

STORMWATER POLLUTION CONTROL PLAN

Farmington Canal Heritage Trail Extension Cheshire, CT

State Project No.: 025-0144



Connecticut Department of Transportation-District 1
1107 Cromwell Avenue
Rocky Hill, CT 06067

February 2015

Prepared by:
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This Stormwater Pollution Control Plan (SPCP) is prepared to comply with the requirements for the General Permit for Stormwater Discharges (GPSD) from Construction Activities. Also to be considered part of the SPCP are the proposed construction plans, special provisions, and the Connecticut Department of Transportation's "Standard Specifications for Roads, Bridges and Incidental Construction" (Form 816) including supplements thereto and the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control* and the 2004 *Stormwater Quality Manual*

Stormwater Pollution Control Plan

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1. Site Description

Site Description

The purpose of this project is to extend a shared use path known as the Farmington Canal Heritage Trail in the town of Cheshire. The Farmington Canal trail covers 84 miles from New Haven, CT to Northampton, MA with gaps located in the town of Cheshire.

This project consists of constructing a 12-foot wide paved shared use path with a 2-foot stone dust shoulder from Jarvis Street to the Southington Town Line. The trail will be constructed utilizing the former railroad corridor and over three existing bridges (see location plan) which do not need any structural modifications. Stone ditches and underdrains will be provided along the trail as needed.

Site work includes temporary access roads due to the trail being built over the former rail corridor and has limited access. Crosswalks will be installed at the side roads and may require alternating one-way traffic.

At the beginning of the project at Jarvis Street, the multi-use trail will be connected to end of the town-designed trail project 25-135. The towns' project extends 1.6 miles south from Jarvis street to Route 68/70 (West Main Street). The project will be aligned on the former railroad corridor with a 12-foot wide pathway and a stone dust shoulder.

Estimated Disturbed Area

The total site area for this project is **21.96 acres**. Please see table below for area breakdowns.

Locations	Total Acres
Multi use trail Impervious Pavement Post construction	3.49
Road crossing Impervious Pavement	0.85
2' Stone dust along trail	0.58
Edge treatment	0.24
*Disturbed area	2.85
Untouched pervious soil in site post construction	13.95
	21.96

*Disturbed area of 2.84 acres is computed using the areas between edge of trail and sloping limits that will be affected during construction.

At the effective outfall location, the total drainage area is 0.17 acres with 0.03 acres of impervious pavement pre and post construction. See location plan attached, Appendix A.

Estimated Runoff Coefficient

The runoff coefficient assumed for pavement is 0.9. For the pervious areas, a coefficient of 0.25 is used and for the rail-bed ballast material a coefficient of 0.70 was assumed. .

The pervious area pre construction is the total site area minus the rail-bed ballast material and road crossing shown as follows.

$$21.96 \text{ acres} - (3.49 \text{ acres} + 0.85 \text{ acres}) = 17.62 \text{ acres of pervious area.}$$

Pre-Construction

$$\frac{(17.62 \text{ ac.} \times 0.25) + (0.85 \text{ ac.} \times 0.9) + (3.49 \text{ ac.} \times 0.70)}{17.62 \text{ ac.} + 0.85 \text{ ac.} + 3.49 \text{ ac.}} = \mathbf{0.35}$$

The runoff coefficient assumed for pavement is 0.9. For the pervious areas, a coefficient of 0.25 was assumed and for the stone dust and edge treatment area a coefficient of 0.25

The pervious and impervious pavement combinations used are as follows:

Pervious: Disturbed area + untouched pervious soil

$$2.85 \text{ acres} + 13.95 \text{ acres} = 16.80 \text{ acres}$$

Impervious: Multi-use paved trail + road crossings

$$3.49 \text{ acres} + 0.85 \text{ acres} = 4.34 \text{ acres}$$

Post Construction

$$\frac{(16.80 \text{ ac.} \times 0.25) + (4.34 \text{ ac.} \times 0.90) + (0.24 \text{ ac.} \times 0.25) + (0.58 \text{ ac.} \times 0.25)}{16.80 \text{ ac.} + 4.34 \text{ ac.} + 0.24 \text{ ac.} + 0.58 \text{ ac.}} = \mathbf{0.37}$$

The estimated average runoff coefficient of the site after construction activities are completed is 0.37

Receiving Waters

The storm water runoff not infiltrated in the ground will sheet flow from the wetlands located alongside the proposed trail. Once the storm runoff exceeds the capacity of the wetlands, the excess water will flow into the Farmington Canal that runs alongside of the majority of the trail eventually discharging into Ten Mile River.

Extent of Wetlands on Site

Although there are no anticipated direct wetland impacts, wetlands are located adjacent to the proposed construction throughout the project. In addition a vernal pool is also located in the vicinity of sta. 286+50 +/- east of the proposed constructions. At several locations, the construction activity will be within the 100-year flood limits as depicted in the plans.

2. Construction Sequencing

The contractor will be given approximately 12 months for the construction of all phases of the project. Prior to any work commencing a preconstruction meeting is required that should include ConnDOT, the contractor, utility representatives, and other agents who have responsibility and authority for the implementation, operation, monitoring and maintenance of the erosion and sediment (E&S) controls.

The duration of all construction activities are approximate and subject to change.

Preconstruction 15 days:

1. Conduct a preconstruction meeting
2. Clearly mark clearing limits and identify trees that need to be saved

Construction:

1. Remove the existing rail road ties within the project limits **(5 days)**
 - a. **NOTE:** The rail road spur located near the Kurt'z property (driveway) must be preserved
2. Perform clearing and grubbing for the trail corridor (start at Jarvis Street and work up station). Clear and grub for access road off Dickerman Road **(21 days combined)**
3. Install *Sedimentation* Control System and Erosion Controls **(3 days)**
4. *Excavate ballast material from Ten Mile River Bridge and reuse to build access road. **(5 days total including activity 6 & 7)**
 - a. Excavate ballast material from West Johnson Ave bridge and reuse it to build access road
 - b. Excavate ballast material from I-691 bridge and reuse it to build access road
5. When the Ten Mile bridge ballast material is removed, repair the Bridge's membrane and place process aggregate base to the elevation shown on the plans. **(37 days)**
6. Repeat the same operation for West Johnson Ave and I-691 bridges as described in paragraph 4
7. Complete bridge work as indicated on the structural plans (except for paving operations)
8. Construct temporary turnaround areas **(3 days)**
9. Excavate to subgrade & contaminated material along the remainder of the trail. **(10 days)**
10. Prepare formation of subgrade for the trail **(3 days)**
11. Install process aggregate base material **(4 days)**
12. Excavate for edge treatments, install geotextile material, underdrains and special rip rap **(16 days)**
 - a. Maximum area allowed of disturbance of 5 acres at any given time.
13. Install pavement layers and stone dust material to a finished grade **(22 days)**

14. Installed paved areas for benches, picnic tables and trash receptacles *(6 days)*
15. Stake out fence locations. *(21 days, between activity 15 & 16)*
16. Install fencing and railing along the corridor
17. Remove turnaround areas *(4 days)*
18. Install signage and pavement markings as indicated on the plans *(8 days)*
19. Install landscaping *(5 days)*
20. Remove temporary access road and reestablish area to its original conditions. *(3 days)*
21. Remove temporary erosion controls *(1 day)*
22. Perform final cleanup *(4 days)*

Approximately 210 working days

If the construction sequencing activities create an area of disturbance between two (2) acres and five (5) acres per discharge point, the Contractor must submit to the Engineer a revised SWPCP for review and approval. The SWPCP must include locations of the temporary sedimentation trap per discharge point with a capacity to contain 134 cubic yards per acre of material as per 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, page 5-11-25. The Contractor shall provide an inspection and maintenance plan for the temporary sedimentation trap as part of the amended SWPCP.

*For excavating ballast material see attached special provision items #0202315A – Disposal of Controlled Materials and #101117A – Controlled Materials Handling. When handling controlled materials (item #101117A) all suitable material excavated from the AOEC's may be reused within the AOEC from which it was excavated as fill/backfill as long as it is in accordance with the following conditions: (1) such soil is deemed to be structurally suitable as fill by the engineer. (2) The soil is not placed below the water table. (3) The CT DEEP groundwater classification of the area is not to be reused as fill. (4) The soil is not to be placed in an area that is subject to erosion.

3. Control Measures

Erosion and Sedimentation Controls

The location of the project is not within any locations of an aquifer protection area. However, CT DOT will have construction inspection personnel assigned to the project in order to oversee the Contractor's operations to ensure compliance with the provisions of the Standard Specifications. Further CT DOT oversight is provided by the District 1 Environmental Coordinator and the Office of Environmental Planning.

The following timelines will be followed for the proposed construction activities:

- If construction activities are complete or have been temporarily halted for more than seven (7) days, stabilization activities will be implemented within three (3) days.
- Areas that remain disturbed but inactive for at least 30 days shall receive temporary seeding or soil protection within seven (7) days.
- Disturbed areas that do not establish a vegetative cover within 30 days of seeding shall have erosion control blankets installed. Prior to the erosion control blanket installation, the soil would be prepared with the application of lime, fertilizer, and seed.
- Areas and the grounds that will be disturbed past the planting season will be covered with a long-term, non-vegetative stabilization method that will provide protection through the winter.
- Stabilization practices will be implemented as quickly as possible in accordance with the Guidelines.
- The Contractor shall stabilize disturbed areas with temporary or permanent measures as quickly as possible after the land is disturbed. Requirements for soil stabilization are detailed in Form 816 Section 1.10.03, Best Management Practices.
- In the event of a flood, the contractor should make every effort to secure the site prior to a major storm event. In the event of an anticipated storm/ flood event, no materials shall be stored and no staging areas should be placed below the 100-year elevation. Any material that can be hazardous to humans, animals or plant life should not be placed within the 500-year elevation. A construction-sequencing plan and water-handling plan with a contingency plan for flooding events must be submitted by the contractor and approved by the engineer prior to construction when working near a waterway.

Temporary Stabilization Practices

- Erosion Control Matting: On slopes steeper than 2:1 erosion control matting shall be used to stabilize the topsoil.
- Silt Fence: Silt fence shall be placed at the base of embankments (fill slopes).
- Anti-Tracking Pads: Construction entrances (gravel anti-tracking pads) shall be constructed at truck access points to off-road route.
- Dust Control: Routine sweeping and application of dust suppression agents, including water and calcium chloride, over exposed subbase shall be completed for dust control.

Stabilization practices shall be implemented no more than three days after completion, as final grades are reached, or if work has been suspended for more than seven days.

Temporary seeding shall be spread over any disturbed areas which will remain inactive for at least 30 days. Areas to remain disturbed through winter shall be protected with non-vegetative stabilization measures. The Contractor must provide an Erosion and Sedimentation Control plan for each winter season during construction operations.

The Contractor may use other controls in the project as necessary that shall conform to the 2002 Connecticut Erosion and Sedimentation Guidelines and are approved by the Engineer. The contractor will be required to provide the necessary details for any erosion controls not specifically called for on the project plans.

During construction, all areas disturbed by the construction activity that have not been stabilized, structural control measures, and locations where vehicles enter or exit the site shall be inspected at least once every seven calendar days. These areas shall also be inspected within 24 hours following any storm in which 0.5 inches or greater of rain occurs.

Stockpile stabilization area shall conform to the Erosion and Sedimentation Control Manual. In addition, if the stockpile is not used within 30 days it needs to be seeded and mulched. A Polyethylene cover shall be placed over the stockpile at all times other than load-in or load-out's. The maximum slope allowed is 1:1 with sand bags placed around the perimeter is required to secure the polyethylene sheeting. Please see environmental plans (ENV-14) for detailed instructions.

Permanent Stabilization Practices

All new embankments disturbed by construction and unpaved areas that are graded or disturbed by construction will receive erosion control matting, topsoil and/or turf establishment. The Contractor shall use permanent stabilization practices approved by the Engineer and conforming to Connecticut's Erosion and Sedimentation Control Guidelines (2002).

Structural Measures

Because of the sheet flow on the trail no stormwater structure measures are required however, there are 5 culverts already in place along the trail that mitigate runoff water and underground flow from each side of the trail. There is no proposed construction work to be done on these structures and will stay in place post-construction.

