

TURNER ENVIRONMENTAL, LLC

P.O. Box 581

East Lyme, CT 06333

(860) 705-8704

April 27, 2021

Maureen FitzGerald
Environmental Planner
Town of Waterford
15 Rope Ferry Road
Waterford, CT 06385

*Re: Scope of Work for Required Corrective Actions (Figure revision May 12, 2021)
Restoration of Riparian Habitat and Channel Stabilization
Rope Ferry Condominiums
54 Rope Ferry Road, Waterford, CT*

Dear Ms. FitzGerald

Turner Environmental, LLC was retained by Rope Ferry Condominiums to assist with response to a Notice of Violation issued February 5, 2021 for "unauthorized clearing of vegetation and soil grading within and adjacent to an intermittent watercourse". The unauthorized activities cleared vegetation on the eastern portion of an intermittent stream and redirected the stream channel along the eastern slope potentially subjecting that recently cleared area to erosion.

On February 26, 2021 you issued a Required Corrective Actions Letter which required several immediate actions.

Item 1 required included grading side casted soil material on the eastern embankment to a stable slope, seed exposed soils and apply sediment control matting to control soil erosion. These items were addressed by work performed in early April and the area was graded by hand, raked and seeded. Erosion control matting was installed on the steeper bank sections and a straw waddle was installed to prevent erosion on the steeper northern portion of the disturbed area.

This work was performed and currently has about 80% grass coverage and no erosion gullies or other erosional features have been observed on the upper eastern slope. All further work proposed is below the straw waddle installed in early April and is largely limited to the lowest two feet of the eastern slope and the western portion of the disturbed area where a soil berm remains.

Item 2 requires submittal of a Restoration Plan for the channel and adjacent embankment and wetland to restore riparian habitat and restore the channel.

This scope of work has been prepared to address this second item and is being submitted for the review and approval of the Waterford Conservation Commission prior to initiating these actions.

The "Restoration Plan" has several objectives which includes addressing stabilization of the steep northern portion of the intermittent stream that enters the Rope Ferry property.

Currently the stream exits a pipe which conveys it under Rope Ferry Road. It has a relatively steep slope that crosses an approximately twenty foot long rip-rap lined channel as it descends toward the wetland. Some erosion of soils is evident adjacent to this stream in the steeper section where the current rip-rap ends. We are proposing to stabilize this area by adding an additional fifteen feet of rip-rap along the northern portion of this channel which has a steep grade. Addition of rip-rap in this area will also allow altering the entry point of the stream into the wetland area from the far eastern portion of the wetland to a more centralized location. We are also proposing stabilization plantings along both sides of the channel to redirect flow from the eastern bank to reduce erosion potential along that bank.

The remainder of the restoration will include re-grading the steep soil bank on the eastern slope of the wetland and to remove a soil berm on the eastern side of the wetland area created by the previous clearing of the channel. The slopes in several areas exceed 2:1 and there are several areas that have short 1:1 slopes that need to be reduced. Re-grading will reduce the slopes on the eastern side of the stream closer to 2.5:1 on the northern portion and approximately 3:1 on the southern portion of the eastern bank. Slopes will be stabilized after re-grading by planting appropriate plants that will hold the soil bank and prevent further erosion. Planting details will be discussed later in this letter. A Sketch showing the proposed re-grading areas and restoration is attached to this letter.

There are currently sections of the eastern bank of the wetland area with a very steep slope. Some of the exposed soils are very sandy and are unlikely to support plant growth. We are proposing to use an excavator to adjust this slope by "cutting" the steep slope on the eastern side. This will necessitate re-locating the stream channel approximately two feet westward. Photographs of the current site conditions are attached to this letter.

