DRAFT

Soil Erosion and Sediment Control Plan

For:

Clear River Energy Center

Wallum Lake Road (RI Route 100)

Burrillville, RI

Assessor's Plat and Lot Number TBD

Owner:	Clear River Energy LLC Attention: John Niland, P.E. Director of Business Development One South Wacker Drive, Suite 1900 Chicago, IL 60606 (781) 424-3223 jniland@invenergyllc.com
Operator: *TO BE DETERMINED UPON CONTRACT AWARD*	Company Name Name Address City, State, Zip Code Telephone Number Email Address
Estimated Project Dates:	Start Date: EPC Limited Notice to Proceed, 7/2016 Completion Date: Substantial Completion 5/2019
SESC Plan Prepared By:	HDR Engineering, Inc. Alexander E. Deuson, P.E. 11 Stanwix Street, Suite 800 Pittsburg, PA 15222 (412) 497-6261 alexander.deuson@hdrinc.com Rhode Island Licensed PE, RI PE #11618

OWNER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the site owner and operator to implement and amend the Soil Erosion and Sediment Control Plan as appropriate in accordance with the requirements of the RIPDES Construction General Permit.

_____

Owner Signature: Date

Owner Name: John Niland, P.E.

Owner Title: Director of Business Development

Company Name: Clear River EnergyLLC.

Address: One South Wacker Drive, Suite 1900, Chicago, IL 60606

Phone Number: (781) 424-3223

Email Address: jniland@invenergyllc.com

OPERATOR CERTIFICATION

Upon contract award, the OPERATOR must sign this certification statement before construction may begin.

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the owner/operator to implement and amend the Soil Erosion and Sediment Control Plan as appropriate in accordance with the requirements of the RIPDES Construction General Permit.

_____

Operator Signature: Date

Contractor Representative: TBD

Contractor Title: TBD

Contractor Company Name: TBD

Address: TBD

Phone Number: TBD

Email Address: TBD

TABLE OF CONTENTS

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INTRODUCTION

This Construction Site Soil Erosion and Sediment Control Plan (SESC Plan) has been prepared for Clear River EnergyLLC for the Clear River Energy Center. In accordance with the RIDEM Rhode Island Pollutant Discharge Elimination System (RIPDES) General Permit for Stormwater Discharge Associated with Construction Activity (RIPDES Construction General Permit ("CGP")), projects that disturb one (1) or more acres require the preparation of a SESC Plan. This SESC Plan provides guidance for complying with the terms and conditions of the RIPDES Construction General Permit and Minimum Standard 10 of the RI Stormwater Design and Installation Standards Manual. In addition, this SESC Plan is also consistent with Part D of the *RI SESC Handbook* entitled "Soil Erosion and Sediment Control Plans". This document does not negate or eliminate the need to understand and adhere to all applicable RIPDES regulations.

The purpose of erosion, runoff, and sedimentation control measures is to prevent pollutants from leaving the construction site and entering waterways or environmentally sensitive areas during and after construction. This SESC Plan has been prepared prior to the initiation of construction activities to address anticipated worksite conditions. The control measures depicted on the site plan and described in this narrative should be considered the minimum measures required to control erosion, sedimentation, and stormwater runoff at the site. Since construction is a dynamic process with changing site conditions, it is the operator's responsibility to manage the site during each construction phase so as to prevent pollutants from leaving the site. This may require the operator to revise and amend the SESC Plan during construction to address varying site and/or weather conditions, such as by adding or realigning erosion or sediment controls to ensure the SESC Plan remains compliant with the RIPDES Construction General Permit. Records of these changes must be added to the amendment log attached to the SESC Plan, and to the site plans as "red-lined" drawings. Please Note: **Even if practices are correctly installed on a site according to the approved plan, the site is only in compliance when erosion, runoff, and sedimentation are effectively controlled throughout the entire site.**

It is the responsibility of the site owner and the site operator to maintain the SESC Plan at the site, including all attachments, amendments and inspection records, and to make all records available for inspection by RIDEM during and after construction. (RIPDES CGP - Part III.G)

The site owner, the site operator, and the designated site inspector are required to review the SESC Plan and sign the Party Certification pages (Section 8). The primary contractor (if different) and all subcontractors (if applicable) involved in earthwork or exterior construction activities are also required to review the SESC Plan and sign the certification pages before construction begins.

Any questions regarding the SESC Plan, control measures, inspection requirements, or any other facet of this document may be addressed to the RIDEM Office of Water Resources, at 401-222-4700 or via email: water@dem.ri.gov.

ADDITIONAL RESOURCES

Rhode Island Department of Environmental Management
Office of Water Resources
235 Promenade Street
Providence, RI 02908-5767
phone: 401-222-4700
email: water@dem.ri.gov

RIDEM *RI Stormwater Design and Installation Standards Manual* (RISDISM) (as amended)
http://www.dem.state.ri.us/programs/benviron/water/permits/ripdes/stwater/t4guide/desman.htm

RI Soil Erosion and Sediment Control Handbook
http://www.dem.state.ri.us/soilerosion2014final.pdf

RIDEM 2013 RIPDES Construction General Permit
http://www.dem.ri.gov/pubs/regs/regs/water/ripdesca.pdf

Rhode Island Department of Transportation *Standard Specifications for Road and Bridge Design and Other Specifications* and *Standard Details*
http://www.dot.ri.gov/business/bluebook.php

RIDEM Office of Water Resources Coordinated Stormwater Permitting website
http://www.dem.state.ri.us/programs/benviron/water/permits/swcoord/index.htm

RIDEM RIPDES Stormwater website
http://www.dem.state.ri.us/programs/benviron/water/permits/ripdes/stwater/index.htm

RIDEM Water Quality website (for 303(d) and TMDL listings)
http://www.dem.ri.gov/programs/benviron/water/quality/index.htm

RIDEM Rhode Island Natural Heritage Program
http://www.dem.ri.gov/programs/bpoladm/plandev/heritage/index.htm

RIDEM Geographic Data Viewer – Environmental Resource Map
http://www.dem.ri.gov/maps/index.htm

Natural Resources Conservation Service - Rhode Island Soil Survey Program
http://www.ri.nrcs.usda.gov/technical/soils.html

EPA NPDES – Stormwater Discharges from Construction Activities webpage:
http://water.epa.gov/polwaste/npdes/stormwater/Stormwater-Discharges-From-Construction-Activities.cfm

EPA Construction Site Stormwater Runoff Control BMP Menu
http://water.epa.gov/polwaste/npdes/swbmp/Construction-Site-Stormwater-Run-Off-Control.cfm

SECTION 1: SITE DESCRIPTION

1.1 Project/Site Information

Project/Site Name:

- Clear River Energy Center
- This project will entail the construction of a power plant facility and accompanying access road and retaining walls, storm water management features and temporary construction staging area. The site is located in northeast Providence County.

Project Street/Location:

- Wallum Lake Road (R.I. Route 100), Burrillville, RI

- 

Provide construction site estimates of the total area of the site and the total area of the site that is expected to undergo soil disturbance.

