

Town of Concord, MA

Concord Public Works (CPW)

Cambridge Turnpike Improvement Project (CTIP)

October 2016 Design Update

The Town of Concord, Concord Public Works (CPW), and the Public Works Commission (PWC) are advancing the design of the Cambridge Turnpike Improvement Project (CTIP), which will implement comprehensive improvements to address roadway deterioration from Lexington Road to Routes 2 and 2A (Crosby's Corner), as illustrated in Figure 1 below.



Figure 1 – Cambridge Turnpike Project Overview

Background

As described in previous updates, the primary focus of this project is to resolve chronic flooding of the roadway, while concurrently integrating multi-modal uses of the corridor, including vehicles,

pedestrians and cyclists. The project is intended to be implemented in an aesthetically pleasing way that complements the community's character, and also is sensitive to the environmental

and historical resources that exist in the area.

Since the May, 2016 update, several important steps have been completed. These include work in the areas as described below:

Geotechnical Challenges and Flooding Mitigation

Additional subsurface investigations and evaluations to characterize challenging soil conditions at the Mill Brook crossings at the west and east ends of the project were undertaken. These conditions include varying depths of peat, low-strength organic soils, and silts. These conditions have resulted in the settlement that causes roadway flooding. As described below, design of roadway improvements in the marsh areas must overcome these conditions to raise the roadway above flood levels and prevent future embankment settlement.

Ground Improvement, Crossings over Mill Brook, Roadway over Marsh Areas

Evaluation and recommendations have been developed for alternatives for construction of the westerly bridge at Mill Brook, retaining walls, easterly culverts at Crosby Pond, and roadway support elements that effectively manage the subsurface conditions in affected areas and that will prevent unacceptable long-term roadway settlement.

Preliminary design of these features includes conventional pile-supported abutments for bridge construction and a system of deep ground improvements as depicted conceptually in Figure 2 below. The ground improvements will be installed over an approximate 800-foot length at the west end of the project between the “Mill Brook Farm” and Hawthorne Lane and over an approximate 600-foot length at the east end of the project near Crosby Pond. Deep ground improvements are needed to support low retaining walls at the edges of the rehabilitated roadway corridor and to support the large box culverts at the outlets of Crosby Pond. The retaining walls are intended to minimize roadway footprint and impacts to sensitive environmental resource areas.

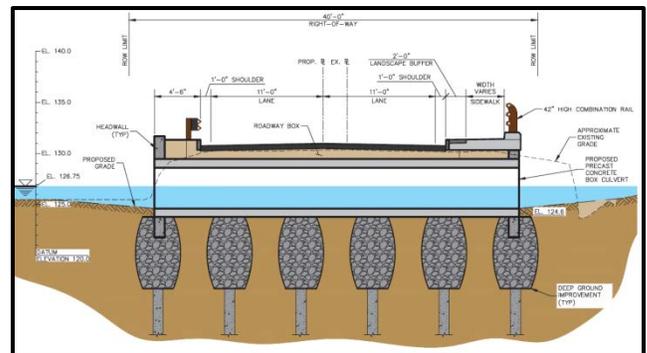


Figure 2 – Typical Culvert Section

Roadway Configuration for Final Design

Evaluation and recommendations have been developed for final roadway configurations throughout all sections of the project, including travel lanes, medians, shoulders, sidewalks, green strips, and curbing. Based on public feedback received at prior public meetings the proposed sidewalk

alignment has been modified and will be extended through the entire corridor all on the southern side opposite the Mill Brook Farm. This represents a modification to the current configuration for which portions are constructed on the north side and the south side, and does not extend for the full length of the Turnpike.

The typical section includes 11-foot wide travel lanes, 1-foot shoulders, a combination of sloped and vertical granite curbing where needed, and a varying width nominal 2-foot green strip separating the roadway from a 5-foot sidewalk. This typical cross section incorporates design objectives developed in earlier phases including; multi-modal transportation uses, enhancements in safety, and context sensitive design principles in keeping with the character of the area. This is illustrated conceptually from a north perspective in Figure 3 below.



Figure 3 – Mill Brook Bridge - North Perspective

The horizontal alignment and vertical profile of the roadway has been developed along the entire corridor, including the Lexington Road intersection and nearby historical facilities, the “Mill

Brook Farm”, transitions to the marsh areas requiring geotechnical design, the Sandy Pond Road intersection, and general roadway sections.



Figure 4 – Mill Brook Bridge - Deck Perspective

Project Permitting

As the project team advances the design, permitting for the corridor can begin. Environmental Permit applications will be filed with the Natural Resources Commission (NRC), Army Corps of Engineers and MEPA office over the upcoming months. Additionally, the Project team will file with the Concord Historic Commission and the Concord Historic District Commission. Project permitting is expected to continue into calendar year 2017.

Project Sequencing /Detours

During construction, there will be periods when through traffic will not be possible, particularly when the structural elements (i.e. bridges, culvert, walls) and deep ground improvements are being constructed over the marsh areas. These times will be limited in duration, but will be disruptive. The Town will further

define these expected periods and detour routes through the final design process. The proposed detour route will maintain traffic flow on major arterials while avoiding residential roadways. The proposed detour is shown below as Figure 5 and can be viewed in detail on Page 53 of the following document: (<http://www.concordma.gov/DocumentCenter/Home/View/356>)



Figure 5 – Detour Map

Schedule/Feedback

The project is on-track with the objective to complete the design and permitting in advance of bidding in late winter/spring of 2017. Construction is anticipated to proceed in 2017, and extending into 2018. Send any comments or feedback to CTIPcomments@concordma.gov