

**ATTACHMENT E
STORMWATER POLLUTION CONTROL PLAN**

**Replacement of Bridge No. 00982
Route 74 over Willimantic River
Tolland & Willington, CT**

State Project No. 160-139

Connecticut Department of Transportation

November 2015

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

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1. Site Description

Site Description

This project involves the total replacement of Bridge No. 00982 carrying Route 74 (Tolland Stage Road) over the Willimantic River. The subject project is categorized as a “Spot Improvement” Project. The bridge is located within a rural area at the boundary of the towns of Tolland and Willington, approximately a half mile east of I-84, exit 69. The existing structure consists of a single span steel thru truss with a concrete deck and concrete abutments. The purpose and need for the project is to address the structural deficiencies and functional obsolescence of Bridge No. 00982. The existing bridge is structurally deficient due to the poor condition of the concrete deck. The bridge is functionally obsolete due to a narrow curb-to-curb width. The bridge is also considered hydraulically inadequate since it is not able to convey the 100-year design storm event. Pressure flow begins between the 10-year and 25-year storm events. There is 3-feet of pressure flow during the 100-year design storm.

The proposed bridge replacement will consist of demolishing the existing structure and constructing a new single span weathering steel girder superstructure with a concrete deck founded on pile-supported abutments. At the bridge, the proposed roadway will consist of two 11-foot lanes, two 5-foot shoulders and a 5-foot sidewalk along the downstream side of the bridge. The Route 74 horizontal alignment will be modified slightly to increase the western approach curve radius from approximately 250-feet to 450-feet. In this area, the shoulders of Route 74 will be 8-feet wide on both sides of the road. Shoulders will then taper to 5-feet wide at the bridge. The vertical alignment of Route 74 will be raised approximately 3-feet at the bridge to allow the 100-year design storm flow of the river to pass under the proposed bridge without pressure flow. Construction of the proposed bridge will be performed while traffic is maintained on a temporary bridge located upstream of the existing structure. The temporary bridge will be 30-feet wide with one lane in each direction and a shoulder wide enough to accommodate pedestrians or bicycles.

The project’s construction is anticipated to last up to two (2) construction seasons. During Season 1, the temporary bridge and temporary roadway approaches will be constructed. A temporary traffic signal will be installed at the intersection of Route 74 and South River Road. Utility poles will be relocated to temporary poles between the existing bridge and the temporary bridge and the existing bridge will be demolished.

During Season 2, the steel piles, concrete abutments and proposed superstructure will be installed. New roadway drainage, reconstructed roadway grading and pavement as well as driveways will be completed. The new bridge will be opened to traffic and the temporary bridge and temporary pavement will be removed. Lastly, the site will be cleaned, turf will be established with topsoil and seeding and select areas of plantings will be installed.

Access to all properties will be maintained and businesses will remain open at all times during construction. Neither night work nor weekend work is proposed during construction.

Estimated Disturbed Area

There will be 3.74 acres disturbed during construction of this project. This area includes the roadway and bridge areas, the embankment slopes around the bridge and portions of residential property. The total site area, which includes all area within the transportation right-of-way, is 4.26 acres.

Estimated Runoff Coefficient

Pre-Construction Condition

	Runoff Coefficient	Area (acres)
Wooded Area	0.40	0.48
Grass Area	0.50	1.66
Impervious Area	0.90	1.60
Total Area		3.74

$$C_{\text{weighted}} = \frac{(0.40)(0.48) + (0.50)(1.66) + (0.90)(1.60)}{3.74} = 0.66$$

Post-Construction Condition

	Runoff Coefficient	Area (acres)
Wooded Area	0.40	0.29
Grass Area	0.50	1.51
Impervious Area	0.90	1.94
Total Area		3.74

$$C_{\text{weighted}} = \frac{(0.40)(0.29) + (0.50)(1.51) + (0.90)(1.94)}{3.74} = 0.70$$

There are two existing outlet points discharging stormwater from the project area (see Existing Drainage Area figures, Appendix A). There is an 18" ACCMP (EO-1) west of Bridge No. 00982 with a discharge drainage area of approximately 4.4 acres. There is a second outlet, 15" RCP, (EO-2) discharging stormwater directly into the river through the east abutment with a discharge drainage area of approximately 3.2 acres.

There are four drainage outlets proposed to replace the two existing drainage outlets (see Appendix A and Appendix C). Three outlets are proposed west of Willimantic River. The first outlet, along Route 74 west of Plantation Road, PO-1, will replace the existing outlet, EO-1. Outlets PO-2 and PO-3 are located just southwest of the bridge location. PO-2 discharges stormwater collected within South River Road. PO-3 discharges stormwater collected within Route 74. The final proposed outlet, PO-4, is located southeast of the existing bridge and discharges stormwater collected within Route 74 east of the bridge.

Receiving Waters

The entire project area discharge to the Willimantic River (Willimantic River Basin, CT DEEP Basin #3100), which is part of the Thames River Basin. The bridge is located within FEMA Flood Zone A7 on map numbers 0901710009A (Tolland) and 0901590012A (Willington) (See FEMA FIRMs, Figure 1 & 2, Appendix A).

Extent of Wetlands on Site

There are two existing wetlands located on-site. Wetland Area 1 contains the Willimantic River, adjacent bank areas and a small tributary entering the river just upstream of the bridge. Wetland Area 2 is located within private land, north of Route 74 just west of the intersection with the New England Central Railroad line. Wetland Area 2 is beyond the limit of construction and will not be affected.

A total of 1,611 square feet (0.037 acres) of permanent impact and 2,570 square feet (0.059 acres) of temporary impact, for an overall total of 4,182 square feet (0.096 acres) of impact is expected for the Site. Wetland functions and values are not expected to be adversely impacted when viewing the wetland system as a whole. Proper outfall protection and native plantings all will aid in offsetting the wetland loss.

2. Construction Sequencing

The selected contractor will be required to stabilize disturbed areas using approved management practices to comply with construction sequencing, erosion and sedimentation control plans and this Stormwater Pollution Control Plan (SPCP). All construction will be in accordance with the 2002 E&S Guidelines. Construction is anticipated to start in April 2016 and be completed by November 2017.

The suggested sequence of construction is as follows:

1. Conduct a preconstruction meeting.
2. Install erosion controls at the effected inlets and at limits of disturbed slopes. Approximate 2 week period.
3. Perform clearing and grubbing activities. Approximate 3 week period.
4. Contractor mobilization and engineering submittals. Approximate 6 week period.
5. Maintain traffic on existing roadway.
6. Install sheeting north of bridge to limits. Approximate 1 week period.
7. Install temporary abutments. Approximate 2 week period.
8. Relocate overhead utilities (by others) to south side of roadway. Approximate 4 week period.
9. Maintain traffic on existing roadway.
10. Construct temporary roadway. Approximate 3 week period.
11. Install the temporary drainage outlet (TO-1). Approximate 1 week period.
12. Install temporary bridge north of the existing bridge. Approximate 4 week period.

13. Shift traffic to temporary roadway.
14. Install debris shield below existing superstructure. Approximate 2 week period.
15. Remove the existing superstructure. Approximate 6 week period.
16. Winter shut-down. Approximate 13 week period.
17. Install sheeting south of the temporary roadway. Approximate 1 week period.
18. Remove the existing abutments, southern wingwalls and a portion of the northern wingwall. Remove existing drainage system and outlets (EO-1 and EO-2). Approximate 4 week period.
19. Maintain traffic on temporary roadway.
20. Install the proposed abutments, construct the proposed roadway base courses, and construct proposed Bridge No. 00982. Approximate 20 week period.
21. Install proposed drainage systems and outlets (PO-1, PO-2, PO-3 and PO-4) Approximate 2 week period.
22. Finalize the construction of the proposed roadway and shift traffic as necessary in transition areas. Approximate 2 week period.
23. Install the proposed slope plantings. Approximate 1 week period.
24. Shift traffic to the proposed roadway.
25. Remove the temporary drainage outlet, temporary bridge, temporary abutments and remaining portions of the existing wingwalls. Approximate 3 week period.
26. Finalize grading north of Bridge No. 00982. Approximate 2 week period.
27. Maintain traffic on proposed roadway.
28. Remove steel sheeting north of the proposed bridge. Approximate 2 week period.
29. Grade grass slopes and immediately stabilize. Establish turf, per plan, on all remaining disturbed areas. Install landscaping. Approximate 2 week period.
30. Remove erosion controls when it is determined that disturbed areas have been stabilized. (This determination will be made by the Engineer).
31. All post-construction stormwater structures shall be cleaned of construction sediment and any remaining silt fence shall be removed prior to the filing of the "Notice of Termination Form".
32. Perform project cleanup.

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 SPCP for review and approval. The SPCP must include locations of the temporary sedimentation trap per discharge point with a capacity to contain 134 cubic yards per acre of material in accordance with the 2002 E&S Guidelines. The Contractor shall provide an inspection and maintenance plan for the temporary sedimentation trap as part of the amended SPCP.

3. Control Measures

Erosion and sedimentation controls will conform to and be maintained in accordance with the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control" (E&S Guidelines), "State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction, Form 816, 2004" (Form 816), included supplements dated July 2014 thereto, and the Contract Plans and Documents.

The location of the erosion and sedimentation controls are shown on the construction plans and detail sheets (see Appendix C, Drawing Numbers DRN-01 and DRN-02). Additional measures, if required, are contained in the above documents.

Erosion and Sedimentation Controls

The Connecticut Department of Transportation (CTDOT) 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 CTDOT 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 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.

Temporary Stabilization Practices

Prior to the start of construction, temporary stabilization measures will be installed. The temporary measures will be removed after final stabilization. Temporary measures include the following:

- 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 embankment
- Anti-Tracking Pads: Construction entrances (gravel anti-tracking pads) shall be constructed at truck access points to off-road routes.
- Dust Control: Routine sweeping and application of dust suppression agents, including water and calcium chloride, over exposed subbase shall be completed for dust control.
- Check Dam: Temporary stabilization to be utilized within the proposed riprap open channel during the formation of the open channel swale.

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 if they conform to the E&S 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. During working hours, these areas shall be inspected following any storm in which 0.1 inches or greater of rain occurs. During non-working hours, these areas shall be inspected within 24 hours following any storm in which 0.5 inches or greater of rain occurs.

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, landscape plantings, mulch and/or turf establishment. The Contractor may use other permanent stabilization practices approved by the Engineer and conforming to the E&S Guidelines.

During construction, permanent stabilization measures will be installed. Riprap splash pads will provide permanent protection at the proposed storm outlets. Proposed landscaping will be placed along the edges of the disturbed wetland areas to restore lost vegetation and steep slopes will be stabilized.

Structural Measures

Structural measures will be utilized to minimize the exposure of soils and disturbance to the existing wetlands around the project site. Erosion Control Matting will be installed at the bottom of the existing embankment slopes. Cofferdams and dewatering structures will be installed to handle and treat intrusive water during construction operations shown on the environmental permit plans. After construction, the cofferdams and dewatering structures will be removed and the embankments will be regraded to match existing conditions. A 4-foot deep sump will be installed along the south curb at the roadway low point to aid in stormwater treatment.

Maintenance

All construction activities and related activities shall conform to the requirements of Section 1.10 "Environmental Compliance" of 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 Form 816 shall be administered during

construction. Control measures shall be inspected and maintained in accordance with the E&S Guidelines and as directed by the Engineer.

4. Dewatering Wastewaters

Dewatering Guidelines

During installation of the cofferdams and storm drainage at the project site, dewatering structures will be placed to handle and treat stormwater and groundwater. The dewatering structures will be located outside of the wetland limits. The dewatering structures will be used during the installation of both the temporary and permanent drainage features.

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. 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. All activities are to be performed in compliance with CTDOT Form 816.

5. Post-Construction Stormwater Management

Runoff Reduction and Low Impact Development

Runoff reduction and Low Impact Development measures are limited due to private property constraints along this linear roadway project. Area to the north of the roadway and west of the river is within the Nye-Holman State Forest. Area to the north of the roadway and east of the river is within residential property. All area south of the roadway is within residential property.

A small area of land is owned by the Department of Transportation directly southwest of the bridge. This area provides driveway access to the river and can't be used for stormwater treatment measures. The project's design measures include maximizing sheet flow (curbing is provided only along residential property), installing landscaping and providing stormwater improvements.

The existing outlet discharging through the east abutment will be eliminated. A section of curbing along the left side of the western approach will also be eliminated to maximize sheet flow in this area. The proposed riprap roadside channel along the south side of Route 74 will discharge stormwater north of the roadway in the vicinity of the existing stormwater discharge point.

All proposed stormwater outlets will discharge onto a riprap splash pad. The splash pads are designed based on the calculated flow using criteria within the CTDOT Drainage Manual (see Appendix B). The splash pads will prevent scour at the outlets and minimize the potential for

downstream erosion by reducing the velocity of the concentrated stormwater flow. All outlets are placed as high as possible to reduce the chance of flood water disturbance and to maximize overland flow.