The following are estimates of the construction site area:

- Total Project Area 35.2 acres
- Total Project Area to be Disturbed 35.2 acres

1.2 Receiving Waters

RIPDES CGP - Parts IV.A.7 & IV.A.8

List the separate storm sewer system or drainage system that stormwater from the site could discharge to and the waterbody(s) that receive discharges from each storm sewer or drainage system.

List/description of separate storm sewer systems or drainage systems that may be impacted during construction and the water bodies that receive discharges from each storm sewer or drainage system:

- There are no separate storm sewer systems or drainage systems that are impacted by this development. Iron Mine Brook and an unnamed tributary to Dry Arm Brook are the receiving waters from this development and both ultimately drain into Clear River.

List the water body(s) that have the potential to receive stormwater from the site or that have the potential to be impacted by construction, including streams, rivers, lakes, coastal waters, and wetlands. Note any stream crossings, if applicable.

List/description of receiving waters that may be impacted during construction:

- Dry Arm Brook – a warm water Category 3 stream as classified by RIDEM
- Iron Mine Brook – an unassessed Category 3 stream as classified by RIDEM

If any of the water bodies above are impaired (303(d) listed) and/or subject to Total Maximum Daily Loads (TMDLs), list the pollutants causing the impairment and any specific requirements in the TMDL(s) that are applicable to construction sites. Visit http://www.dem.ri.gov/programs/benviron/water/quality/index.htm for more information and a list of Rhode Island impaired waters and TMDL Studies. (See also the RIDEM RIPDES Construction General Permit Notice of Intent instructions which can be found at the following link: http://www.dem.ri.gov/pubs/regs/regs/water/ripdesca.pdf)

Are any of the receiving waters in the vicinity of the proposed construction project listed as being impaired or subject to a TMDL?

☐ Yes ☒ No

If yes, List/provide description of 303(d)/TMDL waters and applicable TMDL requirements that must be addressed during construction:

- N/A

1.3 Natural Heritage Area Information

RIPDES CGP - Part III.H

Each project authorized under the RIPDES Construction General Permit must determine if the site is within or directly discharges to a Natural Heritage Area (NHA). DEM Natural Heritage Areas include known occurrences of state and federal rare, threatened and endangered species. Review RIDEM NHA maps to determine if there are natural heritage areas on or near the construction site that may be impacted during construction. (See also the RIDEM Notice of Intent instructions which can be found at the following link: http://www.dem.ri.gov/pubs/regs/regs/water/ripdesca.pdf)

Are there any Natural Heritage Areas being disturbed by the construction activity or will discharges be directed to the Natural Heritage Area as a result of the construction activity?

☐ Yes ☒ No

If yes, describe or refer to documentation which determines the likelihood of an impact on this area and the steps that will be taken to address any impacts.

- N/A

1.4 Historic Preservation/Cultural Resources

The National Historic Preservation Act, and any state, local, and tribal historic preservation laws apply to construction activities. As with endangered species, some permits may specifically require you to assess the potential impact of your stormwater discharges on historic properties. However, whether or not this is stated as a condition for permit coverage, the National Historic Preservation Act and any applicable state or tribal laws apply to you. Contact the Rhode Island Historic Preservation Officer (http://www.preservation.ri.gov/) or your Tribal Historic Preservation Officer (http://grants.cr.nps.gov/THPO_Review/index.cfm) for more information.

Are there any historic properties, historic cemeteries or cultural resources on or near the construction site?

☐ Yes ☒ No

Describe how this determination was made and summarize state or tribal review comments:

- This determination was made through a review of Rhode Island Environmental Resource digital maps and a review of an Environmental Critical Issues analysis performed by ESS Group, Inc. in October, 2014 for the site.

If yes, describe or refer to documentation which determines the likelihood of an impact on this historic property, historic cemetery or cultural resource and the steps taken to address that impact including any conditions or mitigation measures that were approved by other parties.

- N/A

1.5 Site Features and Constraints

Constraints are identified to ensure a comprehensive understanding of the project and surrounding areas. The first goal in the low impact development (LID) site planning and design process is to avoid disturbance of natural features. This includes identification and preservation of natural areas that can be used in the protection of water resources. It is important to understand that minimizing the hydrologic alteration of a site is just as important as stormwater treatment for resource protection. Therefore, describe all site features and sensitive resources that exist at the site such as floodplains, steep slopes (>15%), areas with the potential to receive run-on from off-site areas, erodible soils, wetlands, hydric soils, surface waters, and their riparian buffers, specimen trees, natural vegetation, forest areas, stream crossings, historic properties, historic cemeteries or cultural resources that are to be preserved. ***This includes those site features that should be avoided within the designated limits of disturbance.*** *These areas are often identified on a constraints map or in a separate constraints report. For additional discussion on this topic refer to Appendix F. Site Constraint Map of the RI SESC Handbook.*

List All Site Constraints and Sensitive Areas that require avoidance and protection through the implementation of control measures:

- This site is constrained by biological wetlands and existing forested areas. These boundaries are shown on the plan sheets and a separate constraints map does not appear to be warranted. These areas will be protected by the installation of construction safety fencing along the limits of disturbance boundaries as shown on the plans. The final constraint is Wallum Lake Road (R.I. Route 100 which will be protected by the installation of a rock construction exit.
- The constraints are shown on sheet 01C903, Existing Conditions and Constraints Map.

SECTION 2: EROSION, RUNOFF, AND SEDIMENT CONTROL

RIPDES Construction General Permit – Part III.J.1

The purpose of erosion controls is to prevent sediment from being detached and moved by wind or the action of raindrop, sheet, rill, gully, and channel erosion. Properly installed and maintained erosion controls are the primary defense against sediment pollution.

Runoff controls are used to slow the velocity of concentrated water flows. By intercepting and diverting stormwater runoff to a stabilized outlet or treatment practice or by converting concentrated flows to sheet flow erosion and sedimentation are reduced.

Sediment controls are the last line of defense against moving sediment. The purpose is to prevent sediment from leaving the construction site and entering environmentally sensitive areas.

This section describes the set of control measures that will be installed before and during the construction project to avoid, mitigate, and reduce impacts associated with construction activity. Specific control measures and their applicability are contained in Section Four: Erosion Control Measures, Section Five: Runoff Control Measures, and Section Six: Sediment Control Measures of the *RI SESC Handbook*. The *RI SESC Handbook* can be found at the following address:

http://www.dem.ri.gov/soilerosion2014final.pdf.

2.1 Avoid and Protect Sensitive Areas and Natural Features

Per RI Stormwater Design and Installation Standards Manual 3.3.7.1:

Areas of existing and remaining vegetation and areas that are to be protected as identified in the Section 1.6 of the SESC Plan must be clearly identified on the SESC Site Plans for each Phase of Construction. Prior to any land disturbance activities commencing on the site, the Contractor shall physically mark limits of disturbance (LOD) on the site and any areas to be protected within the site, so that workers can clearly identify the areas to be protected.

Describe and illustrate on SESC Site Plans natural features identified earlier and how each will be protected during construction activity. Examples of areas to be protected include vegetated buffers, forests, stands of trees on the perimeter and within the site, large diameter trees, areas designated for infiltration (QPAs), bioretention, rain gardens, and OWTS leachfields. Protection for stands of trees and individual trees to be preserved must be specified and such protection must comply with the RI SESC Handbook and extend to the drip line.