Approximately 17 inches of the ballast material will be removed from the bridges. In case of a storm event, should the bridge decks be filled with storm water after the ballast material is removed, pumps will be available on site for emergency use to dewater the bridge decks. The ballast material removed from the bridges will be sufficient for use of the anti-tracking pads on

the access roads and had been coordinated with Environmental Compliance.

Maintenance

All construction activities and related activities shall conform to the requirements of Section 1.10 "Environmental Compliance" of ConnDOT's Standard Specifications, Form 816. In general, all construction activities shall proceed in such a manner so as not to pollute any wetlands, watercourses, water body, and conduit carrying stormwater. The Contractor shall limit, in so far as possible, the surface area of earthen materials exposed by construction activity and immediately provide temporary and permanent pollution control to prevent soil erosion and contamination on the site. Water pollution control provisions and best management practices per Section 1.10.03 of the Standard Specifications shall be administered during construction. Control measures shall be inspected and maintained in accordance with the 2002 Guidelines and as directed by the Engineer.

Post-construction maintenance will be under the responsibility of the town of Cheshire. Including but not limited to general tree clearing of overgrown branches, landscaping, trail, pavement repairs, pavement markings, trail amenities and restroom facilities.

4 Dewatering Wastewaters

Dewatering Guidelines

If encountered, dewatering wastewaters will be infiltrated into the ground unless otherwise directed by the Engineer. When dewatering is necessary, pumps used shall not be allowed to discharge directly into a wetland or watercourse. Prior to any dewatering, the Contractor must submit to the Engineer a written proposal for specific methods and devices to be used, and must obtain the Engineer's written approval of such methods and devices, including, but not limited to, the pumping of water into a temporary sedimentation basin, providing surge protection at the inlet or outlet of pumps, floating the intake of a pump, or any other method for minimizing and retaining the suspended solids. If the Engineer determines that a pumping operation is causing turbidity problems, the Contractor shall halt said operation until a means of controlling the turbidity is submitted by the Contractor in writing to the Engineer, approved in writing by the Engineer and implemented by the Contractor. No discharge of dewatering wastewater shall contain or cause a visible oil sheen, floating solids or foaming in the receiving water. If required, all activities are to be performed in compliance with ConnDOT Form 816.

5. Post-Construction Stormwater Management

Post-construction Guidelines

After the project is complete, the Town of Cheshire will perform the following maintenance and restorative measures:

- Litter/debris will be removed from the site.
- Mowing and maintenance of the turf areas and vegetated areas will occur as needed.
- Riprap outlet protection will be inspected and repaired annually or as needed.
- Maintenance of stone dust shoulder.

Post Construction Performance Standards

The existing site is mostly pervious, with the exception of the road crossings classifying the project as “Other Development”. The following values were calculated for post-construction.

Effective Impervious Cover:

$$\begin{aligned} \text{Effective Impervious Cover} &= \frac{\text{Proposed impervious Area (acre)} + \text{Road Crossings (acre)}}{\text{Total Area of Site (acre)}} \times 100\% \\ &= \frac{[12\text{ft (Paved surface)} \times (2.4\text{mile} \times 5280\text{ft})] + 0.85 \text{ acres}}{21.96 \text{ acres}} \\ &= \frac{4.34 \text{ acres}}{21.96 \text{ acres}} \times 100\% \\ &= \mathbf{19.76\%} \end{aligned}$$

With the site being classified as “other development”, the site must be designed to retain the full water quality volume. All of the stormwater on the 4.34 acres of impervious pavement will be treated as sheet flow prior to it reaching its discharge point at Ten Mile River.

Velocity Dissipation:

Splash pad computations are in the attached appendix B.

6. Other Controls

Waste Disposal

Construction site waste shall be properly managed and disposed of during the entire construction period. The contractor will be responsible for removing all waste disposal.

- A waste collection area will be designated. Construction traffic will be minimized through the area.

- Waste collection shall be scheduled regularly to prevent the containers from overflowing.
- Spills shall be cleaned up immediately.
- Defective containers that may cause leaks or spills will be identified through regular inspection. Any found to be defective will be repaired or replaced immediately.
- Any stockpiling of materials should be confined to the designated area as defined by the engineer.

Locations of waste disposal areas are located on environmental plans attached. Environmental plan sheet No. 14.

Washout Areas

Washout of applicators, containers, vehicles and equipment for concrete shall be conducted in a designated washout area. No surface discharge of washout wastewaters from the area will be allowed. All concrete washwater will be directed into a container or pit such that no overflows can occur. Washout shall be conducted in an entirely self-contained system and will be clearly designed and flagged or signed where necessary. The washout area shall be located outside of any buffers and at least 50 feet from any stream, wetland or other sensitive water or natural resources as determined or designated by CTDOT Office of Environmental Planning. Approximate washout area located on plan sheet 10 adjacent to temporary access road, see plans for details.

The designated area shall be designed and maintained such that no overflows can occur during rainfall or after snowmelt. Containers or pits shall be inspected at least once a week to ensure structural integrity, adequate holding capacity and will be repaired prior to future use if leaks are present. The contractor shall remove hardened concrete waste when it accumulates to a height of ½ of the container or pit or as necessary to avoid overflows. All concrete waste shall be disposed of in a manner consistent with all applicable laws, regulations and guidelines.

Anti-tracking Pads and Dust Control

Off-site vehicle tracking of sediment and the generation of dust shall be minimized. Temporary anti-tracking pads from the active work site to the existing pavement will be installed and maintained at the locations shown on the plans. The contractor shall:

- Maintain the entrance in a condition which will prevent tracking and washing of sediment onto paved surfaces.
- Provide periodic top dressing with additional stone or additional length as conditions demand.
- Repair any measures used to trap sediment as needed.
- Immediately remove all sediment spilled, dropped, washed or tracked onto paved surfaces.
- Ensure roads adjacent to a construction site are left clean at the end of each day.

If the construction entrance is being properly maintained and the action of a vehicle traveling over the stone pad is not sufficient to remove the majority of the sediment, then the contractor shall either:

- Increase the length of the construction entrance,
- Modify the construction access road surface, or
- Install washing racks and associated settling area or similar devices before the vehicle enters a paved surface.

For construction activities which cause airborne particulates, wet dust suppression shall be utilized. Construction site dust will be controlled by sprinkling the ground surface with water until it is moist on an as-needed basis. The volume of water sprayed shall be such that it suppresses dust yet also prevents the runoff of water.

Post-Construction

Upon completion of construction activities and stabilization of the site, all post-construction stormwater structures, including the existing 5 culverts, shall be cleaned of construction sediment and any remaining silt fence shall be removed prior to acceptance of the project by CTDOT. Sediment shall be properly disposed of in accordance with all applicable laws, regulations and guidelines.

Maintaining and Storing Vehicles and Equipment

The contractor shall take measures to prevent any contamination to wetlands and watercourses while maintaining and storing construction equipment on the site. All chemical and petroleum containers stored on site shall be provided with impermeable containment which will hold at least 110% of the volume of the largest container, or 10% of the total volume of all containers in the area, whichever is larger, without overflow from the containment area. All chemicals and their containers shall be stored under a roofed area except for those stored in containers of 100 gallon capacity or more, in which case double-walled tanks will suffice.

7. Inspections

Inspection Guidelines

All construction activities shall be inspected initially for plan implementation and then weekly for routine inspections.

During construction, all areas disturbed by the construction activity that have not been stabilized, all erosion and sedimentation control measures, all structural control measures, soil stockpile

areas, washout areas and locations where vehicles enter or exit the site shall be inspected for evidence of, or the potential for, pollutants entering the drainage system and impacts to receiving waters at least once every seven calendar days and within 24 hours of the end of a storm that generates a discharge.

For storms that end on a weekend, holiday or other time in which working hours will not commence within 24 hours, an inspection is required within 24 hours only for storms that equal or exceed 0.5 inches. For lesser storms, inspection shall occur immediately upon the start of subsequent normal working hours.

Where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three months.

Qualified personnel provided by the DOT District 1 Office shall conduct Inspections.

Items to be inspected: the following items shall be inspected as described below:

<u>Item</u>	<u>Procedure</u>
Silt Fence	Silt fence shall be inspected to ensure that the fence line is intact with no breaks or tears. The fence shall be firmly anchored to the ground. Areas where the fence is excessively sagging or where support posts are broken or uprooted shall be noted. Depth of sediment behind the fence shall be noted.
Catch Basin Protection	Protective measures shall be inspected to ensure that sediment is not entering the catch basins. Catch basin sumps shall be monitored for sediment deposition. Hay bales shall be inspected to ensure they have not clogged.
Vehicle Entrances / Exits	Locations where vehicles enter or exit the site shall be inspected for evidence of off-site tracking.
General	Construction areas and the perimeter of the site shall be inspected for any evidence of debris that may blow or wash off site or that has blown or washed off site. Construction areas shall be inspected for any spills or unsafe storage of materials that could pollute off site waters.

8. Keeping Plans Current

Revisions to Stormwater Pollution Control Plans:

CTDOT shall amend the Plan if the actions required by the Plan fail to prevent pollution or otherwise comply with provisions of the General Permit. The Plan shall also be amended whenever there is a change in contractors or sub-contractors at the site. If the results of the inspections require modifications to the Stormwater Pollution Control Plan, the plans shall be revised as soon as practicable after the inspection. Such modifications shall provide for a timely implementation of any changes to non-engineered controls on the site within 24 hours and implementation of any changes to the plan within 3 (three) calendar days following the inspection. For Engineered measures, corrective actions shall be implemented on site within 7 (seven) days and incorporated into a revised Plan within 10 (ten) days of the date of inspection

In no event shall the requirements to keep the Plan current or update a Plan, relieve the permittee and their contactor(s) of the responsibility to properly implement any actions required to protect the waters of the State and to comply with all conditions of the permit.

9. Monitoring Requirements

A written report summarizing the scope of the inspection, the name(s) and qualifications of inspection personnel, the date and time of the inspection, major observations relative to the implementation of the Pollution Control Plan, and actions taken shall be completed within 24 hours of the inspection. This report shall be retained as part of the Stormwater Pollution Control Plan for at least five years after the date of the inspection.

Turbidity monitoring shall be conducted at the three existing culvert locations depicted on the Plan utilizing a procedure consistent with 40 CFR Part 136 (http://www.epa.gov/region9/qa/pdfs/40cfr136_03.pdf) and may be taken manually or by an in-situ turbidity probe or other automatic sampling device equipped to take individual turbidity readings. The first sample shall be taken within the first hour of stormwater discharge from the site and at least three grab samples shall be taken during a storm event and shall be representative of the flow and characteristics of the discharge. Sampling shall be conducted at least monthly when there is a discharge of stormwater from the site while construction activity is ongoing, until final stabilization of the drainage area associated with each outfall is achieved.

Samples shall be taken during normal working hours, which for this project shall be defined as Monday through Friday, 8 am to 6 pm. If a storm continues past working hours, sampling shall

resume the following morning or the morning of the next working day following a weekend or Holiday, as long as the discharge continues. Sampling may be temporarily suspended when conditions exist that may reasonably pose a threat to the safety of the person taking the sample.

Within 30 days following the end of each month, the stormwater sampling results shall be submitted on the Stormwater Monitoring Report (SMR) and submit in accordance with Net DMR. If there is no stormwater discharge during a month, sampling is not required, however, SMR's indicating "no discharge" shall still be submitted as required.

10. Contractors

General

This section shall identify all Contractors and Subcontractors who will perform on site actions which may reasonably be expected to cause or have the potential to cause pollution of the waters of the State.

Certification Statement

All contractors and subcontractors must sign the attached statement. All certification will be included in the Stormwater Pollution Control Plan.

State Project No. 25-144

Farmington Canal Heritage Trail Extension
Cheshire, CT

“I certify under penalty of law that I have read and understand the terms and conditions of the general permit for the discharge of stormwater associated with construction activity. I understand that as Contractor on the project, I am covered by this general permit, and must comply with the terms and conditions of this permit, including, but not limited to, the requirements of the Stormwater Pollution Control Plan prepared for this project.”

