Department of Public Works ARPA/Infrastructure Fund Requests

Funding requests are for the highest priority drainage and flood mitigation projects:

- *Wilton High School Sports Complex*
- *Dredging of School Road*
- *Drainage Repairs and Maintenance Between Lower School Road and Catalpa Road*

Wilton High School Sports Complex Field Hydraulic Analysis

Town of Wilton
Stantec Consulting Services Inc.
4/6/22

Stantec

Study Purpose

- Evaluate existing flooding conditions at the field area for various storms by using a hydraulic model.

- Evaluate different options for improvements to reduce the flooding and future damage to the field.

- Compile estimated cost information for the different proposed flood mitigation alternatives.

    - Cost estimates provided by Stantec are very preliminary with contingencies of 20% for design/inspection, 20% of costs not considered, 20% contingency and 5% cost escalation.

Definitions & Costs

Type Of Storm	Inches of Rain/1 hour	Inches of Rain/6 hours	Inches of Rain/12 hours	Inches of Rain/24 hours	Percent Chance of Occurring Each Year	Cost
Type 1	1.79	3.59	4.49	5.45	10%	-----
Type 2	2.12	4.33	5.43	6.61	4%	$174,000
Type 3	2.38	4.88	6.13	7.49	2%	$1,078,000
Type 4	2.63	5.46	6.87	8.43	1%	$1,160,000
Type 5	2.88	6.14	7.73	9.54	0.5%	$1,160,000
Type 6	3.22	7.13	9.00	11.20	0.2%	------

Data Source:

- National Oceanic and Atmospheric Administration (NOAA)- An agency in the Department of Commerce that maps the oceans and predicts changes to the earth's environment - increased storm intensities by approximately 10-15% over the last 7 – 8 years.
- This information is used as the basis of Storm Drainage design.

Historical Storms:

- September 1st, 2021, Tropical Storm Ida: Approximately 6 inches of rain in 6 -8 hours--Type 4+
- Historical Precipitation by Day for Bridgeport Area, CT:
  - 5.3 inches of rain April 23, 2006
  - 4.80 inches of rain Sept 28, 2012
  - 4.43 inches of rain Jun. 7, 2013
  - 4.15 inches of rain July 9, 2021
  - 4.01 inches of rain Aug 27, 2006
  - 3.99 inches of rain July 3, 2020
  - 3.29 inches of rain Oct 24, 2017

Watershed Areas

FIGURE 1:
DRAINAGE MAP
Wilton Hydraulic Study
Wilton, CT

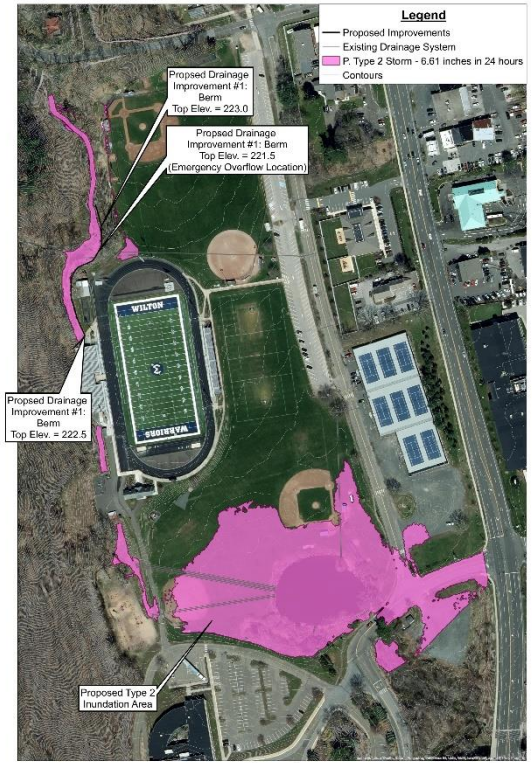
Existing Conditions-Type 1 (10%) Storm

Figure 2:
Existing Type I Inundation Area
Design Storm: 5.45 inches in 24 hours
Wilton, CT

Stadium and sections of other fields are flooded with a Type 1 Storm

Option 1: Install Berm/Wall at Channel-Protects up to Type 2 Storm

Type 2 (4%) Storm



Proposed Drainage Improvements:
1. Berm

Figure 4:
Proposed Type 2 Inundation Area
Design Storm: 6.61 inches in 24 hours
Wilton, CT