Post-Construction Guidelines

Once construction is complete, a series of stormwater management techniques will remain to ensure the control of sediment in stormwater discharges. The proposed catch basins will be installed with 2-foot deep sumps. The catch basin along the southern gutter at the roadway low point east of the bridge will have a 4-foot deep sump. Additionally, the following maintenance measures will be implemented.

- Litter/debris will be removed from the site regularly.
- 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.

Post-Construction Performance Standards

Providing treatment measures to obtain the 80% sediment load removal goal cannot be met due to site constraints. As noted above, there is minimal area within the transportation right-of-way to utilize for storm water management practices. The majority of the 0.52 acre area of undeveloped right-of-way is upgrade of the drainage structures, is narrow in width or is located in front of residential property and is not suitable for use as a stormwater management area.

All post-construction stormwater structures will be cleaned of construction sediment and all temporary erosion control measures will be removed when disturbed areas are permanently stabilized. Upon permanent stabilization, a termination notice pursuant to Section 6 of the General Permit will be filed.

The town of Tolland will be responsible for the discharge of the South River Road basins. All other drainage features will be the responsibility of the state. The catch basin sumps will be cleaned of sediment and the outlet points and grass swales will be inspected for damage and cleaned as required. The fill slopes will be inspected to ensure the slopes remain stable with no erosion.

6. Other Controls

Waste Disposal

Construction site waste shall be properly managed and disposed of during the entire construction period. Additionally,

- A waste collection area will be designated. The selected area will minimize truck travel through the site and will not drain directly to the adjacent wetlands.
- 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.

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.

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 $\frac{1}{2}$ 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 sediments 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 temporary construction features shall be removed. All treatment measures, including dewatering structures, shall be cleaned of construction sediment and any remaining silt fence or hay bales 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. Additionally, refueling east of the project site will not be allowed in order to prevent impact to the existing non-community and non-public wells.

7. Inspections

Inspection Guidelines

All construction activities shall be inspected initially for Plan implementation and then weekly for Routine Inspections.

A rain gauge shall be maintained on-site throughout construction to document rainfall amounts. 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 produces 0.1 inches or greater of rain.

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

Turbidity monitoring inspection sampling during construction shall be conducted at least once per month when there is a discharge of stormwater. 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 Stormwater 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.

The turbidity monitoring shall be conducted at the stormwater outlet 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 physical location of each outlet shall be clearly identified in the field. See Appendices A and C for each outlet location.

A representative discharge sample may be obtained. 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, 7:30 am to 4 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. 160-139

Route 74 over Willimantic River
Tolland & Willington, 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

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Appendix B – Stormwater Calculations

Stormwater Outlet Calculations
Swale Calculations

Appendix C – Plan Sheets (Reduced to 11x17)

Drainage Layout Plans	DRN-01 - 02
Miscellaneous Details	MDS-01 - 02
Landscape Layout Plan	LDS-01 - 02

Appendix D – Stormwater Monitoring Report Form

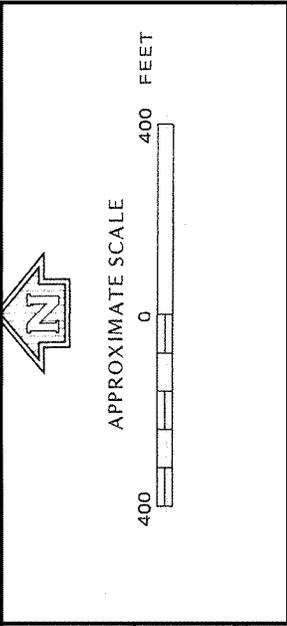
Appendix E – Notice of Termination Form

**State Project No. 160-139
Tolland Turnpike Bridge Replacement
Route 74 over Willimantic River**

Stormwater Pollution Control Plan

**Appendix A
Figures**

**Bridge No. 00982
Tolland & Willington, Connecticut**



NATIONAL FLOOD INSURANCE PROGRAM

FIRM FLOOD INSURANCE RATE MAP

**TOWN OF TOLLAND, CONNECTICUT
TOLLAND COUNTY**

PANEL 9 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
090171 0009 A

EFFECTIVE DATE:
APRIL 1, 1982



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

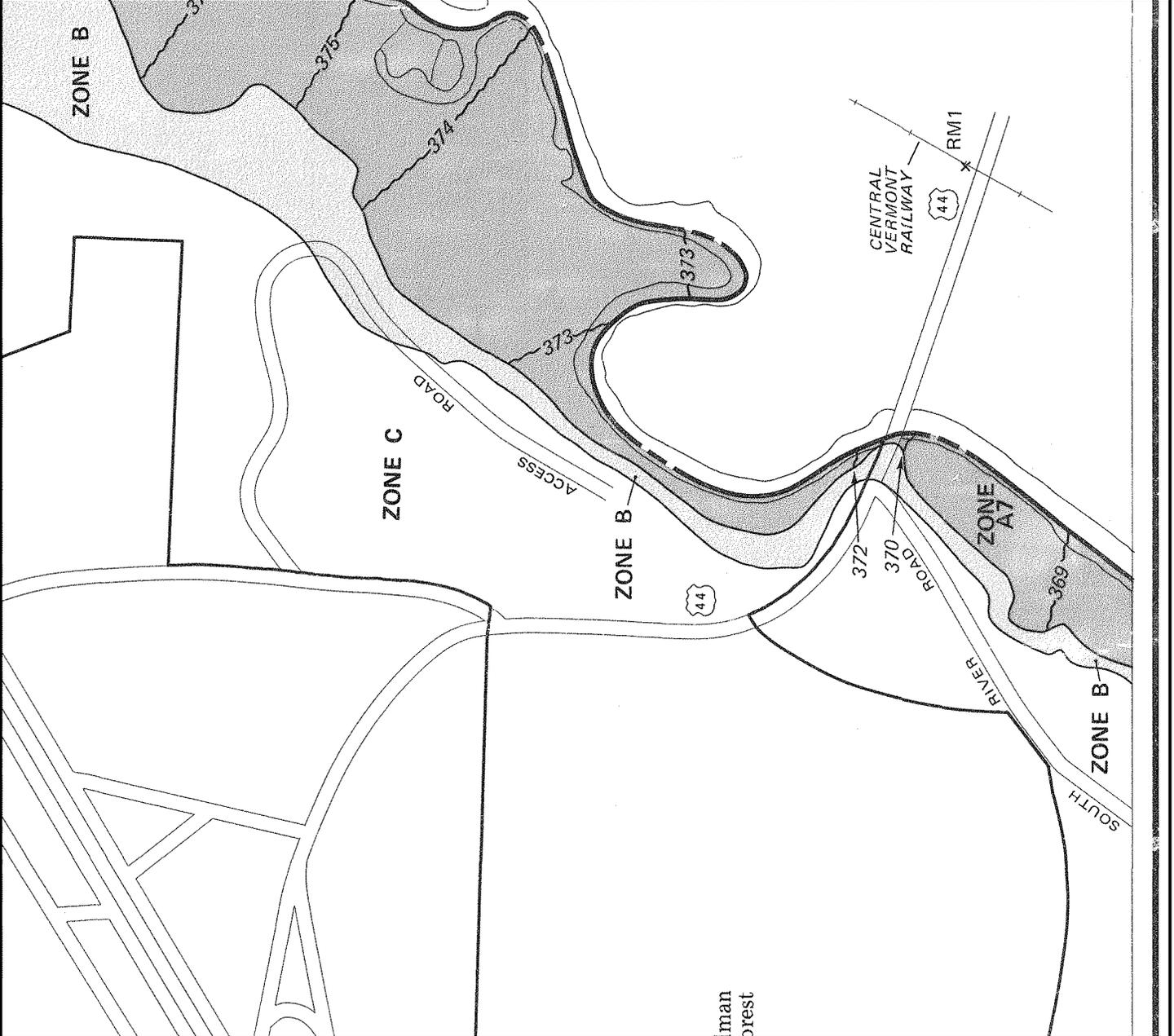


FIGURE NO.: 1

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM
FLOOD INSURANCE RATE MAP**

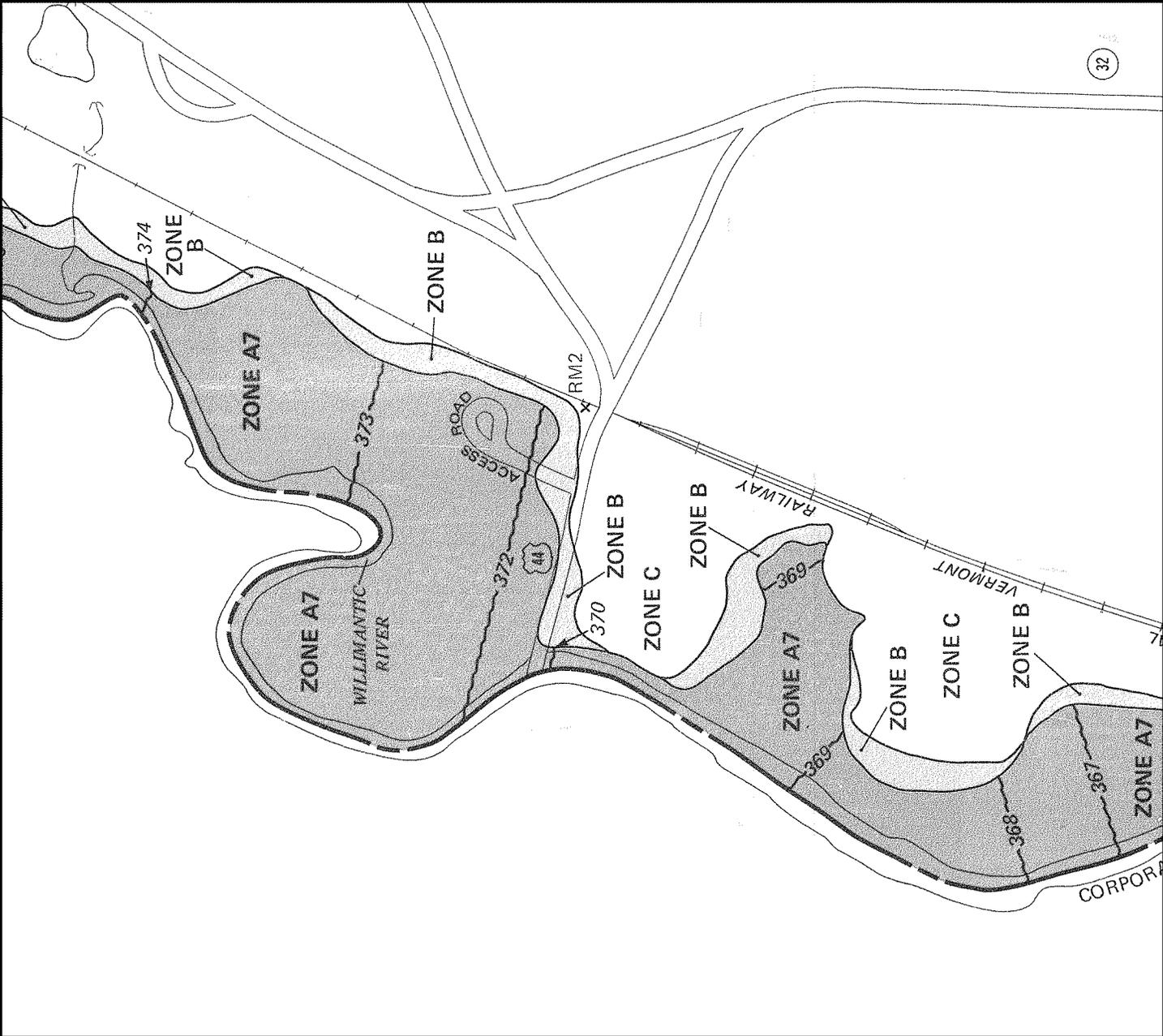
**TOWN OF
WILLINGTON,
CONNECTICUT
TOLLAND COUNTY**