GENERAL CONTRACTOR

Signed: _____

Date: _____

Title: _____

Firm: _____

Telephone: _____

Address: _____

SUBCONTRACTOR

Signed: _____

Date: _____

Title: _____

Firm: _____

Telephone: _____

Address: _____

General:

This Stormwater Pollution Control Plan (SPCP) is prepared to comply with the requirements for the General Permit for Stormwater Discharges (GPSD) from Construction Activities. Also to be considered part of the SPCP are the proposed construction plans, special provisions, and the Connecticut Department of Transportation’s “Standard Specifications for Roads, Bridges and Incidental Construction” (Form 816) including supplements thereto and the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control and 2004 Stormwater Quality Manual.

List of applicable Figures / Plans:

Appendix A - Figures

Location Map	Figure 1
Outlet Location Plans	Figure 2

Appendix B – Drainage Calculations

Drainage Areas Associated with Each Outfall	Figure 3
Splash Pad Rip Rap Computations	

Appendix C – Plan Sheets

Highway Plan set of drawings

Appendix D – Stormwater Monitoring Report Form

Appendix E – Notice of Termination Form

Appendix F – Flood Management General Certification

Appendix G – Specifications for Controlled Materials Handling & Disposal of Controlled Materials

APPENDIX A
Location Map

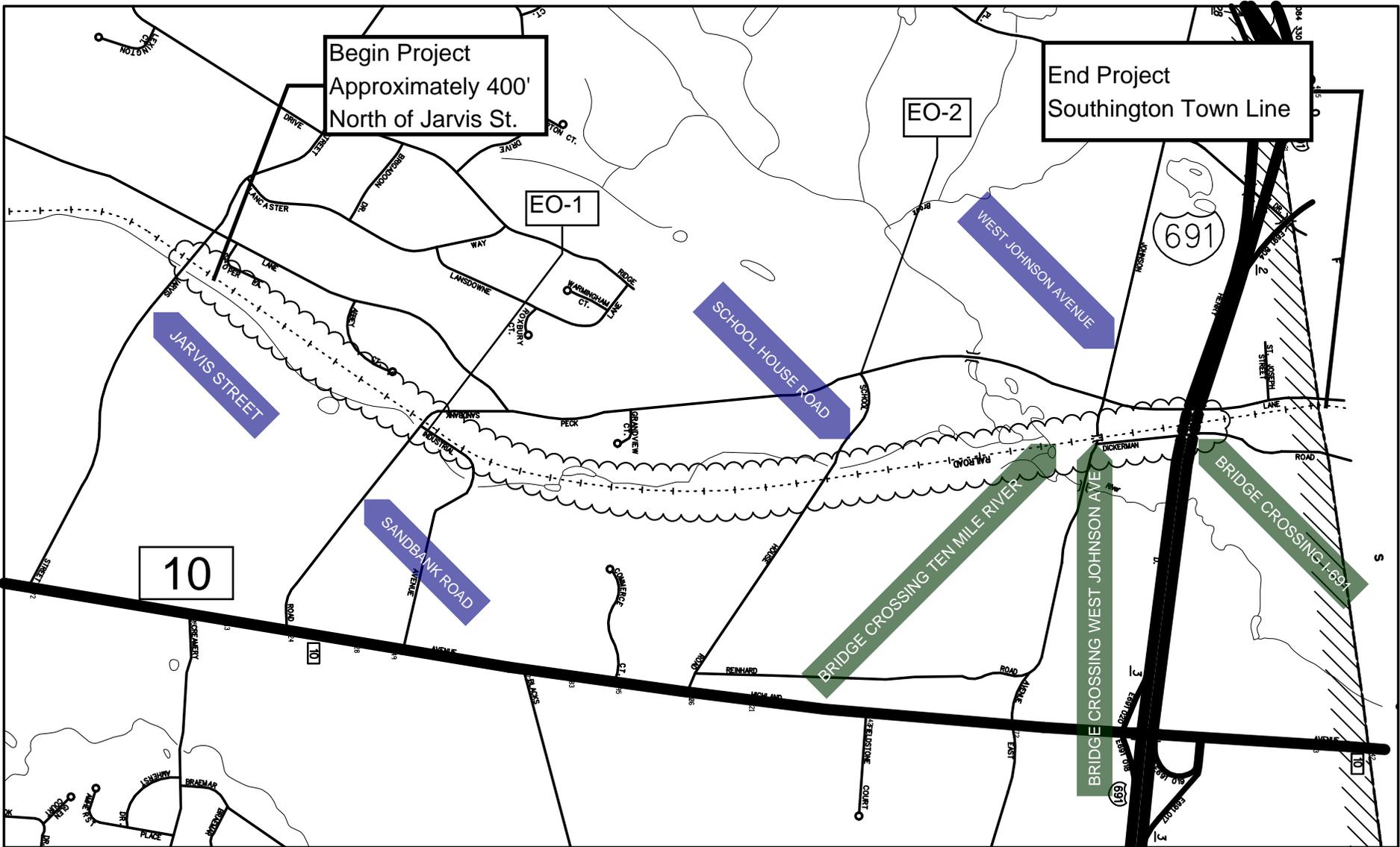


Figure 1

STATE PROJECT NO.:
25-144
 CITY/TOWN:
Town of Cheshire

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION

**Farmington Canal
 Heritage Trail Extension**

OFFICE OF
 ENGINEERING


DATE:



**Total area draining into Outfall EO- 1:
7,524 SF (0.17 ac)**

**Impervious area within drainage
pre-construction: 1,185 SF (0.03 ac)**

**Impervious area within drainage area post
construction: 1,185 SF (0.03 ac)***

Follows edge of trail, top of cross
slope.

EO- #1

**Due to the cross slope of the trail sloping in the westward direction none of the rainfall associated with landing on the impervious 12' trail flows into the Outfall shown.*

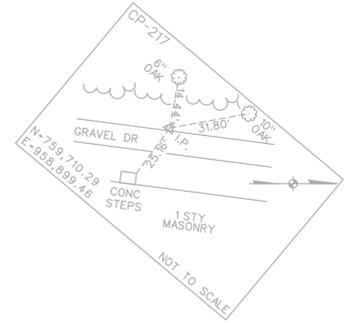
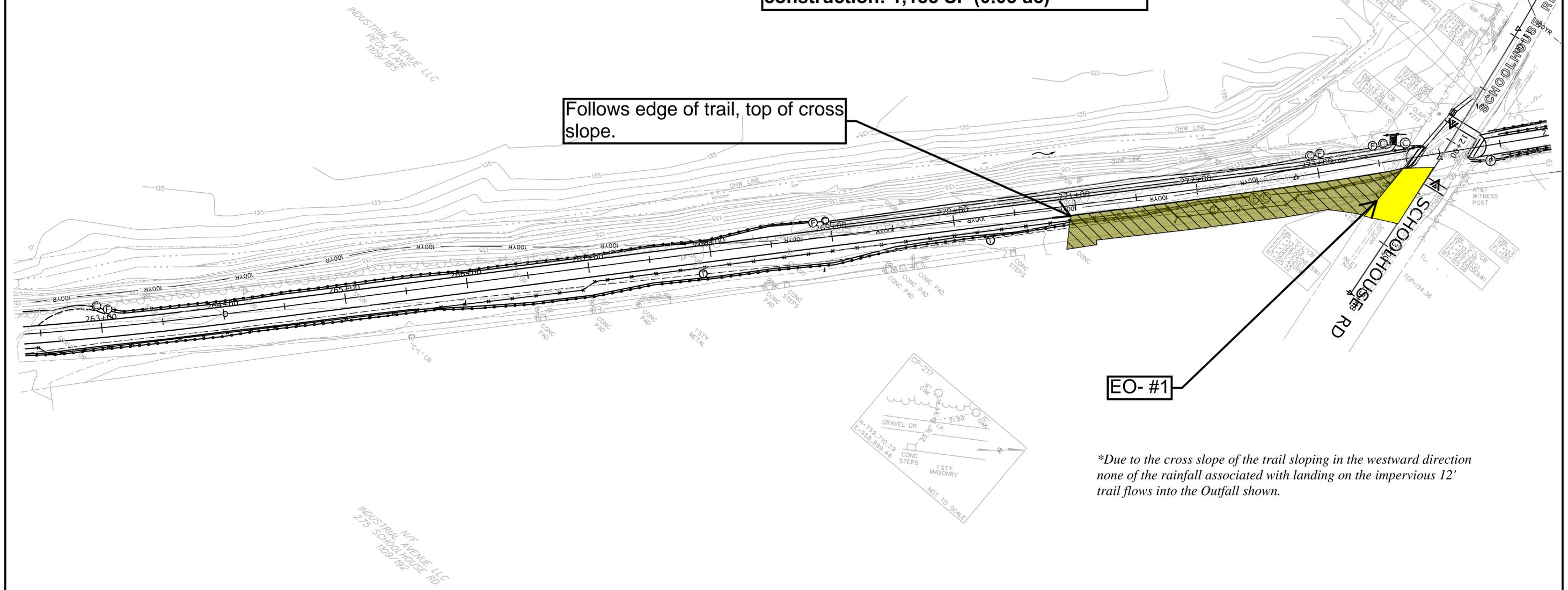


Figure 2

DESIGNER/DRAFTER: MS	<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p>	SIGNATURE/ BLOCK: OFFICE OF ENGINEERING	PROJECT TITLE: FARMINGTON CANAL HERITAGE TRAIL EXTENSION	TOWN: CHESHIRE	PROJECT NO. 25-144
CHECKED BY: VS		APPROVED BY:		DRAWING TITLE: CONSTRUCTION PLAN	DRAWING NO. PLN-06
SCALE IN FEET 0 40 80 SCALE 1"=40'	Plotted Date: 1/9/2015	Filename: ...2d Highway Sheets\Hwy 06.dgn			SHEET NO.

REV.	DATE	REVISION DESCRIPTION	SHEET NO.
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

APPENDIX B
Drainage Calculations

For the Drainage area associated with each outfall: Effective Impervious Area After Construction

Outfall #	Size	Width of Paved Trail (Ft)	Outfall Station	Collecting Start Station	Total length (Ft)	Total Effective Impervious Area (SF)	Total Drainage Area (SF)
EO-1*	36"	12	273+75	271+25	250	0	7,524

		Total	0	
<i>Existing drainage imperivous area associated</i>				
EO-1	36"	Existing area of drainage picked up from road intersection at Schoolhouse Road →	1,185	
		Total SF _{after construction}	1,185	7,524
		Acres	0.03	0.17

* EO - 1: All flow on the proposed impervious 12 foot wide trail sheet flows in a westward direction **away** from the outfall location. Therefore is not incorporated into the total effective impervious area which consists of the existing roadway area on Schoolhouse Drive depicted on the plans.

Note: Total effective Impervious Area associated with each outfall is shown on attached plans in Appendix A .