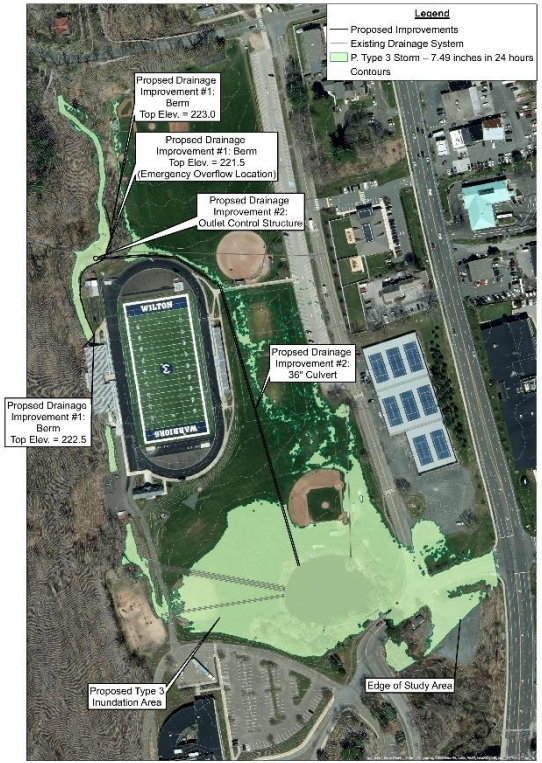
Type 3 (2%) Storm

Proposed Drainage Improvements:
1. Berm

Figure 5:
Proposed Type 3 Inundation Area
Design Storm: 7.49 inches in 24 hours
Wilton, CT

Option 2: Berm/Wall, New 36” Culvert-Protect to Type 3

Type 3 (2%) Storm



Proposed Drainage Improvements:
1. Berm
2. New 36" Culvert & Outlet Control Structure

Figure 6:
Proposed Type 3 Inundation Area
Design Storm: 7.49 inches in 24 hours
Wilton, CT

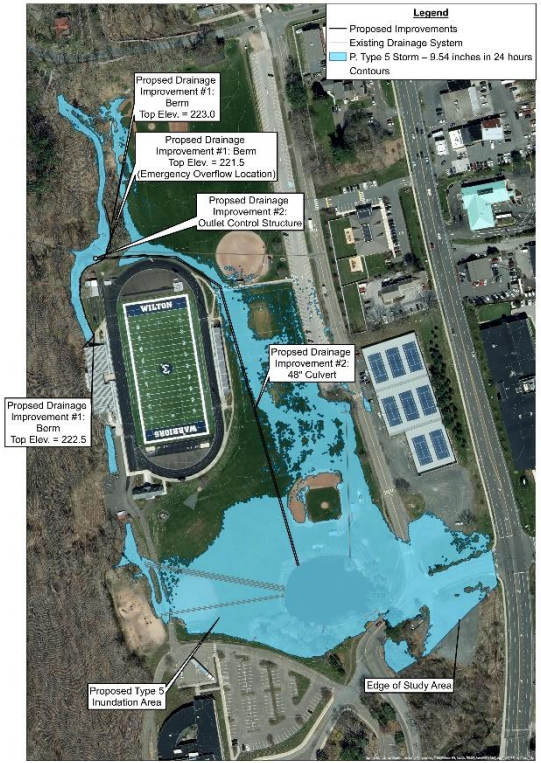
Type 4 (1%) Storm

Proposed Drainage Improvements:
1. Berm
2. New 36" Culvert & Outlet Control Structure

Figure 7:
Proposed Type 4 Inundation Area
Design Storm: 8.43 inches in 24 hours
Wilton, CT