Describe and illustrate on SESC Site Plans based on Constraints Map, the areas that will be disturbed with each phase of construction and the control measures (signs, fences, etc.) that will be used to protect those areas that should not be disturbed. ***This includes marking for limits of disturbance at the perimeter and areas within the limits of disturbance.*** *Acceptable measures include but are not limited to construction fencing (plastic mesh, snow fence, chain link fence etc.) appropriate for the site, boundary markers using construction tape, flagged stakes, etc. for low density use, sediment barriers such as silt fence, compost socks with flagging where also required for sediment control, and signage. The narrative portion of the plan and SESC Site Plans must highlight measures to prevent soil compaction in areas designated as Qualified Pervious Areas (QPAs) and infiltration practices to protect infiltration capacity.*

Feature Requiring Protection	Construction Phase #	Method of Protection	Sheet #
Biological Wetlands	Phase I	Construction Fence	01C904
Wooded areas outside LOD	Phase I	Construction Fence	01C904
Wallum Lake Road	Phase I	Rock Const. Exit	01C904

2.2 Minimize Area of Disturbance

Per RI Stormwater Design and Installation Standards Manual 3.3.7.2:

Will >5 acres be disturbed in order to complete this project?

☒ Yes ☐ No

If yes, phasing must be utilized at this site.

Will <5 acres be disturbed or will disturbance activities be completed within a six (6) month window?

☐ Yes ☒ No

If yes, phasing is not required as long as all other performance criteria will be met and phasing is not necessary to protect sensitive or highly vulnerable areas.

Provide discussion regarding the need to phase or not to phase construction activity in this instance.

Based on the answers to the above questions will phasing be required for this project?

☐ Yes ☒ No

If yes, and phasing is required, describe phasing plan as prompted below.

If No, provide substantive reasons why this was determined to be infeasible.
Due to the cut/fill nature of this development in creating a 16+ acre flat site for the facility, stripping and stockpiling topsoil in order to access desirable soils for fill, it will be very difficult to define distinct boundaries for phasing of the grading operations. Cut materials will also be used to build the entrance road. Phasing of construction will be recommended to the contractor and noted on the plans for the contractor to develop a plan of action that will minimize exposed unstabilized earth during mass grading if possible. If any semblance of construction phasing exists in the plans, it will be that the construction staging/soil stockpile area will be constructed first followed by excavation of basin "A". Then the main facility site will be mass graded. The road construction will include construction of retaining walls to minimize disturbance to wetland areas and timing of this will be contractor driven which could also affect construction phase timing. The use of Phase I, Phase II, Phase III and Phase IV titles of the SESC sheets is for phasing of the SESC plan per EPA Guidelines and not intended to indicate any phasing of construction to minimize disturbed areas during construction..

PHASING PLAN
For each phase of the construction project, provide site estimates of the total area of the project phase, and the total area of the project phase that is expected to undergo soil disturbance.

The following are estimates of each phase of the construction project:

(Copy and paste this section for projects with multiple phases)

Phase No. or Identifier	I
Total Area of Phase	13.8 acres
Area to be Disturbed	3.2 acres

Description of Construction Sequencing for Phase I

Proper sequencing of construction activities is essential to maximize the effectiveness of erosion, runoff, and sediment control measures. Construction sequencing of construction activities for each phase must address the following elements:

1. *Installation of control measures identifying limits of disturbance and areas internal to the site that require protection before start of land disturbance.*
2. *Installation of all erosion, runoff, and sediment controls and temporary pollution prevention measures that are required to be in place and functional before any earthwork begins. This shall be done in accordance with the RI SESC Handbook and/or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended). Upon acceptable completion of site preparation and installation of erosion, runoff, and sediment controls and temporary pollution prevention measures, site construction activities may commence.*
3. *The phasing plan shall address the use of phasing to manage and limit increases in runoff rates and volumes during construction. Designated phases and timing of construction should also address the impacts to important or sensitive habitats.*
4. *Upon commencement of site construction activities, the operator shall initiate appropriate stabilization practices on all disturbed areas as soon as possible, but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased. Such temporary or permanent soil stabilization measures must be installed prior to initiating land disturbance in subsequent phases.*
5. *Routine inspection and maintenance and/or modification of erosion, runoff, and sediment controls and temporary pollution prevention measures while earthwork is ongoing is required.*
6. *Final site stabilization of any disturbed areas after earthwork has been completed and removal of temporary erosion, runoff, and sediment controls and temporary pollution prevention measures.*
7. *Activation of post-construction stormwater treatment conveyances and practices.*

This phase will begin with installation of the LOD fencing and silt fencing followed by installation of the stone construction exit and concrete washout pit. Once these features are installed, excavation and installation of temporary sediment basin “A” and its associated discharge structures will be completed. Diversion ditches to capture storm water runoff and divert to basin “A” will be installed prior to initiating mass grading. This will conclude Phase I of the SESC plan.

Phase No. or Identifier	II
Total Area of Phase	24.2 acres
Area to be Disturbed	24.2 acres

Description of Construction Sequencing for Phase II

Proper sequencing of construction activities is essential to maximize the effectiveness of erosion, runoff, and sediment control measures. Construction sequencing of construction activities for each phase must address the following elements:

1. *Installation of control measures identifying limits of disturbance and areas internal to the site that require protection before start of land disturbance.*
2. *Installation of all erosion, runoff, and sediment controls and temporary pollution prevention measures that are required to be in place and functional before any earthwork*

begins. This shall be done in accordance with the RI SESC Handbook and/or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended). Upon acceptable completion of site preparation and installation of erosion, runoff, and sediment controls and temporary pollution prevention measures, site construction activities may commence.

3. *The phasing plan shall address the use of phasing to manage and limit increases in runoff rates and volumes during construction. Designated phases and timing of construction should also address the impacts to important or sensitive habitats.*

4. *Upon commencement of site construction activities, the operator shall initiate appropriate stabilization practices on all disturbed areas as soon as possible, but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased. Such temporary or permanent soil stabilization measures must be installed prior to initiating land disturbance in subsequent phases.*

5. *Routine inspection and maintenance and/or modification of erosion, runoff, and sediment controls and temporary pollution prevention measures while earthwork is ongoing is required.*

6. *Final site stabilization of any disturbed areas after earthwork has been completed and removal of temporary erosion, runoff, and sediment controls and temporary pollution prevention measures.*

7. *Activation of post-construction stormwater treatment conveyances and practices.*

Phase II begins with clearing and grubbing of the main facility site. Diversion ditches will divert runoff to basin "A". Topsoil will be removed and stored adjacent to the construction staging area. Topsoil stockpile will be seeded at the end of stockpiling and protected at the base with silt fence. Basin "B" will be excavated, outlet structure and outlet protection installed. Basin will be stabilized through temporary seeding. As mass grading commences, a new diversion ditch will be installed that will move with the grading operations in order to begin diverting runoff to basin "B", allowing basin "A" to shrink in size to allow fill operations. Retaining walls will be installed along the entrance road and construction of the entrance road will entail. This will conclude Phase II SESC plan.