PANEL 12 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

**COMMUNITY-PANEL NUMBER
090159 0012 A**

**EFFECTIVE DATE:
JUNE 15, 1982**

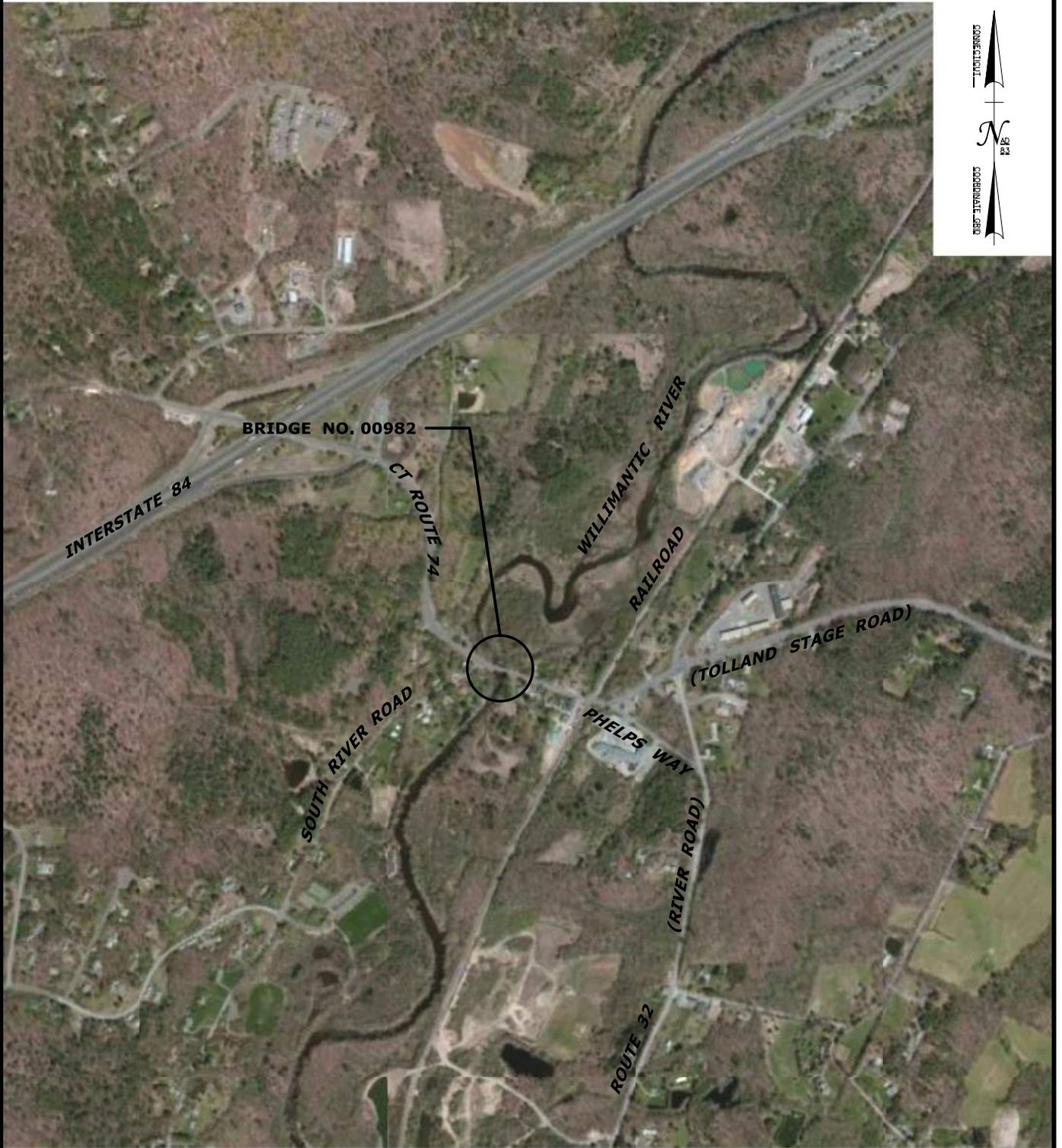

Federal Emergency Management Agency



32

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

FIGURE NO.: 2



ROUTE 74
OVER
WILLIMANTIC RIVER
TOLLAND / WILLINGTON
CONNECTICUT

AERIAL LOCATION
MAP
SCALE: 1" = 1000'

BRIDGE NO.: 00982

DATE: NOVEMBER 2015

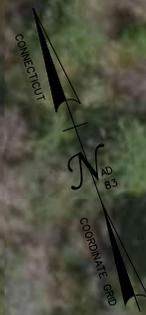
FIGURE NO.: 3



ROUTE 74
 BRIDGE REPLACEMENT
 OVER WILLIMANTIC RIVER
 TOLLAND/WILLINGTON, CT

EXISTING DRAINAGE
 AREA 1
 SCALE: 1" = 100'

BRIDGE NO.: 00982
DATE: NOVEMBER 2015
FIGURE NO.: 4



**EAST ABUTMENT
OUTLET EO-2
DRAINAGE AREA =
3.2 ACRES**

ROUTE 74 (TOLLAND TPKE.)

CL CB
TF- 3152
FL- 3624
BT- 3632

CL CB

TF- 3622
FL- 3632
BT- 3642



**ROUTE 74
BRIDGE REPLACEMENT
OVER WILLIMANTIC RIVER
TOLLAND/WILLINGTON, CT**

**EXISTING DRAINAGE
AREA 2
SCALE: 1" = 100'**

BRIDGE NO.: 00982
DATE: NOVEMBER 2015
FIGURE NO.: 5



ROUTE 74
 BRIDGE REPLACEMENT
 OVER WILLIMANTIC RIVER
 TOLLAND/WILLINGTON, CT

PROPOSED DRAINAGE
 AREA 1
 SCALE: 1" = 100'

BRIDGE NO.: 00982
DATE: NOVEMBER 2015
FIGURE NO.: 6



ROUTE 74
BRIDGE REPLACEMENT
OVER WILLIMANTIC RIVER
TOLLAND/WILLINGTON, CT

PROPOSED DRAINAGE
AREA 2
SCALE: 1" = 100'

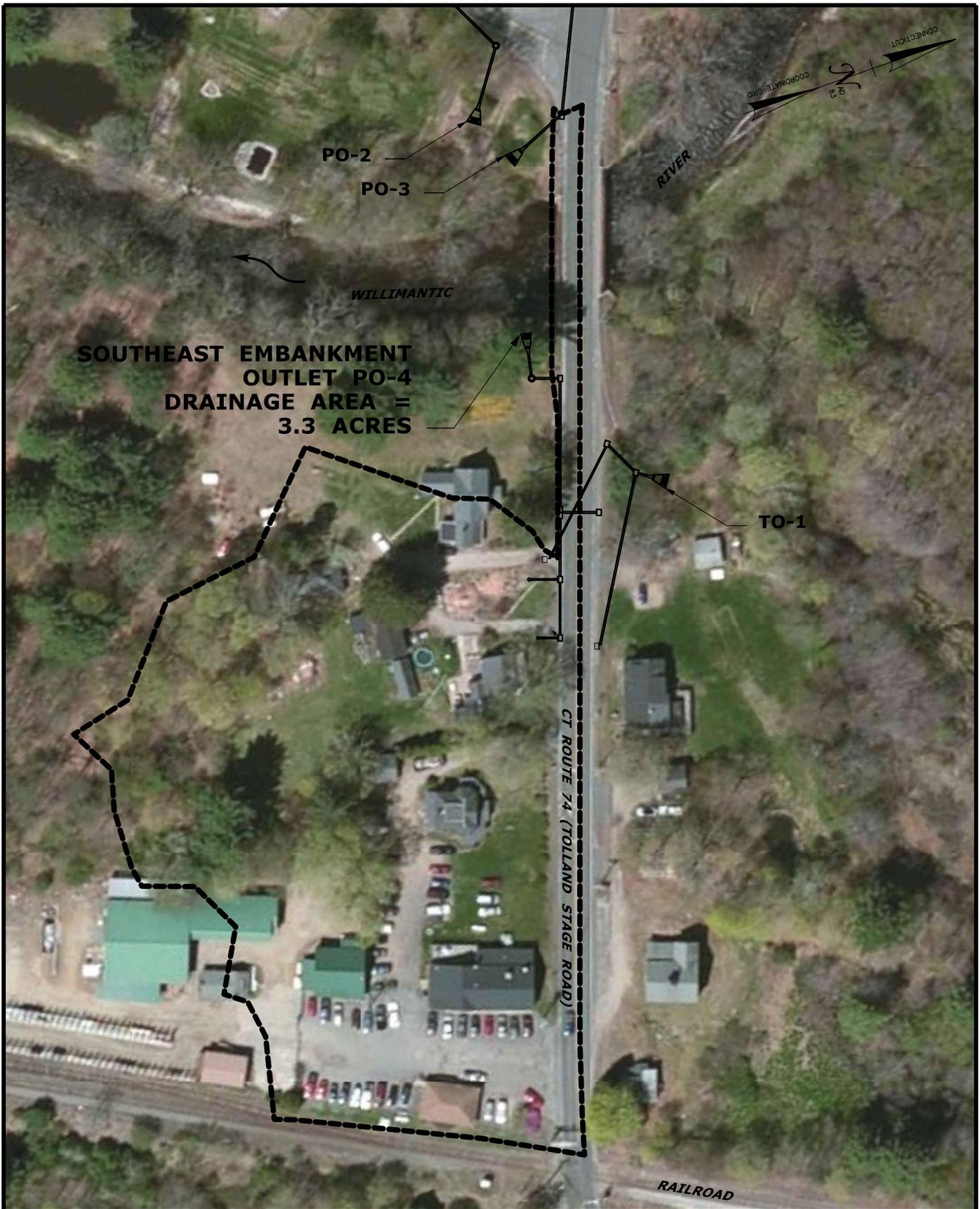
BRIDGE NO.: 00982
DATE: NOVEMBER 2015
FIGURE NO.: 7



ROUTE 74
BRIDGE REPLACEMENT
OVER WILLIMANTIC RIVER
TOLLAND/WILLINGTON, CT

PROPOSED DRAINAGE
AREA 3
SCALE: 1" = 100'

BRIDGE NO.: 00982
DATE: NOVEMBER 2015
FIGURE NO.: 8



ROUTE 74
BRIDGE REPLACEMENT
OVER WILLIMANTIC RIVER
TOLLAND/WILLINGTON, CT

PROPOSED DRAINAGE
AREA 4
SCALE: 1" = 100'

BRIDGE NO.: 00982
DATE: NOVEMBER 2015
FIGURE NO.: 9



ROUTE 74
 BRIDGE REPLACEMENT
 OVER WILLIMANTIC RIVER
 TOLLAND/WILLINGTON, CT

TEMPOARY DRAINAGE
 AREA 1
 SCALE: 1" = 100'

BRIDGE NO.: 00982
DATE: NOVEMBER 2015
FIGURE NO.: 10

Soil Map—State of Connecticut
(NRCS Soil Resource Report)

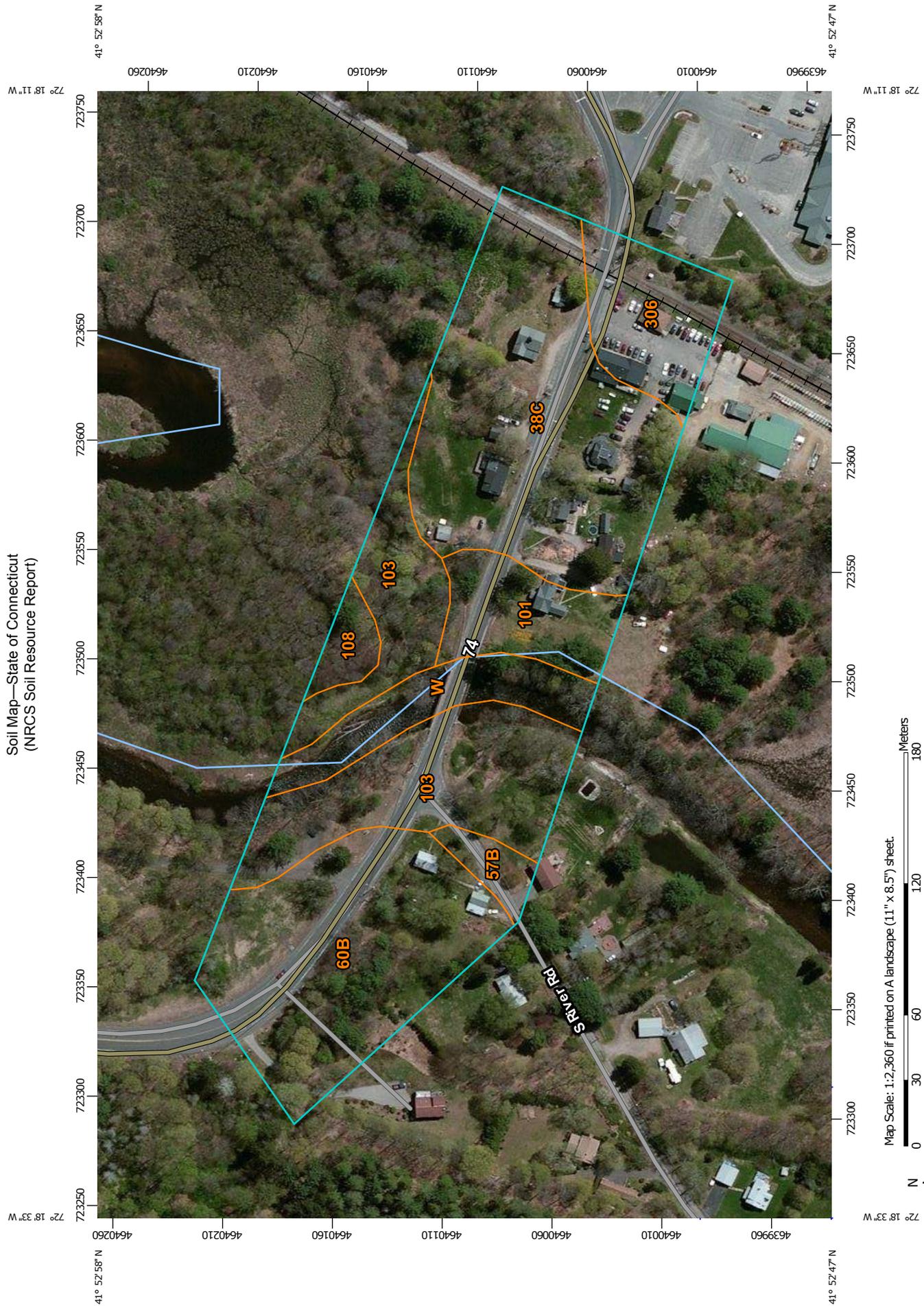


FIGURE NO.: 11.1



MAP LEGEND

Area of Interest (AOI)		Soils		Area of Interest (AOI)	
Area of Interest (AOI)		Soil Map Unit Polygons		Stony Spot	
		Soil Map Unit Lines		Very Stony Spot	
		Soil Map Unit Points		Wet Spot	
Special Point Features				Other	
Blowout				Special Line Features	
Borrow Pit		Water Features			
Clay Spot		Streams and Canals			
Closed Depression		Transportation			
Gravel Pit		Rails			
Gravelly Spot		Interstate Highways			
Landfill		US Routes			
Lava Flow		Major Roads			
Marsh or swamp		Local Roads			
Mine or Quarry		Background			
Miscellaneous Water		Aerial Photography			
Perennial Water					
Rock Outcrop					
Saline Spot					
Sandy Spot					
Severely Eroded Spot					
Sinkhole					
Slide or Slip					
Sodic Spot					

