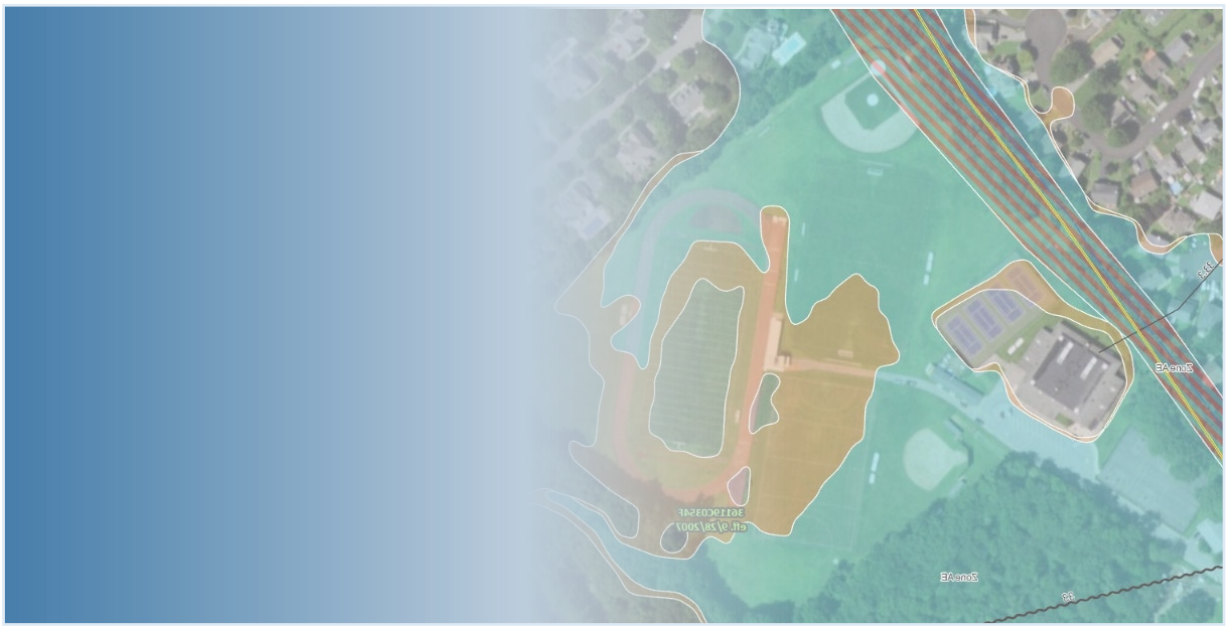


# FLOOD RISK FEASIBILITY ASSESSMENT

## Rye Neck Union Free CSD
## Athletic Field Redevelopment

Mamaroneck, Westchester Co, NY


Prepared by:

THE FLOOD RISK GROUP

Alton Knapp III CFM
alton@floodriskgroup.com


April , 2025

The Flood Risk Group has conducted a feasibility assessment for the proposed athletic facility site improvements project for the Rye Neck CSD. This report shall provide an overall synopsis of the current site conditions, summarize the factors impacting development and the regulatory requirements of the project design. This assessment is based upon available tax mapping data, general topographic information, FEMA mapping , the proposed project plans and other available information.

## LOCATION

The project location is part of the current Rye Neck Union Free Central School District. The following general location map (Figure 1) shows the approximate location of the existing athletic facility and proposed improvements.




Figure#1 - Location Map

## EXISTING CONDITIONS / PROPOSED IMPROVEMENTS.

The campus is located in the northeastern portion of the town, approx. a mile from coastal waters. The campus sits along a portion of the Beaver Swamp Brook that meanders through the northwest part of the site. The existing athletic facilities are located on the northern part of the campus, behind the building complex and adjacent wetland area.

The existing fields are natural turf for softball/baseball, soccer fields and the football field inside the running track. As observed during the site visit, there is a tributary wetland and defined stream that flows along the eastern side of the fields and into the large wetland behind the high

school. Additionally, areas of saturated soil were observed at various locations along the wood line of the football and existing softball fields.