Phase No. or Identifier	III & IV
Total Area of Phase	35.2 acres
Area to be Disturbed	Varies, should not exceed 25 acres

Description of Construction Sequencing for Phase III & IV

Proper sequencing of construction activities is essential to maximize the effectiveness of erosion, runoff, and sediment control measures. Construction sequencing of construction activities for each phase must address the following elements:

8. *Installation of control measures identifying limits of disturbance and areas internal to the site that require protection before start of land disturbance.*

9. *Installation of all erosion, runoff, and sediment controls and temporary pollution prevention measures that are required to be in place and functional before any earthwork begins. This shall be done in accordance with the RI SESC Handbook and/or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended). Upon acceptable completion of site preparation and installation of erosion, runoff,*

and sediment controls and temporary pollution prevention measures, site construction activities may commence.

10. *The phasing plan shall address the use of phasing to manage and limit increases in runoff rates and volumes during construction. Designated phases and timing of construction should also address the impacts to important or sensitive habitats.*

11. *Upon commencement of site construction activities, the operator shall initiate appropriate stabilization practices on all disturbed areas as soon as possible, but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased. Such temporary or permanent soil stabilization measures must be installed prior to initiating land disturbance in subsequent phases.*

12. *Routine inspection and maintenance and/or modification of erosion, runoff, and sediment controls and temporary pollution prevention measures while earthwork is ongoing is required.*

13. *Final site stabilization of any disturbed areas after earthwork has been completed and removal of temporary erosion, runoff, and sediment controls and temporary pollution prevention measures.*

14. *Activation of post-construction stormwater treatment conveyances and practices.*

Phase III

Begins at the end of mass grading. Finer grading of the facility site will ensue and storm drainage system will be installed. Inlets will receive silt fence protection upon installation to minimize sedimentation in the storm system. These installations will effectively treat each small drainage area on the site as a sediment trap. The storm system replaces the diversion ditches and transports storm runoff to basin "B". Sediment basin "A" will no longer be used and should be removed at this time, replaced by final grading with the slope receiving final seeding and mulch for stabilization. Gravel base will then be installed in preparation for final grading/paving. As the site is paved, the inlet protection may change from silt fence to a stone bag protection to facilitate construction. Perimeter final grading will be completed and final seeding/mulching placed to stabilize. Road construction will be completed, basin "B" will be converted to a water quality/detention storm water management basin for the facility.

Phase IV

Temporary erosion and sediment control devices will be removed as the site becomes stabilized and removal is approved by the construction manager and governing agencies. At the end of construction, the construction staging area will be cleaned up and a portion left in place for future use. The soil stockpile will then be distributed over the remaining staging area no longer needed and the area receives final seeding. Once all areas are stabilized, any remaining temporary controls will be removed.

2.3 Minimize the Disturbance of Steep Slopes

Per RI Stormwater Design and Installation Standards Manual 3.3.7.3:

Are steep slopes (>15%) present within the proposed project area?

☒ Yes ☐ No

If yes, steep slopes must be identified on SESC Site Plans.

If yes, also list the specific control measures that will be used to control surface runoff and reduce erosion potential on steep slopes during construction including references to SESC Site Plans where the locations of such control measures are shown. Examples include limiting the number of steep slopes that are disturbed at one time, implementing land grading techniques such as reverse slope benches, diversions, stair steps, and terraced landforms, installation of retaining walls for stabilization of challenging slopes, prevention of soil movement, and slope protection, applying materials for temporary and permanent protection of slopes to prevent erosion such as stone aggregates, rip-rap, erosion control blankets, appropriate spacing of sediment barriers as a function of barrier size, slope, and slope length, geotextile, cellular confinement systems, mattresses (gabions and others), and articulating blocks.

There is a small area on the western edge of the site that may contain some slopes in excess of 15%. It is a small hill within the area of the facility footprint and it will not be protected as this hump will be one of the first areas removed during mass grading operations and removal will eliminate the area with steep slopes.

2.4 Preserve Topsoil

Per RI Stormwater Design and Installation Standards Manual 3.3.7.4:

Site owners and operators must preserve existing topsoil on the construction site to the maximum extent feasible and as necessary to support healthy vegetation, promote soil stabilization, and increase stormwater infiltration rates in the post-construction phase of the project.

Will existing topsoil be preserved at the site?

☒ Yes ☐ No

If Yes, describe how topsoil will be preserved at the site by describing the techniques that will be implemented to achieve appropriate depths of topsoil (4 inch minimum) and identify the locations where topsoil will be restored on SESC Site Plans.

Topsoil for the facility site will be stripped and stockpiled in the area noted on the plans. At the end of construction, topsoil will be installed on the areas to receive final seeding to a minimum depth of 4". Remaining topsoil at this time is planned to be distributed over the construction staging area and contoured into berms that will be grassed and allowed to return to natural habitat. A portion of the staging will remain graveled to facility future use for construction activities that may arise on the power plant site to minimize future land disturbances.

If No, provide substantive reasons why this was determined to be infeasible.

N/A

Soil compaction must be minimized by maintaining limits of disturbance throughout construction. In instances where site soils are compacted the site owner and operator must restore infiltration capacity of the compacted soils by tilling or scarifying compacted soils and amending soils as necessary to ensure a minimum depth of topsoil is available in these areas. In areas where infiltrating stormwater treatment practices are located compacted soils must be amended such that they will comply the design infiltration rates established in the *RI Stormwater Design and Installation Standards Manual*.

Identify the methods that will be used to restore and amend topsoil at the site. Include references to plan notes and SESC Site Plan sheet numbers where this information is made available for the site operator.

This section will not apply to this site.

2.5 Stabilize Soils

Per RI Stormwater Design and Installation Standards Manual 3.3.7.5:

Upon completion and acceptance of site preparation and initial installation of erosion, runoff, and sediment controls and temporary pollution prevention measures, the operator shall initiate appropriate temporary or permanent stabilization practices during all phases of construction on all disturbed areas as soon as possible, but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased.

Any disturbed areas that will not have active construction activity occurring within 14 days must be stabilized using the control measures depicted in the SESC Site Plans, in accordance with the *RI SESC Handbook*, and per manufacturer product specifications.

Only areas that can be reasonably expected to have active construction work being performed within 14 days of disturbance will be cleared/grubbed at any one time. It is NOT acceptable to clear and grub the entire construction site if portions will not be active within the 14-day time frame. Proper phasing of clearing and grubbing activities shall include temporary stabilization techniques for areas cleared and grubbed that will not be active within the 14-day time frame.

All disturbed soils exposed prior to October 15 of any calendar year shall be seeded by that date if vegetative measures are the intended soil stabilization method. Any such areas that do not have adequate vegetative stabilization, as determined by the site operator or designated inspector, by November 15, must be stabilized through the use of non-vegetative erosion control measures. If work continues within any of these areas during the period from October 15 through April 15, care must be taken to ensure that only the area required for that day's work is exposed, and all erodible soil must be restabilized within 5 working days. In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed (i.e. construction of a motocross track).

Describe controls (i.e., temporary seeding with native vegetation, hydroseeding, mulching, application of rolled erosion control products, etc.) including design specifications and details that will be implemented to stabilize exposed soils where construction activities have temporarily or permanently ceased.

