharp-Crested Rectangular Weir (Weir Controls 4.84 cfs @ 2.55 fps)

Pond 1P: (new Pond)



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1A: PR-1A Runoff Area=16,567 sf 22.86% Impervious Runoff Depth>2.95"
Tc=6.0 min CN=69 Runoff=1.31 cfs 4,066 cf

Subcatchment PR-1B: PR-1B Runoff Area=152,848 sf 41.61% Impervious Runoff Depth>3.64"
Tc=6.0 min CN=76 Runoff=14.98 cfs 46,316 cf

Subcatchment PR-1C: PR-1C Runoff Area=22,398 sf 71.14% Impervious Runoff Depth>4.80"
Tc=6.0 min CN=87 Runoff=2.81 cfs 8,960 cf

Subcatchment PR-1D: PR-1D Runoff Area=74,918 sf 42.24% Impervious Runoff Depth>3.74"
Tc=6.0 min CN=77 Runoff=7.54 cfs 23,338 cf

Subcatchment PR-2A: PR-2A Runoff Area=181,639 sf 1.18% Impervious Runoff Depth>2.20"
Flow Length=435' Tc=10.3 min CN=61 Runoff=8.94 cfs 33,348 cf

Subcatchment PR-2B: PR-2B Runoff Area=28,053 sf 4.00% Impervious Runoff Depth>2.38"
Flow Length=270' Slope=0.0200 '/' Tc=7.3 min CN=63 Runoff=1.68 cfs 5,574 cf

Reach 2R: PR-1 Inflow=18.30 cfs 82,398 cf
Outflow=18.30 cfs 82,398 cf

Reach 3R: PR-2 Inflow=10.49 cfs 38,922 cf
Outflow=10.49 cfs 38,922 cf

Pond 1P: (new Pond) Peak Elev=358.67' Storage=8,509 cf Inflow=17.78 cfs 55,276 cf
Outflow=11.29 cfs 54,994 cf

Total Runoff Area = 476,423 sf Runoff Volume = 121,601 cf Average Runoff Depth = 3.06"
75.18% Pervious = 358,185 sf 24.82% Impervious = 118,238 sf

Summary for Subcatchment PR-1A: PR-1A

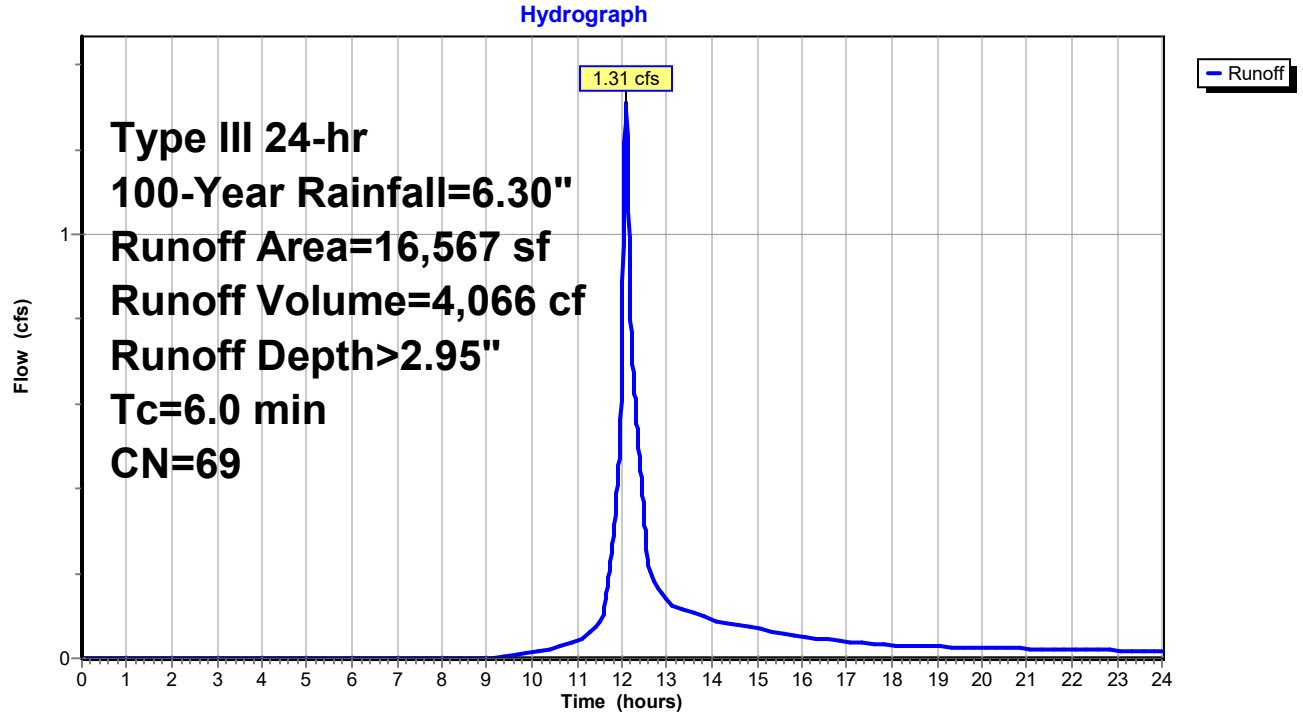
Runoff = 1.31 cfs @ 12.09 hrs, Volume= 4,066 cf, Depth> 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

Area (sf)	CN	Description
3,787	98	Paved parking, HSG B
10,314	61	>75% Grass cover, Good, HSG B
2,466	55	Woods, Good, HSG B
16,567	69	Weighted Average
12,780		77.14% Pervious Area
3,787		22.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1A: PR-1A



Summary for Subcatchment PR-1B: PR-1B

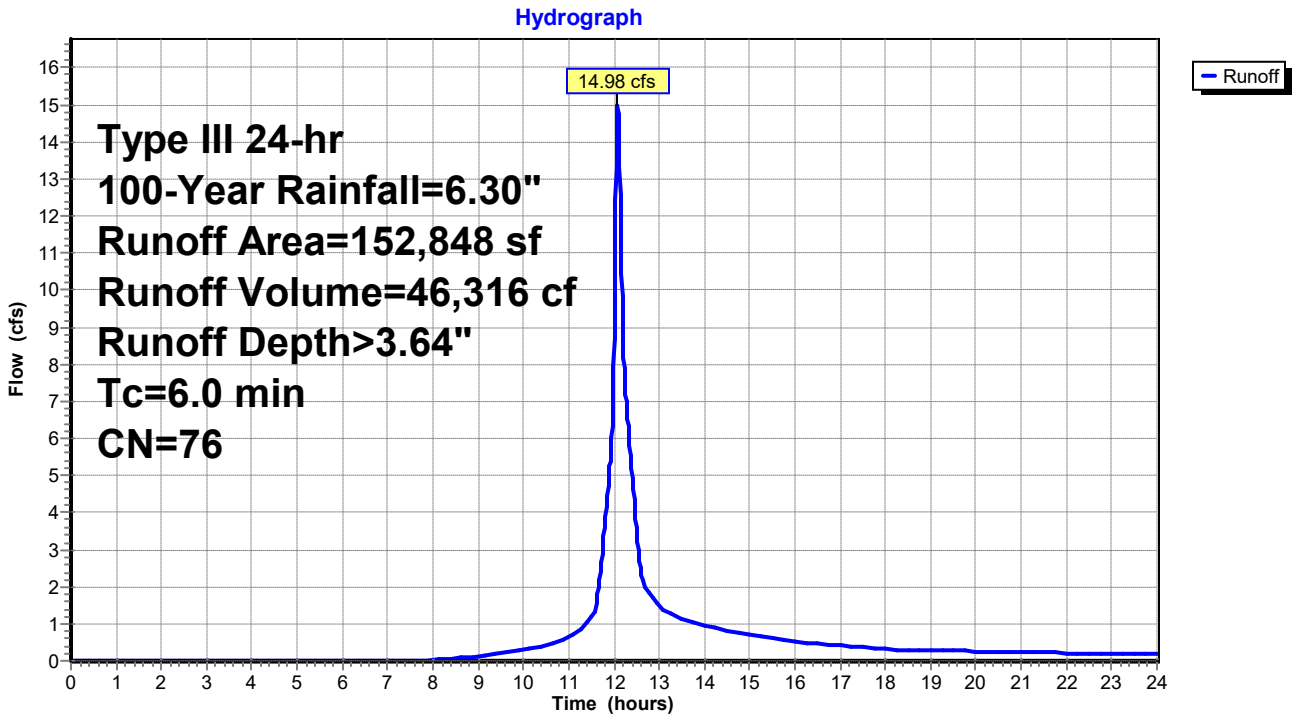
Runoff = 14.98 cfs @ 12.09 hrs, Volume= 46,316 cf, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

Area (sf)	CN	Description
63,599	98	Paved parking, HSG B
88,344	61	>75% Grass cover, Good, HSG B
609	61	>75% Grass cover, Good, HSG B
296	55	Woods, Good, HSG B
152,848	76	Weighted Average
89,249		58.39% Pervious Area
63,599		41.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1B: PR-1B