EST. BY:	MS	DATE:	1/14/2015	DEPARTMENT OF OFFICE OF ENGINEERING	PROJ. NO.:	25-144
CHECKED BY:	VS	DATE:	1/14/2015			1 of 1
Farmington Canal Heritage Trail Extension						
Rational Method (Station 269+00 to 273+60 Left)						
Area to Outlet =	20,072 sq. ft. (0.46 ac.)					
Cross Sectional Area of Grass Ditch	1 sq. ft					
Elevation Difference	133.13-130.76=2.37					
Slope of Channel	2.37/475'=.005					
Flow Length	475 ft					
Time of Concentration	26 min					
Rainfall Intensity 10 yr Storm Ref: Drainage Manual (Table B-2.1)	3.1 in/hr					
Weighted Runoff Coefficient	C=0.9 pavement C=0.25 Turf Area					
	Cw= 5520 sq. ft. x (0.9) + 14552 sq. ft x (0.25)		=		0.43	
	20,072 sq. ft					
Rational Flow	Q=(0.43)x(3.1 in/hr)x(0.46 ac.)		=		0.61 cfs	
			Round to		1 cfs	
Velocity in Channel			V=Q/A=1cfs/1 sq. ft		1 ft/s	
Use Modified Riprap As assumed by Table 11.11						
Width of Splash Pad	W=3Sp					
Assume Sp=2'	W=3x2'		W=6'			
Length of Splash Pad at Outlet (Assume Eq. 11.31)						
Use Type A riprap for a Min. Tailwater condition	La=1.80(Q-5)/Sp ^{1.5} +10					
	La=1.80(1-5)/2 ^{1.5} +10		=		7.5 ft	
Riprap Splash Pad Final Dimensions	6' x 7.5'					
Rounded Dimensions	6' x 8'					

EST. BY:	MS	DATE:	1/14/2015	DEPARTMENT OF TRANSPORTATION	PROJ. NO.:	25-144
CHECKED BY:	VS	DATE:	1/14/2015			
Farmington Canal Heritage Trail Extension						
Riprap Splash Pad Computation (Sta. 212+50 Rt)						
Elevation Difference	165.39-163.55=1.84					
Length of Underdrain	L=361 ft					
Slope of Underdrain	1.84/361'=0.005					
Cross Sectional Area of 6" Underdrain	0.2 sq. ft					
Wetted Perimeter	1.57					
Hydraulic Radius R=A/Pw	0.13					
Mannings Coefficient Chapter 8 (Appendix A) (Plastic Pipe)	0.015					
Assume Full Flow for 6" Underdrain Calculate Flow using Mannings Eqn.	$Q = A \times 1.49 (R)^{2/3} (S)^{1/2}$					
	n					
	$Q = (0.2) \times 1.49 \times (0.13)^{2/3} \times (0.005)^{1/2}$					
	0.015					
	=					
	0.35					
	cfs					
	Round to					
	0.5					
	cfs					
Velocity at Outlet of drain	V=Q/A=.5cfs/0.2 sq. ft					
Use Modified Riprap See Table 11.11	2.5 ft/s					
Length of Apron	$L = 5 \times D + 3 \text{ ft}$	$L = 5 \times (0.5 \text{ ft}) + 3 \text{ ft}$	L=5.5 ft			
Width (at end of apron)	$W = 3 \times D + (2/3) \times L$	$W = 3 \times 0.5' + (2/3) \times (5.5')$	W=5.2 ft	Use 5 ft		
Width at outlet of U drain	$W = 3 \times D$	$W = 3 \times 0.5 \text{ ft}$	W=1.5 ft			
Depth of Riprap	$D = 2.4 \times D_{50}$	$D = 2.4 \times 10"$	Depth=24"			
Refer to next Sheet for typical layout.						
"Hydraulic Design of Engery Dissipators for Culverts and Channels"						

HYDRAULIC DESIGN OF ENERGY DISSIPATORS FOR CULVERTS AND CHANNELS

10.2 RIPRAP APRON

The most commonly used device for outlet protection, primarily for culverts 1500 mm (60 in) or smaller, is a riprap apron. An example schematic of an apron taken from the Federal Lands Division of the Federal Highway Administration is shown in Figure 10.4.

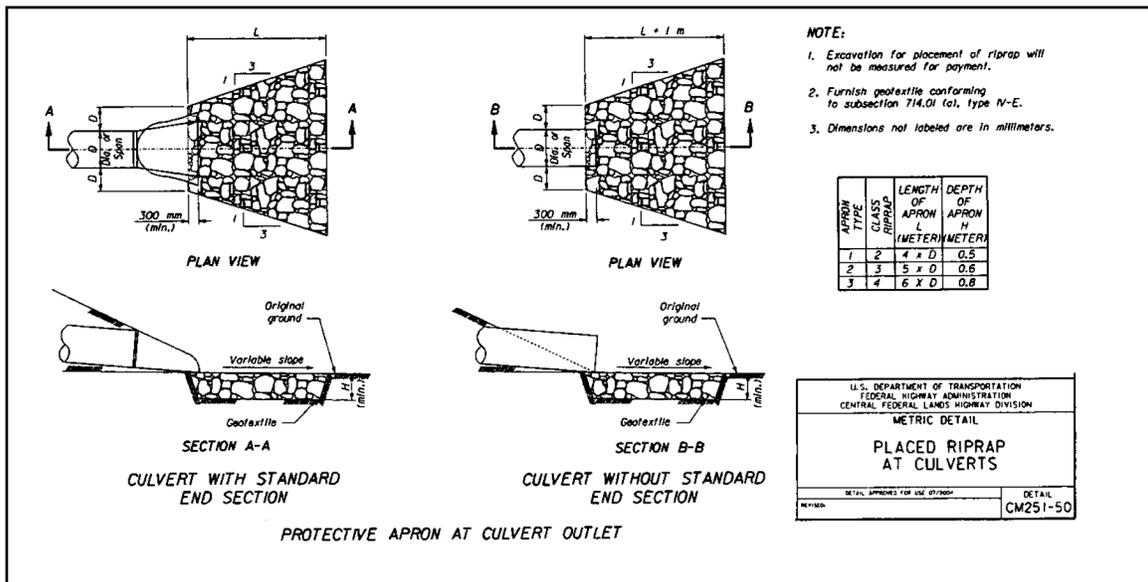
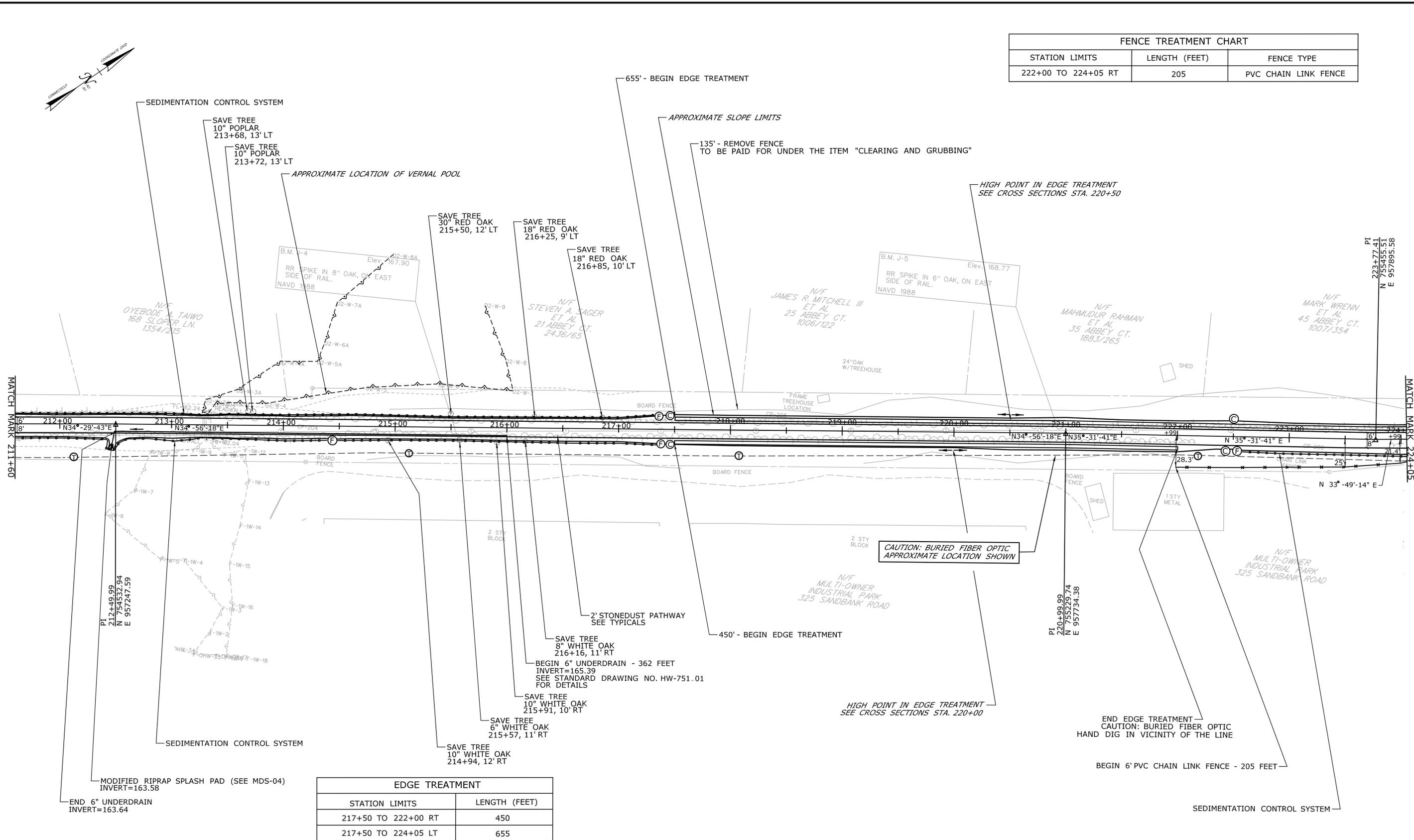


Figure 10.4. Placed Riprap at Culverts (Central Federal Lands Highway Division)

They are constructed of riprap or grouted riprap at a zero grade for a distance that is often related to the outlet pipe diameter. These aprons do not dissipate significant energy except

APPENDIX C
Plan Sheets

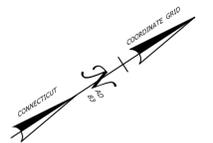
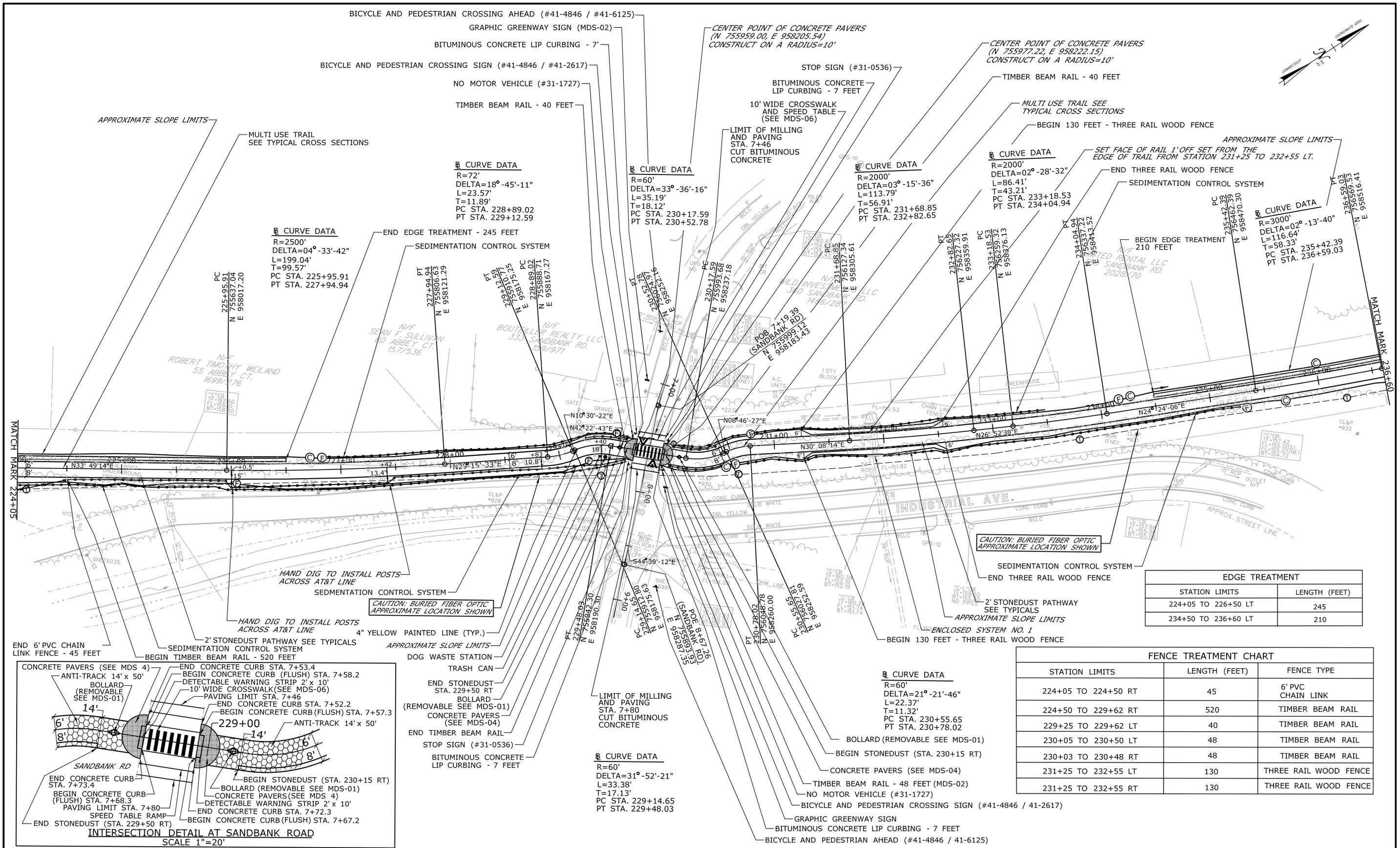
FENCE TREATMENT CHART		
STATION LIMITS	LENGTH (FEET)	FENCE TYPE
222+00 TO 224+05 RT	205	PVC CHAIN LINK FENCE