Temporary Vegetative Control Measures

- Areas of the site that will be free of construction activities for more than 14 days will receive temporary seeding/mulching and fertilizer in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook

Temporary Non-Vegetative Control Measures

- Areas that may require temporary non-vegetative controls will be field determined if needed as construction proceeds and contractor develops grading operations plan.

- Specific locations are TBD at this time.

Permanent Vegetative Control Measures

- Permanent vegetative control measure will be used on the perimeter of the site on constructed slopes, along the new access road and areas where stockpiled topsoil is redistributed.

Permanent Non-Vegetative Control Measures

- Permanent non-vegetative control measures will be implemented within basin "B" once it is converted into the permanent water quality/detention basin.

2.6 Protect Storm Drain Outlets

Per RI Stormwater Design and Installation Standards Manual 3.3.7.7:

Temporary or permanent outlet protection must be used to prevent scour and erosion at discharge points through the protection of the soil surface, reduction in discharge velocities, and through the promotion of infiltration. Outlets often have high velocity, high volume flows, and require strong materials that will withstand the forces of stormwater. Storm drain outlet control measures also offer a last line of protection against sediment entering environmentally sensitive areas.

All stormwater outlets that may discharge sediment-laden stormwater flow from the construction site must be protected using the control practices depicted on the approved plan set and in accordance with the *RI SESC Handbook*.

Describe controls, including design specifications and details, which will be implemented to protect outlets discharging stormwater from the project.

Will temporary or permanent point source discharges be generated at the site as the result of construction of sediment traps or basins, diversions, and conveyance channels?

☒ Yes ☐ No

If Yes, describe the method(s) of outlet protection specified for each instance where a point source discharge will be generated. In addition, specifically reference SESC Site Plan Sheet Numbers which identify where the outlets will be constructed at the site and the corresponding control measures that will be utilized for their protection including any associated specifications required for their installation and maintenance.

Basin “A” (temporary sediment basin) will have a discharge outlet as shown on sheet 01C909, this outlet will have rip-rap outlet protection as detailed on the plan. Basin “B” (initially used as a sediment basin to be converted to a water quality/storm water management detention basin will have an outlet where the pipe enters a stone bed below surrounding grade and allowed to bubble up to the ground surface. Basin B is shown on sheets 01C905, 01C910 & 01C911.

If No, discuss rationale for not including these elements in the SESC Plan.

N/A

2.7 Establish Temporary Controls for the Protection of Post-Construction Stormwater Treatment Practices

Per RI Stormwater Design and Installation Standards Manual 3.3.7.8:

Temporary measures shall be installed to protect permanent or long-term stormwater control and treatment measures as they are installed and throughout the construction phase of the project so that they will function properly when they are brought online.

Examples of temporary control measures that can be used to protect permanent stormwater control measures include: establishing temporary sediment barriers around infiltrating practices, ensuring proper material staging areas and equipment routing (i.e. do not allow construction equipment to compact areas

where infiltrating practices will be installed), and by conducting final cleaning of structural long term practices after construction is completed.

List and describe all post-construction stormwater treatment practices that will be installed during the construction process. Next, outline how these measures will be protected during the construction phase of the project to ensure that they will function appropriately once they are brought online.

Will long-term stormwater treatment practices be installed at the site?

☒ Yes ☐ No

If Yes, describe the specific long-term stormwater treatment practices that will require protection from sedimentation and compaction. In addition, specifically reference SESC Site Plan Sheet Numbers which identify the location of these practices and the corresponding control measures that will be utilized for their protection including any associated specifications required for their installation and maintenance.

Basin "B" will be converted to the final storm water control feature when the site is stabilized and no protection during construction will be necessary. There is an additional detention basin to be constructed adjacent to the construction staging area that will serve as a detention basin for the access road when it is constructed. A "dry swale" is being used along the road for water quality treatment prior to the water entering the detention basin.

If No, discuss rationale for not including these elements in the SESC Plan.

N/A

2.8 Divert or Manage Run-on from Up-gradient Areas

Per RI Stormwater Design and Installation Standards Manual 3.3.7.10:

Is stormwater from off-site areas anticipated to flow onto the project area or onto areas where soils will be disturbed?

☐ Yes ☒ No

If Yes, describe the specific runoff control measures (i.e., check dams, water bars, diversions, perimeter dikes, lined waterways, vegetated waterways, temporary line channels, sediment barriers, pipe slope drains, etc.) that will be utilized at the site including references to the SESC Site Plan Sheet Numbers, design specifications and details. See the RI SESC Handbook,Section Five: Runoff Control Measures for additional guidance.

Pre-Construction and Construction sub-watershed maps are included for each phase in this SESC Plan submittal.

Structural control measures will be used to limit stormwater flow from coming onto the project area, and to divert and slow on-site stormwater flow that is expected to impact exposed soils for the purpose of minimizing erosion, runoff, and the discharge of pollutants from the site.

Control measures shall be installed as depicted on the approved plan set and in accordance with the *RI SESC Handbook* or the *RI Department of Transportation Standard Specifications for Road and Bridge Construction*. **Run-on and Run-off Management**				
Construction Phase #	On-site or Off-site Run-on?	Control measure	Identified on Sheet #	Detail(s) is/are on Sheet #
N/A				

If No, discuss rationale for not including these elements in the SESC Plan.

On the northwest side of the site, construction grading will be cutting down below the grade that is falling away from the construction site. From the limits of disturbance, offsite water in the area will flow away from our site. If any offsite water flowing onto the site occurs, it will be miniscule and have no impact on the construction site.

2.9 Retain Sediment Onsite through Structural and Non-Structural Practices

Per RI Stormwater Design and Installation Standards Manual 3.3.7.12:

Once the erosion control measures and the run-on diversions are identified and located on the plans, the next step to site planning is sediment control and sediment management. Sediment barriers, inlet protection, construction entrances, stockpile containment, temporary sediment traps, and temporary sediment basins must be integrated into the SESC Plan if applicable. Refer to the RI SESC Handbook Section Six: Sediment Control Measures for additional guidance.

Per RI Stormwater Design and Installation Standards Manual 3.3.7.9:

SEDIMENT BARRIERS must be installed along the perimeter areas of the site that will receive stormwater from disturbed areas. This also may include the use of sediment barriers along the contour of disturbed slopes to maintain sheet flow and minimize rill and gully erosion during construction. Installation and maintenance of sediment barriers must be completed in accordance with the maintenance requirements specified by the product manufacturer or the *RI SESC Handbook*.

Will sediment barriers be utilized at the toe of slopes and other downgradient areas subject to stormwater impacts and erosion during construction?

☒ Yes ☐ No

If Yes, Describe the rationale for selecting control measures to serve as sediment barriers at the toe of slopes and other down gradient areas subject to stormwater impacts during construction. Describe the specific sediment barriers that will be used at the site in the table provided.

Beyond the use of sediment basins, silt fencing will be the primary sediment barrier used at the toe of slopes and along linear aspects of the construction (access road and gas line construction). Silt fence

that is running down a slope and not along a contour will be installed using J-hook method every third foot of elevation change along the path to minimize flow velocity along the silt fence and provide areas for siltation to occur. Silt fence will be constructed along the limits of disturbance fencing with the separation from the LOD fencing being field determined by the contractor. Some areas will require the silt fence to be installed right against the LOD fencing and other areas there will be flexibility to place the silt fence 3' away from the LOD fencing.