Summary for Subcatchment PR-1C: PR-1C

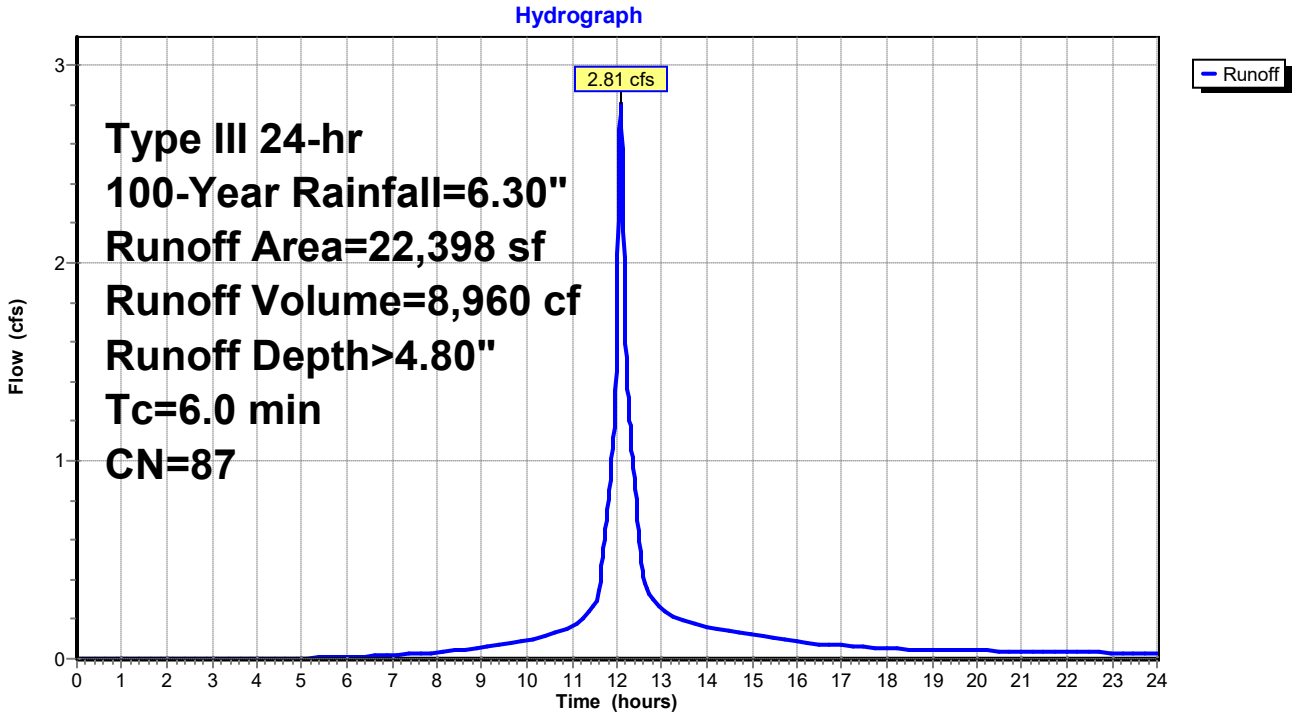
Runoff = 2.81 cfs @ 12.09 hrs, Volume= 8,960 cf, Depth> 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

Area (sf)	CN	Description
6,463	61	>75% Grass cover, Good, HSG B
15,935	98	Paved parking, HSG B
22,398	87	Weighted Average
6,463		28.86% Pervious Area
15,935		71.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1C: PR-1C



Summary for Subcatchment PR-1D: PR-1D

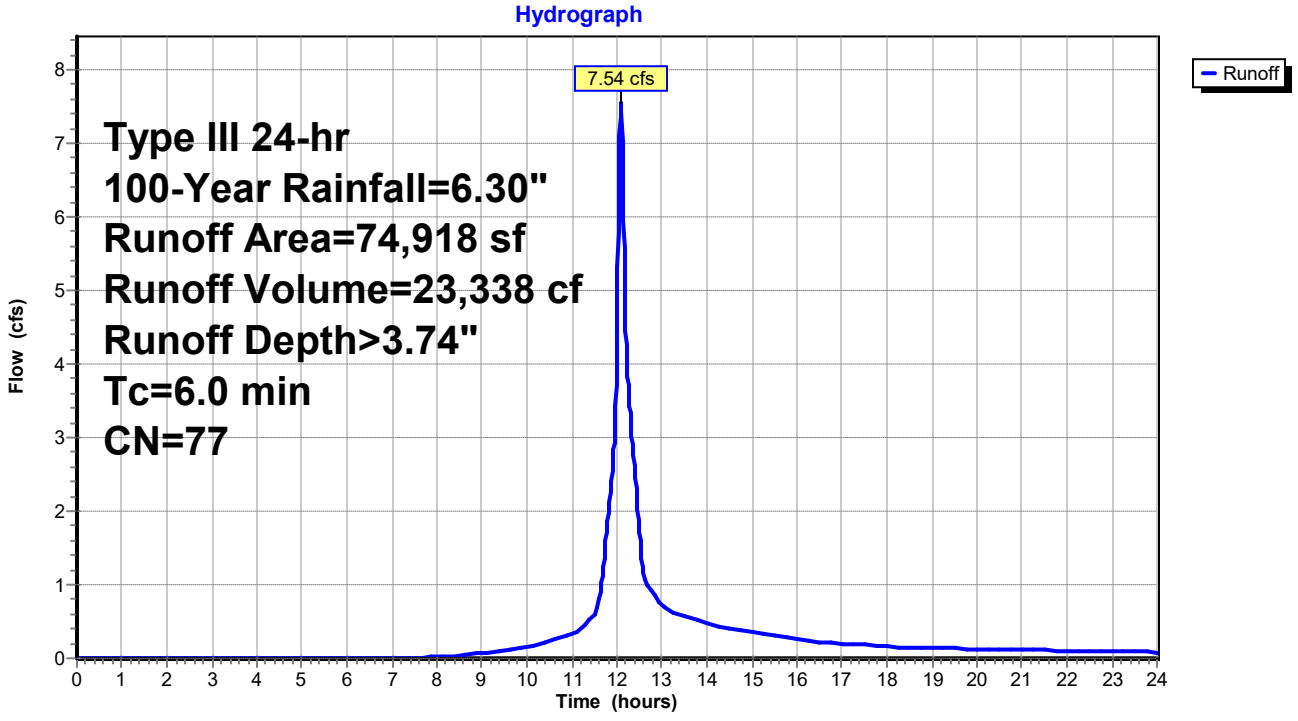
Runoff = 7.54 cfs @ 12.09 hrs, Volume= 23,338 cf, Depth> 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

	Area (sf)	CN	Description
	31,644	98	Paved parking, HSG B
*	1,233	86	Fallow, bare soil, HSG B
	42,041	61	>75% Grass cover, Good, HSG B
	74,918	77	Weighted Average
	43,274		57.76% Pervious Area
	31,644		42.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1D: PR-1D



Summary for Subcatchment PR-2A: PR-2A

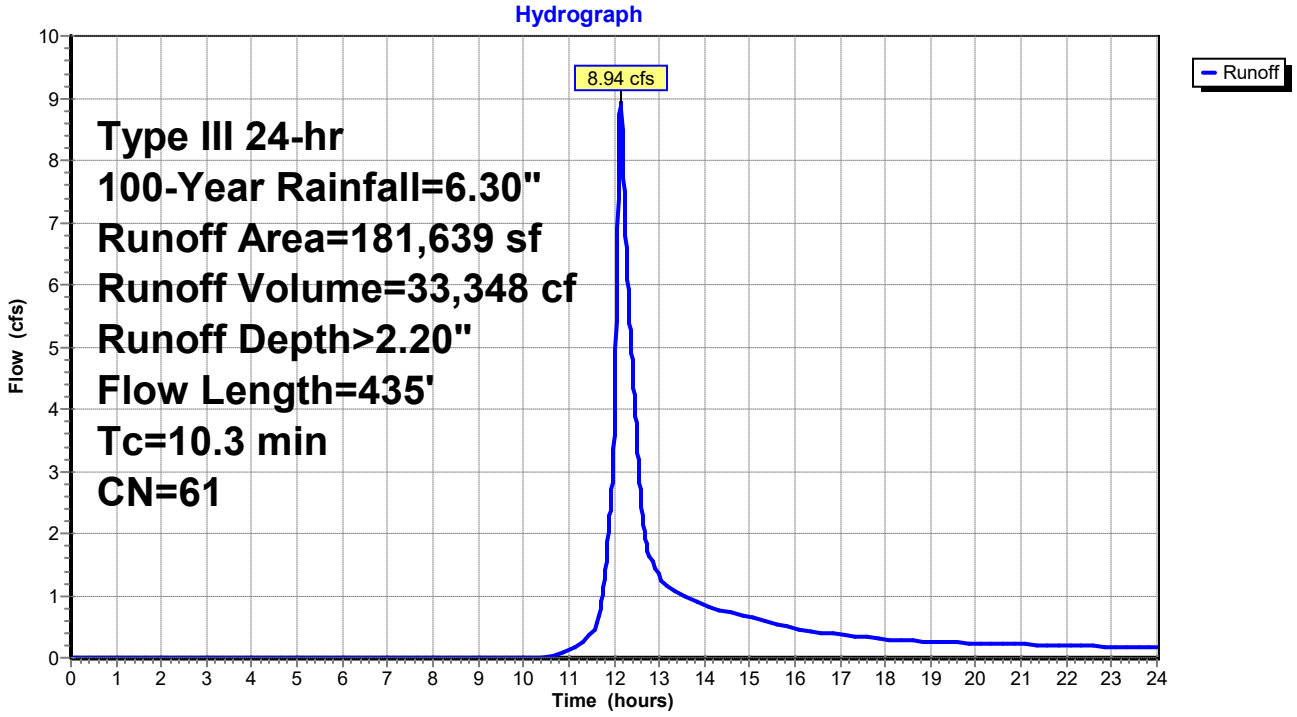
Runoff = 8.94 cfs @ 12.15 hrs, Volume= 33,348 cf, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

Area (sf)	CN	Description
2,151	98	Paved parking, HSG B
9,906	86	Fallow, bare soil, HSG B
52,789	55	Woods, Good, HSG B
116,793	61	>75% Grass cover, Good, HSG B
181,639	61	Weighted Average
179,488		98.82% Pervious Area
2,151		1.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
2.7	325	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	60	0.3000	8.82		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.3	435	Total			