The proposed improvements to the athletic facilities consist of rehabilitation of the natural grass fields and major improvement consisting of construction of an artificial turf athletic field and running track with associated track and field event spaces as well as artificial turf multipurpose fields. Because the artificial field requires underground drainage, it is anticipated that some fill will be needed to elevate the facility to accommodate gravity outfall piping and elevate to reduce risk from potential flooding. Additionally, a new concession building and associated MEP improvements for the project are also planned. (See Appendix A for Site Plan)

## FACTORS IMPACTING SITE IMPROVEMENTS

There are several factors impacting the flood risk of the site and will influence the design and feasibility of the proposed facilities.

- *Floodplain – FEMA Flood Insurance Rate Map (FIRM) 36119C0354F*

  As shown on FEMA's FIRM mapping ( Appendix A) for Westchester County dated 09/28/2007, the flood risk for the campus is designated as a Zone AE, with effective flood elevations ranging from 33.3' to 33.5' (NAVD88). The regulatory Base Flood Elevation (BFE) of 33.5' will be used as a design elevation for this project. The mapping also shows a regulatory Floodway along the channel that encompasses a narrow portion of the overbank and baseball field. Elevations in the existing field area range from 31.5' to 35.3' , resulting in 1-2' of inundation during a major flood event. A recent flood in 2021 impacted the campus and resulted in portions of the parking lot to be flooded. Based on discussions with the facility management, only the maintenance building was impacted due to overland flow, but a surcharge in groundwater flooded some lower level basements and utilities. Flood elevations were recorded to be almost the same as the calculated BFE determined by FEMA. Such a correlation provides confidence in the risk level established , but it should be stated that high flood elevation can occur depending on storm intensity within the watershed.

  *Soils*

  Soil mapping obtained from the USDA NRCS Web Soil Survey indicates that there is one predominate soil type of "Uc" Udorthents, wet substratum in the field area.

  These soils are typically nonnative and consist of mixed soils indicating fill . The hydrologic soil group is A/D (HSG A/D) and described as poorly drained drained or having a limited infiltration rate.

  A copy of the Web Soil Survey is included in Appendix B

## REGULATORY REQUIREMENTS

The feasibility of the facility improvements in relation to flood risk is also dependent on several Federal, State and Local laws and design guidance documents .

- *Federal / State*
  - *US Code, Title 42 – NFIP*
  - *Title 44 CFR, Part 60 –* Criteria for Land Management and Use.

    This regulation is reflected in the municipal Local Laws
  - *International Building Code (IBC) 2021*
    - *Chapter 16* – Buildings and Other Structures
    - *Chapter 18* – Placement of Fill
    - *Chapter 27* – Electrical
    - *Appendix G* – Flood Resistant Design
  - *ASCE 24-24 –* Flood Resistant Design and Construction
    - For all structure and building groups in flood zone, MEP, sanitary.

## DESIGN IMPACT RESULTS

Based on the proposed layout and reconstruction of the fields shown on the provided plan (See Appendix C), both current baseball and softball would be minimally impacted by current flood conditions. A portion of the baseball field is within the floodway of Beaver Swamp Brook and while no major improvements are planned currently, future changes to fencing and backstop should be looked at for impact.

There are two multi-purpose fields proposed on the site. One is located adjacent to the existing tennis courts, just outside of the floodway. The other is on the east portion of the campus along the wetland and tributary stream. Special consideration should be made in design to avoid potential impact to flood flow redirection for fill placed to elevate the fields. Soil testing should be completed to determine the infiltration capacity of the underlying soils for design purposes. Based on the soils report, the soils are not favorable for infiltration and drainage of small storms will need to be directed to existing drainage paths offsite.

It is proposed that the new Track and Field facility utilizing artificial turf will be elevated above the flood elevation with fill. In order to maintain a compact footprint for the field, a small retaining wall is proposed on the west end of the field. Special consideration should be used in the design of the wall for stability and resiliency from storm and flood events that may impact the structure. Any fill should be compacted so it is resistant to erosion and scour from flood conditions.