If No, discuss rationale for not including these elements in the SESC Plan.

N/A

Describe rationale for whether or sediment barriers are required at regular intervals along slopes in order to minimize the creation of concentrated flow paths (i.e. rilling, gully erosion) and to encourage sheet flow. Keep in mind that sediment barriers can be placed at the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow. The description of the selected control measures must focus on sediment barrier spacing as a function of slope length and steepness. Refer to the RI SESC Handbook, Section Six: Sediment Control Measure, Straw Wattles, Compost Tubes, and Fiber Rolls Control Measure for additional information on acceptable spacing distances.

Will sediment barriers be utilized along the contour of slopes to maintain sheet flow and minimize rill and gully erosion during construction?

☐ Yes ☒ No

If Yes, list the specific sediment barriers that will be used at the site in the table provided. Describe the rationale for the locations and spacing frequency selected by the designer based on slope length and steepness. For additional guidance refer to the RI SESC Handbook or sediment barrier manufacturer's specifications.

SEDIMENT BARRIERS			
Construction Phase #	Sediment Barrier Type	Sediment Barrier is Labeled on Sheet #	Detail is on Sheet #
N/A			

If No, discuss rationale for not including these elements in the SESC Plan.

Due to the layout of the site, overland storm water flow will be toward the temporary sediment Basin "A". Any sediment barriers installed would be in the way of construction operations. Overland flow will be collected by a diversion ditch at the top of the sediment basin to direct flow to the south end of the basin. Although not anticipated to be needed, check dams will be installed in this diversion ditch to slow the flow velocity in the ditch, if needed. The existing gradient across the grading area toward the basin is between 1% and 2%. This relatively flat grade will help to minimize erosion and as the site is graded the slope approaches 0% with future drainage areas having a grade of 1% that will drain toward the storm drain inlets that will be installed.

Per RI Stormwater Design and Installation Standards Manual 3.3.7.6:

INLET PROTECTION will be utilized to prevent soil and debris from entering storm drain inlets. These measures are usually temporary and are implemented before a site is disturbed. ALL stormwater inlets &/or catch basins that are operational during construction and have the potential to receive sediment-

laden stormwater flow from the construction site must be protected using control measures outlined in the *RI SESC Handbook*.

For more information on inlet protection refer to the *RI SESC Handbook*, Inlet Protection control measure.

Maintenance

The operator must clean, or remove and replace the inlet protection measures as sediment accumulates, the filter becomes clogged, and/or as performance is compromised. Accumulated sediment adjacent to the inlet protection measures should be removed by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.

Describe controls, including design specifications and details, which will be implemented to protect all inlets receiving stormwater from the project during the entire duration of the project. For more information on inlet protection refer to the RI SESC Handbook Inlet Protection control measure.

Do inlets exist adjacent to or within the project area that require temporary protection?

☒ Yes ☐ No

If Yes, describe the method(s) of inlet protection, including maintenance requirements and complete the table provided.

The following lists the proposed storm drain inlet types selected from Section Six of the *RI SESC Handbook*. Each row is unique for each phase and inlet protection type.

INLET PROTECTION			
Construction Phase #	Inlet Protection Type	Inlet Protection is labeled on Sheet #	Detail(s) is/are on Sheet #
III	Filter Fabric Drop Inlet Protection	01C906	01C908
IV	Filter Fabric Inlet inserts	01C907 after paving	N/A

If No, discuss rationale for not including these elements in the SESC Plan.

N/A

CONSTRUCTION ENTRANCES will be used in conjunction with the stabilization of construction roads to reduce the amount of sediment tracking off the project. This project has avoided placing construction entrances on poorly drained soils where possible. Where poorly drained soils could not be eliminated, the detail includes subsurface drainage.

Any construction site access point must employ the control measures on the approved SESC site plans and in accordance with the *RI SESC Handbook*. Construction entrances shall be used in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by construction vehicles. All construction access roads shall be constructed prior to any roadway accepting construction traffic.

The site owner and operator must:

1. Restrict vehicle use to properly designated exit points.

2. Use properly designed and constructed construction entrances at all points that exit onto paved roads so that sediment removal occurs prior to vehicle exit.

3. When and where necessary, use additional controls to remove sediment from vehicle tires prior to exit (i.e. wheel washing racks, rumble strips, and rattle plates).

4. Where sediment has been tracked out from the construction site onto the surface of off-site streets, other paved areas, and sidewalks, the deposited sediment must be removed by the end of the same work day in which the track out occurs. Track-out must be removed by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal.

Will construction entrances be utilized at the proposed construction site?

☒ Yes ☐ No

If Yes, indicate location(s) of vehicle entrance(s) and exit(s), and stabilization practices used to prevent sediment from being tracked off-site in the table provided. See also RI SESC Handbook, Section Six, Construction Entrances Measure.

CONSTRUCTION ENTRANCE			
Construction Phase #	Soil Type at the Entrance	Entrance is located on Sheet #	Detail is on Sheet #
Phase I	Soils are C/D classification	01C904	01C908

If No, discuss rationale.

N/A

STOCKPILE CONTAINMENT will be used onsite to minimize or eliminate the discharge of soil, topsoil, base material or rubble, from entering drainage systems or surface waters. All stockpiles must be located within the limit of disturbance, protected from run-on with the use of temporary sediment barriers and provided with cover or stabilization to avoid contact with precipitation and wind where and when practical.

Stock pile management consists of procedures and practices designed to minimize or eliminate the discharge of stockpiled material (soil, topsoil, base material, rubble) from entering drainage systems or surface waters.

For any stockpiles or land clearing debris composed, in whole or in part, of sediment or soil, you must comply with the following requirements:

1. Locate piles within the designated limits of disturbance.

2. Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier.

3. Where practicable, provide cover or appropriate temporary vegetative or structural stabilization to avoid direct contact with precipitation or to minimize sediment discharge.

4. NEVER hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or surface water.

5. To the maximum extent practicable, contain and securely protect from wind.

Describe materials expected to be stockpiled or stored on-site and procedures for storage of materials to minimize exposure of the materials to stormwater and to eliminate the discharge of stockpiled material from entering drainage systems and surface waters. Refer to the RI SESC Handbook, Stockpile and Staging Area Management Control Measure for additional guidance. Complete the table provided.

STOCKPILE CONTAINMENT				
Construction Phase #	Run-on measures necessary? (yes/no)	Stabilization or Cover Type	Stockpile Containment Measure	Sheet #
Phase I	no	Temporary mulch/seeding	silt fence at base	01C904

CONSTRUCTED SEDIMENT STRUCTURES

If each common drainage location receives water from an area with less than one (1) acre disturbed at a time, this section can be deleted and no sediment traps or basins are required. However, it is important to remember that there is still a requirement to retain sediment on-site. Therefore, if it is in the best professional judgment of the designer, that there is a condition or circumstance which may require structural controls (per Section 3.3.7.13 of the RI Stormwater Design and Installation Standards Manual), this section can be used.