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

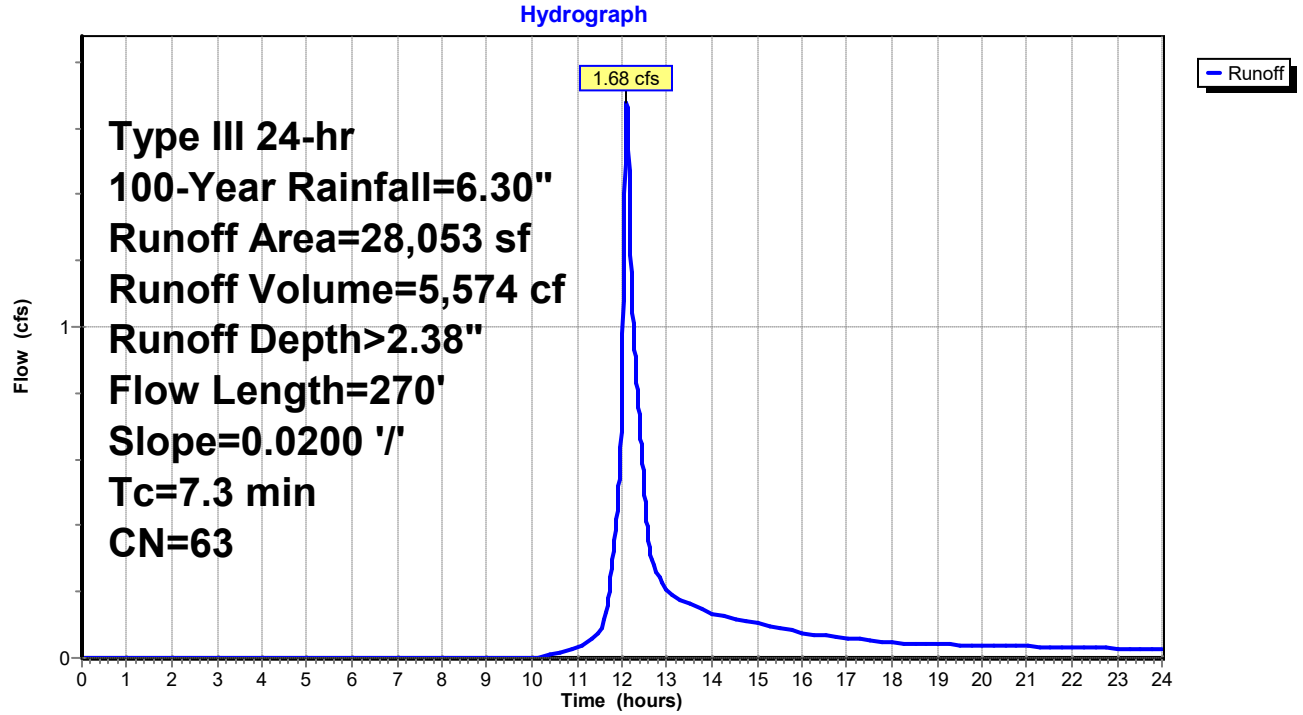
Runoff = 1.68 cfs @ 12.11 hrs, Volume= 5,574 cf, Depth> 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.30"

Area (sf)	CN	Description
1,122	98	Paved parking, HSG B
516	86	Fallow, bare soil, HSG B
896	55	Woods, Good, HSG B
25,519	61	>75% Grass cover, Good, HSG B
28,053	63	Weighted Average
26,931		96.00% Pervious Area
1,122		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.6	220	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	270	Total			

Subcatchment PR-2B: PR-2B

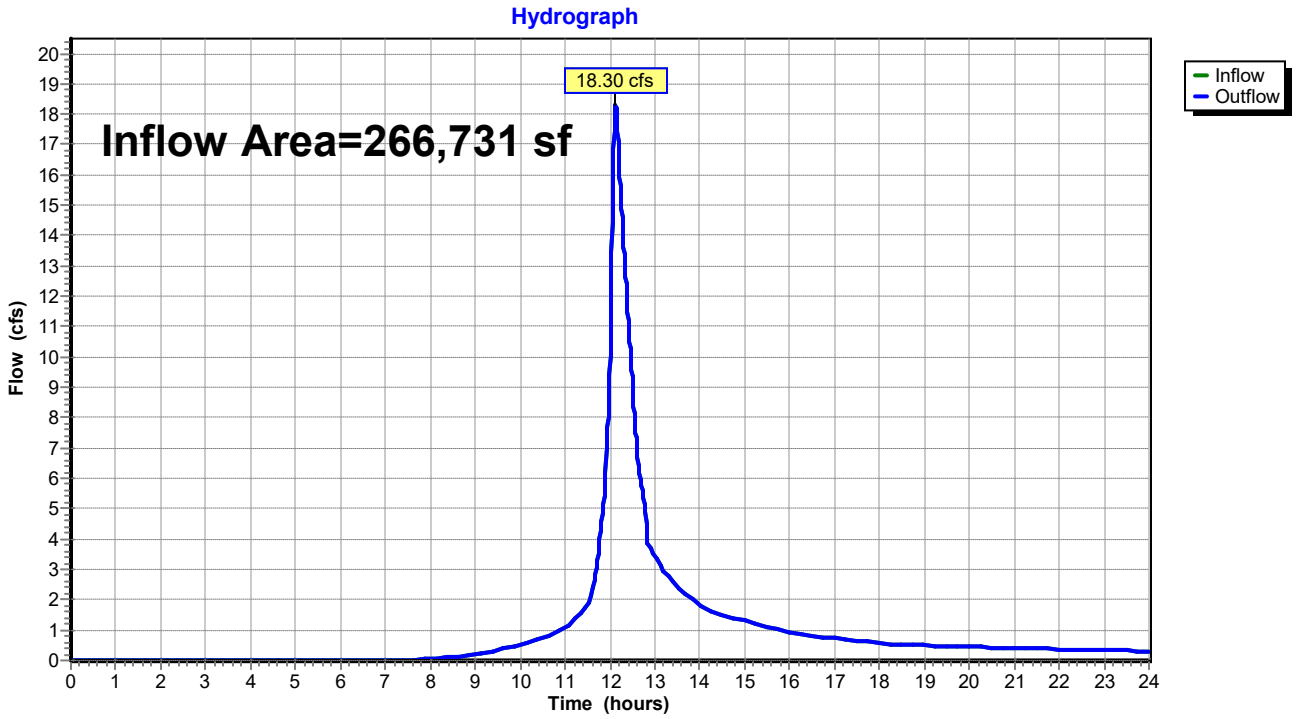


Summary for Reach 2R: PR-1

Inflow Area = 266,731 sf, 43.10% Impervious, Inflow Depth > 3.71" for 100-Year event
Inflow = 18.30 cfs @ 12.13 hrs, Volume= 82,398 cf
Outflow = 18.30 cfs @ 12.13 hrs, Volume= 82,398 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 2R: PR-1

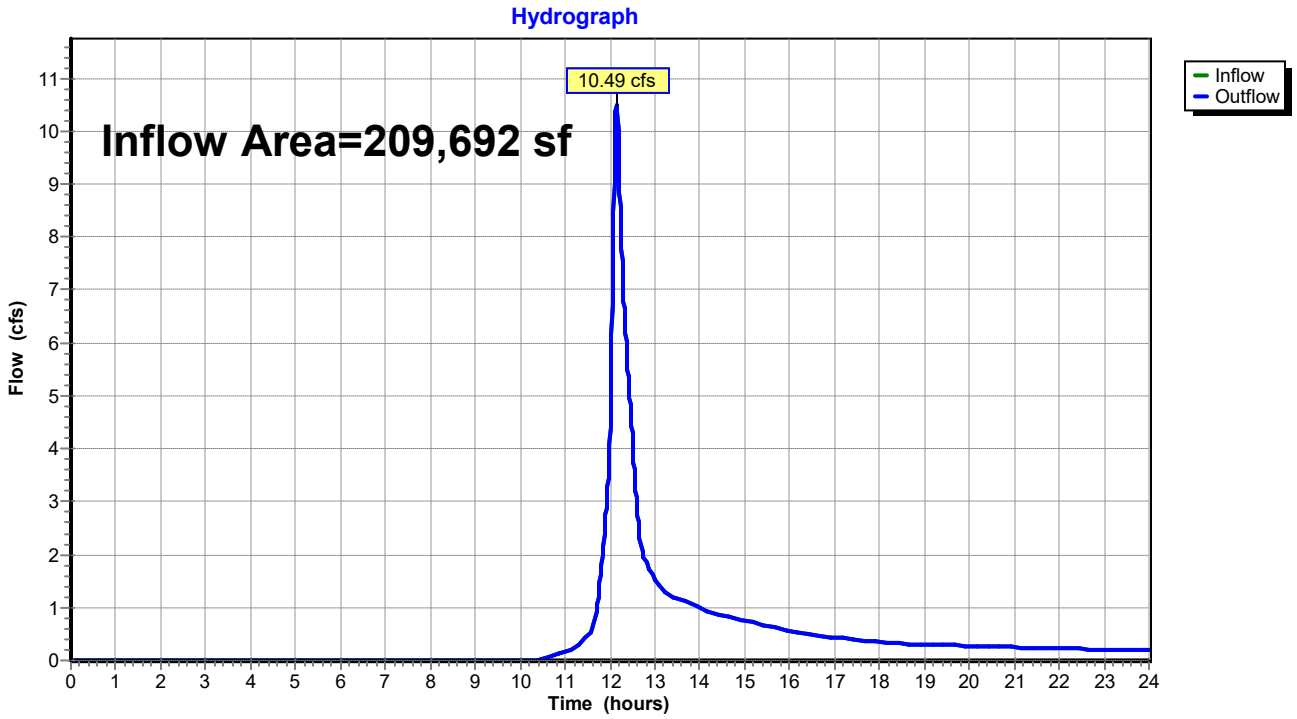


Summary for Reach 3R: PR-2

Inflow Area = 209,692 sf, 1.56% Impervious, Inflow Depth > 2.23" for 100-Year event
Inflow = 10.49 cfs @ 12.14 hrs, Volume= 38,922 cf
Outflow = 10.49 cfs @ 12.14 hrs, Volume= 38,922 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 3R: PR-2



Summary for Pond 1P: (new Pond)

Inflow Area = 175,246 sf, 45.38% Impervious, Inflow Depth > 3.79" for 100-Year event
Inflow = 17.78 cfs @ 12.09 hrs, Volume= 55,276 cf
Outflow = 11.29 cfs @ 12.19 hrs, Volume= 54,994 cf, Atten= 37%, Lag= 5.8 min
Primary = 11.29 cfs @ 12.19 hrs, Volume= 54,994 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 358.67' @ 12.19 hrs Surf.Area= 0 sf Storage= 8,509 cf

Plug-Flow detention time= 14.8 min calculated for 54,994 cf (99% of inflow)
Center-of-Mass det. time= 11.7 min (828.2 - 816.5)