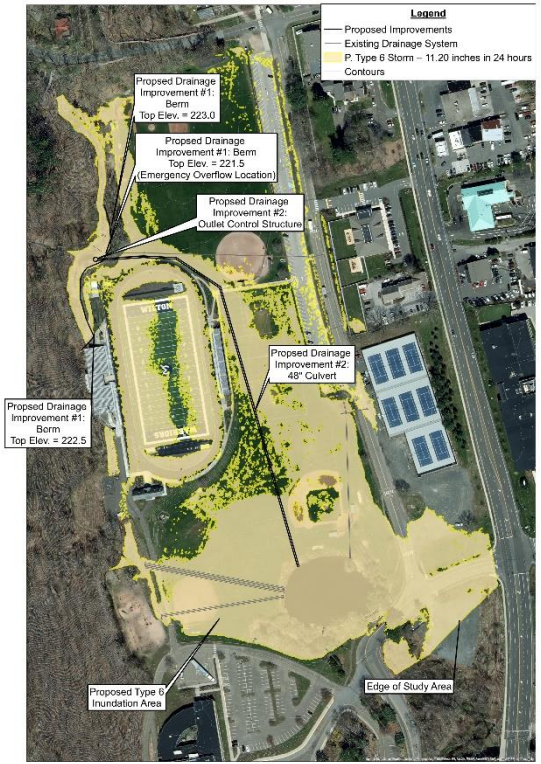
Option 3: Berm/Wall, New 48” Culvert

Type 5 (.5%) Storm



Proposed Drainage Improvements:
1. Berm
2. New 48" Culvert & Outlet Control Structure

Figure 8:
Proposed Type 5 Inundation Area
Design Storm: 9.54 inches in 24 hours
Wilton, CT



Proposed Drainage Improvements:
1. Berm
2. New 48" Culvert & Outlet Control Structure

Figure 9:
Proposed Type 6 Inundation Area
Design Storm: 11.20 inches in 24 hours
Wilton, CT

Summary

- **Tropical Storm Ida was between a Type 4 a Type 5 Storm, with a less than 1% change of occurrence. The result was**
  - *Over $300,000 of repairs. 75% of which are expected to be reimbursed by FEMA.*
  - *Wilton employees diverted from normal work. Delays in the normal work.*
  - *Loss of the use of the field an the track for approximately 6 weeks.*

- **Option 1 at an estimated cost of $173,662 will provide protection for a Type 2 storm, which has a 4% chance of occurrence each year.**

- **Option 2, at an estimated cost of $1,078,028, will provide protection up to a Type 3 storm, with a 2% chance of occurrence each year.**

- **Option 3, at an estimated cost of $1,159,538, will provide protection up to a Type 5 storm, with a .5% chance of occurrence each year.**

Estimated Cost

Option 1	Estimated Cost
Soil Berm	$12,750
Rip Rap	$17,500
Concrete Wall	$75,000
Contingencies	$68,412
Total	**$173,662**

Option 2	Estimated Cost
Soil Berm	$12,750
Rip Rap	$17,500
Concrete Wall	$75,000
OCS Structure	$15,000
Manholes	$50,000
36” HDPE Pipe	$438,000
Field Restoration	$45,000
Contingencies	$424,677
Total	**$1,078,028**

Option 3	Estimated Cost
Soil Berm	$12,750
Rip Rap	$17,500
Concrete Wall	$75,000
OCS Structure	$15,000
Manholes	$50,000
48” HDPE Pipe	$487,000
Field Restoration	$45,000
Contingencies	$456,787
Total	**$1,159,538**

Pond Dredging: Estimated Cost - $754,875

- Remove accumulated silt within the existing pond near the JV Baseball Field.
- Includes testing, excavating and remove material to a disposal facility.

Item	Estimated Costs
Remove Sediment Forebay	$24,000
Sediment Material Disposal	$42,000
Dredge Pond	$108,000
Dredge Material Disposal	$283,500
Contingencies	$297,375
Total	**$754,875**

Maintenance: Approximate Cost - $292,875

- Video inspect existing storm pipes,
- Clean pipes as needed,
- Remove various trees along the existing stream,
- Install large stones along stream bed.

Item	Estimated Costs
TV Pipes	$80,000
Clean Pipes	$60,000
Remove Trees	$20,000
Rip rap channel banks	$17,500
Contingencies	$115,375
Total	**$292,875**

Guy Whitten Field – Potential Turf Installation Issues

- Stormwater overflow from stream would drain onto this potential field,
- Field would have to extend into the adjacent parking lot by approximately 25 feet. This is needed to accommodate field runoff area and to accommodate stormwater overflow area in between both fields,
- Field would have to be raised by approximately 2 feet near the softball field and approximately 6 feet near the JV Baseball field.
- The football field would extend into the JV Baseball field leaving the distance between home plate and football field approximately 265 feet.