TEMPORARY SEDIMENT TRAPS will be utilized onsite. There will be no disturbed drainage areas greater than one acre that will be exposed for longer than six months. Design and sizing calculations in accordance with the *RI SESC Handbook*, Section Six are found in __N/A___ of this SESC Plan. A summary of the calculations are provided below:

For Disturbed Areas 1 to 5 Acres – Those areas with a common drainage location that serves an area between one (1) and five (5) acres disturbed at one time, a temporary sediment trap must be provided where attainable and where the sediment trap is only intended to be used for a period of six (6) months or less. For longer term projects with a common drainage location that serves between one (1) and five (5) acres disturbed at one time, a temporary sediment basin must be provided where attainable. Temporary sediment trapping practices must be designed in accordance with the RI SESC Handbook and must be sized to have a total storage volume capable of storing one (1) inch of runoff from the contributing area or one hundred and thirty four (134) cubic yards per acre of drainage area. A minimum of fifty percent (50%) of the total volume shall be storage below the outlet (wet storage). See RISDISM 3.3.7.12 for requirements and RI SESC Handbook, Section Six: Temporary Sediment Traps Measure for design details.

Are temporary sediment traps required at the site?

☐ Yes ☒ No

If Yes, complete the table provided. If an area greater than one acre will be exposed for longer than 6 months and a sediment trap is proposed, explain why the sediment basin was not attainable.

SEDIMENT TRAPS				
Construction Phase #	Exposed Area (acres)	Trap #	Sheet #	Detail found on Sheet#
N/A				

Trap #	Wet Storage Volume (cu.ft)	Dry Storage Volume (cu.ft.)	Cleanout Depth (ft)	Provide Reference to Location of Supporting Design and Sizing Calculations
N/A				

All traps will be functional and installed prior to disturbance in the contributing drainage area. Access for sediment removal is provided on the plans with cleanout depth requirements. The removed sediment will be utilized onsite or disposed of properly off-site.

If No, discuss rationale.

Sediment will be contained by the use of temporary sediment basins, all areas not served by the basins will be controlled through use of silt fencing.

TEMPORARY SEDIMENT BASIN(S) will be utilized onsite. Every effort must be made to prevent erosion and control it near the source.

If the following criterion does not apply to your proposed construction project, then this section may be eliminated from the plan.

For Disturbed Areas of 1 to 5 Acres – Those areas with a common drainage location that serves an area between one (1) and five (5) acres disturbed at one time for longer than six (6) months.

For Disturbed Areas > 5 Acres – Those areas with a common drainage location that serves an area with greater than five (5) acres disturbed at one time, a temporary (or permanent) sediment basin must be provided where attainable until final stabilization of the site is complete. Temporary sediment basins must be designed in accordance with the RI SESC Handbook. The volume of wet storage shall be at least twice the sediment storage volume and shall have a minimum depth of two (2) feet. Sediment storage volume must accommodate a minimum of one year of predicted sediment load as calculated using the sediment volume formula in the RI SESC Handbook. In addition to sediment storage volume and wet storage volume, the sediment basin shall provide adequate residence storage volume to provide a minimum 10 hours residence time for a ten (10) -year frequency, twenty four (24) hour duration, Type III distribution storm. To the maximum extent practicable, outlet structures must be utilized that withdraw water from the surface of temporary sedimentation basins for the purpose of minimizing the discharge of pollutants. Exceptions may include periods of extended cold weather, where alternative outlets are required during frozen periods. If such a device is infeasible for portions of or the entire construction period justification must be made in the SESC Plan. Describe the reasons sediment basins are required for this project. They may include physical conditions, land ownership, construction operations etc. For design details see RI SESC Handbook Section Six: Temporary Sediment Basins Measure.

Are temporary sediment basins required at the site?

☒ Yes ☐ No

If No, discuss rationale.

N/A

If Yes, complete the table provided.

There will be disturbed areas greater than 5 acres and/or disturbed areas greater than one acre but exposed for longer than six months. The basins have been located to intercept runoff only from disturbed areas and minimize interference with other construction activities and construction of utilities. They have been located outside of any natural buffers. The dam height is less than six feet and holds less than fifteen (15) acre-ft.

Modeling, Design and Sizing calculations in accordance with the *RI SESC Handbook*, Section Six are found in Appendices A & B of this SESC Plan. The designs were also prepared to satisfy Section 3.3.7.13 of the Stormwater Manual and will control Temporary Increases in Stormwater Velocity, Volume, and Peak Flows. A summary of the assumptions and calculations are provided below:

TEMPORARY SEDIMENT BASINS				
Construction Phase #	Exposed Area (acres)	Basin #	Sheet #	Detail found on Sheet#
I	3.20	A	01C904	01C909
II	7.23	B	01C905	01C910 & 01C911

Provide the following tables for each temporary sediment basin. Each basin shall be designed to contain sediment and runoff from the 10-year Type III distribution storm.

SEDIMENT BASIN #A Pre-Development					
Pre-Construction Cover Type	Contributing Area (acres)	Soil Type	Curve Number	Tc (minutes)	10- Year Type III (cfs, at time t, acre feet)
Drg Area 1, Forest	3.68	C/D	79	21.6	7.65 cfs, 0.833 af
Drg Area 2, Forest	4.97	C/D	79	19.1	10.86 cfs, 1.125 af
Drg Area 3, Basin-Newly Graded	3.20	C/D	94	10	12.89 cfs, 1.122 af
				Total Pre-Construction Volume (cuft):	**134,165 cf**
During Construction					
Construction Cover Type	Contributing Area	Erosion Rates	Curve Number	Tc (minutes)	10-Year Type III (cfs, at time t, acre feet)
Drg Area 1, newly graded	5.11	50 tons/ac/yr	94	12.3	19.2 cfs, 1.792 af
Drg Area 2, newly graded	5.40	50 tons/ac/yr	94	12.3	20.3 cfs, 1.894 af
Drg Area 3, newly	4.90	50 tons/ac/yr	94	10	12.9 cfs, 1.122 af

graded					
Total Runoff Volume During Construction (cuft):					**209,436 cf**
Basin #A					
Pre-Construction Peak Discharge (cfs)	Wet Storage Volume (cuft)	Sediment Storage Volume (cuft)	Residence Storage Volume (cuft)	Outlet Max Discharge Rate (cfs)	Emergency Spillway Discharge Capacity (cfs)
26.02	154,313	14,840	88,725	0.85	5.66
SEDIMENT BASIN #B Pre-Development					
Pre-Construction Cover Type	Contributing Area (acres)	Soil Type	Curve Number	Tc (minutes)	10- Year Type III (cfs, at time t, acre feet)
Drg Area 6, Forest Fair Cond	7.23	C/D	79	10	20.12 cfs, 1.636 af
Total Pre-Construction Volume (cuft):					**Insert Text**
During Construction					
Construction Cover Type	Contributing Area	Erosion Rates	Curve Number	Tc (minutes)	10-Year Type III (cfs, at time t, acre feet)
Drg Area 4, Newly Graded	8.14	50 tons/ac/yr	94	12.3 cfs	30.63 cfs, 2.855 af
Drg Area 5, Newly Graded	8.85	50 tons/ac/yr	94	11.5	34.1 cfs, 3.104 af
Drg Area 6, Newly Graded	7.23	50 tons/ac/yr	94	10	29.1 cfs, 2.536 af
Total Runoff Volume During Construction (cuft):					**Insert Text**
Basin #B					
Pre-Construction Peak Discharge (cfs)	Wet Storage Volume (cuft)	Sediment Storage Volume (cuft)	Residence Storage Volume (cuft)	Outlet Max Discharge Rate (cfs)	Emergency Spillway Discharge Capacity (cfs)
20.1	328,072	14,430	392,773	0.85	45.4

Discuss if baffles will be required in order to create effective flow length. The details should contain sediment storage markers.