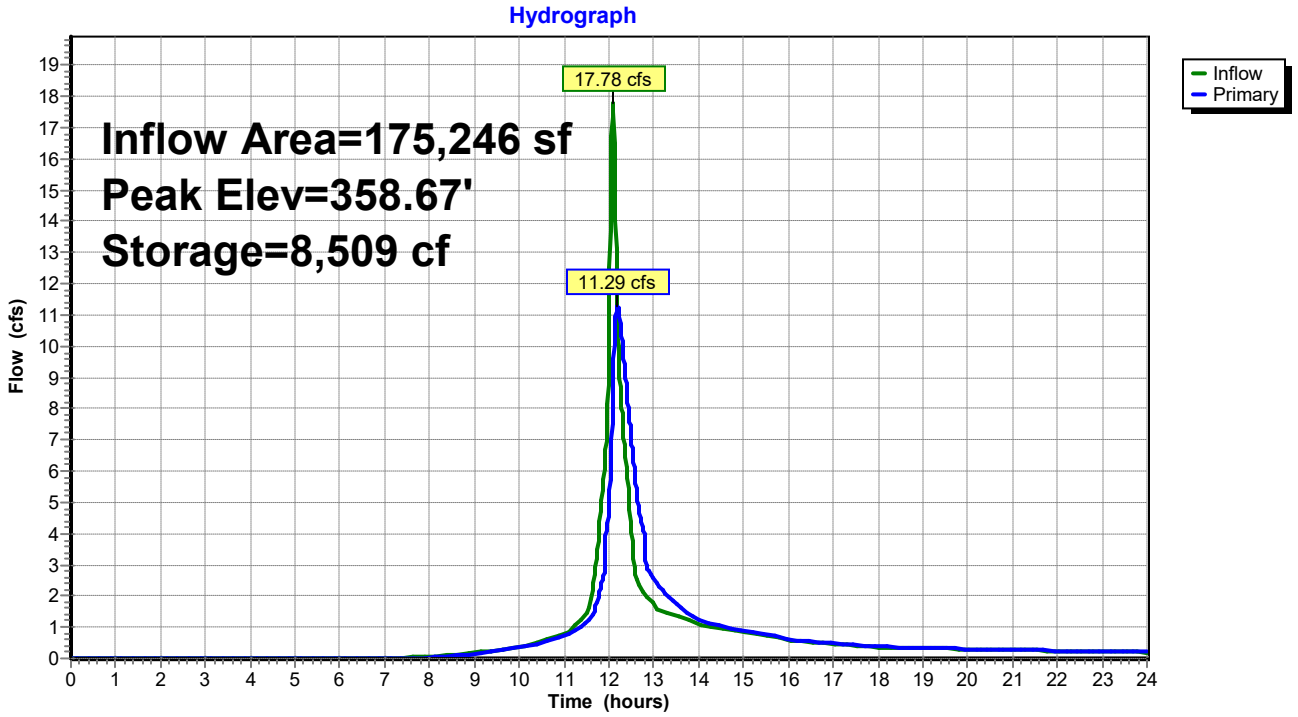
Volume	Invert	Avail.Storage	Storage Description
#1	355.43'	8,511 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
355.43	0
358.17	3,196
358.67	8,511

Device	Routing	Invert	Outlet Devices
#1	Primary	355.43'	**8.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	358.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=11.28 cfs @ 12.19 hrs HW=358.67' (Free Discharge)
1=Orifice/Grate (Orifice Controls 3.22 cfs @ 8.18 fps)
2=Sharp-Crested Rectangular Weir (Weir Controls 8.06 cfs @ 3.11 fps)

Pond 1P: (new Pond)



TSS Removal Calculations

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Ayers Shirley Track & Field Renovation

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Street Sweeping - 10%	0.10	1.00	0.10	0.90
Sediment Forebay	0.25	0.90	0.23	0.68
Deep Sump and Hooded Catch Basin	0.25	0.68	0.17	0.51
Infiltration Basin	0.80	0.51	0.41	0.10
	0.00	0.10	0.00	0.10

Total TSS Removal = 90%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 21015
Prepared By: MEB
Date: 11/15/21

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Operation and Maintenance Plan

Bound Separately

Operation and Maintenance Plan

ASRSD Track and Field Renovation

Ayer Shirley High School
141 Washington Street
Ayer, MA 01432

Owner:
Ayer Shirley Regional School District
115 Washington Street
Ayer, MA 01432

Submitted To:
Town of Ayer
1 Main Street
Ayer, MA 01432

Applicant:
Activitas, Inc.
16 School Street
Dedham, MA 02026
(781) 355-7040

November 18, 2021

Table of Contents

1.0 Operation and Maintenance Plan

The ASRSD Track and Field project site is subject to Standard 9 - Operation and Maintenance Plan of the Massachusetts Stormwater Handbook. This Operation and Maintenance Plan details management recommendations for long-term pollution prevention.

The area to be renovated is the existing track and field and the adjacent baseball field. The project scope is limited to an area of approximately 8.3 acres. The project consists of installation of a new resilient surface track and synthetic turf playing field, a cement concrete entrance plaza, ADA accessible walkways leading from the parking lot to the site, a concessions/restroom building, spectator seating and a new game management box, and renovations to the grass baseball field to improve field conditions.

1.1 Pavement

Maintenance of the parking area will include regular sweeping. The sweeping program will remove contaminants directly from paved surfaces to prevent their release into the drainage system. Street sweeping has been shown to be an effective initial treatment for reducing pollutant loadings in stormwater.

Inspections and Cleaning

- Record all maintenance and repairs. Submit reports every year for compliance.
- Sweep asphalt areas at least four times per year with a commercial cleaning unit and properly dispose of removed material.
- More frequent sweeping will result in less accumulation in catch basins and less cleaning of the subsurface structures.

1.2 Catch Basins

Catch basins on site will have sumps a minimum of 4 feet deep and hooded outlets to trap debris, sediment, and floating contaminants. Catch basins should be cleaned twice per year. Catch basins should be checked after every storm event, typically within 72 hours after the end of the rainfall event.

- Record all maintenance and repairs. Submit reports every year for compliance.
- Inspect all catch basins after every storm (or at least four times a year) and at the end of the foliage and snow-removal season.
- If sediment is more than six inches deep and/or there are floatable pollutants, they will be removed from the basin and disposed of.
- During colder periods, basin grates shall be kept free of ice and snow.
- During warmer periods, basin grates shall be kept free of leaves, litter, sand, and other debris.

1.3 Outlet Control Structure

There will be one outlet control structure on site to control the flow out of the synthetic turf drainage system. The outlet control structure should be inspected twice each year and cleaned twice per year. The outlet control structure should be checked at least four times a year and at the end of the foliage and snow-removal season.

- Record all maintenance and repairs. Submit reports every year for compliance.
- Inspect the outlet control structure every storm (or at least four times a year) and at the end of the foliage and snow-removal season.
- If sediment is more than six inches deep and/or there are floatable pollutants, they will be removed from the outlet control structure and disposed of.

1.4 Area Drains

Area drains should be cleaned twice per year. Area drains should be checked at least four times a year and at the end of the foliage and snow-removal seasons.

- Record all maintenance and repairs. Submit reports every year for compliance.
- Inspect all area drains after every storm (or at least four times a year) and at the end of the foliage and snow-removal seasons.

- If sediment is more than six inches deep and/or there are floatable pollutants, they will be removed from the drain and disposed of.
- During colder periods, area drain grates shall be kept free of ice and snow.
- During warmer periods, area drain grates shall be kept free of leaves, litter, sand, and other debris.

1.5 Synthetic Turf Field Maintenance

See Appendix 2.2 for an example of a synthetic turf maintenance manual.

1.6 Vegetated Areas Maintenance

Although not a structural component of the drainage system, the maintenance of vegetated areas may affect the function of stormwater management practices. This includes the health/density of vegetative cover and activities such as the application and disposal of lawn and garden care products, disposal of leaves and yard trimmings.

- Inspect planted areas on a semi-annual basis and remove any litter.
- Maintain planted areas adjacent to pavement to prevent soil washout.
- Immediately clean any soil deposited on pavement.
- Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming.
- Plant alternative mixture of grass species in the event of unsuccessful establishment.

1.7 Spill Prevention and Control Plan

The Property Owner will be responsible for training of people in the proper handling and cleanup of spilled materials. No spilled hazardous materials or hazardous wastes will be allowed to come in contact with stormwater discharges. If such contact occurs, the stormwater discharge will be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated stormwater.

In order to minimize the potential for a spill of hazardous materials to come into contact with stormwater, the following steps will be implemented:

1. All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.
2. The minimum practical quantity of all such materials will be kept on the site.
3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dustpans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the maintenance area of the site.
4. Manufacturers recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

In the event of a spill, the following procedures should be followed:

1. All spills will be cleaned up immediately after discovery.
2. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances.
3. The Owner will be notified immediately.
4. Spills of toxic or hazardous materials will be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill.

The Property Owner will be the spill prevention and response coordinator. He will designate the individuals who will receive spill prevention and response training. These individuals will each become responsible for a particular phase of prevention and response. The names of these personnel will be posted in the material storage area and other applicable areas onsite.

2.0 Appendices

2.1 Operations and Maintenance Logs

Inspection for Year: _____

NOTE: See Operations and Maintenance Plan for details of inspection requirements.

Structural Best Management Practice	Action	Date Completed	Comments	Completed By	Action	Date Completed	Comments	Completed By
Synthetic Turf Field (refer to separate specific maintenance log for turf field system)	Inspect				Clean (if required—See Plan for details.)			
Stormwater Outfalls—Inspect annually.	Inspect				Clean (if required—See Plan for details.)			
Catch Basins/Area Drains	Inspect				Clean (if required—See Plan for details.)			

2.2 Example Synthetic Turf Maintenance Manual

MAINTENANCE MANUAL

CONTENTS

INTRODUCTION TO MAINTENANCE

Following these simple suggestions will significantly extend the life and performance of your product:

- Keep it clean
- Do not abuse it. No vehicle traffic, no heavy static loads, or fireworks, etc.
- Make all minor repairs to your surface promptly
- Consult with a Shaw Sports Turf professional if your repairs and renovations are complicated
- Maintain proper infill levels in high use areas

NOTE: This manual is intended for customer use. It is important that the people who are responsible for field maintenance are thoroughly familiar with its contents and refer to it regularly. The contents in this manual represent the most current information regarding suggested procedures for the proper use and care of Shaw Sports Turf synthetic turf systems.

Shaw Sports Turf makes no representations, warranties or guarantees of any kind, expressed or implied, regarding the information contained herein and disclaims all liability or any loss or damage arising out of its use.