EDGE TREATMENT	
STATION LIMITS	LENGTH (FEET)
217+50 TO 222+00 RT	450
217+50 TO 224+05 LT	655

SEE TYPICAL CROSS SECTIONS (TYP-01) FOR EDGE TREATMENT DETAILS

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.	DESIGNER/DRAFTER: MS	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/ BLOCK: 	PROJECT TITLE: FARMINGTON CANAL HERITAGE TRAIL EXTENSION	TOWN: CHESHIRE	PROJECT NO. 25-144
	CHECKED BY: VS					
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B CURVE DATA
 R=2500'
 DELTA=04°-33'-42"
 L=199.04'
 T=99.57'
 PC STA. 225+95.91
 PT STA. 227+94.94

B CURVE DATA
 R=72'
 DELTA=18°-45'-11"
 L=23.57'
 T=11.89'
 PC STA. 228+89.02
 PT STA. 229+12.59

B CURVE DATA
 R=60'
 DELTA=33°-36'-16"
 L=35.19'
 T=18.12'
 PC STA. 230+17.59
 PT STA. 230+52.78

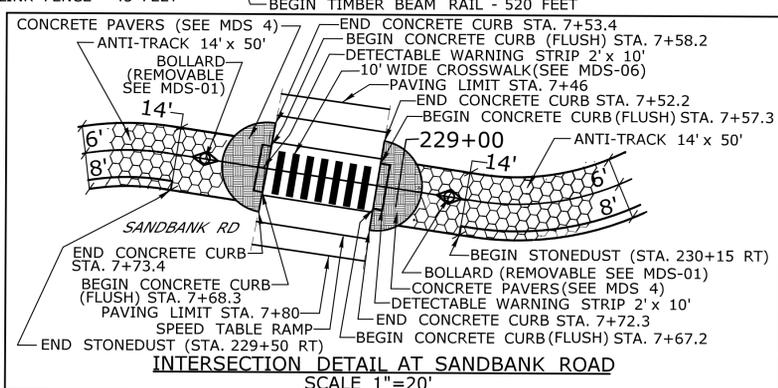
B CURVE DATA
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 DELTA=03°-15'-36"
 L=113.79'
 T=56.91'
 PC STA. 231+68.85
 PT STA. 232+82.65

B CURVE DATA
 R=2000'
 DELTA=02°-28'-32"
 L=86.41'
 T=43.21'
 PC STA. 233+18.53
 PT STA. 234+04.94

B CURVE DATA
 R=3000'
 DELTA=02°-13'-40"
 L=116.64'
 T=58.33'
 PC STA. 235+42.39
 PT STA. 236+59.03

EDGE TREATMENT	
STATION LIMITS	LENGTH (FEET)
224+05 TO 226+50 LT	245
234+50 TO 236+60 LT	210

FENCE TREATMENT CHART		
STATION LIMITS	LENGTH (FEET)	FENCE TYPE
224+05 TO 224+50 RT	45	6' PVC CHAIN LINK
224+50 TO 229+62 RT	520	TIMBER BEAM RAIL
229+25 TO 229+62 LT	40	TIMBER BEAM RAIL
230+05 TO 230+50 LT	48	TIMBER BEAM RAIL
230+03 TO 230+48 RT	48	TIMBER BEAM RAIL
231+25 TO 232+55 LT	130	THREE RAIL WOOD FENCE
231+25 TO 232+55 RT	130	THREE RAIL WOOD FENCE



REV.	DATE	REVISION DESCRIPTION	SHEET NO.
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DESIGNER/DRAFTER: **MS**
 CHECKED BY: **VS**
 SCALE IN FEET
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 SCALE 1"=40'

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION

OFFICE OF ENGINEERING

APPROVED BY: *Willie B. Burt*

PROJECT TITLE: **FARMINGTON CANAL HERITAGE TRAIL EXTENSION**

TOWN: **CHESHIRE**

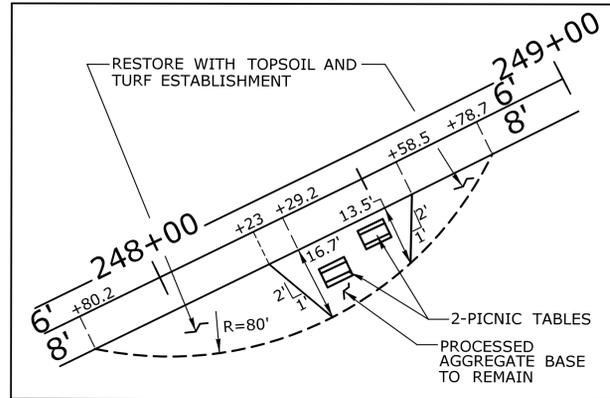
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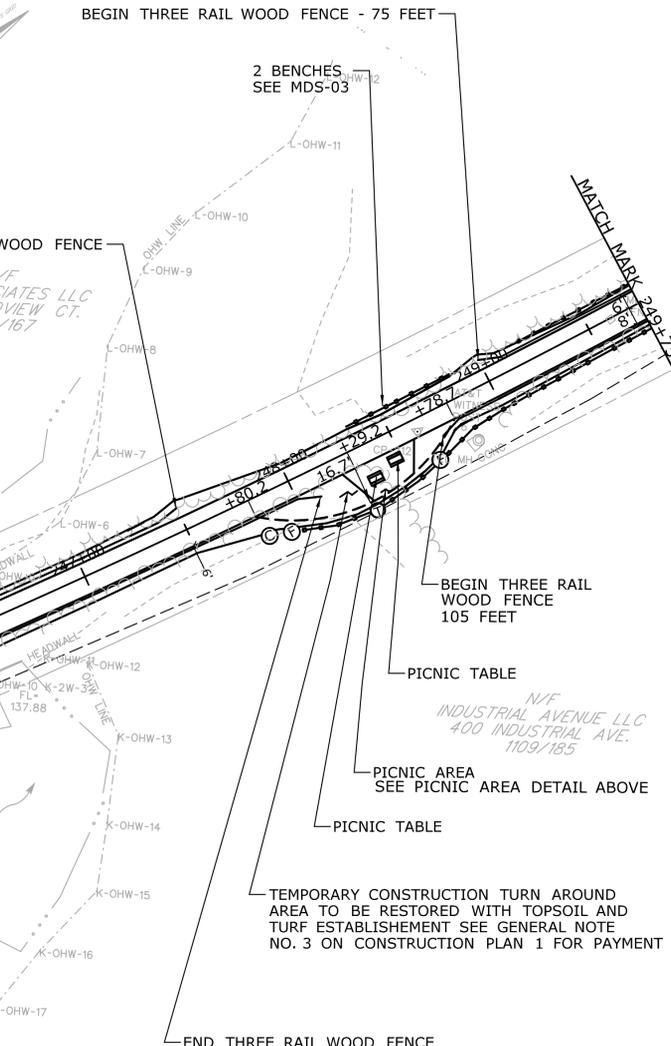
Plotted Date: 2/26/2015	Filename: ...\\2d Highway Sheets\Hwy 03.dgn
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FENCE TREATMENT CHART		
STATION LIMITS	LENGTH (FEET)	FENCE TYPE
241+00 TO 248+10 RT	710	THREE RAIL WOOD FENCE
248+70 TO 249+75 RT	105	THREE RAIL WOOD FENCE
244+00 TO 247+50 LT	350	THREE RAIL WOOD FENCE
249+00 TO 249+75 LT	75	THREE RAIL WOOD FENCE

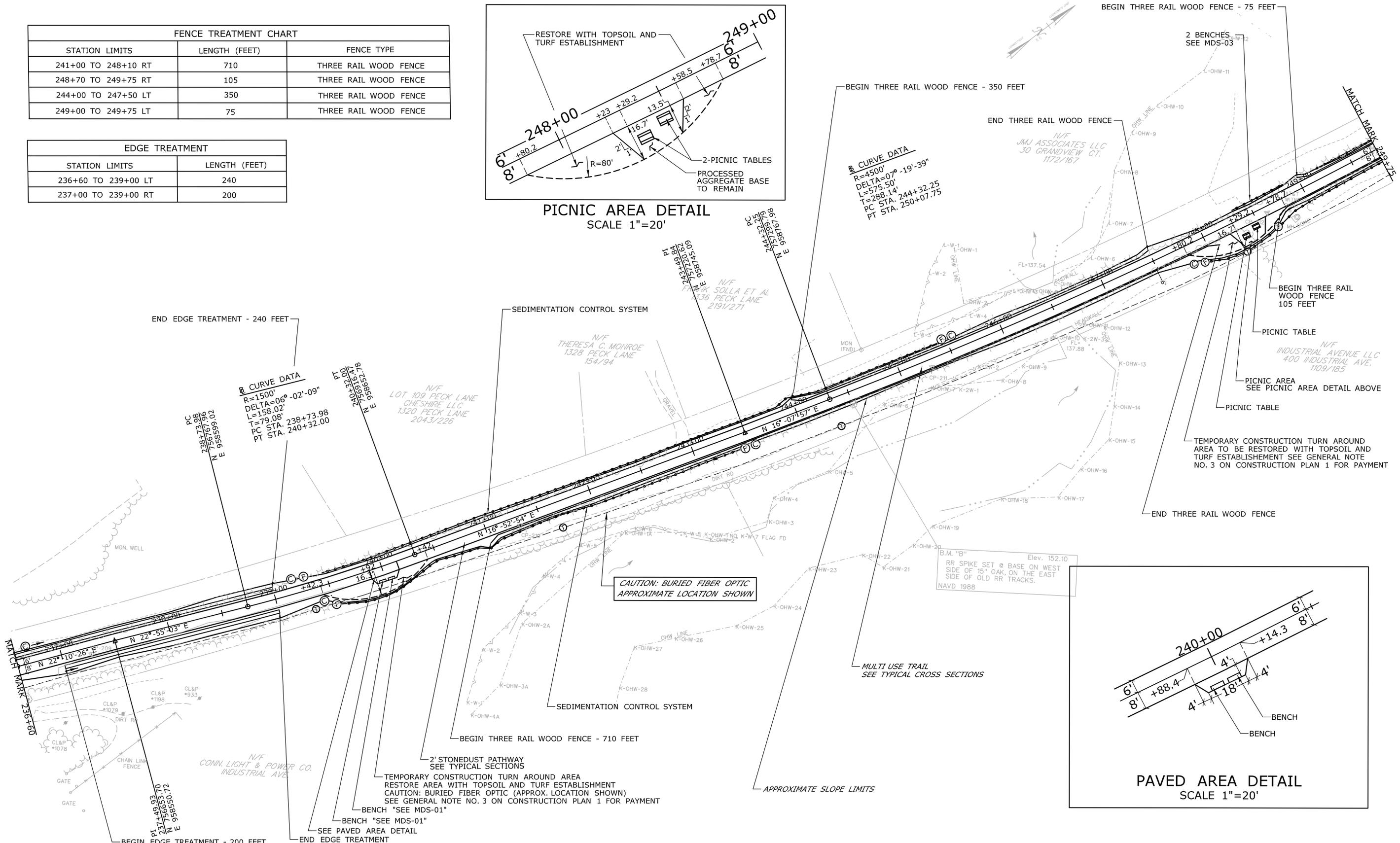
EDGE TREATMENT	
STATION LIMITS	LENGTH (FEET)
236+60 TO 239+00 LT	240
237+00 TO 239+00 RT	200