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.
Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 13, Oct 28, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

FIGURE NO.: 11.2

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
38C	Hinckley gravelly sandy loam, 3 to 15 percent slopes	3.5	29.9%
57B	Gloucester gravelly sandy loam, 3 to 8 percent slopes	0.2	1.9%
60B	Canton and Charlton soils, 3 to 8 percent slopes	2.7	23.2%
101	Occum fine sandy loam	0.8	6.9%
103	Rippowam fine sandy loam	2.5	21.5%
108	Saco silt loam	0.2	2.0%
306	Udorthents-Urban land complex	0.9	8.0%
W	Water	0.8	6.7%
Totals for Area of Interest		11.9	100.0%

**State Project No. 160-139
Tolland Turnpike Bridge Replacement
Route 74 over Willimantic River**

Stormwater Pollution Control Plan

**Appendix B
Outlet Protection Calculations
Swale Calculations**

**Bridge No. 00982
Tolland & Willington, Connecticut**

BL Companies

Environmental / Engineers / Architects

150 Trumbull Street

Sixth Floor

Hartford, CT 06103

PROJECT: Route 74 Bridge Replacement

PROJECT NO. 160-139 SHEET NO. _____ OF _____

CALCULATED BY DMC DATE 12/17/2009

CHECKED BY TPR DATE 12/21/2009

**OUTLET PROTECTION
STATION 13+44, 62' LT
10 YEARS RAINFALL INTENSITY**

Given: **Data from StormCAD Calculations**

Q = 4.32 cfs Tw = 0.53 ft

V = 8.81 ft/s

15 inch RCP

Tailwater Elevation equals HGL.

Minimum Tailwater Condition

Use Type A Apron

BL Companies

Environmental / Engineers / Architects

150 Trumbull Street

Sixth Floor

Hartford, CT 06103

Project: Route 74 Bridge Replacement

Project No. 160-139

Sheet No. _____

Calculated By DMC

Date 12/17/2009

Checked By TPR

Date 12/21/2009

STATION 13+44, 62' LT

1. Assess the erosion potential at the outlet and other critical site factors

Describe the conditions at the outlet location:
Free outfall.

- No well-defined channel
- Well-defined channel

2. Determine the tailwater (TW) conditions at the outlet

TW depth: 0.53 ft TW elevation: 376.53 ft

TW computational method: StormCAD

Channel bed elevation 376.00 ft Estimated velocity channel: _____

3. Calculate and evaluate the outlet velocity for the design discharge

Design Discharge: 4.32 cfs Design Frequency: 10 Years

Outlet Pipe Size: 15 inch Type: RCP

Slope: 0.033 Length: 62 ft Outlet Invert Elevation: 376.0

Outlet Velocity at design discharge: 8.81 ft/sec

Velocity computational method: StormCAD

4. Select the type of outlet protection

Riprap Apron
(See Figures 8-9 & 8-10)

Type	A
Riprap type:	Modified
Length (L _a):	10
Width (W ₁):	3.75
Width (W ₂):	10.75

Performed Scout Hole
(See Figure 8-11)

	Type 1	Type 2
d ₅₀	_____	_____
F	_____	_____
C	_____	_____
B	_____	_____
S _p	_____	_____

Proposed Type:
Riprap Type

BL Companies

Environmental / Engineers / Architects

150 Trumbull Street

Sixth Floor

Hartford, CT 06103

PROJECT: Route 74 Bridge Replacement

PROJECT NO. 160-139 SHEET NO. _____ OF _____

CALCULATED BY DMC DATE 12/17/2009

CHECKED BY TPR DATE 12/21/2009

**OUTLET PROTECTION
STATION 18+39, 52' RT
10 YEARS RAINFALL INTENSITY**

Given: **Data from StormCAD Calculations**

Q = 0.55 cfs

Tw = 0.16 ft

V = 6.08 ft/s

15 inch RCP

Tailwater Elevation equals HGL.

Minimum Tailwater Condition

Use Type A Apron

STATION 18+39, 52' RT

1. Assess the erosion potential at the outlet and other critical site factors

Describe the conditions at the outlet location:
Free outfall.

- No well-defined channel
 Well-defined channel

2. Determine the tailwater (TW) conditions at the outlet

TW depth: 0.16 ft TW elevation: 365.16 ft
 TW computational method: StormCAD
 Channel bed elevation 365.00 ft Estimated velocity channel: _____

3. Calculate and evaluate the outlet velocity for the design discharge

Design Discharge: 0.55 cfs Design Frequency: 10 Years
 Outlet Pipe Size: 15 inch Type: RCP
 Slope: 0.061 Length: 50 ft Outlet Invert Elevation: 365.0
 Outlet Velocity at design discharge: 6.08 ft/sec
 Velocity computational method: StormCAD

4. Select the type of outlet protection

Riprap Apron
 (See Figures 8-9 & 8-10)

Type	A
Riprap type:	Modified
Length (L _a):	10
Width (W ₁):	3.75
Width (W ₂):	10.75

Performed Scout Hole
 (See Figure 8-11)

	<u>Type 1</u>	<u>Type 2</u>
d ₅₀	_____	_____
F	_____	_____
C	_____	_____
B	_____	_____
S _p	_____	_____

Proposed Type:
 Riprap Type

BL Companies

Environmental / Engineers / Architects

150 Trumbull Street

Sixth Floor

Hartford, CT 06103

PROJECT: Route 74 Bridge Replacement

PROJECT NO. 160-139 SHEET NO. _____ OF _____

CALCULATED BY DMC DATE 12/8/2010

CHECKED BY TPR DATE 12/10/2010

**OUTLET PROTECTION
STATION 19+64, 40' RT
10 YEARS RAINFALL INTENSITY**

Given: **Data from StormCAD Calculations**

Q = 4.46 cfs

Tw = 0.86 ft

V = 4.65 ft/s

15 inch RCP

Tailwater Elevation equals HGL.

Maximum Tailwater Condition

Use Type B Apron

BL Companies

Environmental / Engineers / Architects

150 Trumbull Street

Sixth Floor

Hartford, CT 06103

Project: **Route 74 Bridge Replacement**

Project No. 160-139

Sheet No. _____

Calculated By DMC

Date 12/8/2010

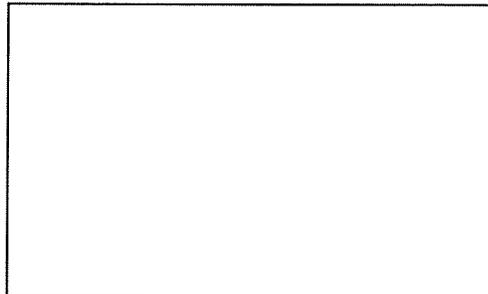
Checked By TPR

Date 12/10/2010

STATION 13+44, 62' LT

1. Assess the erosion potential at the outlet and other critical site factors

Describe the conditions at the outlet location:
Free outfall.



- No well-defined channel
 Well-defined channel

2. Determine the tailwater (TW) conditions at the outlet

TW depth: 0.86 ft TW elevation: 364.86 ft
TW computational method: StormCAD
Channel bed elevation 364.00 ft Estimated velocity channel: _____

3. Calculate and evaluate the outlet velocity for the design discharge

Design Discharge: 4.46 cfs Design Frequency: 10 Years
Outlet Pipe Size: 15 inch Type: RCP
Slope: 0.006 Length: 22 ft Outlet Invert Elevation: 364.0
Outlet Velocity at design discharge: 4.65 ft/sec
Velocity computational method: StormCAD

4. Select the type of outlet protection

Riprap Apron
(See Figures 8-9 & 8-10)

Type	B
Riprap type:	Modified
Length (L _a):	10
Width (W ₁):	3.75
Width (W ₂):	7.75

Performed Scout Hole
(See Figure 8-11)

	Type 1	Type 2
d ₅₀	_____	_____
F	_____	_____
C	_____	_____
B	_____	_____
S _p	_____	_____

Proposed Type:
Riprap Type

BL Companies

Environmental / Engineers / Architects

150 Trumbull Street

Sixth Floor

Hartford, CT 06103

PROJECT: Route 74 Bridge Replacement

PROJECT NO. 160-139 SHEET NO. _____ OF _____

CALCULATED BY DMC DATE 12/17/2009

CHECKED BY TPR DATE 12/21/2009

**OUTLET PROTECTION
STATION 3+42, 78' RT
10 YEARS RAINFALL INTENSITY**

Given: **Data from StormCAD Calculations**

Q = 1.15 cfs Tw = 0.30 ft
V = 5.08 ft/s
15 inch RCP

Tailwater Elevation equals HGL.

Minimum Tailwater Condition

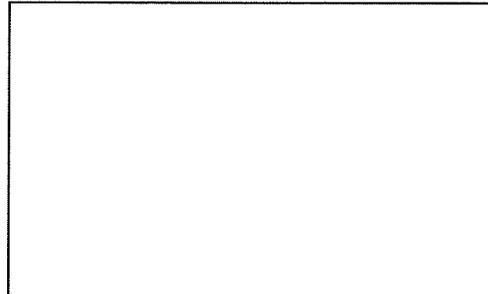
Use Type A Apron

STATION 3+42, 78' RT

1. Assess the erosion potential at the outlet and other critical site factors

Describe the conditions at the outlet location:

Free outfall.