The artificial turf system is not considered a structure under NFIP (National Flood Insurance Program ) regulations and is not well defined in the Building code or ASCE 24 standards. Elevation of that facility is recommended but not required. Case studies of artificial turf fields that have been affected by flooding showed that they are not very resistant to inundation and typically the turf damaged, the infill material needs to be replaced, and the turf sanitized, so it is recommended that sustainable design features are selected that will provide resiliency from flood damage during an event.

The new concession stand and storage building is proposed to be located outside the flood zone. While the area currently has naturally high ground, careful planning should be used in the design process to ensure that the lowest floor of the building is maintained above the flood elevation or if the grade is lowered, wet floodproofing of the building to equalize the hydrostatic pressure from floodwater.

All Mechanical, Electrical and plumbing (MEP) proposed for the site will need to be flood proofed per the building code, including the freeboard requirements of an additional 2' above the flood elevation. ASCE 24-24 is also a recommended design guidance resource for all facility improvements for resiliency.

For any other proposed facilities not shown on the concept plan, all MEP and any buildings or structures ( Enclosures) will need to be floodproofed to +2' above the Base Flood Elevation (BFE) as required.

The Flood Risk Group appreciates the opportunity to provide this Flood Risk Assessment. If you have any questions or require additional information, please contact me.

Thank you

*Alton Knapp III, CFM*

Alton Knapp III, CFM

The Flood Risk Group LLC

# Appendix A

Federal Emergency Management Agency

Flood Insurance Rate Map

(FEMA FIRM)

# National Flood Hazard Layer FIRMette

FEMA

73°43'15"W 40°57'42"N




73°42'38"W 40°57'15"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

*Basemap Imagery Source: USGS National Map 2023*

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**OTHER FEATURES**
- 20.2 — Cross Sections with 1% Annual Chance
- 17.5 — Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/17/2025 at 6:10 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

# Appendix B

USGS Web Soil Survey


73° 43' 4" W
73° 42' 29" W
607900
608000
608100
608200
608300
608400
608500
608600
608700
40° 57' 50" N
40° 57' 14" N
4535500
4535400
4535300
4535200
4535100
4535000
4534900
4534800
4534700
4534600
4534500
1st St
127
Gleason Pl
Hunt Pl
Beaver Swamp Brook
Barlow Ln
Woodland Dr
1
CrC
Uc
UlC
PnB
Ub
Ce
W
Uf
Soil Map may not be valid at this scale.
Map Scale: 1:5,360 if printed on A portrait (8.5" x 11") sheet.
Meters
0 50 100 200 300
Feet
0 250 500 1000 1500
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**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 1:12,000.

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: Westchester County, New York
Survey Area Data: Version 20, Aug 26, 2024

