

Mr. Brendhan Zubricki
Town Administrator
Town of Essex
30 Martin Street
Essex, MA 01929

January 17, 2023

Ref. T0967.02

Re: Apple Street Roadbed Elevation and Culvert Replacement Project; Essex, MA

Dear Mr. Zubricki:

We have reviewed the follow up recommendations to the Board of Selectmen and the Planning Board issued by a resident on 11/5/22, the additional request submitted by the Planning Board to the Board of Selectmen following their meeting on 12/7/22, and general questions and comments received during the two project presentations and the site walk all held on 11/2/22, and we offer the following responses:

General:

- The draft plans have been revised to reflect some of the items discussed during the 11/2/22 meeting including modifying the slope impacts. Where feasible, although not yet shown, we will be providing new tree planting locations (of smaller caliper) to replace existing trees that are scoped for removal. The proposed rockfill slopes will be dressed in loam and seed allowing vegetation and shrubs and wild trees to grow over time as demonstrated successfully during our 11/2/22 meeting on previous MassDOT projects. We will present proposed tree planting locations as part of future design submissions and further coordination.
- The Board of Selectmen has indicated that the Board intends to work with a local tree professional and local landscape architects to review engineering plans as necessary, on a voluntary basis, to make recommendations for the final design. The project limits as currently proposed are consistent with the scoped improvements associated with the Town's design and permitting grant funds. Reducing the project limits to just the work around the proposed culvert replacement will not address the potential roadway flooding in the "second dip" roadway area fronting the 128, 129, and 131 Apple Street parcels. Further, we understand the length of the entire project is critical in generating a favorable Benefit Cost Ratio necessary to qualify the project for Federal funding for construction (currently anticipated at 90%).

Freeboard Elevation Height:

- For our transportation improvement project, our "building" is essentially the roadway elevation where our goal is to have its "finished floor elevation" above the predicted future storm surge and sea level rise elevation.

- As discussed at the 11/2/22 meeting, our goal is to create dry passage in the spirit of the grant funding, but also, at the request of the Town, to not have vehicles exposed to the saltwater.
- The freeboard mentioned during the 11/2/22 meeting was taken at the crown in the center of the roadway (i.e., its highest point in cross section). The edge of the roadway will be lower than the crown by a few inches and therefore have less freeboard to the predicted future water elevation.

Road Width:

- It has been suggested that we request a waiver to preserve characteristics of the scenic road which would maintain the current width of the road. Such a design exception would need to be accepted by the approving authority of the project. As the Town has utilized many funding sources to date, we have reached out to both state and federal transportation agencies for their input on a potential waiver. Most recently, TEC spoke with representatives from both the Federal Highway Administration (FHWA) and the Massachusetts Department of Transportation, Highway Division (MassDOT). Both agencies have indicated that since the potential construction funds would be coming from the Federal Emergency Management Agency (FEMA) and not FHWA, then neither FHWA nor MassDOT would be involved in the project and the approving authority would be at the local/Town level. Apple Street's functional classification is a "local roadway". The minimum recommended width per AASHTO Geometric Design of Highways and Streets Table 5-5 with an average daily traffic of approximately 820 vehicles is 20 feet. Typically, on state or federally funded projects, a much wider roadway footprint is required to provide bicycle and pedestrian accommodation and improved safety. We are following established design standards and will not propose anything less as Engineer of record for this project. We acknowledge that a narrower roadway would have less impact as suggested, but we are providing the narrowest roadway width permitted considering the design speed, average daily traffic, and roadway classification. This is a minimum requirement that is based on traffic safety as well. Additionally, and consistent with our recommendations, the Town's current minimum pavement width for rural streets is 20 feet (per the Town's subdivision rules and regulations).
- Several of the comments indicating a reduced number of impacts, etc. were demonstrated and presented in Alternatives 1 and 2 where we only raised the road to provide dry passage above the March 2018 observed water elevations. We agree that raising the road less generates fewer impact quantities, but not substantially less than the preferred alternative that fully supports the interests of the grant program. As previously mentioned above, the reduction in road elevation design height will also jeopardize the project generating a favorable Benefit Cost Ratio necessary to qualify the project for any Federal funding.
- The proposed project will require the construction of a 3'-4' high retaining wall along an 80-foot section of Apple Street nearest 128 Apple Street as shown in the updated plan set. This is needed to facilitate the proposed drainage outfall in addition to not adversely impacting the brook's banks where the proposed slope limits would otherwise encroach. Understanding that aesthetics is of priority importance to this scenic road, we are investigating the suitability of "green" infrastructure such as a vegetated retaining

wall concept as shown on the next page to achieve this project feature. The updated draft plans included with this response show the location and limits of this proposed wall. The design team will provide additional details for this wall construction as the design advances.



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- Reference has been made to a forthcoming updated Project Development and Design Guide to be issued by MassDOT. This document is still in draft format and to our knowledge is not currently publicly available for implementation. We agree that transportation facilities should fit their physical setting and preserve scenic, historic, aesthetic, community, and environmental resources to the extent possible. We are continually revising our design plans to incorporate our goal of providing a context sensitive design as mentioned during the 11/2/22 meeting.

