

# 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



# 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

<u>Type Of Storm</u>	<u>Inches of Rain/1 hour</u>	<u>Inches of Rain/6 hours</u>	<u>Inches of Rain/12 hours</u>	<u>Inches of Rain/24 hours</u>	<u>Percent Chance of Occurring Each Year</u>	<u>Cost</u>
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 1<sup>st</sup>, 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

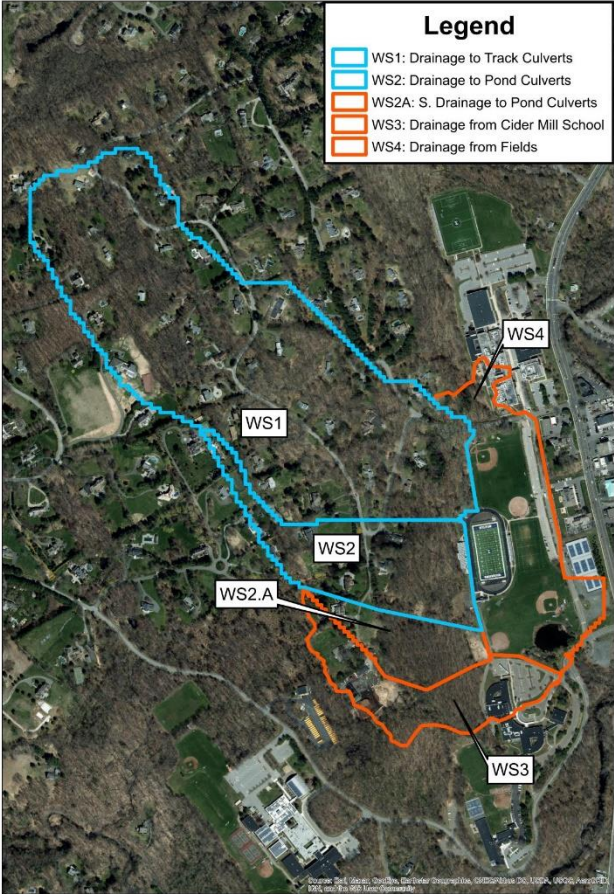


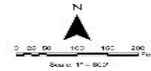
FIGURE 1:  
DRAINAGE MAP  
Wilton Hydraulic Study  
Wilton, CT



# Existing Conditions-Type 1 (10%) Storm



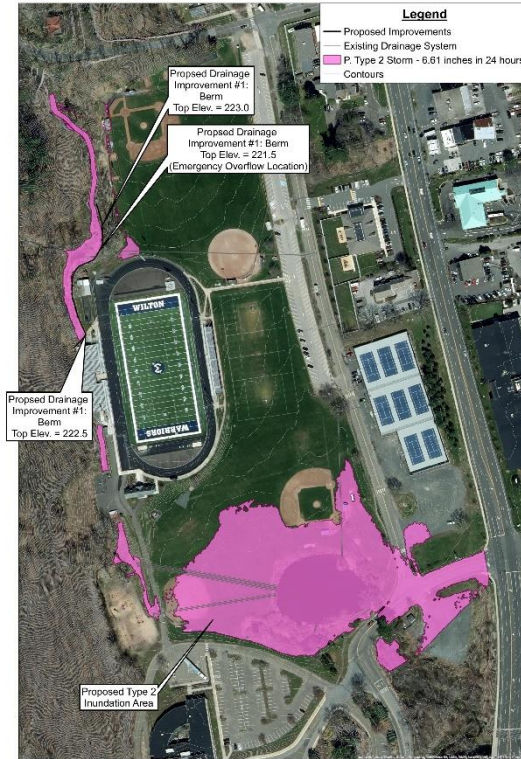
Figure 2:  
Existing Type I Inundation Area  
Design Storm: 5.45 inches in 24 hours  
Wilton, CT



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

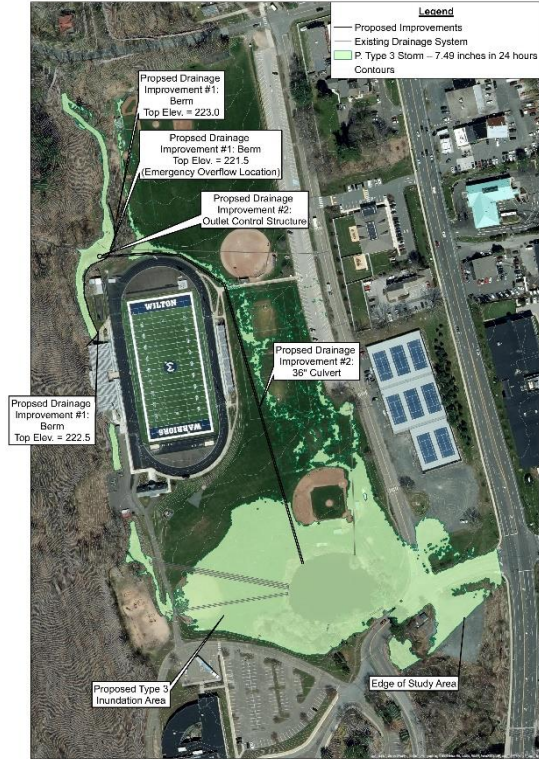


Proposed Drainage Improvements:  
1. Berm

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

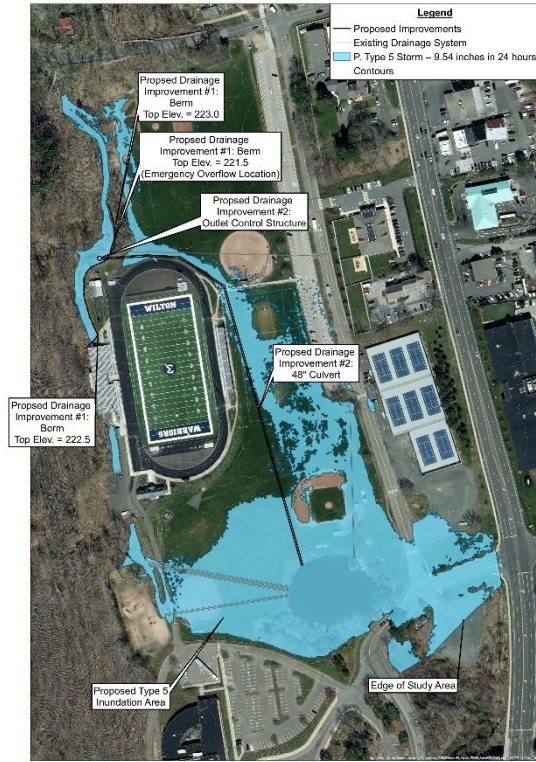
Figure 7:  
 Proposed Type 4 Inundation Area  
 Design Storm: 8.43 inches in 24 hours  
 Wilton, CT





# Option 3: Berm/Wall, New 48" Culvert

## Type 5 (.5%) Storm



**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

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

# 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	<u>\$68,412</u>
<b>Total</b>	<b>\$173,662</b>

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	<u>\$424,677</u>
<b>Total</b>	<b>\$1,078,028</b>

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	<u>\$456,787</u>
<b>Total</b>	<b>\$1,159,538</b>

## 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	<u>\$297,375</u>
<b>Total</b>	<b>\$754,875</b>

## 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	<u>\$115,375</u>
<b>Total</b>	<b>\$292,875</b>

## **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.