- No well-defined channel
- Well-defined channel

2. Determine the tailwater (TW) conditions at the outlet

TW depth: 0.30 ft TW elevation: 364.3 ft
 TW computational method: StormCAD
 Channel bed elevation 364.00 ft Estimated velocity channel: _____

3. Calculate and evaluate the outlet velocity for the design discharge

Design Discharge: 1.15 cfs Design Frequency: 10 Years
 Outlet Pipe Size: 15 inch Type: RCP
 Slope: 0.02 Length: 48 ft Outlet Invert Elevation: 364.0
 Outlet Velocity at design discharge: 5.08 ft/sec
 Velocity computational method: StormCAD

4. Select the type of outlet protection

Riprap Apron
(See Figures 8-9 & 8-10)

Type	A
Riprap type:	Modified
Length (L _a):	10
Width (W ₁):	3.75
Width (W ₂):	10.75

Performed Scout Hole
(See Figure 8-11)

	<u>Type 1</u>	<u>Type 2</u>
d ₅₀	_____	_____
F	_____	_____
C	_____	_____
B	_____	_____
S _p	_____	_____

Proposed Type:
Riprap Type

Swale Calculations

Sheet 1 – Analysis of Artificial and Natural Lining Types at Station 12+93.7, 43' RT

Sheet 2 – Analysis of Riprap Lining at Station 12+93.7, 43' RT

Sheet 3 – Analysis of Artificial and Natural Lining Types at the beginning of the swale at Station 9+30 RT (documenting the failure of Class C vegetation at the start of the swale)

Commands Read From File: F:\JOBS06\06C178~2\ENG\ROADWA~1\SWALEC~1\ROUTE7~1.CHL

JOB ROUTE74
 UNI 0
 ** UNITS PARAMETER = 0 (ENGLISH)
 CHL .0506 3.75
 TRP 3 2 2
 ** LEFT SIDE SLOPE 2.0 AND RIGHT SIDE SLOPE 2.0
 ** THE BASE WIDTH OF THE TRAPEZOID (ft) 3.00
 END
 *****END OF COMMAND FILE*****

ROUTE74

INPUT REVIEW

DESIGN PARAMETERS:
 DESIGN DISCHARGE (ft³/s): 3.75
 CHANNEL SHAPE: TRAPEZOIDAL
 CHANNEL SLOPE (ft/ft): .051

RESULTS

Lining Type	SHEAR STRESS(psf)		Len of Super Protect (ft)	Super Elev (ft)	Remark	Stab. Factor	Max Q (cfs)	---DESIGN---	
	Permiss	Bottom						Depth (ft)	Mann n
TEMPORARY (FLEXIBLE)									
WOVEN PAPER NET	.15	.54	.00	0.	UNSTAB	.28	.4	.17	.014
JUTE NET	.45	.82	.00	0.	UNSTAB	.55	1.1	.26	.030
FIBERGLASS SINGLE	.60	.81	.00	0.	UNSTAB	.75	2.1	.26	.029
FIBERGLASS DOUBLE	.85	.84	.00	0.	STABLE	1.01	3.8	.27	.031
STRAW WITH NET	1.45	1.18	.00	0.	STABLE	1.23	6.1	.37	.056
CURLED WOOD MAT	1.55	1.19	.00	0.	STABLE	1.30	6.8	.38	.057
SYNTHETIC MAT	2.00	.93	.00	0.	STABLE	2.16	18.5	.29	.037
PERMANENT (FLEXIBLE)									
*** WARNING: DEPTH DID NOT CONVERGE. PROGRAM WILL CONTINUE WITH MOST RECENT VALUE									
VEGETATIVE A	3.70	3.67	.00	0.	STABLE	1.01	3.9	1.16	.455
*** WARNING: DEPTH DID NOT CONVERGE. PROGRAM WILL CONTINUE WITH MOST RECENT VALUE									
VEGETATIVE B	2.10	2.32	.00	0.	UNSTAB	.90	2.5	.73	.190
VEGETATIVE C	1.00	1.64	.00	0.	UNSTAB	.61	.7	.52	.100
VEGETATIVE D	.60	1.39	.00	0.	UNSTAB	.43	.2	.44	.074
VEGETATIVE E	.35	1.25	.00	0.	UNSTAB	.28	.0	.40	.062
RIGID									
CONCRETE	*****	.55	.00	0.	STABLE	*****	.0	.17	.015
GROUTED RIPRAP	*****	.97	.00	0.	STABLE	*****	.0	.31	.040
STONE MASONRY	*****	1.00	.00	0.	STABLE	*****	.0	.32	.042
SOIL CEMENT	*****	.74	.00	0.	STABLE	*****	.0	.24	.025
ASPHALT	*****	.61	.00	0.	STABLE	*****	.0	.19	.018

SOME RIPRAP AND GABION LININGS MAY ALSO BE STABLE

Commands Read From File: F:\JOBS06\06C178~2\ENG\ROADWA~1\SWALEC~1\TESTE7~1.CHL

```

JOB ROUTE74R
UNI 0
** UNITS PARAMETER = 0 (ENGLISH)
   CHL .0506  3.75
   TRP 3      2      2
** LEFT SIDE SLOPE      2.0 AND RIGHT SIDE SLOPE      2.0
** THE BASE WIDTH OF THE TRAPEZOID (ft)      3.00
   LRR .35    2 41    2.65  0.047
** D50 (ft)      .35
** ANGLE OF REPOSE (DEGREES)      41.00
** SPECIFIC GRAVITY      2.65
** SHIELDS PARAMETER      .047
END

```

*****END OF COMMAND FILE*****

ROUTE74R

INPUT REVIEW

```

DESIGN PARAMETERS:
  DESIGN DISCHARGE (ft^3/s):      3.75
  CHANNEL SHAPE:      TRAPEZOIDAL
  CHANNEL SLOPE (ft/ft):      .051

```

HYDRAULIC CALCULATIONS USING BATHURST

```

FLOW (cfs)      3.75
MAX DEPTH (ft)  .38
AREA (ft^2)     1.42
WETTED PERIMETER (ft)  4.69
HYDRAULIC RADIUS (ft) .30
AVG VELOCITY (ft/s)  2.65
MANNINGS EQUIVALENT .058
Davg / D50      .90
FROUDE NUMBER   .76
REYNOLDS NUMBER (10^5) .26

```

STABILITY ANALYSIS

CONDITION	LINING TYPE	PERMIS SHR (LB/FT^2)	CALC. SHR (LB/FT^2)	STAB. FACTOR	REMARKS
BOTTOM; STRAIGHT	RIPRAP	1.69	1.19	1.43	STABLE
SIDE; STRAIGHT	RIPRAP	1.24	.91	1.36	STABLE

*** NORMAL END OF HYCHL ***

Commands Read From File: F:\JOBS06\06C178~2\ENG\ROADWA~1\SWALEC~1\STA9_5~1.CHL

JOB STA9+50

UNI 0

** UNITS PARAMETER = 0 (ENGLISH)

CHL .051 1.5

TRP 3 2 2

** LEFT SIDE SLOPE 2.0 AND RIGHT SIDE SLOPE 2.0

** THE BASE WIDTH OF THE TRAPEZOID (ft) 3.00

END

*****END OF COMMAND FILE*****

STA9+50

INPUT REVIEW

DESIGN PARAMETERS:

DESIGN DISCHARGE (ft³/s): 1.50
 CHANNEL SHAPE: TRAPEZOIDAL
 CHANNEL SLOPE (ft/ft): .051

RESULTS

Lining Type	SHEAR STRESS(psf)		Len of Protect (ft)	Super Elev (ft)	Remark	Stab. Factor	Max Q (cfs)	---DESIGN---	
	Permiss	Bottom						Depth (ft)	Mann n
TEMPORARY (FLEXIBLE)									
WOVEN PAPER NET	.15	.32	.00	0.	UNSTAB	.46	.4	.10	.015
JUTE NET	.45	.53	.00	0.	UNSTAB	.85	1.1	.17	.035
FIBERGLASS SINGLE	.60	.52	.00	0.	STABLE	1.16	2.0	.16	.033
FIBERGLASS DOUBLE	.85	.55	.00	0.	STABLE	1.55	3.8	.17	.037
STRAW WITH NET	1.45	.82	.00	0.	STABLE	1.76	6.0	.26	.074
CURLED WOOD MAT	1.55	.82	.00	0.	STABLE	1.89	6.7	.26	.074
SYNTHETIC MAT	2.00	.62	.00	0.	STABLE	3.25	18.3	.19	.045
PERMANENT (FLEXIBLE)									
VEGETATIVE A	3.70	3.10	.00	0.	STABLE	1.19	3.8	.97	.814
VEGETATIVE B	2.10	1.89	.00	0.	STABLE	1.11	2.5	.59	.322
VEGETATIVE C	1.00	1.23	.00	0.	UNSTAB	.82	.7	.39	.148
VEGETATIVE D	.60	.99	.00	0.	UNSTAB	.60	.2	.31	.103
VEGETATIVE E	.35	.87	.00	0.	UNSTAB	.40	.0	.27	.082
RIGID									
CONCRETE	*****	.32	.00	0.	STABLE	*****	.0	.10	.015
GROUTED RIPRAP	*****	.58	.00	0.	STABLE	*****	.0	.18	.040
STONE MASONRY	*****	.59	.00	0.	STABLE	*****	.0	.19	.042
SOIL CEMENT	*****	.44	.00	0.	STABLE	*****	.0	.14	.025
ASPHALT	*****	.36	.00	0.	STABLE	*****	.0	.11	.018

SOME RIPRAP AND GABION LININGS MAY ALSO BE STABLE
 *** NORMAL END OF HYCHL ***

**State Project No. 160-139
Tolland Turnpike Bridge Replacement
Route 74 over Willimantic River**

Stormwater Pollution Control Plan

**Appendix C
Plan Sheets (Reduced to 11x17)**

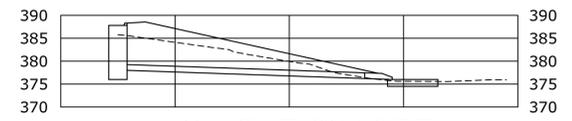
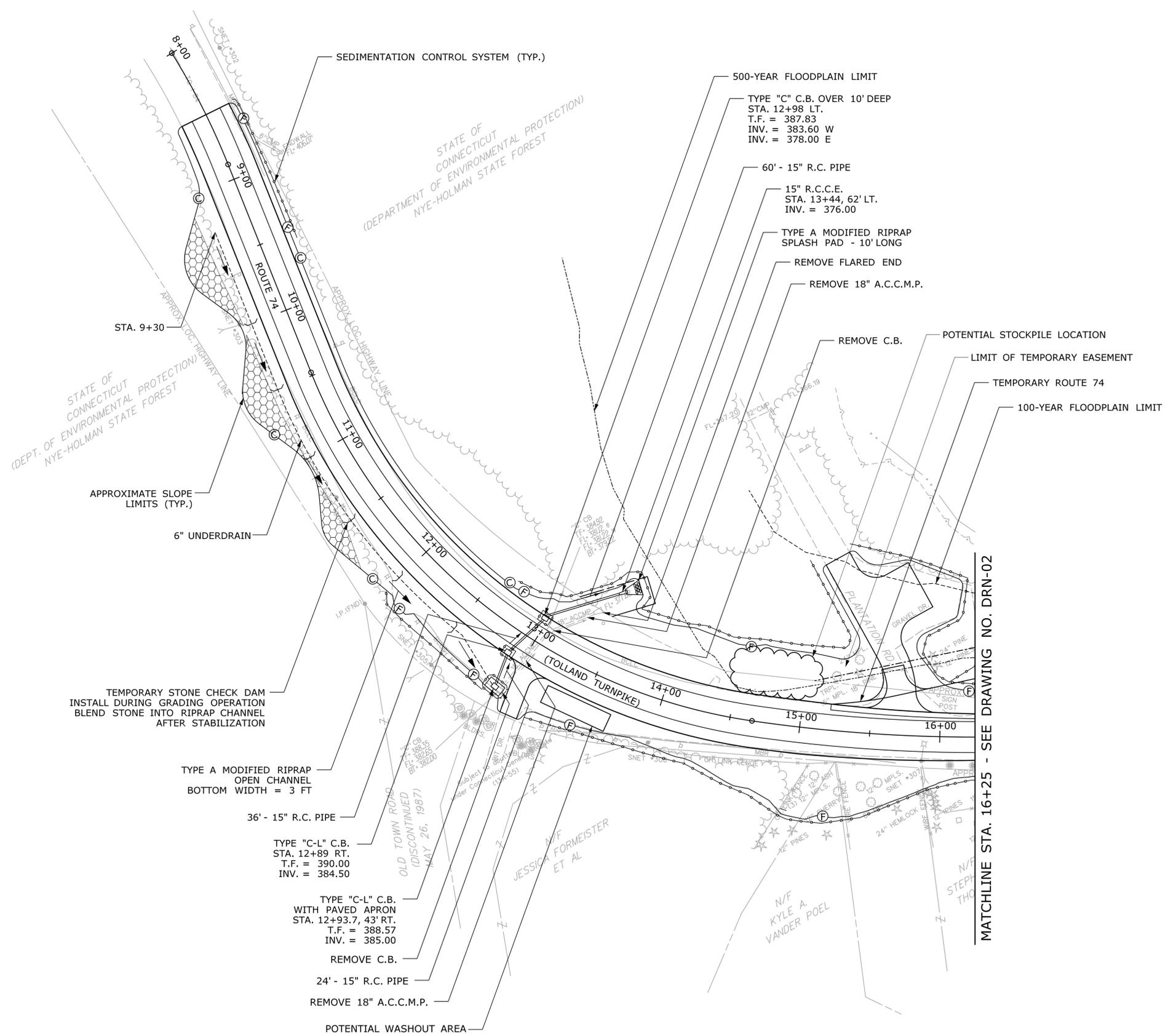
**Bridge No. 00982
Tolland & Willington, Connecticut**

CONSTRUCTION NOTES:

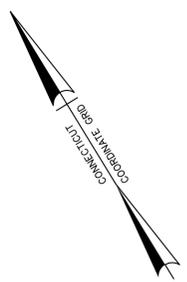
1. TOP OF FRAME (T.F.) ELEVATIONS CALLED OUT ON THIS SHEET REPRESENT THEORETICAL GUTTER LINE ELEVATIONS. SEE CTDOT STANDARD SHEETS FOR DEPRESSION DETAILS.
2. ALL CATCH BASINS HAVE 2-FOOT SUMPS UNLESS NOTED OTHERWISE.
3. SEE THE 2002 GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR SEDIMENT BARRIER DETAILS.
4. THE INSTALLATION OF SEDIMENT BARRIERS SHOULD BE AVOIDED FROM LATE AUGUST THROUGH SEPTEMBER AND FROM MARCH THROUGH MID-MAY. DURING THIS TIME, AMPHIBIANS AND REPTILES ARE ACTIVE IN WETLAND AREAS.
5. THE PLACEMENT OF SEDIMENT BARRIERS SHALL BE STAGGERED TO ALLOW AMPHIBIAN AND REPTILE MIGRATION.
6. SEDIMENT BARRIERS ARE TO BE REMOVED AS SOON AS SOIL IS STABLE.
7. STOCKPILED MATERIAL SHALL BE COMPLETELY ENCLOSED WITH SEDIMENT BARRIER TO PREVENT ANIMAL INTRUSION.

