

June 5, 2018

Streambed Restoration Plan

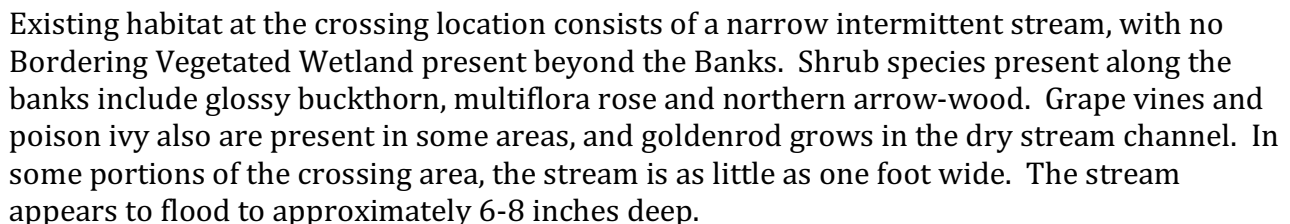
Stream Crossing #1

Timber Crest Estates Development
Medway, MA

Submitted to:
Medway Conservation Commission

Prepared for:
Timber Crest Estates LLC

On behalf of the applicant, Timber Crest Estates LLC, Goddard Consulting, LLC is pleased to submit this Streambed Restoration Plan for the construction of “Wetland Crossing #1” of the Timber Crest Estates development in Medway, MA. This crossing is located within the 13 Ohlson Circle property, to the east of the existing residence. The crossing will consist of a three-sided box culvert over an intermittent stream for construction of a 15-foot wide emergency access roadway (see detail below). 70 linear feet of Bank and 270 square feet of Land Under Waterbodies (LUW) will be altered by the crossing.



1. Supervision: All work shall be supervised by a qualified wetland scientist with a minimum of five years' experience. The supervisor shall submit monitoring reports to

the Conservation Commission as described below. Reports shall contain details of all work performed and photographs of completed conditions.

2. Timing: Work within the stream shall take place during low- to no-flow conditions, which is typically between July 1 and September 30.
 - a. If flow is encountered, provide a temporary sand bag dam or pump system upstream to divert stream around construction area.
 - b. Provide dewatering basin if pumping is required.
3. Survey: Field stake limit of work as shown on the project site plans.
4. Photograph Pre-Construction Conditions: Supervising Scientist shall take detailed photographic and/or video documentation of pre-existing streambed conditions. This will aid in the restoration of pre-existing streambed conditions within the culvert after installation.
5. Erosion Control Barrier (ECB): Place ECB (staked siltation fence and mulch sock, or similar invasive-free barrier) upstream and downstream of crossing location, as shown in the project site plans. This will remain in place and be maintained until the areas are completely stabilized.
6. Remove any potential wildlife habitat features: This includes rocks, stones (at least 6-inches long +/-) or large woody debris. These features should be stockpiled nearby for later replacement within the culvert.
7. Excavate stream bed material: First excavate top 1-3 inches of organic, sandy or cobbly substrate. Stockpile material carefully in a designated location nearby for replacement in culvert. Then remove remainder of stream bed soils to desired grade.
8. Install Culvert and Retaining Walls: Perform the culvert and retaining wall installation in accordance with Steps 2-9 of "Box Culvert Replacement Sequence" from Detail Sheet #42 of the plans dated 5/31/18 (shown below).

BOX CULVERT REPLACEMENT CONSTRUCTION SEQUENCE

THE CULVERT SHOULD BE INSTALLED DURING THE LOW FLOW PERIOD (APPROXIMATELY JUNE TO OCTOBER). OWNER/CONTRACTOR MUST NOTIFY CONSERVATION COMMISSION 1 WEEK IN ADVANCE OF PROPOSED COMMENCEMENT TO ENSURE SUITABLE CONDITIONS ARE PRESENT AND SHALL FOLLOW THIS CONSTRUCTION SEQUENCE AS CLOSELY AS POSSIBLE. THE CULVERT INSTALLATION IS EXPECTED TO TAKE 1 WEEK, AND SHOULD BE DONE IN CONJUNCTION WITH THE RETAINING WALLS TO MINIMIZE POTENTIAL DISTURBANCE TO THE WETLANDS.