PICNIC AREA DETAIL
SCALE 1"=20'



PAVED AREA DETAIL
SCALE 1"=20'



REV.	DATE	REVISION DESCRIPTION	SHEET NO.
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Plotted Date: 2/19/2015

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STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

OFFICE OF ENGINEERING

APPROVED BY: *Willie B. Burt*

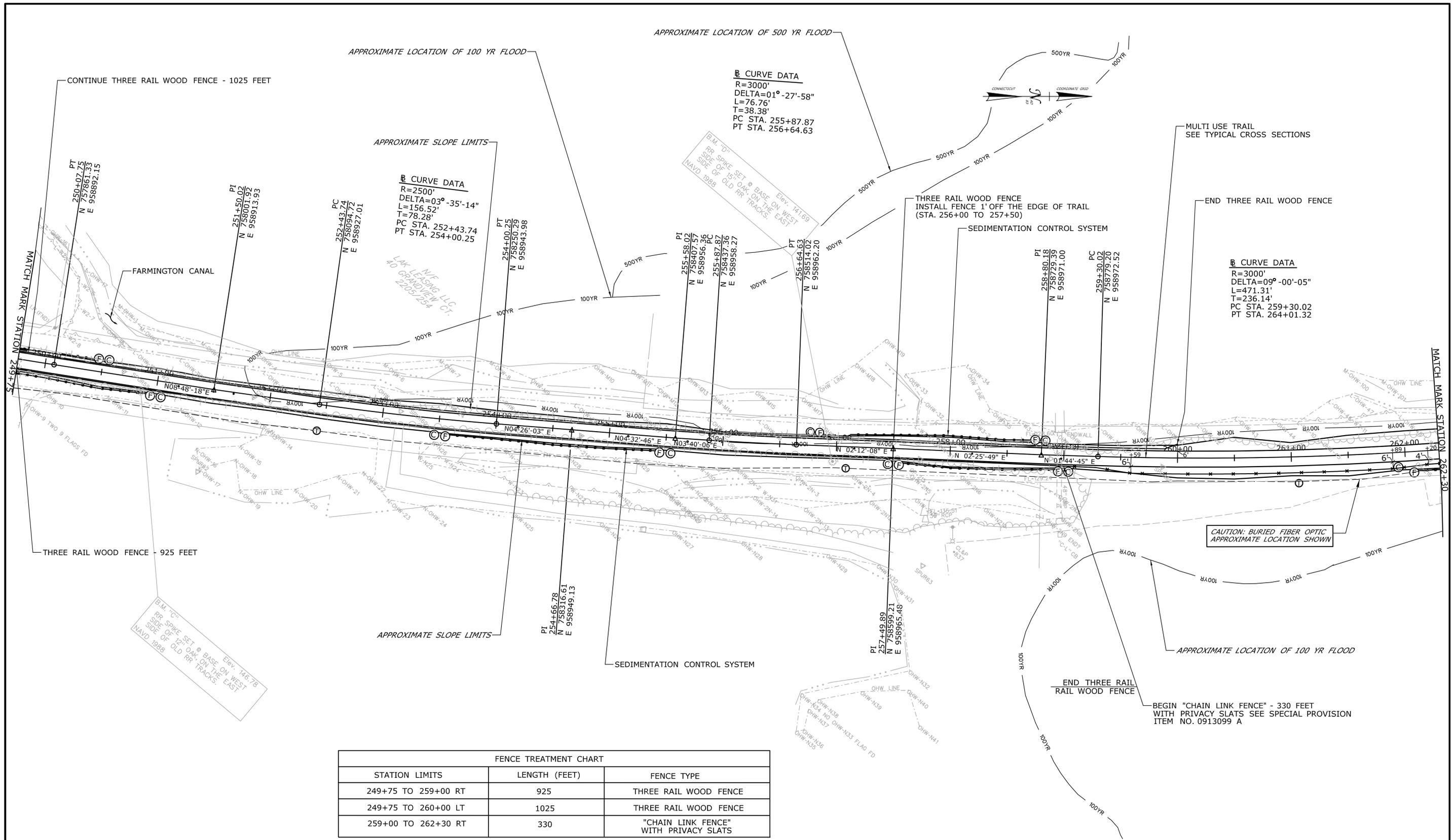
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APPROVED BY: *Willie B. Burt*

PROJECT TITLE:
FARMINGTON CANAL HERITAGE TRAIL EXTENSION

TOWN: **CHESHIRE**
DRAWING TITLE:
CONSTRUCTION PLAN

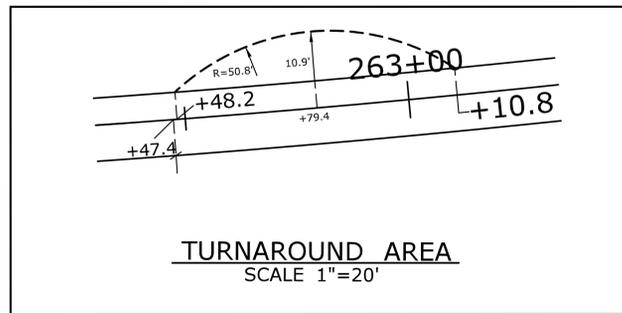
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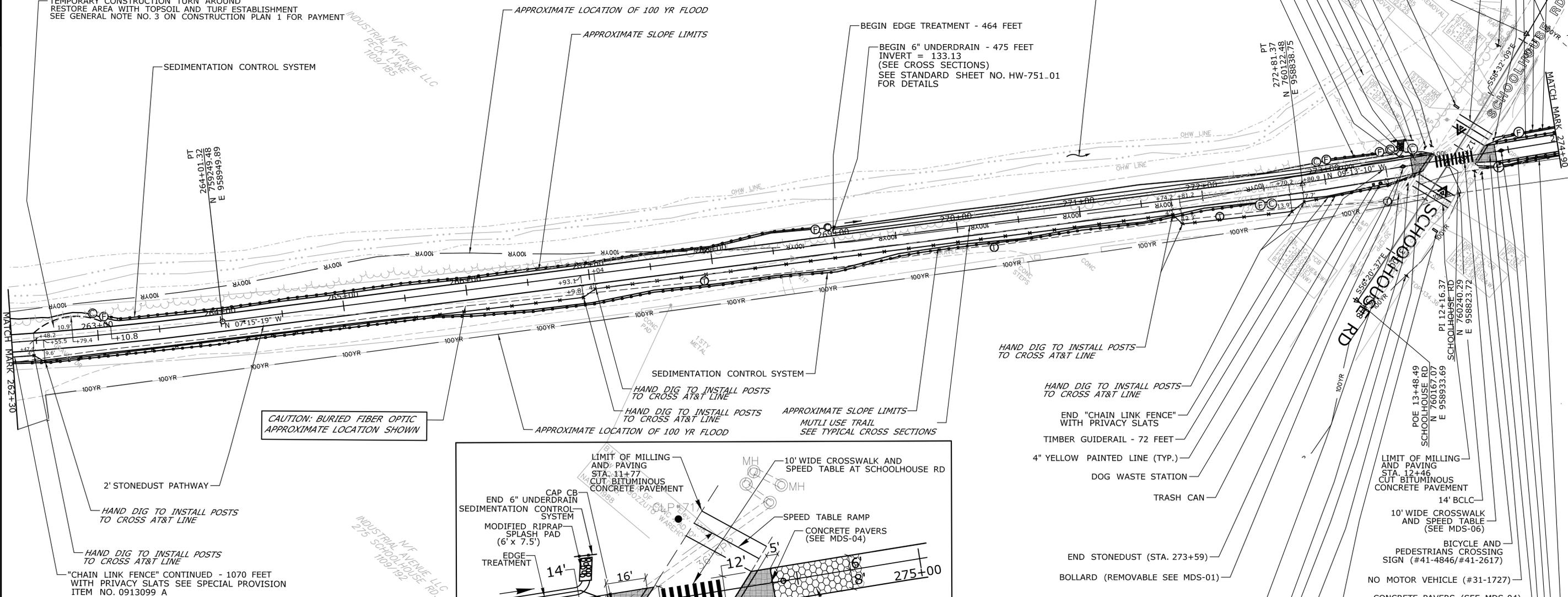
FENCE TREATMENT CHART		
STATION LIMITS	LENGTH (FEET)	FENCE TYPE
249+75 TO 259+00 RT	925	THREE RAIL WOOD FENCE
249+75 TO 260+00 LT	1025	THREE RAIL WOOD FENCE
259+00 TO 262+30 RT	330	"CHAIN LINK FENCE" WITH PRIVACY SLATS

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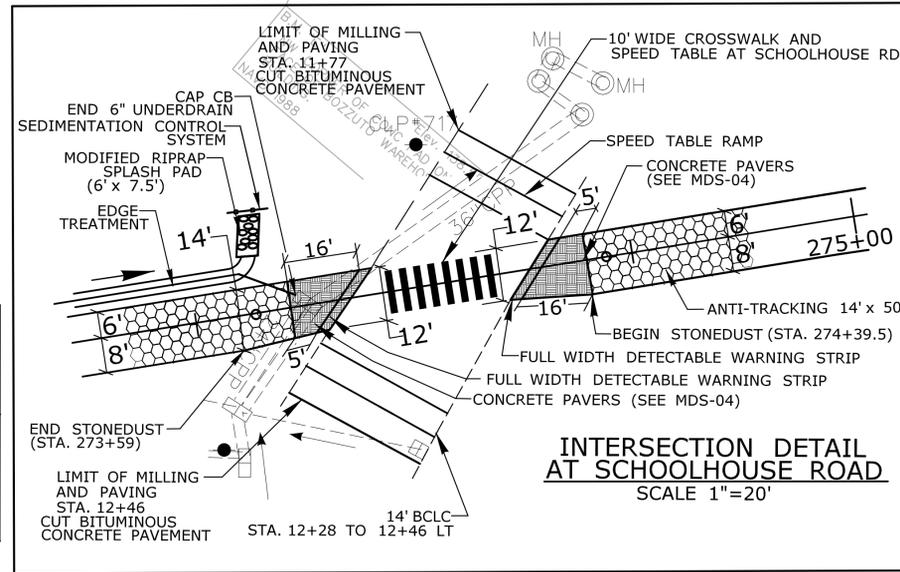
EDGE TREATMENT	
STATION LIMITS	LENGTH (FEET)
269+00 TO 273+64 LT	464



TEMPORARY CONSTRUCTION TURN AROUND
RESTORE AREA WITH TOPSOIL AND TURF ESTABLISHMENT
SEE GENERAL NOTE NO. 3 ON CONSTRUCTION PLAN 1 FOR PAYMENT