LEGEND

-  SEDIMENTATION CONTROL SYSTEM
-  4" TOPSOIL
-  TURF ESTABLISHMENT AND EROSION CONTROL MATTING TYPE D



DRAINAGE NETWORK 1 OUTLET
STA. 12+98 LT. TO STA. 13+44 LT.
1" = 20'



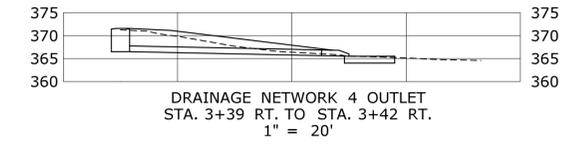
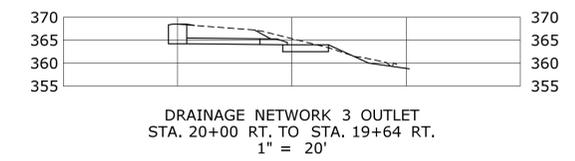
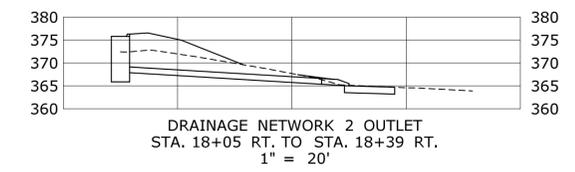
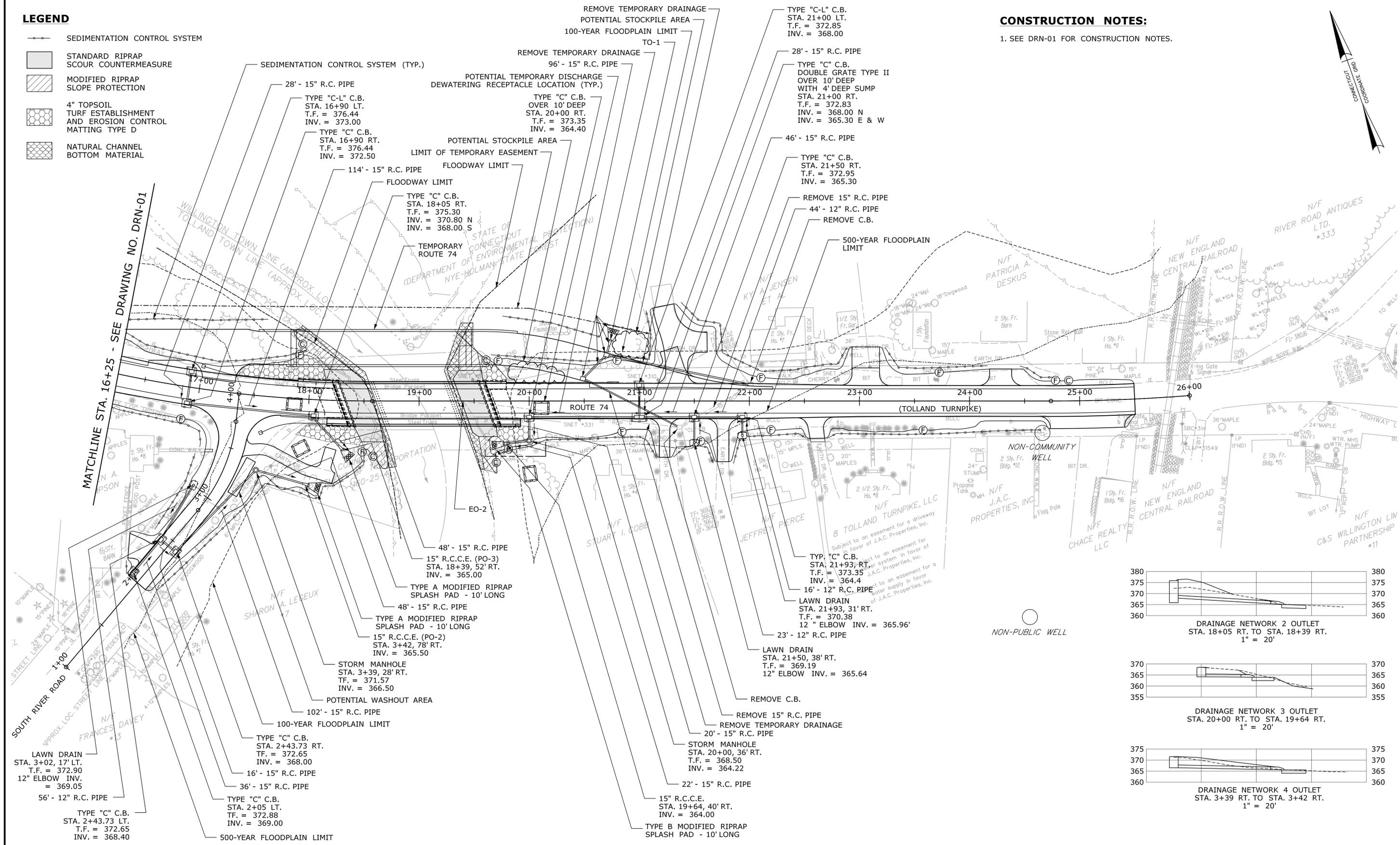
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				CHECKED BY: N.R.G.				SCALE IN FEET 0 40 80 SCALE 1"=40'	DRAWING TITLE: DRAINAGE LAYOUT & SEDIMENTATION CONTROL PLAN

LEGEND

-  SEDIMENTATION CONTROL SYSTEM
-  STANDARD RIPRAP SCOUR COUNTERMEASURE
-  MODIFIED RIPRAP SLOPE PROTECTION
-  4" TOPSOIL TURF ESTABLISHMENT AND EROSION CONTROL MATTING TYPE D
-  NATURAL CHANNEL BOTTOM MATERIAL

CONSTRUCTION NOTES:

1. SEE DRN-01 FOR CONSTRUCTION NOTES.



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.

Plotted Date: 11/3/2015

DESIGNER/DRAFTER:
S.D.F./J.H.E.

CHECKED BY:
N.R.G.

SCALE IN FEET
0 40 80
SCALE 1"=40'



SIGNATURE/BLOCK:

DESIGNED BY:
BL
BL COMPANIES, INC.
355 RESEARCH PARKWAY
MERRIDEN, CT 06450

PROJECT TITLE:
**ROUTE 74 BRIDGE REPLACEMENT
OVER WILLIMANTIC RIVER
BRIDGE NO. 00982**

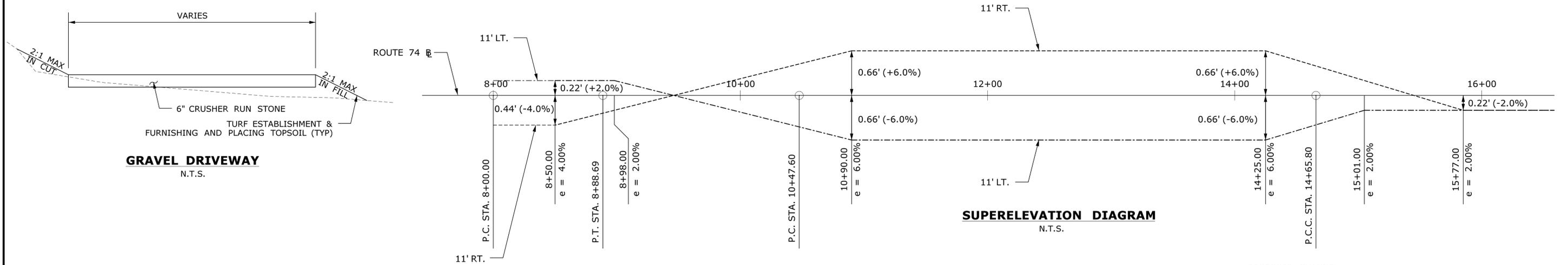
TOWN:
TOLLAND & WILLINGTON

DRAWING TITLE:
**DRAINAGE LAYOUT &
SEDIMENTATION CONTROL PLAN**

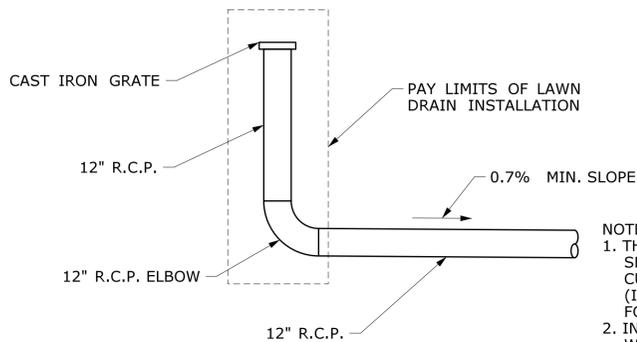
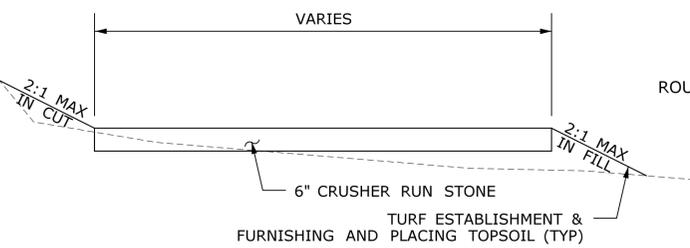
PROJECT NO.
160-139

DRAWING NO.
DRN-02

SHEET NO.
03.13

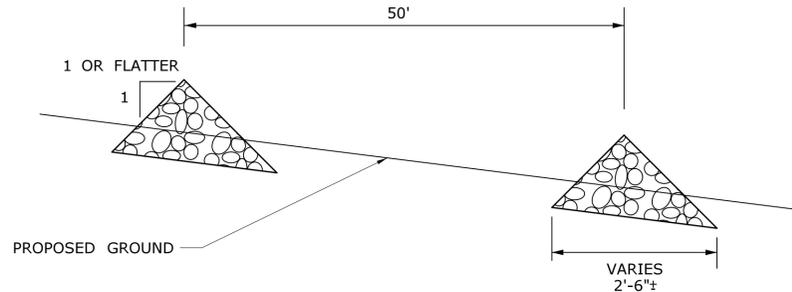


GRAVEL DRIVEWAY
N.T.S.

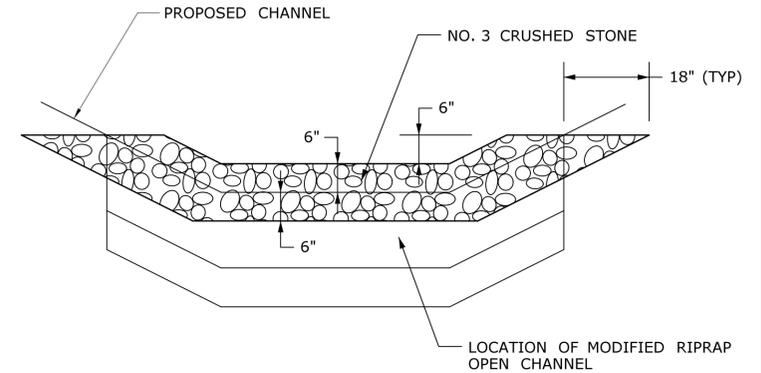


LAWN DRAIN

- NOTES:
1. THE CONTRACTOR SHALL FURNISH, IN CONFORMANCE WITH SECTION 1.06 - CONTROL OF MATERIALS, FORM 816, PRODUCT CUT SHEETS AND DESCRIPTIVE LITERATURE FOR LAWN DRAINS (INCLUDING THE GRATE SIZE AND STYLE) TO THE ENGINEER FOR APPROVAL.
 2. INSTALLATION OF LAWN DRAIN SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS & SECTION 5.07 IN THE STANDARD SPECIFICATIONS FORM 816.
 3. GRATE, ELBOW AND VERTICAL R.C. PIPE TO BE INCLUDED IN THE CONTRACT UNIT PRICE FOR "LAWN DRAIN."