USAGE GUIDES

Each Shaw Sports Turf surface is specially designed for optimal performance and is suitable for some of the following applications:

- Football, Soccer, Lacrosse, Field Hockey, Rugby
- Softball / Baseball (non-metal cleats)
- Marching Band
- Physical Exercises
- Physical Education Activities
- Pneumatic rubber-tired maintenance and service vehicles
- Pedestrian traffic and other similar uses

PROTECTING YOUR SURFACE

It is good business to protect your investment and take care of your synthetic turf system. To do this most effectively, KEEP IT CLEAN. The following maintenance precautions are advised:

- Control access to field
- Keep your surface free of litter, mud and debris
- Post signs prohibiting smoking and carrying food or drink onto the field
- Minimize and properly monitor the use of motorized vehicles on your surface
- Repair minor damage promptly
- Follow suggested maintenance and cleaning procedures

CLEANING AND STAIN REMOVAL

For outdoor surfaces, rain is the best cleanser. Rainfall gently cleans the fibers of dust, pollen and airborne pollutants in a way that is difficult to duplicate. In areas where rainfall is scarce – or during prolonged periods of drought – an occasional watering is beneficial to cleanse the synthetic surface. Listed below are the suggested precautionary maintenance practices:

- Keep trash and litter containers on site
- Route field's access traffic in such a way to minimize mud/dirt tracking on the field
- Set up drinks for athletes during practice breaks off the synthetic surface if possible
- Enforce a smoke free environment and discourage the use of chewing tobacco, gum and sunflower seeds

DAILY CARE

Daily care is on-going care, it does not necessarily mean care each and every day. The amount and frequency of daily care is dependant on not only the surface, but also by the volume and the type of use. Shaw Sports Turf recommends that every Shaw turf system shall be periodically groomed and swept to remove litter and dust etc.

LITTER REMOVAL

Light trash (paper, peanut shells, sunflower seeds, athletic tape etc.) and airborne dust can be removed easily with a lawn sweeper or maintenance sweeper.

SWEEPERS

When using machines, several points should be observed:

BRISTLE TYPE

The sweeper should have synthetic fiber bristles such as nylon or polypropylene. The minimum brush length should be 2.5". The maximum bristle diameter should be .030". The brush must contain no metal or wire. Metal fibers can fall out and cause injuries to players and can also damage the surface.

BRUSH SETTING

The brush setting should be monitored. The actual setting will of course depend on the model and type of sweeper. The sweeper will work best, however, when the brush is set so that it barely touches the tips of the fibers of the turf.

DO NOT SET THE BRUSH SO LOW THAT IT DIGS INTO THE TURF PILE OR BACKING.

Too low a setting can damage the turf. Vacuum cleaners are not recommended to remove mud. Contact your Shaw Sports Turf representative if you have any questions about the type of machine to use or brush settings.

TURF LOADING LIMITATIONS

Brushing and brush cleaning may require several trips over the field to finish the operation. Any sweeper that weighs more than 300 lbs. should have turf type low ground pressure tires (pneumatic tires) with a maximum tire pressure of 35 pounds per square inch (psi). Do not park vehicles on the turf, especially in the heat of the day, or leave vehicles on wet turf for long periods of time.

EXHAUST FUMES

For outdoor use we recommend either electric or propane. The type of fuel or power used by a sweeper is of no major importance for outdoor use. However, if the sweeper has an internal combustion engine, make certain that the hot engine exhaust is not discharged down toward the playing surface. Hot objects can damage the field and engine exhaust may soil it. Also check to make sure that the sweeper is designed in such a way that a hot muffler or exhaust pipe cannot drop onto the surface.

OIL SPILLAGE, ETC.

Care should be taken to prevent lubricating oil, gasoline, grease, transmission fluids, battery acid, brake fluid, etc. from dripping, leaking or spilling on the turf surface during sweepings. Such spills can discolor the turf and damage the fibers and turf backing. Proper maintenance procedures should be observed in this regard. Battery acid and other fluids should not be allowed on the surface. Never change or add fluids to maintenance equipment while on the surface.

CAUTION: Electrically powered units may not be properly grounded, do not use them on wet or damp surfaces.

FREQUENCY

The removal of loose rubbish and surface dust should be performed on an as needed basis, generally about once a week depending on usage.

DO'S

Shaw Sports Turf synthetic turf systems are designed to resist both wear and exposure to the elements. The effectiveness of their materials, design and construction is demonstrated by the long life of fields under heavy use in many climates. The following are the most obvious precautions:

- Control access to the synthetic turf system. Keep the synthetic turf system and close adjacent areas clean and free of litter, mud and debris.
- Post signs prohibiting smoking and carrying food or drink onto the synthetic turf system.
- Observe load limits for static and rolling loads, especially when the surface is wet.
- Repair minor damage promptly.
- Follow suggested maintenance and cleaning procedures.
- Contact your Shaw Sports Turf representative for assistance with repairs, renovation work, or any further technical details.

DON'T'S

DO NOT ABUSE THE SYNTHETIC TURF SYSTEM WITH:

- Vehicle traffic
- Heavy static loads
- Fireworks
- Storage of materials such as drums, lumber, equipment, etc.
- Golfing, shot putting, javelin or discus throwing
- Use of long spike track shoes
- Open flames, welding, etc.
- Use of wire brushes in any form
- Use of cleaning equipment, materials, and methods not authorized by Shaw Sports Turf
- High-pressure water sprays exceeding 500 PSI
- Vehicles with non-pneumatic tires
- Introduction of infills or impregnated layers other than supplied or authorized by Shaw Sports Turf
- Do not allow the use of bikes, skateboards, lawn mowers, etc.
- Do not allow any unauthorized use
- Improper storage of a Shaw Sports Turf removable synthetic turf system

GROOMING OF INFILLED TURF

Shaw Sports Turf recommends that every Shaw turf system has a routine brushing every 80 to 120 hours of usage. Routine brushing is accomplished with a commercial turf brush suitable for brushing the surface.

If you do not have a commercial turf brush please contact your Shaw Sports Turf representative to purchase one.

Infilled surfaces do require grooming. Additional grooming may be necessary only when and if the infill has become displaced due to excessive use in certain areas of the surface such as a goal and heavy traffic areas.

ROUTINE BRUSHING

Routine brushing keeps the surface free from debris, but also maintains your Shaw Sports Turf synthetic turf system at its optimum performance. Routine brushing simultaneously achieves three objectives:

1. Keeps infill layer uniform in its distribution
2. Ensures that the exposed part of the fiber is uniform in its direction and stays erect
3. Helps remove litter, leaves, dirt, etc.

The realized benefits from routine brushing are:

1. Consistent footing and ball bounce throughout the surface
2. Maximum aesthetic appeal
3. Lengthened life expectancy

STAIN REMOVAL GENERAL INSTRUCTIONS

Shaw Sports Turf fibers are among the most stain resistant in the industry. Most stains are not "true" stains but rather residue of foreign matter that must be promptly and thoroughly removed.

The first rule in spot removal is promptness. It is always easier to clean up a fresh spill than one that has dried and hardened. Remove any solid or paste-like deposit with a spatula or table knife. Blot up excess liquids with a thick stack of paper towels or a dry absorbent such as "kitty litter" or Fullers Earth. Dry absorbents can then be swept or vacuumed up.

Shaw Sports Turf surfaces provide good resistance to staining. However, it is important to realize they are only one part of a sophisticated system of various components designed for overall field performance. Some cleaning agents that are safe for the fiber can be harmful to other components of the system.

NYLON FIBERS

Cleaning agents are grouped into two sets, one of which can be used in liberal amounts directly on the turf surface, and the second which should only be applied by rubbing a cloth soaked in cleaner, in order to minimize penetration of possibly harmful agents below the turf fibers.

In the first group of cleaners, which generally can be applied to non-infilled systems without any special precautions, are the following:

1. A warm, mild solution of granular household detergent such as Tide or ALL in water, or any neutral low sudsing detergent that is recommended for fine fabrics. Use approximately one teaspoon of detergent to one pint of water. This will handle most stains.
2. Use three percent solution of ammonia in water for more severe cleaning problems. (NOTE: household ammonia is three percent. Industrial aqua ammonia is 33 percent. Dilute nine parts water to one part industrial ammonia, or the available supply as appropriate.) Thoroughly flush the surface, rinse with plenty of cold water afterwards.
3. Clean, dry absorbents such as paper towels or commercial "kitty litter" can be used for applicable stains.

In the second group of cleaners, where agents must be applied sparingly, care must be taken to avoid penetration beneath the turf fibers. We recommend consulting a professional for application instructions.

POLYPROPYLENE & POLYETHYLENE FIBERS

Polypropylene & polyethylene fibers are among the most stain resistant fibers known to man. Hence, most "stains" on Shaw Sports Turf polypropylene and polyethylene fields are not true stains but rather residues of foreign matter which must be promptly and thoroughly removed. (This is not the case with nylon and other fibers on the market.)

Most "stains" on polypropylene or polyethylene fields can be removed with water or soap and water. The first rule is promptness. It is much easier to clean up a fresh oil spill before it has time to dry and harden. Remove any solid or paste-like deposit promptly using a dull knife or spatula-like tool. Blot up excess liquids with a stack of towels, cloth or paper. Dry absorbent clay based materials, such as cat litter absorbers ("kitty litter") can be very useful and should be stored on site. Such dry absorbers can be sweptor vacuumed up.

Cleaning agents are grouped into two sets, one of which can be used in liberal amounts directly on the turf surface, and the second of which should only be applied by rubbing a cloth soaked in the cleaner, in order to minimize penetration of possibly harmful agents below the turf fibers.

The first group of cleaners can generally be applied to infilled systems without any special precautions.

"WATER BORNE" RESIDUES

Most "stains" commonly associated with polypropylene and polyethylene playing fields can be classified as "water borne" stains. These stains are best removed using a warm mild solution of granular household detergent (non-abrasive) and water.

TYPICAL WATER BORNE STAINS

Acid	Cola	Latex Paint
Alcohol	Dye	Milk
Alkali	Food Coloring	Mustard
Beer	Fruit Juice	Tea
Blood	Gatorade	Thimerosal
Butter	Glue	Urine
Chocolate	Ice Cream	Water Colors
Coffee	Ketchup	

1. Brush the residue with a stiff brush
2. Scrub the area with soap and water
3. Rinse the area thoroughly with clear water to remove all traces of soap
4. Dry with absorbent towel(s), if necessary

A three percent solution of ammonia in water may be used in lieu of household detergent for more stubborn residues or stains.