CAUTION: BURIED FIBER OPTIC
APPROXIMATE LOCATION SHOWN



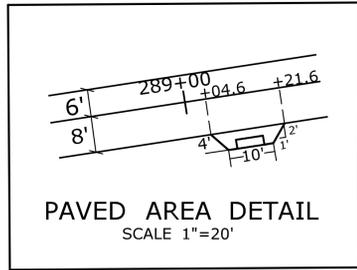
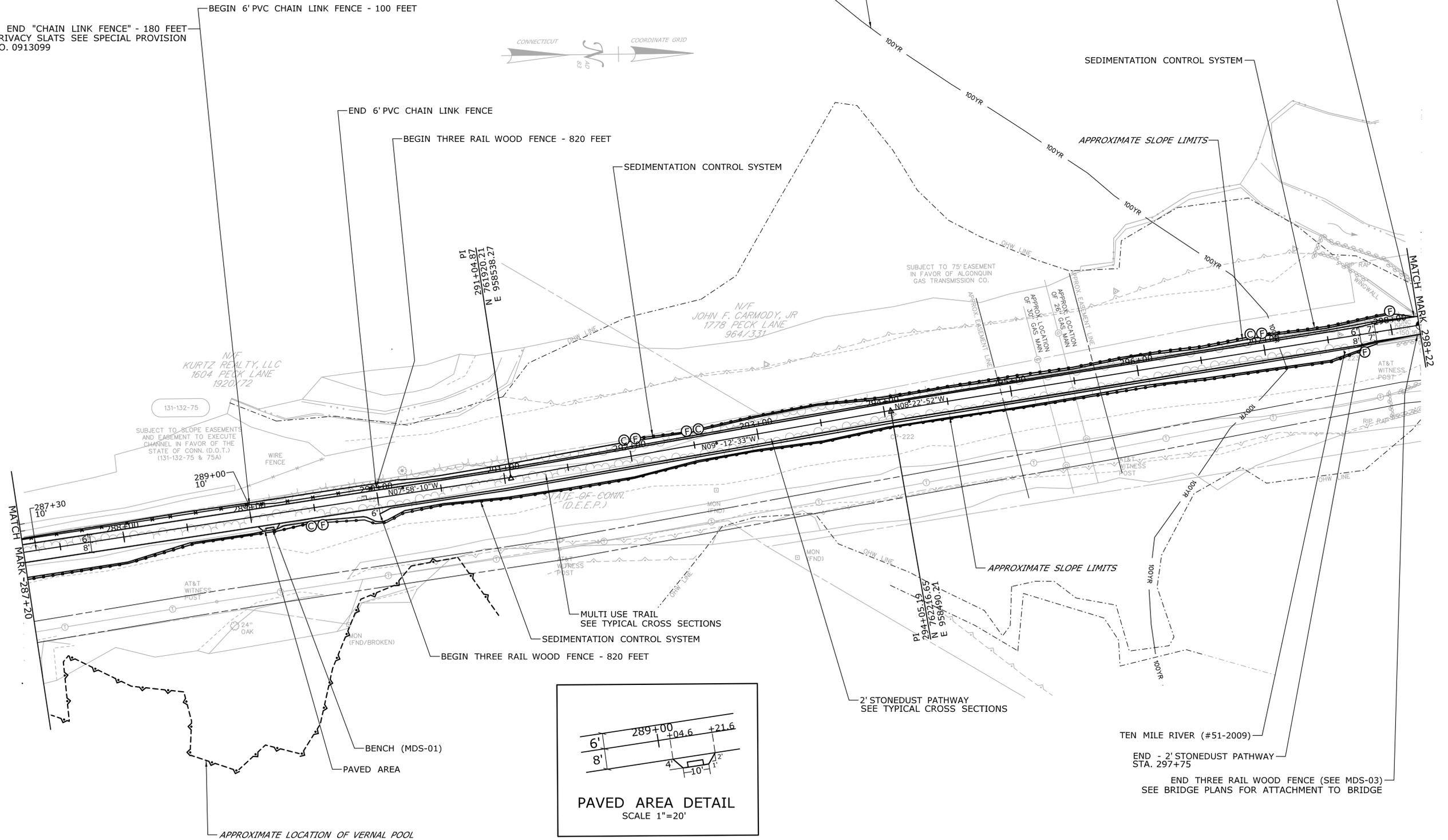
FENCE TREATMENT CHART		
STATION LIMITS	LENGTH (FEET)	FENCE TYPE
262+36 TO 273+00 RT	1070	"CHAIN LINK FENCE" WITH PRIVACY SLATS
273+00 TO 273+74 RT	72	TIMBER BEAM RAIL
273+65 TO 273+89 LT	24	TIMBER BEAM RAIL
274+50 TO 274+98 LT	48	TIMBER BEAM RAIL
274+50 TO 274+98 RT	48	TIMBER BEAM RAIL

REV. DATE REVISION DESCRIPTION SHEET NO.	THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.	DESIGNER/DRAFTER: MS	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/BLOCK: <i>Willie B. Burt</i>	PROJECT TITLE: FARMINGTON CANAL HERITAGE TRAIL EXTENSION	TOWN: CHESHIRE	PROJECT NO. 25-144 DRAWING NO. PLN-06 SHEET NO. 03.20
		CHECKED BY: VS SCALE IN FEET 0 40 80 SCALE 1"=40'		APPROVED BY:			

FENCE TREATMENT CHART		
STATION LIMITS	LENGTH (FEET)	FENCE TYPE
287+20 TO 280+00 LT	180	"CHAIN LINK FENCE" WITH PRIVACY SLATS
289+00 TO 290+00 LT	100	6' PVC CHAIN LINK FENCE
290+00 TO 298+20 RT	820	THREE RAIL WOOD FENCE
290+00 TO 298+20 LT	820	THREE RAIL WOOD FENCE

END "CHAIN LINK FENCE" - 180 FEET WITH PRIVACY SLATS SEE SPECIAL PROVISION ITEM NO. 0913099

BEGIN 6' PVC CHAIN LINK FENCE - 100 FEET



REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Plotted Date: 2/25/2015

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 SCALE 1"=40'

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION

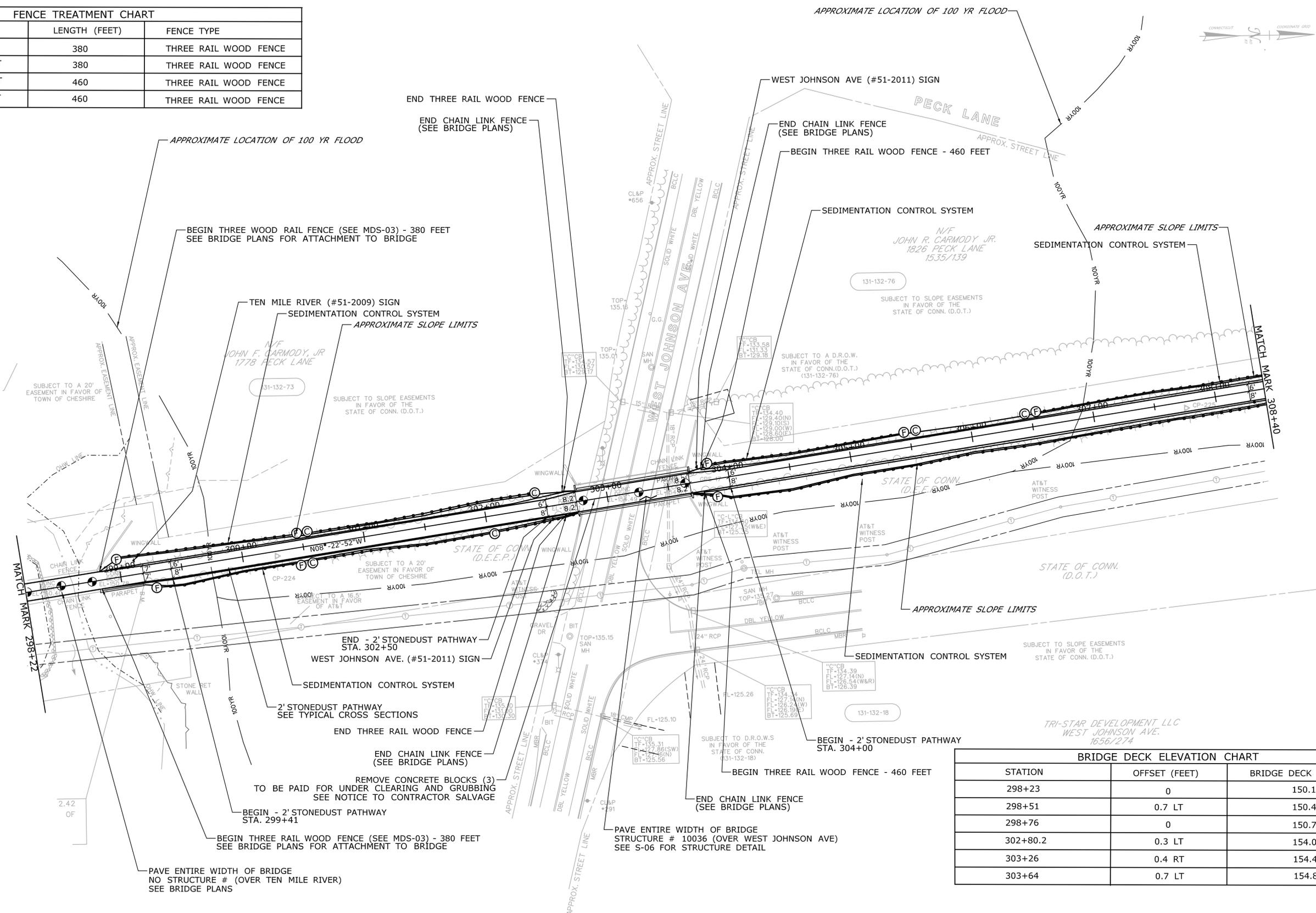
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 APPROVED BY: *Willie B. ...*
 OFFICE OF ENGINEERING

PROJECT TITLE:
FARMINGTON CANAL HERITAGE TRAIL EXTENSION

TOWN: **CHESHIRE**
 DRAWING TITLE:
CONSTRUCTION PLAN

PROJECT NO.: **25-144**
 DRAWING NO.: **PLN-08**
 SHEET NO.: **03.22**

FENCE TREATMENT CHART		
STATION LIMITS	LENGTH (FEET)	FENCE TYPE
298+85 TO 302+65 LT	380	THREE RAIL WOOD FENCE
298+85 TO 302+65 RT	380	THREE RAIL WOOD FENCE
303+80 TO 308+40 RT	460	THREE RAIL WOOD FENCE
303+80 TO 308+40 LT	460	THREE RAIL WOOD FENCE



BRIDGE DECK ELEVATION CHART		
STATION	OFFSET (FEET)	BRIDGE DECK ELEVATION
298+23	0	150.16
298+51	0.7 LT	150.40
298+76	0	150.78
302+80.2	0.3 LT	154.01
303+26	0.4 RT	154.49
303+64	0.7 LT	154.83

REV.	DATE	REVISION DESCRIPTION	SHEET NO.
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THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

Plotted Date: 2/13/2015

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 CHECKED BY: **VS**
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 SCALE 1" = 40'

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION

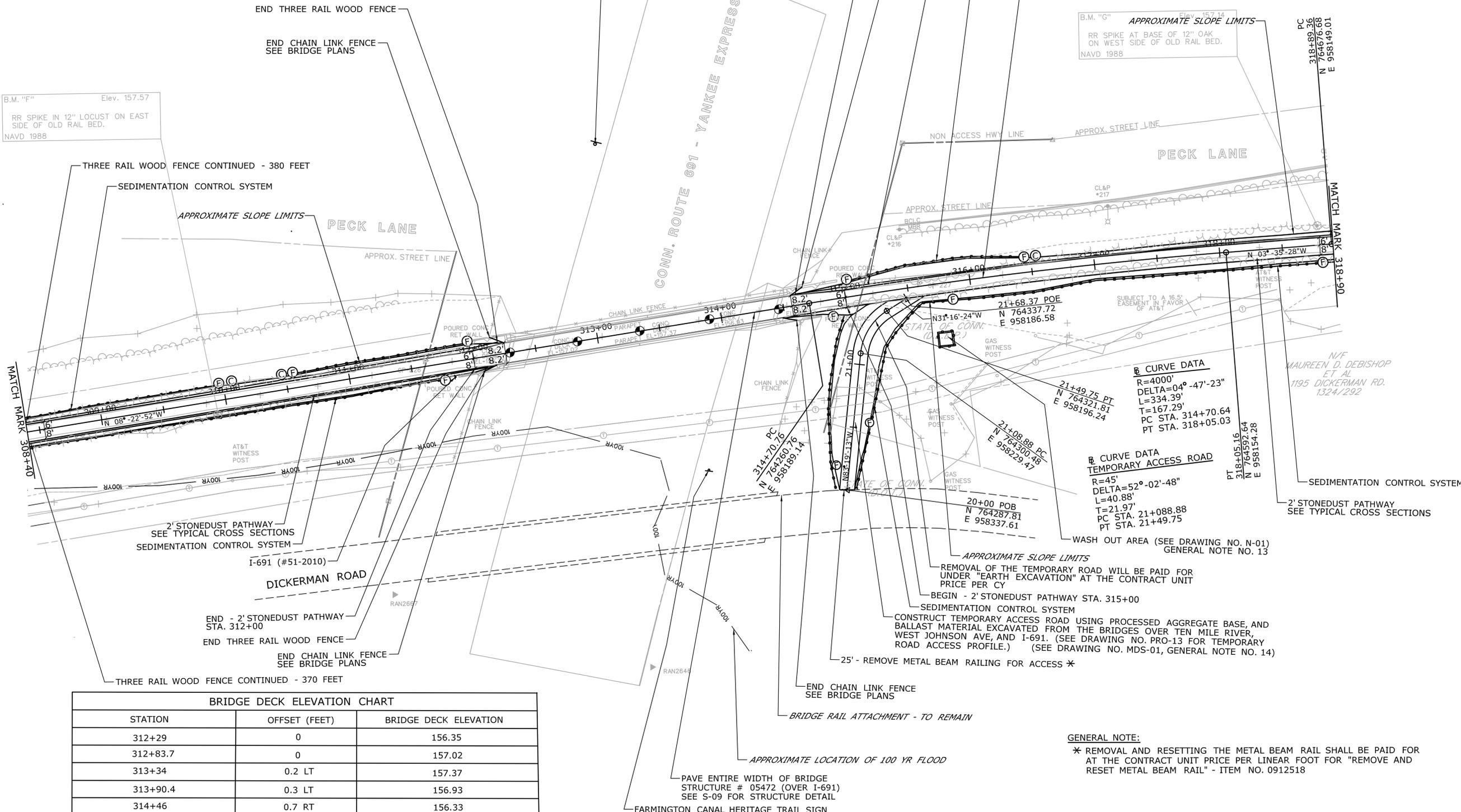
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 OFFICE OF ENGINEERING