Cost Saving and Benefits of reducing the elevation and the width:

- We do not agree that reducing the elevation would act as a traffic calming measure, as several of the residents noted their concern of speeding on the road today. As discussed during the meeting, we feel that introducing the required guardrail throughout the project limits will cause motorists to travel slower despite the two-foot increase in pavement width.

Protection of Existing Trees:

- Construction of a stone clad retaining wall would include the construction of a concrete wall and slab footing that would extend underneath the roadway (i.e., also referred to as a concrete moment slab) which in our opinion would negatively impact the trees and their root systems envisioned to be protected under this suggestion (given their proximity to the edge of road) and will add more cost to the project.
- Discontinuing the guardrail at existing trees as suggested is not advised and would lead to a potentially unsafe condition. We would be introducing a barrier system that is designed to deflect vehicles and is not designed to terminate abruptly at a rigid, roadside object (i.e., tree). Guardrail has specific length requirements to work effectively. For Test Level 2 guardrail (speed less than 45 mph), each time a new segment of guardrail is introduced it would need to begin with a crash worthy unit

referred to as a tangent end treatment. Each of these units are a minimum 25 feet long with each subsequent panel being 12'-6" long. It would not be practical or safe to terminate the guard rail at each tree. Additionally, the tree and root system will be significantly impacted by the rise in roadway elevation, hence the need for the tree to be removed.

- We intend to include provisions in the construction documents to tag all trees that are to remain as part of the project.
- We intend to identify all trees that have been located by our surveying subconsultant within the limits of work and provide designation as to whether they are to be removed or retained.
- We acknowledge that the proposed project will cause tree removal and will look to replant trees (of smaller caliper) to mitigate the impact resulting from proposed roadway construction.

Stone Walls:

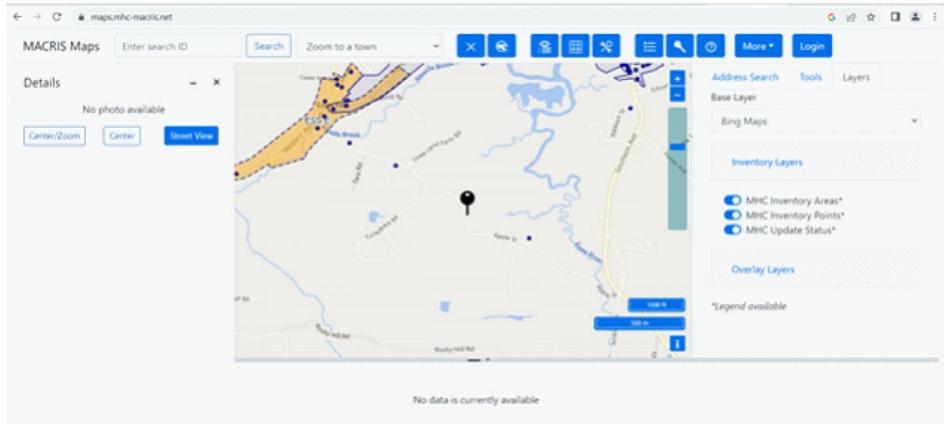
- We intend to include both in our plans and special provisions, details, and requirements for identifying, photographing, cataloging, stockpiling, and reconstructing existing stone walls that are to be removed and rebuilt as part of the project. Our goal is to continue to make the stone walls visible from the roadway to the greatest extent practical.
- The embankment construction will need to follow a particular material specification based on MassDOT requirements including the size and gradation of the stones to be used to ensure that the slope is stable. We will include in our special provisions requirements to reuse the native stones provided they meet specifications, or else provide a local similar conforming.

Items of note related to the ongoing Massachusetts Climate Change Assessment and Cultural Inventory Protection:

- Comment noted. The Town already received their grant from EEA. We are required to provide EEA constant communication and monthly progress reports for our project. Michelle Rowden attended the public meeting on 11/2/22.

MEPA Review:

- Apple Street is not listed in a State Historic District per MHC inventory maps (see next page); We intend to file an ENF with MEPA for tree and stone wall removal; the MEPA threshold for road widening (by one or more travel lanes) or new roadway construction is for 2 or more miles. This project length is much less.



Additionally, below is a list of all environmental permits/agency consultation that we will be securing and performing as part of this project. We have confirmed with FEMA that additional federal permits not listed below would be managed internally by them as part of their project review:

Environmental Permits / Licenses / Approvals
MEPA Review (ENF)
Wetlands Protection Act (Order of Conditions)
Army Corps (USACE) Permit (Section 404)
CZM Federal Consistency Review
Chapter 91 Waterways Permit or License
MassDEP Water Quality Certification
Endangered Species Consultation (State)

Please do not hesitate to contact me directly if you have any questions concerning our response at 978-794-1792. Thank you for your consideration.

Sincerely,
TEC, Inc.
"The Engineering Corporation"

Jody P. Trunfio, P.E.
Principal

Cc: Michelle Rowden - EEA