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

Date(s) aerial images were photographed: May 10, 2023—May 11, 2023

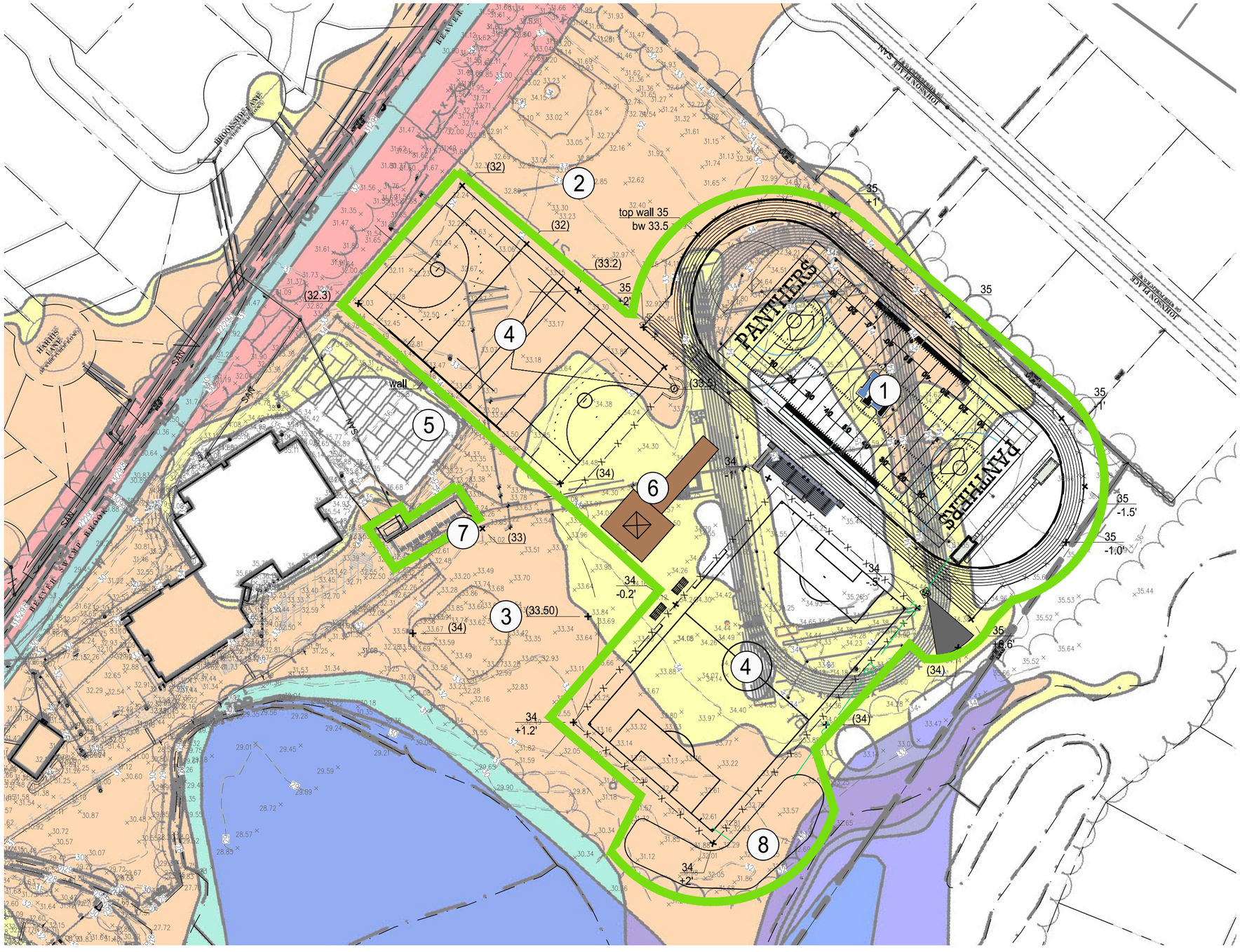
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| Ce | Catden muck, 0 to 2 percent slopes | 23.7 | 32.2% |
| CrC | Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky | 4.1 | 5.6% |
| PnB | Paxton fine sandy loam, 3 to 8 percent slopes | 2.9 | 4.0% |
| Ub | Udorthents, smoothed | 2.6 | 3.5% |
| Uc | Udorthents, wet substratum | 36.4 | 49.4% |
| Uf | Urban land | 0.1 | 0.1% |
| UlC | Urban land-Charlton-Chatfield complex, rolling, very rocky | 2.9 | 4.0% |
| W | Water | 0.9 | 1.3% |
| **Totals for Area of Interest** | | **73.7** | **100.0%** |

# Appendix C

Site Plan




## KEYED NOTES

1. Track and Field
   - 6 Lane Track
   - Throwing Events
   - Multipurpose Syn. Turf Field
   - Grandstand and Pressbox
   - Field Lighting
2. Existing Baseball Field to Remain
3. Existing Softball Field to Remain
4. Multipurpose Field
5. Existing Tennis Courts to Remain
6. Concessions Stand and Storage Building
7. Parking Lot
8. Stormwater Pond

## LEGEND

- Wetland (DEC)
- Wetland (ACoE)
- 500-Year Floodplain
- 100-Year Floodplain
- Floodway

# Rye Neck Union Free School District

Rye Neck, NY
Date: 03.31.25

Scale: 1" = 100'

LAN ASSOCIATES

The LA GROUP
Landscape Architecture & Engineering P.C.