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Refer to File No, BOX-0205

Date: October 14, 2020

Mr. Ross Povenmire, Agent
Conservation Commission
7 Spofford Road
Boxford, MA 01921

RE: NOI Supplemental Information
Lot 8A Andersen Drive
Boxford, MA

Applicant: Donald Gianquitto
DEP File #114-1306

Dear Mr. Povenmire,

Hayes Engineering, Inc. is submitting the following supplemental information in response to comments received at the Conservation Commission's hearing held on September 17, 2020.

Plan Revisions

Seven (7) prints of the Hayes Engineering, Inc. plan titled "Notice of Intent, Lot 8A Andersen Drive, Boxford, Mass." revised through October 13, 2020 are attached to this letter for the Conservation Commission's review. An electronic copy of the plan and letter documents will be sent as well. Plan revisions consist of the following:

1. Wetland flags 6A, A6, A-8B, and A-8C were added to plan sheets 1 of 4 and 3 of 4.
2. Proposed 30" RCP replacement culvert was changed to a two-piece precast box culvert measuring 10'W x 22'-6" L x 4' Ht to provide sufficient water flow and wildlife transit area pursuant to the Massachusetts Stream Crossing Standards.
3. Sheet 4 of 4 was added to provide details, calculations, and construction notes relative to the new box culvert crossing design and sediment control.
4. Plan sheets 1 of 4 and 3 of 4 were revised to show the new culvert crossing design and associated relocated erosion control barrier at the crossing. Culvert labels were added or revised to reflect the new crossing design and reference to detail sheet 4 of 4.
5. Revision date of October 13, 2020 was added to each of the 4 plan sheets.

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Wetland Boundary Evaluation

The Conservation members requested that the wetland boundary shown on the submitted plans be re-evaluated for accuracy since the flags were last reviewed by the Conservation Commission pursuant to the 2015 - 2016 initial Order of Conditions for this project. The Hayes Engineering, Inc. survey staff re-established the wetland flag locations on September 22, 2020 and the undersigned Professional Wetland Scientist subsequently visited the site and evaluated the flag locations to confirm that the boundary was still properly delineated. Four (4) flags consisting of 6A, A6, A-8B, and A-8C were added to the wetland lines to clarify location of the wetland boundary at the culvert crossing headwalls and to more accurately define the boundary along slopes. These additional flags, in place for the Conservation Commission’s review at their site visit on September 29th, were added to the Notice of Intent plan revised as noted above.

Crossing Redesign - Compliance with Massachusetts Stream Crossing Standards

The 30” round corrugated metal pipe at the existing Fish Brook crossing is clogged and otherwise in deteriorated condition, and its replacement was requested by the Town Engineer (both past and present) to be conducted as part of the driveway project. The crossing design initially proposed in kind replacement of the pipe with associated reconstruction of the stone headwalls. Based on Commission comments received prior to and at the September 17th hearing, Hayes Engineering, Inc. reconfigured the pipe replacement to consist of a 10-foot wide, 22’-6”-foot long box culvert with adjacent slope stabilizing riprap on each side as detailed on the revised Notice of Intent plan. This redesigned crossing meets, as much as practicable, the Massachusetts Stream Crossing Standards summarized in the document titled “Massachusetts River and Stream Crossing Standards” revised through 2012 as follows.

Standards Summary

	General Standards	Optimal Standard
Structure Type	Open-bottom span preferred	Bridge
Embedment	If a culvert, then it should be embedded: <ul style="list-style-type: none"> • A minimum of 2 feet for all culverts, • A minimum of 2 feet and at least 25 percent for round pipe culverts • When embedment material includes elements > 15 inches in diameter, embedment depths should be at least twice the D₈₄ of the embedment material 	NA
Crossing Span	Minimum: 1.2 x bankfull width	Minimum: 1.2 x bankfull width
Substrate	Matches stream substrate	Matches stream substrate
Water Depth & Velocity	Matches water depth & velocity in natural stream over a range of flows	Matches water depth & velocity in natural stream over a range of flows