NON "WATER BORNE" RESIDUES

In the second group of cleaners, where agents must be applied sparingly, care must be taken to avoid penetration into the turf fibers. We recommend consulting a professional for application instructions.

NON WATER BORNE STAINS

Asphalt	Floor Wax	Rubber Cleat Marks
Ball-point	Grease	Shoe Polish
Chewing Gum	Lipstick	Suntan Oil
Cooking Oil	Motor Oil	
Crayon	Paraffin wax	

FIELD MARKING, LOGOS, ADVERTISING AND DECORATION PAINTED LINE AND MARKING SYSTEM

NOTE: Inlaid line and marking systems are preferred for optimum performance. Inlaid line and marking systems are constructed utilizing the same material specifications, and are to be inset in such a manner to ensure a good bond, an even finished surface and physical strength equal to the material prior to introduction of the line and marking system. Permanent inlaid line and marking systems are more attractive than painted systems because of the reduction in maintenance and quality of image.

Alternative painting of line and marking systems and their care is explained below. Many facility owners like to use elaborate line and marking systems, including facility logos, league logos, sponsor logos, mid-field and end-zone designs in assorted colors. Others prefer the simpler approach of sharp, well-defined game markings with no extraneous markings. In either instance, the materials and techniques used in applying paints will determine the life of the markings and the ease of removal when these need to be changed. In marking, do not apply paint too heavily. Light applications give good visibility and adequate life and are less abrasive than excessive layers of "caked-on" paint. Also, where possible, do not paint over inlaid lines and logos.

DRY MARKINGS

Chalk markings are NOT recommended for infilled systems. Dry chalk can be captured by the infill which can degrade a field's performance and drainage. There are some aerosol chalks that have proven to work well on synthetic turf. Some brands can stain inlaid lines and logos. We recommend Pioneer's Aerosol chalk as it fades to white over time and will not stain turf.

PAINTS

Regardless of the type of paint used and design required, best results will be obtained when paint is applied to a clean, dry, dust and grease-free base. It is extremely important that old, degraded paint and dirt be washed off any area that is to be repainted if the best appearance and traffic resistance are to be obtained.

If your field needs this type of attention, we recommend contacting a Pioneer Athletics representative for quotations and scheduling at 800-877-1500.

TEMPORARY PAINT

The recommended paints in this category are designed to be easily removable after usage in a limited number of sport games on infilled systems. Usually, the removal can be achieved by applying a special paint remover solution, agitating with a deck brush or remover machine and rinsing thoroughly with water. We suggest a top quality water based paint designed specifically for synthetic turf such as Pioneer Athletics GameLine paints. One day curing of these paints, at moderate temperature and dry weather, is sufficient. Traditional grass paints or household paints can be very difficult to remove.

DURABLE PAINTS

High quality latex based permanent paint is highly durable. Once applied and cured, this paint may require special chemicals and equipment to remove. Thus it is imperative that use of this paint be restricted to carefully chosen areas. For each of the above paints, it is recommended that 24-48 hours be allowed for complete cure. Paint should always be applied to dry turf at moderate temperatures. We recommend Pioneer Athletic's ExtremeLine paints for infilled systems and Titan for non-infilled systems.

STRIPING AND PAINTING

The application procedure for applying temporary and permanent paint is as follows:

Remove excess paint existing on field. Test application procedure before going on the field (use a scrap of turf fastened to asphalt, plywood or use a corner of the field.) Use no more paint than absolutely necessary. Keep water on hand and readily available to rinse any spills or mistakes before they dry.

The paint should be applied lightly to the tips of the turf fibers–not the entire length of every fiber. Applying the paint too heavily makes for a very rough, abrasive surface and will make the removal job very difficult. An airless system is recommended as it provides a superior look while using less paint. We recommend applying paint at 500-1,000 psi using a 317 or smaller tip. Sprayers that do not atomize the paint are not recommended as paint will flow into the infill and negatively impact removal and field performance.

When applying paint, use large templates and cardboard or wood windshields to minimize paint over-spray.

For logos and other markings, always use a guide such as templates or straight edges. Applying more than one coat of paint may make removal significantly more difficult. Therefore, we recommend a single coat be used where possible.

Painting Shaw Sports Turf systems with brushes or rollers is not recommended. Spraying equipment is recommended for the following four reasons:

1. Spraying can make a more uniform paint application
2. A more intricate template can be used if the paint is sprayed
3. Paint can be applied more rapidly with spray techniques
4. Paint can be removed more easily from areas that have been correctly sprayed than from areas on which the paint has been rolled

PAINT REMOVAL

The main key to efficient removal of temporary paint from surfaces is initial control in the application. The use of excessive amounts of paints is wasteful, presents abrasion hazards to players and requires extra work in removal.

Either of the following two techniques should result in clean removal of temporary paints within reasonable time and without excessive labor.

EQUIPMENT NEEDED FOR PAINT REMOVAL:

Use a street broom, deck brush, small sprayer or watering can, water hose, medium-sized tank or bucket for mixing, and a couple of wet vacuums.

MATERIALS NEEDED:

Paint removal method requires the use of 8 percent ammonia. The solution should be prepared in advance and access to water outlets provided. The percent ammonia solution is prepared from aqua ammonia (33 percent ammonia) by diluting with three parts water to one part aqua ammonia.

CAUTION: Aqua ammonia is a strong chemical. Follow the seller's instruction for handling – including eye protection, avoiding skin contact, etc. Ammonia is very corrosive to copper alloys do not use brass nozzles or fittings. For mixing, use galvanized watering cans and a sprayer tank at all times.

PROCEDURES

1. Hose down the painted area with water until the surface is saturated. Using a sprayer or a watering can, apply the ammonia solution on the painted area. It is important that the ammonia solution be metered out uniformly at the rate of one gallon per 45 to 50 square feet. Scrub the wet area with a street broom until the ammonia solution turns to foam. A sweeping motion similar to sweeping a floor is sufficient. During this step, the paint will start to loosen and the pigment will begin to run. However, do not shorten the sweeping at this point.

2. Wait about 10 minutes to allow the foamed ammonia to work. Apply the same amount of ammonia solution on the area a second time. Thoroughly scrub the area with a street broom. This scrubbing is not intended to be a light scrub, scrub vigorously.

3. Hose down the area with water and simultaneously pick up the water and dislodged paint residue with the wet vacuum. Do not let the water and paint residue seep across the field. If the residue and water start to spread, stop the hosing and let the wet vacuum catch up. Repeat the process if necessary. However, if the paint was applied lightly and uniformly, repeating the process should not be necessary.

If the paint stubbornly adheres to the turf, take the following additional steps:

1. Repeat steps as above. Blast or fracture the paint loose with hot water from an industrial high pressure hot water sprayer. Set the water temperature at 150 degrees F (65C). Do not spray the water at "point blank" range – keep the wand at least 12 - 15 inches (30 - 40cm) from the turf. Use 10 gallons of hot water per minute and a water pressure of no more than 300 psi (21 kg/cm^2). No solvent is required.
2. Wet vacuum the residue and water or immediately flood the field.
3. Rinse the area thoroughly with lots of water and pick up rinse water rapidly to avoid unsightly spots or paint residue.

LOAD LIMITS

As a general rule, no long term static load of more than 3 PSI (300 lbs./sq.ft), nor any transient rolling load of more than 35 PSI be applied to any Shaw Sports Turf surface (foam pad or elastic layer underpad). Rolling loads of up to 30 psi are acceptable on an occasional basis. (The loading of a pneumatic-tired vehicle is approximately equal to the air pressure in its tires.)

It is good practice to eliminate any unnecessary long-term static loads. Sheets of 3/4" exterior plywood or pieces of 2" x 10" lumber may be used to spread major static loads and thus minimize the risk of damage to the turf system.

NOTE: Under static loads, the surface should first be covered with a load spreader such as polyethylene sheeting to keep it clean. New plywood may contain materials that will leach out and stain the turf if it is exposed to water therefore a polypropylene barrier should be used under the plywood to prevent this from happening.

SNOW AND ICE MANAGEMENT

Snow and ice are not harmful to Shaw Sports Turf synthetic turf systems and can generally be left to melt and run off on their own accord. Sometimes, however, it becomes essential to clear away snow and ice to permit scheduled use of the surface. When this happens, the working principle for snow is to leave it in place until as near to time of use as possible. Doing so will minimize the risk of ice build up from cold wind blowing across a damp snow-cleared surface. Ice removal is more difficult, especially if a heavy layer has built up following freezing rains (see below). Two methods are used for snow removal:

SNOW BLOWERS

If the snow is dry and powdery, it can be swept or blown from the field using a rotary brush or snow blower. Be sure that any machinery used is set so as not to dig into the turf or gouge the surface.

If using a blower:

1. The first pass of the blower should be down the center of the field.
2. Second pass should be made at the edge of either side of the first pass and the blower must be adjusted so that the snow is deposited in the truck.
3. The blower then continues down one side and up the other accompanied by the truck.
4. Clean off remaining snow with a mechanical broom.

SNOW PLOWS

Snow that is wet and sticky may be more easily pushed off the field by using a snow blade with a 4" to 6" wide rubber tip mounted on a Jeep or light tractor. If such a blade is used, extreme care should be taken to avoid digging into the surface. The best blade setting is one that barely "kisses" the top of the surface and rolls the snow ahead of the blade.

In this procedure, the snow itself will maintain contact with the surface. Wood, metal or other rigid surface blades should not be used. Adjust the blade to proper height taking care that it will not gouge

or dig into the surface. Shaw Sports Turf recommends wheels on each side of the blade to ensure the blade can not possibly dig into the surface.

If using a plow:

1. Push snow into piles off playing surface.
2. Scoop into truck using front-end-loader., also with rubber tipped blade. Use extreme caution.
3. Use a rotary mechanical broom to clean off the remaining snow.

Severe cases of ice can be removed by using a small lawn roller to break up the ice and then proceed as above. It is recommended that all of the equipment used as described above be moved on pneumatic tires. LUGS, STUDS AND CHAINS ARE DAMAGING AND SHOULD NOT BE USED.

