Planning & Zoning Site Plan Application
for
Scenic Road & Coastal Site Plan

Replacement of the Sound Beach Avenue Bridge
over Cider Mill Brook
Bridge No. 03954

Town of Greenwich
Department of Public Works, Engineering Division

November 5, 2020
Project Purpose

Bridge Replacement
Sound Beach Avenue Bridge
(Bridge No. 03954)

Routine & Underwater Inspection:
Superstructure Rating of 4
(Poor Condition)
6/15/2011
6/11/2013
6/10/2015
6/01/2017
4/10/2019
Coastal Site Plan - Existing Coastal Resources
Coastal Site Plan

APPLICABLE CT GENERAL STATUTES:
COASTAL AREA MANAGEMENT - CHAPTER 444 - Sec. 22a-92(10)(b)(1)

Assessment of the Suitability of the Project for the Proposed Site and the Capability of the Resources to Accommodate the Proposed Use:

(D) to require that structures in tidal wetlands and coastal waters be designed, constructed and maintained to minimize adverse impacts on coastal resources, circulation and sedimentation patterns, water quality, and flooding and erosion, to reduce to the maximum extent practicable the use of fill, and to reduce conflicts with the riparian rights of adjacent landowners;

• The bridge will be raised to increase the flood capacity and prevent overtopping and flooding upstream during extreme rain events.
• The center pier will be removed.
• The sediment deposited island due to blockage from the existing western span of the bridge will be removed to provide more natural stream flow.

(F) to make use of rehabilitation, upgrading and improvement of existing transportation facilities as the primary means of meeting transportation needs in the coastal area;
Coastal Site Plan

Photos taken 9/25/18 @ ~ 4 PM
2.91 inches rain in 24 hr period = 1 year storm
Photos taken 9/25/18 @ ~4 PM
2.91 inches rain in 24 hr period = 1 year storm
Coastal Site Plan

Photos taken 9/25/18 @ ~ 4 PM
2.91 inches rain in 24 hr period = 1 year storm
Evaluation of the Potential Beneficial Impacts of the Project:
Restoration will include additional plantings along the stream bank to restore a riparian buffer.

Additional Plantings
- 7 trees
- 54 shrubs
- 120 plantings
FEMA Flood Insurance Rate Map

* Base Flood Elevation = 11’
Binney Park Scenic Loop

- September 9, 2020 Planning and Zoning approved the Loop
- Loop includes portions Sound Beach Ave, Wesskum Wood Rd, & Arch Street
- Article 3, Sec. 11-13(c):

  Procedures for making alterations or improvements.

  Any proposal for alteration or improvement of a scenic road, whether by public or private applicant, shall be submitted initially to the Planning and Zoning Commission, along with a map showing in detail the proposed alteration or improvement. The Planning and Zoning Commission may require the applicant to submit engineering or other technical reports documenting the need for the alteration or improvement and outlining potential alternative solutions. The Planning and Zoning Commission may hold a duly noticed public hearing on the application. The Planning and Zoning Commission shall submit findings of fact, the minutes of any hearing, and a recommendation to the Commissioner of Public Works.

  The Commissioner of Public Works shall give due consideration to the findings of fact and recommendations of the Planning and Zoning Commission, and shall hold a duly noticed public hearing regarding the proposed alteration or improvement. The Commissioner's decision with regard to a proposed alteration or improvement to a scenic road shall be in writing and shall state the reasons therefor.

- Aesthetic and historic appeal of the bridge will be maintained within design and safety requirements.
Existing Conditions - Section View

Existing Bridge Section

- Sidewalk to be relocated to the interior
- Exterior stone walls to be 3’-6” high from sidewalk instead of 2’ (ADA compliant)
- Bridge parapet ends to be curved instead of blunt ends
- Center pier to be eliminated

Existing Bridge Profile

- Debris to be removed
Proposed Conditions - Parapets & End Walls

Legend:
- Limits of Metal Guiderail
- Limits of Curved Masonry End Wall
Proposed Bridge Section

Proposed Bridge Profile

- Curved end walls
- Exterior stone walls to be 3’-6” high from sidewalk
- Sidewalk on the interior
- Unrestricted hydraulic opening
Grading:

Legend:
- Bridge Area
- Limit of regrading
- Area of regrading

*No trees to be affected
Grading:
Thank you!