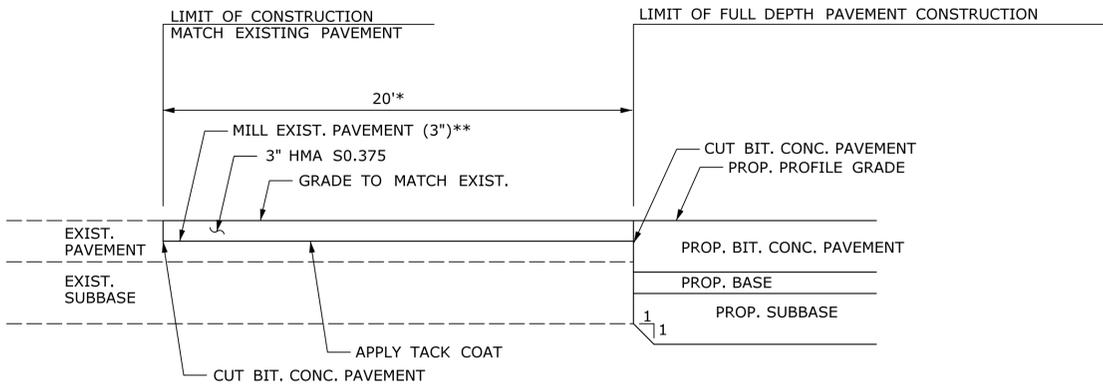


SPACING BETWEEN CHECK DAMS



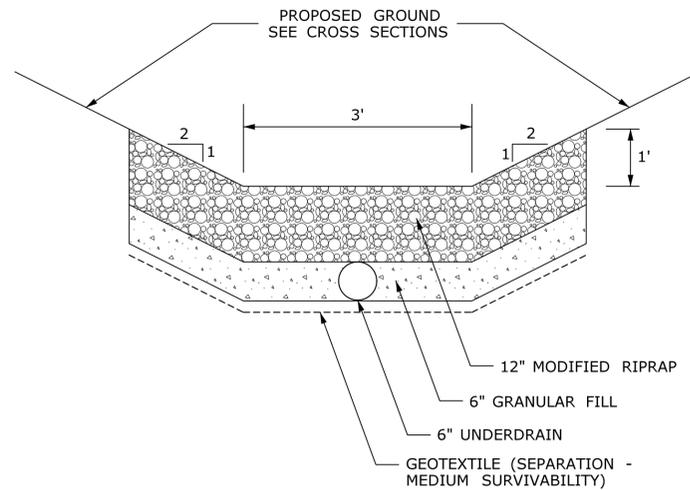
VIEW LOOKING UPSTREAM

TEMPORARY STONE CHECK DAM

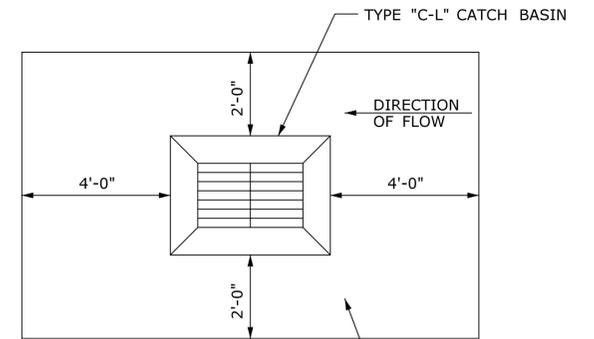


MILLING FOR PAVEMENT TIE-IN

- * OR AS SHOWN ON PLANS
- ** TO BE PAID FOR UNDER THE ITEM "MILLING OF BITUMINOUS CONCRETE (0" - 4")"



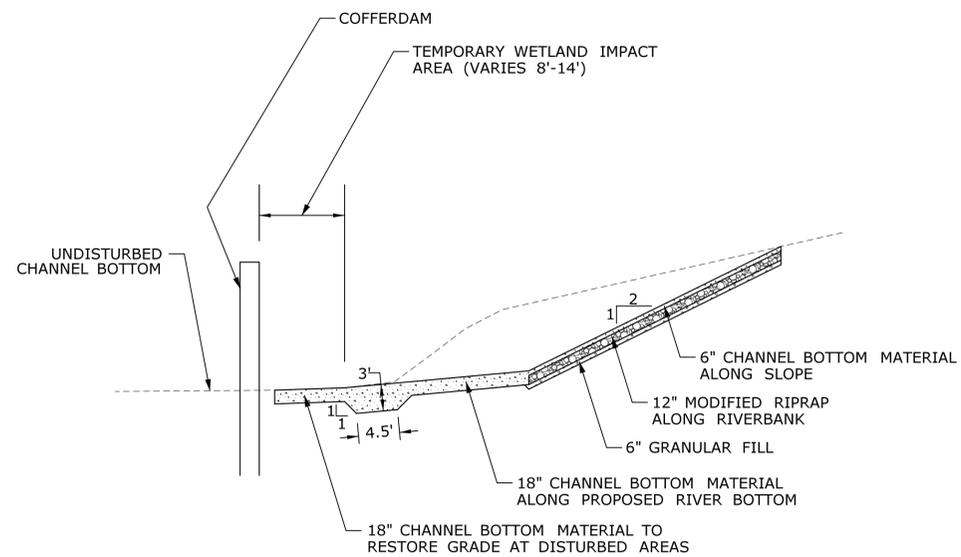
TYPE A MODIFIED RIPRAP OPEN CHANNEL



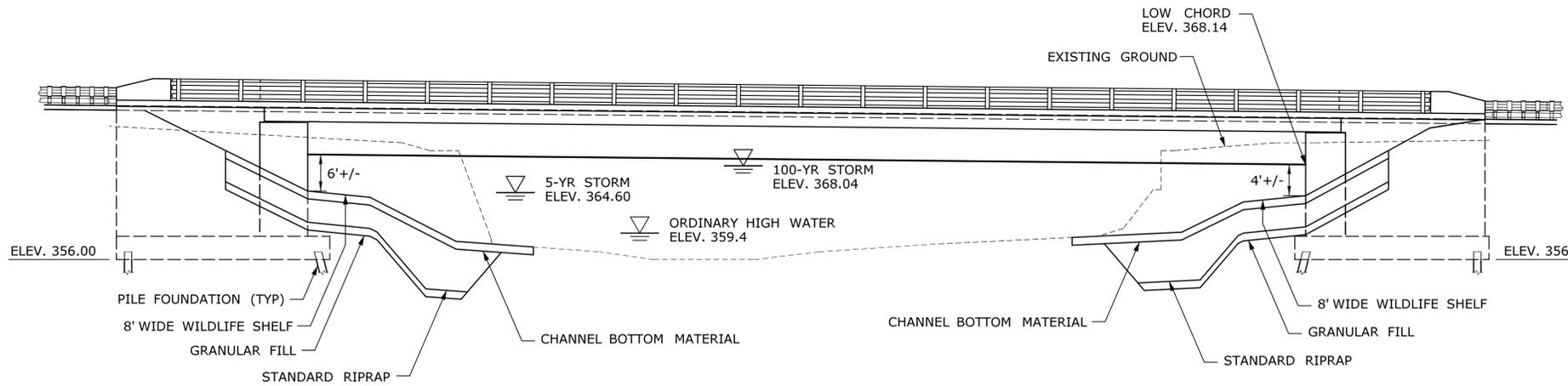
PLAN VIEW - SAG CONDITION

PAVED APRON FOR TYPE "C-L" CATCH BASIN

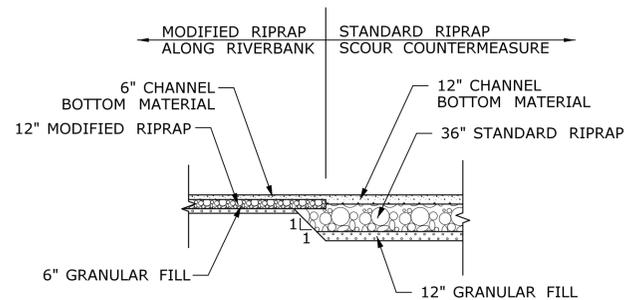
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: S.D.F./J.H.E. CHECKED BY: N.R.G. SCALE IN FEET SCALE 1"=40'	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...\\09\\HW_MSH_160-139_MDS-01.dgn	SIGNATURE/BLOCK: DESIGNED BY: BL COMPANIES, INC. 355 RESEARCH PARKWAY MERIDEN, CT 06450	PROJECT TITLE: ROUTE 74 BRIDGE REPLACEMENT OVER WILLIMANTIC RIVER BRIDGE NO. 00982	TOWN: TOLLAND & WILLINGTON	PROJECT NO. 160-139
REV. DATE REVISION DESCRIPTION SHEET NO.	Plotted Date: 9/22/2015	SCALE 1"=40'	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/BLOCK:	PROJECT TITLE:	TOWN:	PROJECT NO.
						DRAWING TITLE: MISCELLANEOUS DETAILS	DRAWING NO. MDS-01
						SHEET NO. 03.06	



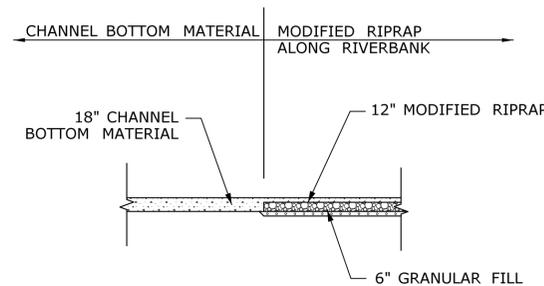
RIPRAP INSTALLATION ALONG RIVERBANK



PROPOSED BRIDGE ELEVATION

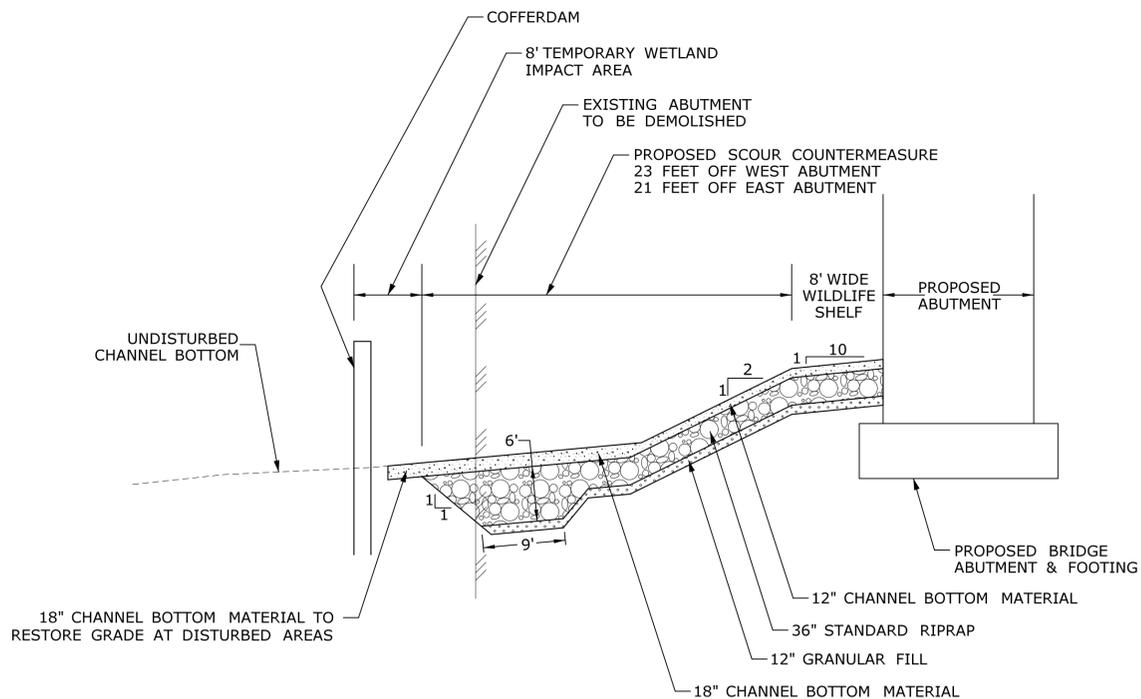


SECTION A
GRA-02



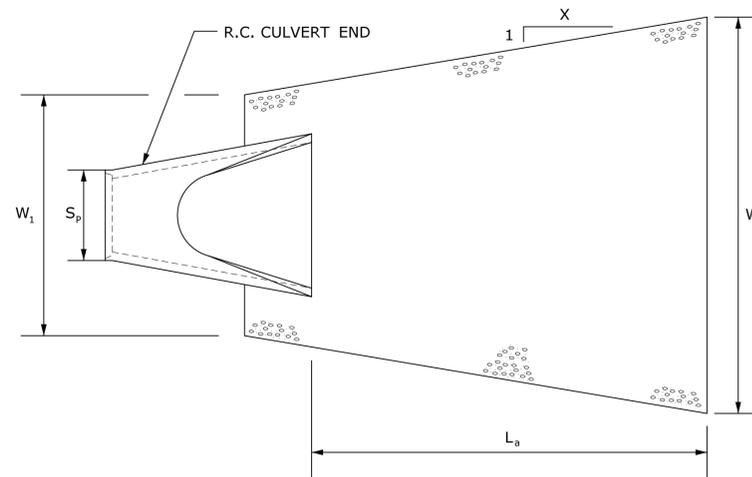
SECTION B
GRA-02

RIPRAP TRANSITION DETAILS

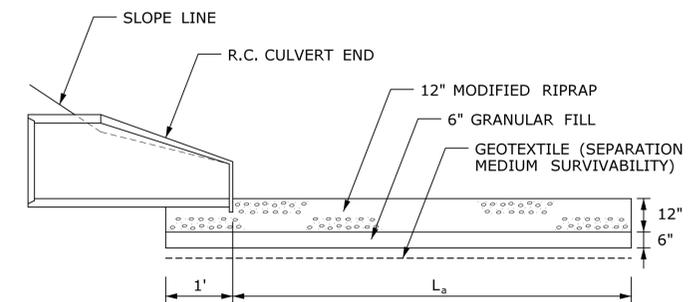


RIPRAP INSTALLATION ALONG ABUTMENT FACE

RIPRAP INSTALLATION DETAILS



PLAN



ELEVATION

TYPE A AND B MODIFIED RIPRAP SPLASH PAD

LEGEND

S_p = INSIDE PIPE DIAMETER

	X	W_1	W_2
TYPE A RIPRAP APRON	3	$3S_p$	$3S_p + 0.7 L_a$
TYPE B RIPRAP APRON	5	$3S_p$	$3S_p + 0.4 L_a$

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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DESIGNER/DRAFTER:
S.D.F./J.H.E.
CHECKED BY:
N.R.G.
NOT TO SCALE