Another issue is that a small "mound" of organic soil was created on the western side of the stream when the area was initially disturbed. This mound will be removed to level the topography on the western portion of the stream and will be used on the eastern streambank to amend the sandy soil exposed by the previous excavation. The soil mound on the western portion of the stream is approximately six inches high and about fifty feet long. That soil has a much higher organic content and will be suitable for the proposed plantings. The relocation of the organic material on the western portion of the disturbed area will be limited to re-establishing a level grade on the western portion of the stream.

We are proposing using a small tracked mini-excavator operated on 12" wide planks in the area of sediment deposition and emergent vegetation on the western side of the stream to perform the work to regrade the base of the eastern side of the stream and avoid further disturbance of the restored area on the eastern upland slope.

The steeper sections of the eastern bank will be cut by drawing soil down toward the channel – the sandy soil in this area will be amended with the highly organic soil from the berm created on the western side of the stream. We estimate that the current channel will be re-located approximately two feet further west of its present location by this process. The regrading will remove the very steep grades on the eastern side of stream and reduce erosion potential. Proposed plantings on both sides of the stream will help stabilize the centered stream channel.

The proposed plan removes the mound of soil on the western side of the stream and also provides a suitable soil supplement on the eastern bank for subsequent planting. Excess soils, if any, will be removed from the wetland area and reused on upland areas of the. They will be used to amend soil in future landscaping projects.

The stream channel runs for approximately seventy feet until the water reaches the level of the existing pond where its velocity is substantially reduced.

It should be noted that there are several tree stumps along the eastern edge of the stream/pond that were extensively cut. It is our opinion that these trees are likely to re-grow and the stumps and roots remaining in place will not be further disturbed. The root systems will help retain and stabilize the eastern bank.

We believe these actions will stabilize the northern portion of the stream with hardscape and relocate the remainder of the stream slightly west of the current position along the western bank. The southern portion of the disturbed area will be stabilized by the planting scheme proposed below.

The remainder of the bank area will be stabilized by planting two different types of sedges along the lower bank of the stream. We consulted with Richard Snarski, a Certified Wetland Scientist, on the types of plants and planting scheme for stabilization of the relocated stream channel.

We are proposing planting Woolgrass and Tussock sedge along the eastern bank for approximately 180 feet. This will include from where the rip-rap ends south to the location of an approximately five foot high boulder along the eastern side of the pond. These plants will be planted in a "saw tooth" pattern alternating four inches above the typical standing water line to twelve inches above the standing water line. Plants will be randomly alternated. These plants are deeply rooted and once established will help stabilize the relocated channel toward the center of the wetland area on the northern portion of the Rope Ferry Pond and away from the eastern side-slope which is currently subject to erosion.

A similar saw tooth pattern will be used to plant approximately sixty feet along the western side of the stream to help stabilize the centered channel.

We estimate that approximately 230 plants will be installed in the disturbed area to accomplish the stabilization. We are recommending two inch diameter plant plugs placed in the saw tooth planting scheme previously recommended to stabilize the lower bank during this second phase of restoration.

A sketch showing the proposed work areas and plantings is attached to this letter.

The condo association will perform some additional aesthetic plantings in the upland on the eastern bank. We are suggesting planting plugs of Wild Blue Lupine and Butterfly Milkweed in the upland. In addition, we are suggesting plant blue iris and Swamp Milkweed on the western

side of the stream for aesthetic purposes. This will be done at a later date following the restoration activities.

Based on the proposed restoration plan the stream channel will be slightly relocated and centered, the northern portion will be hardscaped to reduce erosion in the steeper section and "softscaped" through planting appropriate wetland plants on both sides of the stream where the stream enters the pond. The stream channel is currently approximately four to six feet wide in the proposed work area.