PROJECT TITLE:
FARMINGTON CANAL HERITAGE TRAIL EXTENSION

TOWN: **CHESHIRE**
 DRAWING TITLE:
CONSTRUCTION PLAN

PROJECT NO.: **25-144**
 DRAWING NO.: **PLN-09**
 SHEET NO.: **03.23**

FENCE TREATMENT CHART		
STATION LIMITS	LENGTH (FEET)	FENCE TYPE
308+40 TO 312+10 RT	370	THREE RAIL WOOD FENCE
308+40 TO 312+20 LT	380	THREE RAIL WOOD FENCE
314+60 TO 318+90 LT	430	THREE RAIL WOOD FENCE



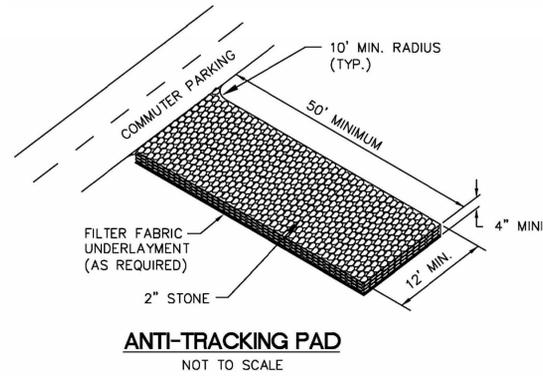
BRIDGE DECK ELEVATION CHART		
STATION	OFFSET (FEET)	BRIDGE DECK ELEVATION
312+29	0	156.35
312+83.7	0	157.02
313+34	0.2 LT	157.37
313+90.4	0.3 LT	156.93
314+46	0.7 RT	156.33

GENERAL NOTE:
 * REMOVAL AND RESETTING THE METAL BEAM RAIL SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR "REMOVE AND RESET METAL BEAM RAIL" - ITEM NO. 0912518

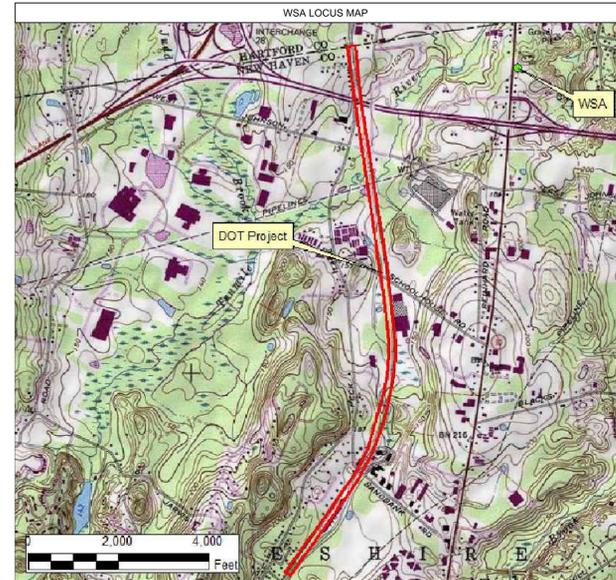
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	CHECKED BY: VS		OFFICE OF ENGINEERING APPROVED BY:			
REV. DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 2/13/2015	SCALE IN FEET 0 40 80 SCALE 1"=40'	Filename: ...12d Highway Sheets\Hwy 10.dgn	



HIGHLAND AVE. (ROUTE 10)



ANTI-TRACKING PAD
NOT TO SCALE

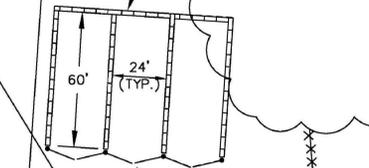


WSA CONSTRUCTION NOTES:

1. SITE DRAWING IS BASED ON GOOGLE EARTH MAPPING DATED APRIL 1, 2008. ALL DIMENSIONS ARE APPROXIMATE, BASED ON MAPPING.
2. CONTRACTOR SHALL COORDINATE WITH ALL ASSOCIATED UTILITY AGENCIES REGARDING MEASURES TO PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING OPERATION OF THE WSA. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE STATE AND TO THE SATISFACTION OF THE GOVERNING UTILITY.
3. THE APPROXIMATE LAYOUT AND SIZES OF BINS ARE SHOWN. THE ACTUAL LAYOUT AND SIZES SHALL BE DETERMINED IN THE FIELD, AS APPROVED BY THE ENGINEER. BASED ON ESTIMATED QUANTITIES OF CONTROLLED MATERIALS, THREE BINS ARE ASSUMED TO BE ADEQUATE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION, MAINTENANCE, AND REPAIR OF ALL COMPONENTS OF THE WSA DURING WSA OPERATIONS.
5. THE CONTROLLED MATERIALS SHALL BE PLACED ON 30 MIL POLYETHYLENE SHEETING. SHEETING TORN OR DESTROYED DURING LOAD-OUT SHALL BE REPLACED PRIOR TO LOADING THE WSA WITH ADDITIONAL CONTROLLED MATERIALS.
6. POLYETHYLENE STOCKPILE COVER SHALL REMAIN IN PLACE AT ALL TIMES OTHER THAN LOAD-IN OR LOAD-OUT.
7. THE ROUTE FROM THE EXCAVATION AREA TO THE WSA SHALL BE CLEANED DAILY OR AS DIRECTED BY THE ENGINEER TO REMOVE ANY CONTROLLED MATERIAL LOST IN TRANSIT.
8. THE ACCESS ROAD TO THE STATE POLICE PROPERTY EAST OF THE WSA SHALL BE MAINTAINED SUCH THAT THE STATE POLICE CAN ACCESS THE GATE WHEN NEEDED. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REMOVE ALL RESIDUAL CONTROLLED MATERIAL AND DECONTAMINATE THE BLOCKS AS NECESSARY, PRIOR TO TRANSPORT OFF SITE.
9. THE CURBING ALONG THE ACCESS ROAD SHALL BE PROTECTED OR REMOVED AS NECESSARY FOR LOAD-IN AND LOAD-OUT TRAFFIC AT WSA. UPON COMPLETION OF THE PROJECT, THE CURBING SHALL BE REPAIRED AND/OR REPLACED TO ORIGINAL CONDITION.

REMOVE CURBING AS NECESSARY FOR TRUCK ENTRANCE TO BINS. REPLACE CURBING AS PART OF RESTORATION.

COMMUTER PARKING

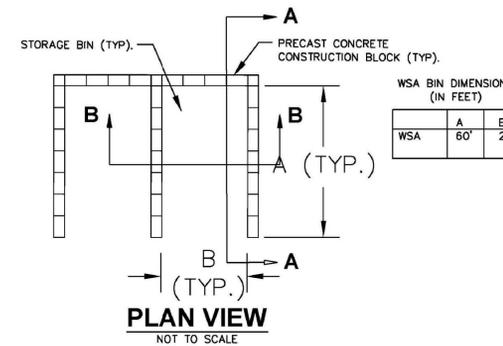


ACCESS ROAD

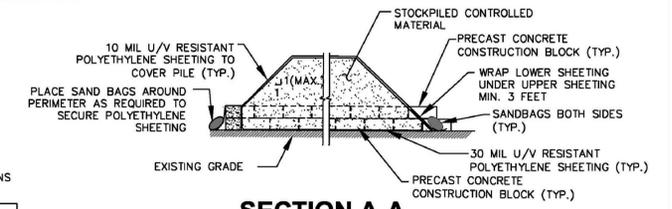
GATE TO STATE POLICE PROPERTY

ANTI-TRACKING PAD

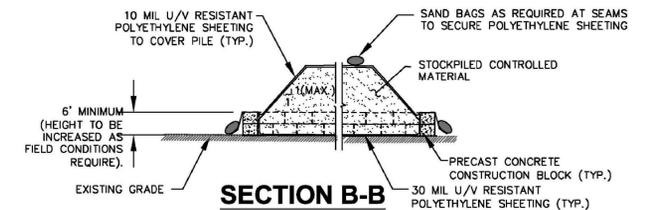
INSTALL DOUBLE SWING GATES (TYP.) ACROSS ENTRANCES TO BINS.



PLAN VIEW
NOT TO SCALE



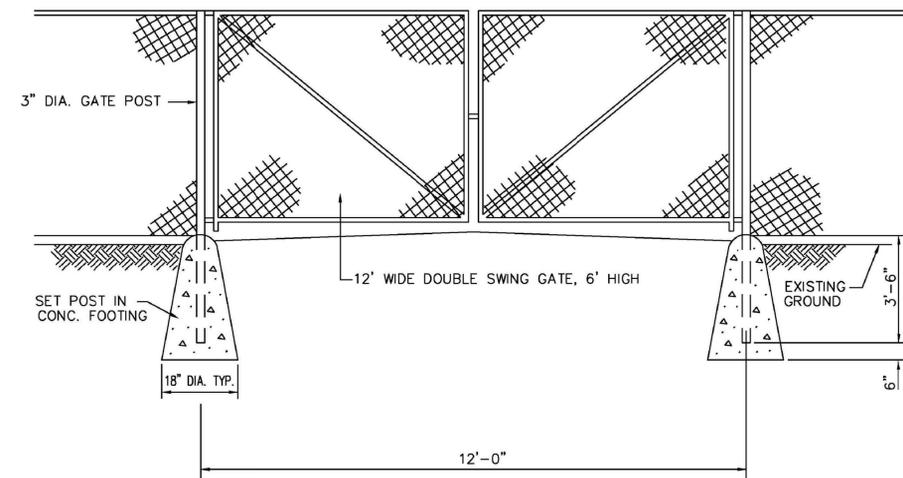
SECTION A-A
NOT TO SCALE



SECTION B-B
NOT TO SCALE

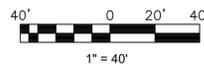
TEMPORARY WASTE STOCKPILE AREA (WSA)

NOT TO SCALE



GATE DETAIL
NOT TO SCALE

REV.	DATE	DESCRIPTION REVISIONS	SHEET NO.



DESIGNER: GDW
DRAFTER: DML
CHECKED BY: WAS
DATE CHECKED: 11/25/2014

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

ENGINEER: HRP ASSOCIATES, INC.

APPROVED BY:

DATE:

PROJECT TITLE:
FARMINGTON CANAL HERITAGE
TRAIL EXTENSION
ROUTES 68 & 70 OVER THE FARMINGTON CANAL

TOWN: CHESHIRE
DRAWING TITLE: WASTE STOCKPILE AREA (WSA) DETAILS
PROJECT NO.: 0025-0144
DRAWING NO.: ENV-14
SHEET NO.: 06.014

PLOTTED 11/25/2014