SIGNATURE/BLOCK:
DESIGNED BY:
BL COMPANIES, INC.
355 RESEARCH PARKWAY
MERIDEN, CT 06450

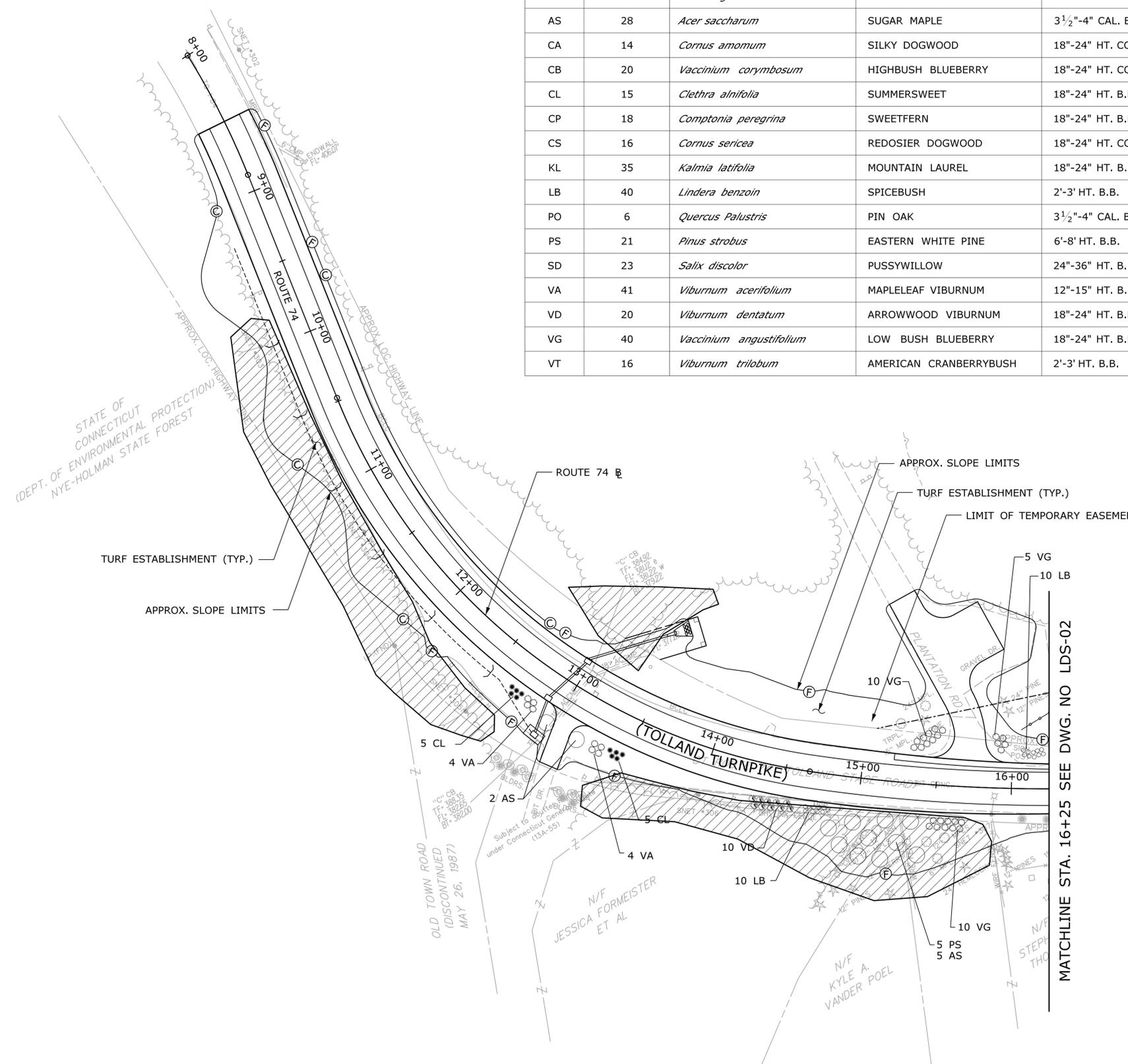
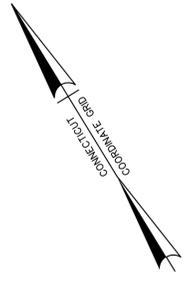
PROJECT TITLE:
ROUTE 74 BRIDGE REPLACEMENT OVER WILLIMANTIC RIVER BRIDGE NO. 00982

TOWN:
TOLLAND & WILLINGTON
DRAWING TITLE:
MISCELLANEOUS DETAILS

PROJECT NO.
160-139
DRAWING NO.
MDS-02
SHEET NO.
03.07

LANDSCAPE SCHEDULE

KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
AR	16	<i>Alnus rugosa</i>	SPECKLED ALDER	18"-24" HT. B.B.	4' ON CENTER SPACING
AS	28	<i>Acer saccharum</i>	SUGAR MAPLE	3 1/2"-4" CAL. B.B.	15' ON CENTER SPACING
CA	14	<i>Cornus amomum</i>	SILKY DOGWOOD	18"-24" HT. CONTAINER	4' ON CENTER SPACING
CB	20	<i>Vaccinium corymbosum</i>	HIGHBUSH BLUEBERRY	18"-24" HT. CONTAINER	4' ON CENTER SPACING
CL	15	<i>Clethra alnifolia</i>	SUMMERSWEET	18"-24" HT. B.B.	4' ON CENTER SPACING
CP	18	<i>Comptonia peregrina</i>	SWEETFERN	18"-24" HT. B.B.	4' ON CENTER SPACING
CS	16	<i>Cornus sericea</i>	REDOSIER DOGWOOD	18"-24" HT. CONTAINER	4' ON CENTER SPACING
KL	35	<i>Kalmia latifolia</i>	MOUNTAIN LAUREL	18"-24" HT. B.B.	4' ON CENTER SPACING
LB	40	<i>Lindera benzoin</i>	SPICEBUSH	2'-3' HT. B.B.	4' ON CENTER SPACING
PO	6	<i>Quercus Palustris</i>	PIN OAK	3 1/2"-4" CAL. B.B.	15' ON CENTER SPACING
PS	21	<i>Pinus strobus</i>	EASTERN WHITE PINE	6'-8' HT. B.B.	4' ON CENTER SPACING
SD	23	<i>Salix discolor</i>	PUSSYWILLOW	24"-36" HT. B.B.	8' ON CENTER SPACING
VA	41	<i>Viburnum acerifolium</i>	MAPLELEAF VIBURNUM	12"-15" HT. B.B.	4' ON CENTER SPACING
VD	20	<i>Viburnum dentatum</i>	ARROWWOOD VIBURNUM	18"-24" HT. B.B.	4' ON CENTER SPACING
VG	40	<i>Vaccinium angustifolium</i>	LOW BUSH BLUEBERRY	18"-24" HT. B.B.	4' ON CENTER SPACING
VT	16	<i>Viburnum trilobum</i>	AMERICAN CRANBERRYBUSH	2'-3' HT. B.B.	4' ON CENTER SPACING



LEGEND
 INVASIVE SPECIES REMOVAL LIMITS

FINAL DESIGN REVIEW

PROJECT NO.	160-139
DRAWING NO.	LDS-01
SHEET NO.	09.02
TOWN:	TOLLAND & WILLINGTON
DRAWING TITLE:	LANDSCAPE LAYOUT

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

Plotted Date: 9/22/2015

DESIGNER/DRAFTER: **S.D.F./J.H.E.**
 CHECKED BY: **N.R.G.**
 SCALE AS NOTED

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\\(84)HW_MSH_160-139_LDS-01.dgn

SIGNATURE/BLOCK:

DESIGNED BY:

 BL COMPANIES, INC.
 355 RESEARCH PARKWAY
 MERIDEN, CT 06450

PROJECT TITLE:
**ROUTE 74 BRIDGE REPLACEMENT
 OVER WILLIMANTIC RIVER
 BRIDGE NO. 00982**

**State Project No. 160-139
Tolland Turnpike Bridge Replacement
Route 74 over Willimantic River**

Stormwater Pollution Control Plan

**Appendix D
Stormwater Monitoring Report Form**

**Bridge No. 00982
Tolland & Willington, Connecticut**



**Connecticut Department of
Energy & Environmental Protection**
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

**General Permit for the Discharge of Stormwater and Dewatering Wastewaters from
Construction Activities, issued 8/21/13, effective 10/1/13
Stormwater Monitoring Report**

SITE INFORMATION

Permittee: Connecticut Department of Transportation

Mailing Address: 1107 Cromwell Avenue, Rocky Hill, CT 06067

Business Phone: 860-594-2932 ext.: _____ Fax: _____

Contact Person: Ravi V. Chandran Title: District 1 Engineer

Site Name: Bridge No. 00982

Site Address: Route 74 over Willimantic River

Receiving Water (name, basin): Willimantic River

Stormwater Permit No. GSN

SAMPLING INFORMATION (Submit a separate form for each outfall)

Outfall Designation: _____ Date/Time Collected: _____

Outfall Location(s) (lat/lon or map link): _____

Person Collecting Sample: _____

Storm Magnitude (inches): _____ Storm Duration (hours): _____

Size of Disturbed Area at any time: _____

MONITORING RESULTS

Sample #	Parameter	Method	Results (units)	Laboratory (if applicable)
1	Turbidity			
2	Turbidity			
3	Turbidity			
4	Turbidity			

(provide an attachment if more than 4 samples were taken for this outfall)

Avg = _____

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____

Signature: _____ Date: _____

Please send completed form to:

DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE
79 ELM STREET
HARTFORD, CT 06106-5127
ATTN: NEAL WILLIAMS

**State Project No. 160-139
Tolland Turnpike Bridge Replacement
Route 74 over Willimantic River**

Stormwater Pollution Control Plan

**Appendix E
Notice of Termination Form**

**Bridge No. 00982
Tolland & Willington, Connecticut**



General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Notice of Termination Form

Please complete and submit this form in accordance with the general permit (DEP-PED-GP-015) in order to ensure the proper handling of your termination. Print or type unless otherwise noted.

Note: Ensure that for commercial and industrial facilities, registrations under the *General Permit for the Discharge of Stormwater Associated with Industrial Activity* (DEP-PED-GP-014) or the *General Permit for the Discharge of Stormwater from Commercial Activities* (DEP-PED-GP-004) have been filed where applicable. For questions about the applicability of these general permits, please call the Department at 860-424-3018.

Part I: Registrant Information

1. Permit number: GSN			
2. Fill in the name of the registrant(s) as indicated on the registration certificate: Registrant: Connecticut DOT, Ravi V. Chandran, District 1 Engineer			
3. Site Address: 1107 Cromwell Avenue			
City/Town: Rocky Hill	State: CT	Zip Code: 06067	
4. Date all storm drainage structures were cleaned of construction sediment: Date of Completion of Construction: Date of Last Inspection (must be at least three months after final stabilization pursuant to Section 6(b)(6)(D) of the general permit):			
5. Check the post-construction activities at the site (check all that apply):			
<input type="checkbox"/> Industrial	<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Capped Landfill
<input checked="" type="checkbox"/> Other (describe): Transportation			

Part II: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."	
_____ Signature of Permittee	_____ Date
_____ Name of Permittee (print or type)	_____ Title (if applicable)

Note: Please submit this Notice of Termination Form to:
STORMWATER PERMIT COORDINATOR
BUREAU OF WATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127