1. INSTALL SILT FENCE PER PLANS.
2. CLEAR AND GRUB UNSUITABLE SOILS
3. INSTALL WATER AND SEWER LINES PER PLANS, AND RESTORE STREAM CHANNEL LINES AND GRADES.
4. EXCAVATE FOR NEW CULVERT AND WALL FOOTINGS PER STRUCTURAL PLANS.
 - 4.1. EXCAVATED AREA SHOULD EXTEND 24" HORIZONTALLY BEYOND THE EDGE OF THE PROPOSED CULVERT AND WALL FOUNDATIONS.
 - 4.2. SCRAPE BOTTOM OF FOOTING TRENCH WITH NON-TOOTHED MACHINE, IMMEDIATELY FOLLOWED BY PLACEMENT OF A REINFORCING GEOTEXTILE AND A 12" LAYER OF 1" SIZE CRUSHED STONE, IF REQUIRED.
 - 4.3. CONTRACTOR SHALL UTILIZE THE STONE FOOTING TRENCH FOR GROUNDWATER CONTROL IF NECESSARY. A SUMP MAY BE DUG ADJACENT TO THE UPSTREAM END OF FOOTING TRENCHES WHERE A PUMP MAY BE INSTALLED TO MAINTAIN WATER LEVELS BELOW THE FOOTINGS. THE PUMP DISCHARGE SHALL BE ROUTED TO A TEMPORARY STRAW-BALE FILTER AT DOWNGRADIENT END.
 - 4.4. WHERE WORK IS TO BE DONE DURING NO FLOW/DRY CONDITIONS, IT IS NOT ANTICIPATED THAT TEMPORARY BY-PASS PIPING OR PUMPS SHALL BE NECESSARY. HOWEVER, CONTRACTOR SHALL BE PREPARED TO IMPLEMENT A CONTINGENCY PLAN IF WEATHER CONDITIONS ARISE (SUCH AS A HURRICANE FORECAST) TO PROVIDE AN OPEN STREAM CHANNEL WITH A CRUSHED STONE CHECK DAM AND STRAW BALES/SILT FENCE AT OUTLET END OF STREAM.
5. INSTALL FOOTINGS PER STRUCTURAL CULVERT PLANS.
6. INSTALL BOX CULVERT AND BACKFILL INTERIOR AS SECTIONS ARE PLACED.
 - 6.1. COMPACT BED MATERIAL.
 - 6.2. WASH BED MATERIAL TO ENSURE THAT FINE MATERIALS FILL VOIDS.
 - 6.3. BY-PASS PIPING MAY BE REMOVED, IF ANY.
7. INSTALL RETAINING WALLS PER PLANS.
8. BACKFILL WALLS AND RESTORE/CONSTRUCT WELL-GRADED BANKS FOR ROUGHNESS AND PASSAGE BY SMALL WILDLIFE AND IN-STREAM BANK-EDGE HABITAT. USING NATIVE SUBSOIL OVERLAID WITH 6" LAYER OF COMPOST SAND AND LOAM MIXTURE (EQUAL PARTS) BLEND CONSTRUCTED BANKS INTO EXISTING BANKS.
9. IMPLEMENT RESTORATION PLAN PER GODDARD CONSULTING.

9. Restore Streambed: Following culvert installation, restore historic stream channel and substrate.
 - a. Grade stream channel in accordance with the proposed grading. Final micro-topography of the channel should be a sinuous configuration to match the profiles of the existing stream above where the stream is in its natural state.
 - b. If the topsoil has been stripped, replace with stockpiled material.
 - c. Place rocks or stones (6-inch +/-) in the stream bed (try to use those existing on site if none were stockpiled) in a natural/random formation to approximate the existing historic stream bed.

10. Complete roadway: Following the completion of streambed restoration, complete the roadway with final grading, curbing, and paving.
11. Restoration Monitoring: Annual monitoring reports shall be prepared for the restoration area by a qualified wetland scientist for a period of 2 additional years after installation. This monitoring program will consist of a once-annual inspection, during spring or other time of year when the stream is flowing **and** vegetation is growing. Monitoring reports shall be submitted to the Commission by November 30th of each year. Monitoring reports shall describe, using narrative and color photographs, the physical characteristics of the streambed restoration area with respect to flow characteristics, wildlife habitat features, soil characteristics, and survival of vegetation from the seed mix.