Snow removal equipment may be stopped momentarily on the surface, but DO NOT PARK SUCH EQUIPMENT ON THE FIELD OVERNIGHT OR FOR SEVERAL HOURS. Tire pressure should be below 35 PSI.

IMPORTANT: Keep tarps or field covers off the field in freezing weather. They are difficult to remove when frozen to the surface. Avoid using a tarp on the field during freezing weather. Tarps can freeze to the turf by means of condensation and thus can be very difficult to remove for a scheduled event.

WATERING OUTDOOR SYNTHETIC TURF SYSTEMS

Some owners have found it desirable to deliberately wet their synthetic turf surfaces, especially in periods of very hot weather.

Wetting the surface provides moisture for cooling the field before evaporation takes place. It also acts as a lubricant to the turf but it must be noted it may also lower traction to a slight degree. On a hot sunny day outdoor playing surfaces can receive enough radiant energy to evaporate about a quart of water per square yard per hour. As the moisture evaporates the temperature of the synthetic turf will match that of natural grass in the same area.

A full sized soccer, hockey or football field may evaporate up to 1200 gallons of water per hour in extremely hot weather. If you decide to water your field, be careful to distribute the water evenly. If water is put on the field, it should not be from a polluted supply. Also be aware, when a field is watered on an extremely hot day, you risk dangerously raising the heat index level which can be harmful to athletes.

SPECIAL EVENTS ON NON-REMOVABLE SYNTHETIC TURF SYSTEMS

Assemblies and convocation facilities with synthetic surfaces are often used for graduation ceremonies at many colleges / universities. The basic precaution is to keep long-term static loads below 300 pounds per square foot by the use of plywood or other load spreaders. Normally, 4' x 8' sheets of 3/4 " plywood do a good job of load spreading, provided the load is not applied too near the edges of each panel. Landscape fabric should be laid over the turf under the load spreaders to avoid staining or spoilage of the turf.

Any chairs placed directly on the playing field surface should be inspected to be sure that the tips of the legs couldn't damage the turf. Metal chair legs should be protected with rubber tips. The legs of wooden chairs should be free of any sharp edges that may tear the turf or damage the underpad.

MINOR REPAIRS TO TURF SURFACES

Your playing surface has been carefully engineered to provide many years of service. In the case of vandalism or unusual abuse, limit your maintenance staff to performing minor repair. For more serious problems, consult your Shaw Sports Turf representative.

WHEN TO REPAIR

To properly maintain a synthetic playing field, be aware of day-to-day activities, usage and condition of the facility. It is very important that any minor damage be repaired immediately because a small problem may eventually grow into a major repair. In addition to routine awareness of field conditions, once or twice a year, each field should be given a careful and thorough inspection, preferably in the spring with a follow-up in early fall. All seams should be inspected and any loose areas noted and repaired. Go over the body of each panel of fabric and note any rips and/or tears. Assess the status of the under-padding and the condition of the surface. In the case of an older and/or heavily used field, inspections should be made more frequently.

WHY A SPRING INSPECTION?

Fields endure their heaviest scheduled activity during the fall months. Once your inspection has been completed you may require the assistance of a professional Shaw Sports Turf crew. Your Shaw Sports Turf representative is always available to assist in the case of an emergency, but planned visits permit more efficient and cost effective service. If repairs are required they are easier to make in warm, dry weather. Adhesives will hold better and cure faster when there is more opportunity to leave the repaired area undisturbed. Gluing repairs should not be attempted if the field is wet.

WHAT ARE "MINOR REPAIRS?"

An open spot in a sewn or glued seam, where the loose area in the seam extends from a few inches to one or two feet (along a glued seam line where at least one of the turf edges is still attached to the seam tape).

Cuts, rips or tears in the surface fabric that are less than six inches or so in length do not generally require a special trip by our service staff and can be repaired by the owner without much effort. These can also be regarded as minor unless allowed to become larger. All of these problems can be handled by sewing or adhering the repairs. To repair minor seam openings or loose seam areas:

1. For infilled systems vacuum sand or rubber from the turf to be repaired.
2. Be sure that the fabrics to be adhered are dry, free from loose sand, dirt, old adhesive and other foreign matter.
3. Remove the area of debris.
4. Position the fabric to check for satisfactory final placement.

5. Be sure the seaming tape to which the fabric will be adhered is itself adhered to the underlying pad (If system uses an underlying pad).
6. Apply a small amount of caulk onto seaming tape. Avoid excessive adhesive to reduce the possibility of bleed through or bleed out. Spread the adhesive with a trowel and trowel so that the entire fabric is coated lightly and evenly.
7. Press the fabric into the adhesive bed uniformly.
8. Weight down the area and allow to cure for a minimum of 2 hours.
9. For in-filled systems, spread appropriate rubber or sand on the repaired area and brush into the turf thoroughly until even with surrounding playing areas.

SMOKING SHOULD BE STRICTLY PROHIBITED IN THIS AREA!

OTHER TYPICAL REPAIRS
CIGARETTE / FIREWORK BURNS

Use a hand held metal brush (such as is used to remove paint) and brush the spot vigorously to separate the fibers. If brushing the turf does not remove the damage, take a razor knife and cut the fused area away.

CONCLUSION

Since 1989, Shaw Sports Turf has refined installation techniques and developed and manufactured synthetic surfaces that are extremely advanced both in material and design. In comparison to natural grass surfaces, our synthetic turf systems can be considered virtually "maintenance-free. " However, your surface will perform, look and feel better for a longer period of time if the maintenance procedures outlined in this manual are followed closely. This manual attempts to address and answer the most frequently asked questions regarding your surface. However, there are always new demands, uncertainties and unanticipated occurrences that may arise. Please, do not hesitate to call us for any questions or concerns that you may have regarding specific care for your surface.

PROHIBITED ACTIVITIES ON A SYNTHETIC TURF SYSTEM:

- Storage of materials such as drums, lumber, equipment, etc
- Unnecessary vehicle traffic
- Shot putting, javelin or discus throwing, and the use of any metal spiked shoe
- Open flame, fireworks, welding, etc.
- Use of wire brushes in any form
- Use of cleaning equipment, methods or materials not authorized
- High-pressure water sprays exceeding 1000 psi
- Vehicles with non-pneumatic tires
- Introduction of infills that varies from the Shaw Sports Turf specifications

Like most sports surfaces, your Shaw Sports Turf system requires scheduled cleaning and maintenance to ensure the appearance of the surface. The frequency of this cleaning schedule depends on the desired performance, the type of surface and its uses, the hours of operation and the foot traffic volume of the facility. The closer a maintenance schedule is followed, the better the appearance and performance of your synthetic turf system.

KEY POINTS TO REMEMBER

- Keep the field clean.
- Cross-brush the turf surface as often as required.
- Post "NO SMOKING" signs around the turf. Some people break the rules, but most will follow them. Surfaces do not burn readily, but will scorch as a result of cigarettes and burning matches.
- Do not park vehicles or equipment on the field for hours or overnight.
- Do not abuse the surface by overloading it. Place plywood on surface to protect and to displace weight of heavy loads over a larger area.
- Call for help or advice when you have questions about your field and its use. Your representative can assist with your questions and inquiries and we are always eager to help you experience your field to its fullest potential.
- Follow the exact recommendations and procedures shown in this manual, will assure that your Shaw Sports Turf surface will give you years of good service with minimal maintenance.

www.shawsportsturf.com

Contact us today at 866-703-4004 or
visit shawsportsturf.com to learn more about
our sports surfacing capabilities.

A Division of Shaw, A Berkshire Hathaway Company

PLANNING BOARD
Town of Ayer
1 Main Street, Ayer, MA 01432
Tel: (978) 772-8218 | Fax: (978) 772-3017 | Planning@Ayer.MA.US

Minutes of November 9, 2021 - Ayer Planning Board Meeting
Location: via Zoom
Meeting was recorded and then broadcasted on APAC

Members Present: Geof Tillotson, Chairman; Ken Diskin, Vice Chairman; Jonathan Kranz, Clerk; Julie Murray and Nathan King

Also Present: Mark Archambault, Town Planner

Chairman Tillotson called the meeting to order at 6:15 PM.

At 6:15 PM Chairman Tillotson read aloud the notice allowing for remote participation meetings as stated on the posted agenda.

General Business

Approve the Agenda

At 6:16 PM Mr. Jonathan Kranz made a motion to approve the agenda as presented. Ms. Julie Murray seconded.
Discussion:
Mr. Ken Diskin stated that he would like to see the
At 6:17 PM Mr. Ken Diskin made a motion to move the discussion on Stratton Hill to after the Site Plan review for 99 Fitchburg Road.
Chairman Tillotson mentioned that he would like to see the discussion on consultants removed from the agenda as the abutters have not been notified that the project would be discussed this evening and wait to have the discussion till the December 14, 2021, when the item will be discussed again.
Mr. Jonathan Kranz seconded, Mr. Diskin's motion. Vote to approve by roll call vote: Ms. Julie Murray, aye; Mr. Ken Diskin, aye; Mr. Jonathan Kranz, aye; Mr. Nathan King, aye and Chairman Tillotson, aye
At 6:20 PM Chairman Tillotson made a motion to remove the discussion on consultants for Stratton Hill from the agenda. Mr. Ken Diskin seconded.
Discussion:
Mr. Archambault stated that he felt it was fine to discuss consultants for the Stratton Hill project without the public present and mentioned that the as it was discussed at the last meeting that there would be a discussion on consultants this evening.
Chairman Tillotson stated that he wants to remain as transparent as possible with the residents regarding this and every project.
Mr. Nathan King stated that the item was on the agenda so the public did have notice, he mentioned that he did not want to see the discussion wait till December 14th and asked if it was possible to hold the discussion at the November 23rd meeting.

Mr. Jonathan Kranz stated that he felt that it is necessary to have the discussion on consultants before the December 14th meeting.
At 6:28 PM Chairman Tillotson withdrew his motion and requested that the discussion on the consultants be added to the November 23rd agenda. Mr. Jonathan Kranz seconded. No discussion. Vote to approve be roll call vote: Ms. Julie Murray, aye; Mr. Ken Diskin, aye; Mr. Jonathan Kranz, aye; Mr. Nathan King, aye and Chairman Tillotson, aye
At 6:29 Mr. Ken Diskin made a motion to approve the agenda as amended. Mr. Jonathan Kranz seconded. No discussion. Vote by roll call vote: Ms. Julie Murray, aye; Mr. Ken Diskin, aye; Mr. Jonathan Kranz, aye; Mr. Nathan King, aye and Chairman Tillotson, aye.