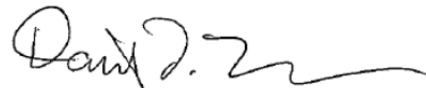
The original disturbance for which this restoration plan was prepared is estimated to be approximately 1200-1400 square feet. The upland portion of this area has already been partially restored by grading and seeding. We estimate that the proposed restoration work discussed in this plan will result in a **temporary disturbance** of approximately 1,100 square feet of wetland area during this restoration process with no net loss of wetland upon completion of the work. The proposed work will also require operation of equipment in a regulated area on the western portion of the site. The area will be somewhat protected by using a mat or planks on the area of emergent vegetation estimated to be approximately 2,100 square feet. The regrading and soil relocation work will be supervised and directed by R. Snarski.

Once this plan is approved by the Conservation Commission it will be implemented within 30 days of approval.

The plantings would be inspected 30 days after installation and at the end of the growing season. We will prepare a report for submittal to the Conservation Commission currently estimated to be on June 30 and on September 30, 2021, respectively. The reports will document the survival of the plantings and success of the soil stabilization areas and will include photographs.

Please feel free to contact me at (860) 705-8704 if you have any questions.

Sincerely,
Turner Environmental, LLC

A handwritten signature in black ink, appearing to read "David T. Turner", with a stylized flourish at the end.

David T. Turner, L.E.P.

Attachments Photographs of current conditions
 Sketches showing proposed work area and plantings

Rope Ferry Condominiums



Current conditions – looking north - area for proposed rip-rap extension and channel realignment. Channel along eastern bank to be relocated approximately two feet west – steep slope on west to be cut and added to eastern bank to amend soil and decrease slope.



Photo of northern portion of stream looking north showing steep slopes to be regraded. Organic soils from the western side will be used to amend soils on the lower eastern side to “extend” slope further west and amend soil. Stream channel to be relocated about two feet west from current location.