Questions?
May 22, 2020

Mr. James Michel, PE
Deputy Commissioner
Department of Public Works
Town Hall – 2nd Floor
101 Field Point Road
Greenwich, Connecticut 06836-2540

Subject: Cider Mill Brook – Drainage System Evaluations Summary
Town of Greenwich

Dear Mr. Michel:

This letter is being provided to summarize the drainage studies that have been prepared for the Cider Mill Brook watershed. This 1,560-acre watershed on the easterly side of the Town of Greenwich includes Binney Park Pond, Laddins Rock Sanctuary and the Palmer Hill area. The watershed drains in a southerly direction within two brooks: Cider Mill Brook and its Easterly Tributary, through Binney Park Pond and eventually discharges to the tidally influenced Greenwich Cove.

The following provides a summary of the work that has been done by CDM Smith within the Cider Mill Brook watershed and includes: a summary of previous studies, explanation of the difference between riverine and coastal storms and recommendations for improvements within the Binney Park Pond area.

Drainage System Studies
CDM Smith has prepared riverine studies and drainage system evaluations in several watersheds within the Town. The following studies have been completed within the Cider Mill Brook watershed:


“Cider Mill 100-year Flood Delineation Update” Memorandum dated March 12, 2012

The 2009 study included a riverine hydrologic and hydraulic analysis of Cider Mill Brook using the HEC-HMS and HEC-RAS models developed by the US Army Corps of Engineers. This study evaluated the riverine characteristics of the Cider Mill Brook watershed during 10-year, 25-year, 50-year and 100-year storm events. The models simulate the riverine flows within Cider Mill Brook and its Easterly Tributary during the varying storm events. The results were then used to show inundation depths and limits of flooding for the different storm events.
This report also evaluated the existing flooding limits and capacities of in line structures (bridges and culverts) to assess if improvements are warranted to alleviate flooding. Recommendations developed as part of this study addressed riverine flooding within the watershed.

The March 2012 Memorandum was developed to present the limits of both riverine and coastal flooding based on CDM Smith’s riverine study and the Federal Emergency Management Association’s (FEMA) coastal study. Figure 1 from that memorandum (attached) shows the difference between the existing riverine (blue shading) and FEMA’s existing coastal (red line). It is important to note that this figure shows a comparison of the areas impacted by the riverine and coastal storms.

**Riverine and Coastal Comparison**

It is important to understand the differences between riverine and coastal storms. The two storms occur under very different weather conditions and can have significantly different impacts. Riverine studies are overland flow models that simulate stormwater flow from the headwaters of the watershed to the outlet at the downstream end. These models are hydraulic models that simulate flow through the riverine system from upstream to downstream. Even though riverine studies take into consideration downstream conditions that may typically be tidally influenced (as is the case with Cider Mill Brook), these studies do not simulate coastal storms and the storm surge associated with coastal events.

Coastal flooding is driven storm surge that typically occurs during large hurricane’s and may not be accompanied by the most extreme inland rainfall that drives extreme riverine flooding. The extreme coastal flooding of Hurricane Sandy that was accompanied by significant but not extreme precipitation is a good example. Coastal models are hydrodynamic models that simulate storm surge, wind, tides, wave action, and sea level rise utilizing coastal transects (cross sections) within the model to predict flood elevations during coastal storm events. These models predict coastal still water elevations, wave action, wave transgression, coastal erosion as well as other coastal impacts. FEMA’s coastal mapping updates in 2012 updated the coastal flooding limits within the Town of Greenwich including the Cider Mill Brook area.

**Recommendations**

Based on the studies that were developed by CDM Smith for Cider Mill Brook and coordination with emergency personnel in the Town, CDM Smith supports the raising of the roadway where Sound Beach Avenue crosses over the Easterly Tributary of Cider Mill Brook. It is recommended to raise the roadway to accommodate riverine flood flows to pass underneath the structure. This would significantly minimize impacts from riverine storm events and improve conditions during coastal storm events.

This location was identified by the Town of Greenwich’s emergency management group as a high priority project due to decreased emergency access during riverine storm events. Improvements at this location are also supported by the Greenwich Flood Erosion Control Board based on the prioritization developed by both the Greenwich DPW and the Greenwich Flood Erosion Control Board.
If you have any questions or require any additional information, please contact me directly at (401) 215-6310.

Sincerely,

Cynthia A. Baumann, PE, CFM, PMP
Principal, Senior Project Manager
CDM Smith
Legend:
- Bridge Area
- Limit of regrading
- Area of regrading

Proposed Bridge Plan

*No trees to be affected

Proposed Road Section

Modifications to grade