Covenant and Bond Releases – None

Continued Public Hearing, Definitive Subdivision, Wright Road Stratton Hill

Continued Public Hearing, Stormwater Management Permit, Wright Road, Stratton Hill

Continued Site Plan Review, Ayer Zoning Bylaw Section 9.6, Land Clearing and Grading, Wright Road Stratton Hill
Present: There were no applicant representative present at the time of the meeting

Mr. Archambault stated that the Planning office received a letter from Attorney Bob Collins requesting a continuance to the Planning Boards first meeting in December.

Mr. Nathan King read into the record the letter sent by Attorney Bob Collins.

At 6:30 PM Mr. Jonathan Kranz made a motion to continue the Public Hearing for the Definitive Subdivision, Stratton Hill on Wright Road to the Planning Boards next meeting on November 23 ,2021. Ms. Julie Murray seconded. No discussion. Vote by roll call vote: Ms. Julie Murray, aye; Mr. Ken Diskin, aye; Mr. Jonathan Kranz, aye; Mr. Nathan King, aye and Chairman Tillotson, aye.

At 6:31 PM Mr. Jonathan Kranz made a motion to continue the Public Hearing for the Stormwater Management Permit for Stratton Hill subdivision on Wright Road to the Planning Boards next meeting on November 23, 2021. Ms. Julie Murray seconded. No discussion. Vote by roll call vote: Ms. Julie Murray, aye; Mr. Ken Diskin, aye; Mr. Jonathan Kranz, aye; Mr. Nathan King, aye and Chairman Tillotson, aye.

At 6:31 PM Mr. Jonathan Kranz made a motion to continue the Site Plan Review for Stratton Hill off Wright Road to the Planning Boards next meeting on November 23, 2021. Ms. Julie Murray seconded. No discussion. Vote by roll call vote: Ms. Julie Murray, aye; Mr. Ken Diskin, aye; Mr. Jonathan Kranz, aye; Mr. Nathan King, aye and Chairman Tillotson, aye.

ANR 99 Fitchburg Rd
Present: Mr. Chris Tymula, from Greenman-Pedersen, Inc.

Mr. Archambault asked Mr. Chris Tymula review the ANR plan with the Board.

Mr. Chris Tymula went over the proposed ANR plan with the Board that will consolidate the three lots, lot 5, lot 6 and lot 7 into one parcel.

Mr. Archambault stated that he reviewed the plan and sees no issue with the Board voting to endorse the ANR plan.

Chairman Tillotson asked the Board members for their comments on the proposed ANR plan.

Mr. Ken Diskin mentioned to those residents present that under the Subdivision Control Law the Board is allowed to approve the ANR plan which is stated in the plan notes.

Mr. Nathan King asked the Board if they wanted to see the note changed regarding the size of the lot needing to be 120,000 sq.ft. as it is stated in the bylaw even though it is a mistake and is really 20,000 sq.ft.

Mr. Archambault stated the Board would be voting to endorse the plan to consolidate the 3 lots and minimum lot size in the use table of the Bylaw is a miss print and should not affect the endorsement of the ANR plan.

Chairman Tillotson agreed with Mr. Archambault that the note about lot size should not be changed it should be left as it is stated in the Bylaw. Chairman Tillotson did note another minor error on the ANR plan with the locus and requested that the Board vote to endorse the plan this evening and will sign the corrected plan once received in the Planning office.

At 6:42 PM Mr. Jonathan Kranz made a motion to endorse the ANR plan for 99 Fitchburg Road as amended. Ms. Julie Murray seconded. No discussion. Vote by roll call vote: Ms. Julie Murray, aye; Mr. Ken Diskin, aye; Mr. Jonathan Kranz, aye; Mr. Nathan King, aye and Chairman Tillotson, aye.

<u>Continued Site Plan Review, 99 Fitchburg Rd.</u>
Present: Mr. Chris Tymula and Robert Bollinger from Greenman-Pedersen, Inc. as well as several area residents.

At 6:45 PM Mr. Jonathan Kranz made a motion to open the continued site plan review for 99 Fitchburg Road. Mr. Ken Diskin seconded. No discussion. Vote by roll call vote: Mr. Ken Diskin, aye; Mr. Jonathan Kranz, aye; Mr. Nathan King, aye and Chairman Tillotson, aye.

Mr. Mark Archambault went over the items listed in his report for the Board to go over and act on this evening including the waiver request for the driveway width. Mr. Archambault mentioned that the Board has received revised plans for the site that Mr. Tymula should go through the changes to the plans which include a new landscaping plan with screening shown on site, notes stating that trucks will be limited to access the site from Fitchburg Road, additional stripping on the roadway for traffic control as well as the Stormwater Management permit which will have a public hearing at the next meeting on November 23rd. Mr. Archambault also mentioned that at the last Land Use meeting it was discussed with the Building Commissioner and the Fire Chief to issue a new address for this location.

Mr. Chris Tymula from Greenman-Pedersen, Inc., shared the updated plans with the Board and those present. Mr. Tymula went over the changes to the plans that included the addition of a full landscaping plan, as well as a 20-foot apron at the driveway. The project will have 2 30,000-gallon tanks on site that will have a chain link fence around them which the company feels meets safety and screening concerns.

Mr. Tymula mentioned that the Stormwater Management Permit application has been submitted. Mr. Tymula mentioned that he has also submitted a traffic letter with vehicle numbers for the facility.

Chairman Tillotson requested that additional plantings be added on the street side of the tanks to provide additional screening.

Mr. Tymula stated that he can add the additional plantings if the Board wishes.

The Board held a discussion regarding the truck traffic on leaving the facility and the additional signage and stripping that will be added to the property to keep trucks from turning left and driving down Groton Shirley Road.

There were several area residents present at the meeting all of which expressed concerns regarding vehicle traffic on Groton-Shirley Road.

Mr. Robert Bollinger, from Greenman-Pedersen, Inc. gave a run through of the traffic letter submitted and the number of vehicles that will be going to and from the site. Mr. Bollinger stated that the larger tanker trucks will be entering the facility from Fitchburg Road and will be around 2-3 trucks per week. The smaller bobtail delivery trucks which will be around 8-9 trucks per day will be instructed to use Fitchburg Road and there will be signage at the driveway pointing truck to the right leaving the property. Only trucks making deliveries on Groton Shirley Road will be traveling left from the property.

At 8:23 PM Mr. Ken Diskin made a motion to grant the waiver to Section 9.1.5.B.1 for driveway width as requested. Mr. Jonathan Kranz seconded. No discussion. Vote to approve by roll call vote: Mr. Ken Diskin, aye; Mr. Nathan King, aye; Mr. Jonathan Kranz, aye; Ms. Julie Murray, aye and Chairman Tillotson, aye.

At 8:25 PM Mr. Jonathan Kranz made a motion to continue the Site Plan Review for 99 Fitchburg Road to the next Planning Board meeting on November 23, 2021. Mr. Nathan King seconded. No discussion. Vote to approve by roll call vote: Mr. Ken Diskin, aye; Mr. Nathan King, aye; Mr. Jonathan Kranz, aye; Ms. Julie Murray, aye and Chairman Tillotson, aye.

Town Planner Update

Mr. Archambault reminded the Board that they wanted Mr. Glen Eaton from MRPC to attend an upcoming meeting and suggested that the next meeting on November 23rd would be a good time.

Chairman Tillotson stated that Mr. Eaton would be traveling then and suggested that he come to the December 14th meeting instead.

Mr. Archambault also mentioned that the architect to the high school field project contacted the office looking for deadline information for submitting the site plan.

Ms. Heather Hampson, Administrative Coordinator, asked the Board if they would consider a wavier for the public hearing notice requirement and the abutter notification since this is a town project.

The Board held a brief discussion on the matter of waiver the public notice requirement.

Chairman Tillotson stated that even through it is a town project it is important the public be notified and will not waive the requirements.

Approval of Meeting Minutes October 12, 2021

At 8:34 PM Mr. Jonathan Kranz made a motion to approve the minutes of the October 12, 2021, as presented. Ms. Julie Murry seconded. No discussion. Vote to approve by roll call vote: Mr. Ken Diskin, aye; Mr. Nathan King, aye; Mr. Jonathan Kranz, aye; Ms. Julie Murray, aye and Chairman Tillotson, aye.

Approval of Meeting Minutes October 26, 2021

At 8:37 PM Mr. Jonathan Kranz made a motion to approve the minutes of October 26, 2021, as presented. Ms. Julie Murray seconded. No discussion. Vote to approve by roll call vote: Mr. Ken Diskin, aye; Mr. Nathan King, aye; Mr. Jonathan Kranz, aye; Ms. Julie Murray, aye and Chairman Tillotson, aye.

Old Business

Project updates
Chairman Tillotson mentioned that he would like to have an update on some previously approved projects at the next meeting along with a site visit. Chairman Tillotson asked Mr. Archambault to give an update at the next meeting during his Town Planner report.

Airbnb/Short Term Rentals

Chairman Tillotson gave a brief presentation on all the information he has found on short term rentals, including Mass. General Law Chapter 337 Acts of 2018 on short term rentals. Chairman Tillotson went over the highlights of the act which allows each city and town to set out a permitting process and zoning as well as number of days allowed to rent and additional local taxes.

Chairman Tillotson stated that there is a lot to review but would like to bring a bylaw for short term rentals the fall town meeting next year.

Majority Vote change

Mr. Diskin asked Mr. Archambault to look into the change in Zoning vote that no longer require a two-thirds vote and now require a majority vote. Mr. Diskin stated that this information will be important for future town meetings.

Meeting Adjournment

At 8:55 PM Jonathan Kranz made a motion to adjourn. Ms. Julie Murray seconded. No discussion. No discussion. Vote to approve by roll call vote: Mr. Ken Diskin, aye; Mr. Nathan King, aye; Ms. Julie Murray, aye; Mr. Jonathan Kranz, aye and Chairman Tillotson, aye.

Minutes recorded and submitted by Heather Hampson, Administrative Coordinator

Planning Board Approval _____
Date

Planning Board Chairman (Geof Tillotson)

_____