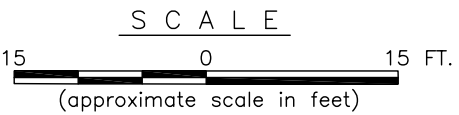
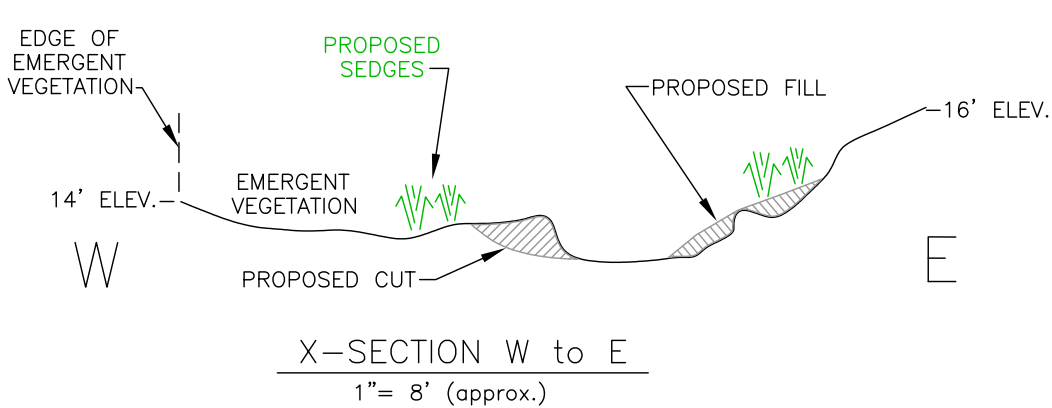
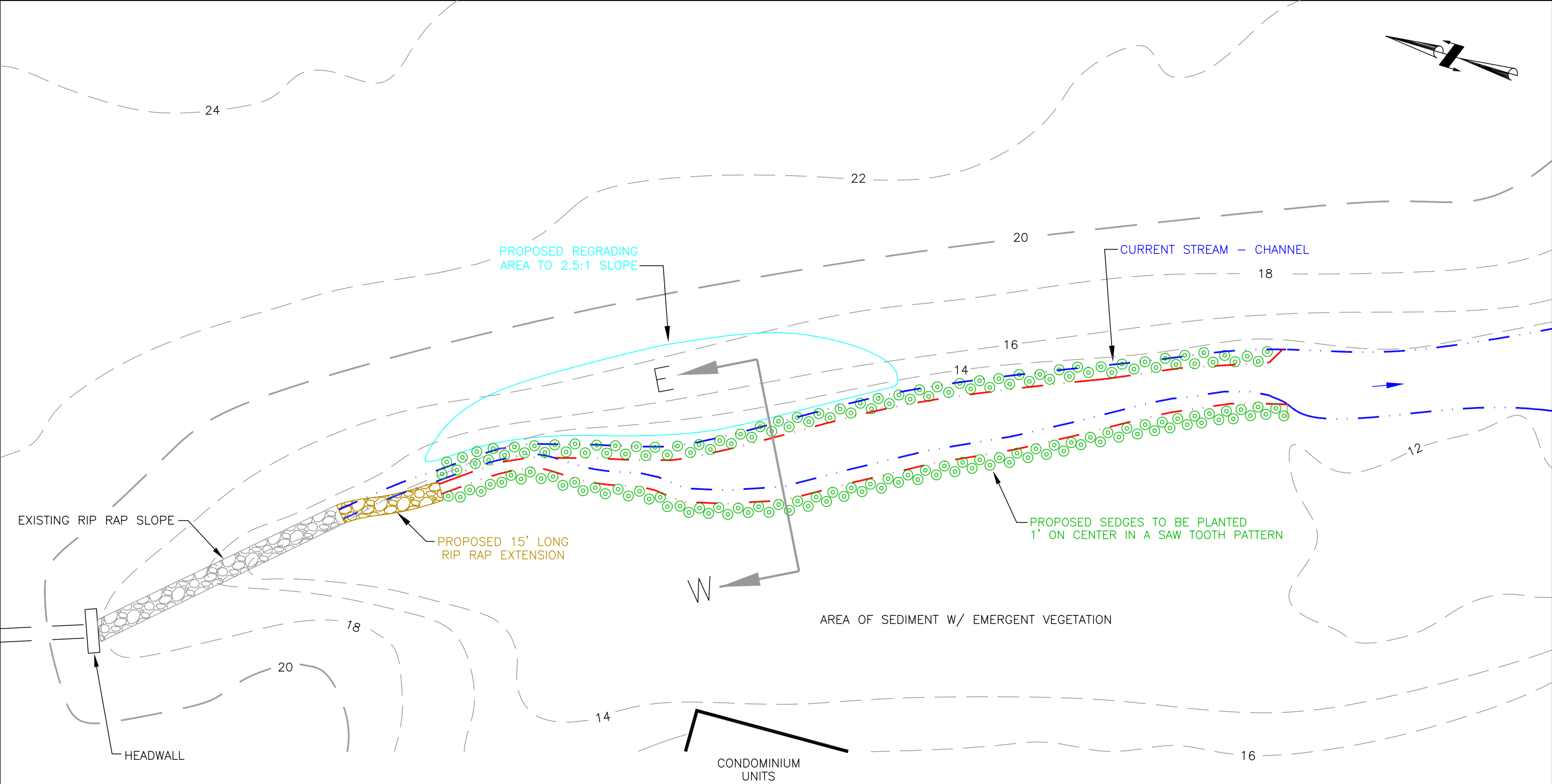
Rope Ferry Condominiums



Current conditiond showing steep slope on the northeastern portion of the stream to be regraded.



Current condition of stream on northern portion of the property.
Area proposed to extend rip-rap and redirect stream entry point.



Turner Environmental LLC P.O. Box 581 East Lyme, CT 06333 (860) 705-8704 turnerenviro@att.net	Figure 4 - Proposed Restoration Plantings	Drawn: KMH
		Date: 5/11/21
	Client: Rope Ferry Condominium Association, Inc.. 54 Rope Ferry Road Town of Waterford, New London County, Connecticut	Scale: AS SHOWN
		Project: TE17-015
		Figure: FIGURE 4