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Openness (& height)	Openness: 0.82 ft. (0.25 m)	Conditions that inhibit wildlife passage over road Openness: 2.46 ft. (0.75 m) Height: 8 ft. (2.4 m) Otherwise Openness: 1.64 ft. (0.5 m) Height: 6 ft. (1.8 m)
Banks	<ul style="list-style-type: none"> • On both sides of the stream • Match the horizontal profile of the existing stream and banks • Constructed so as not to hinder use by riverine wildlife 	<ul style="list-style-type: none"> • On both sides of the stream • Match the horizontal profile of the existing stream and banks • Constructed so as not to hinder use by wildlife • Sufficient headroom for wildlife

Embedment

This replacement crossing proposes a closed bottom box culvert and therefore it will be sunk (embedded) into the ground to avoid creating any wildlife or water flow barrier.

Substrate

Stone and soil materials will be placed within the bottom of the box culvert to form a channel with shallow banks for continuity of the existing stream bed.

Openness

The box culvert provides an openness of 0.82 as shown in the calculations provided on sheet 4 of 4 of the revised plan set.

Photographs Showing Example of Box Culvert Crossing

The proposed box culvert crossing detailed on the revised Notice of Intent plan is similar to the 2018 driveway crossing at #57 Candlewood Drive in Topsfield, MA designed by Hayes Engineering, Inc. Photographs of that completed culvert crossing are attached for the Commission’s consideration.

Driveway Alternatives Analysis

This driveway project can be considered as a limited project under the Wetlands Protection Act Regulations (310 CMR 10.53 (3)(e.)) since the intermittent stream (Fish Brook) and associated wetlands cross the property in a parallel manner with Andersen Drive, effectively separating the driveway entrance at Andersen Drive from the northerly upland portions of the property.

The following addresses the alternatives considered for this design.

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Proposed Design:

The current 11-foot wide driveway design enters from Andersen Drive in the narrow corridor between properties at #35 and #41 Andersen Drive, and routes the driveway through a portion of a pre-existing, overgrown woods road easement (Cartwright Lane) which crosses through buffer zone areas and over existing culvert crossings associated with intermittent wetland drainage and stream. This design utilizes the only available entrance to the property, existing utility connections, and avoids significant wetland and stream channel disturbances by locating the drive within pre-existing culvert crossings. Stormwater and wetland construction mitigation, as well as provision of erosion controls are included in the project to the extent practicable, although they result in some buffer zone disturbance.

Alternative Properties:

There are no other properties in Boxford owned by the applicant.

Alternative Driveway Width and Length:

The driveway is designed to have a minimal 11-foot width with grass filter strips on each side. An alternative driveway with a decreased width is not practicable due to the need to accommodate heavy trucks and other vehicles that will need access along the driveway for house construction and other site work. The driveway width was reviewed and accepted by the Town during the Commission's 2013-14 project review. Reducing the driveway length is not practicable since it will move the house closer to wetland and buffer zone areas.

Alternative Entrance:

The location of the driveway entrance on this property is restricted by the single narrow entrance available between #35 and #41 Andersen Drive. No alternative property entrance location is available which would avoid buffer zone and resource area disturbance due to presence of other developed Andersen Drive residential properties not owned by the applicant, the presence of the large CR open space and residential parcels between the property and other roadways, and the presence of the pond, streams, and wetlands located on, and in, the vicinity of the property.

We trust that this information addresses the Conservation Commission's concerns and allows the Commission to close the hearing. Feel free to contact me at (781)246-2800 or by email (lwallis@hayeseng.com) with any questions or comments you may have regarding the contents of this letter.

Very truly yours,



Elizabeth Wallis, P.W.S
Professional Wetland Scientist

ECW/ecw

Enclosure

cc: Donald Gianquitto

SAMPLE BOX CULVERT CROSSING # 57 CANDLEWOOD DRIVE TOPSFIELD, MA 2018



2018 5 30 8102

SAMPLE BOX CULVERT CROSSING #57 CANDLEWOOD DRIVE TOPSFIELD, MA 2018

2018 5 30



SAMPLE BOX CUVERT CROSSING #157 CASTLEWOOD DRIVE TOPSFIELD, MA 2018



SAMPLE BOX CULVERT CROSSING #57 CANDLEWOOD DRIVE TORRIFIELD, MA 2018



2018 5 30