No baffles are required, W & L requirements are met in basin B. See calcs in Appendices A & B. There is adequate sediment storage volume in each basin in excess of requirements. Semi-Annual cleaning of sediment will sufficiently maintain the basins and sediment storage markers are not warranted.

Describe the surface outlets. Identify whether or not these devices will be infeasible to use during periods of extended cold weather. If periods of extended cold weather are anticipated to be an issue, provide the operator with instructions for discharging from the basin using an alternate method during this period of time. In addition, instruct the operator to document the justification for not using a surface outlet device during frozen periods in the inspection reports associated with these instances.

Surface outlet consists of a Faircloth Skimmer in each basin sized to allow a max flow of 0.85 cfs. A 10 year storm event does not reach the primary inlet elevation of the outlet structure in either basin A or basin B.

All sediment basins will be functional and installed prior to disturbance in the contributing drainage area. Access for sediment removal is provided on the plans with cleanout depth specifications. The removed sediment will be utilized onsite or properly disposed of off-site.

2.10 Properly Design Constructed Stormwater Conveyance Channels

Conveyances are required to be designed for inlets to temporary sediment basins. The construction site planner must use best professional judgment to determine if additional conveyance design is required for run-on control or in any other location where velocity control is required.

Are temporary stormwater conveyance practices required in order to properly manage runoff within the proposed construction project?

☒ Yes ☐ No

If Yes, describe the specific control measures that will be used at the site. Provide or attach design calculations associated with each proposed conveyance measure, demonstrating that each one is designed and sized to handle the peak flow from a 10-year, 24-hour, Type III design storm. Note where within the site plans each specified conveyance is depicted, including specifications and construction details.

This site utilizes temporary diversion ditches to transport storm water to the desired inlet point of the sediment basins. Typically, the ditches have slopes in the 0.5% to 1.0% range to minimize velocity of flow in the channels. The ditches are shown on sheets 01C904 and 01C905 with details provided on 01C908.

The conveyance will be maintained as depicted on SESC Site Plans and in accordance with the *RI SESC Handbook* and if applicable.

If No, discuss rationale for not including conveyance measures in the SESC Plan.

N/A

2.11 Erosion, Runoff, and Sediment Control Measure List

Complete the following table for each Phase of construction where Erosion, Runoff, and Sediment Control Measures are located. This table is to be used as part of the SESC Plan Inspection Report – please fill out accordingly.

It is expected that this table and corresponding Inspection Reports will be amended as needed throughout the construction project as control measures are added or modified.

Phase No. I		
Location/Station	**Control Measure Description/Reference**	**Maintenance Requirement**
Perimeter of Site along all Limits of Disturbance	Silt Fence. Section Six, Sediment Control Measures – RI SESC Handbook	Inspection should be made after each storm event or 1/week and repair or replacement should be made promptly as needed. Cleanout of accumulated sediment behind the wattle if sediment accumulates to at least ½ the height of the silt fence
East Side of Facility Site, Sediment Basin A	Temporary Sediment Basin. Section Six, Sediment Control Measures – RI SESC Handbook	Basin is to be maintained by the removal of sediment semi-annually or when sedimentation depth reaches 3 inches in the bottom of the basin
Main Entrance off of Wallum Lake Road (RI Route 100)	Stone Construction Entrance. Section Six, Sediment Control Measures, Construction Entrances – RI SESC Handbook	The entrance shall be maintained in a condition which will prevent tracking or flowing 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. Roads adjacent to a construction site shall be left clean at the end of each day.
South end of Sediment Basin A	Two Rows of Silt Fence to break up slope long slope. Section Six, Sediment Control Measures – RI SESC Handbook	Inspection should be made after each storm event or 1/week and repair or replacement should be made promptly as needed. Cleanout of accumulated sediment behind the wattle if sediment accumulates to at least ½ the height of the silt fence
Around Soil Stockpile Area	Silt Fence. Section Six, Sediment Control Measures – RI SESC Handbook	Inspection should be made after each storm event or 1/week and repair or replacement should be made promptly as needed. Cleanout of accumulated sediment behind the wattle if sediment accumulates to at least ½ the height of the silt fence

Phase No. II		
Location/Station	**Control Measure Description/Reference**	**Maintenance Requirement**
Throughout site as storm system is installed.Silt Fence Drop Inlet Protection	Silt Fence. Section Six, Sediment Control Measures, Silt Fence - *RI SESC Handbook*.	Inspection should be made after each storm event or 1/week and repair or replacement should be made promptly as needed. Cleanout of accumulated sediment behind the silt if sediment accumulates to at least ½ the height of the silt fence
East side of main facility site, Sediment Basin B	Temporary Sediment Basin. Section Six, Sediment Control Measures – RI SESC Handbook	Basin is to be maintained by the removal of sediment annually or when sedimentation depth reaches 3 inches in the bottom of the basin

Phase No. III		
Location/Station	**Control Measure Description/Reference**	**Maintenance Requirement**
Site Storm Drain Inlets	Filter Fabric Inlet Filter. Section Six, Sediment Control Measures - *RI SESC Handbook*.	Inspect the fabric barrier after each rain event and make repairs as needed. Remove sediment from the pool area as necessary with care not to undercut or damage the filter fabric. Upon stabilization of the drainage area, remove all materials and unstable sediment and dispose of properly. Bring the adjacent area of the drop inlet to grade, smooth and compact and stabilize in the appropriate manner to the site.
Off-sie utlity installations	Silt Fence. Section Six, Sediment Control Measures, Silt Fence - *RI SESC Handbook*.	Inspection should be made after each storm event or 1/week and repair or replacement should be made promptly as needed. Cleanout of accumulated sediment behind the silt if sediment accumulates to at least ½ the height of the silt fence

SECTION 3: CONSTRUCTION ACTIVITY POLLUTION PREVENTION

Per RI Stormwater Design and Installation Standards Manual 3.3.7.14:

The purpose of construction activity pollution prevention is to prevent day to day construction activities from causing pollution.

This section describes the key pollution prevention measures that must be implemented to avoid and reduce the discharge of pollutants in stormwater. Example control measures include the proper management of waste, material handling and storage, and equipment/vehicle fueling/washing/maintenance operations.

Where applicable, include *RI SESC Handbook* or the *RI Department of Transportation Standard Specifications for Road and Bridge Construction* (as amended) specifications.

3.1 Existing Data of Known Discharges from Site

Per RIPDES Construction General Permit – Part III.I:

List and provide existing data (if available) on the quality of any known discharges from the site. Examples include discharges from existing stormwater collection systems, discharges from industrial areas of the site, etc.

Are there known discharges from the project area?

☐ Yes ☒ No

Describe how this determination was made:

- Site is currently undeveloped land covered in native vegetation and trees.

If yes, list discharges and locations:

- N/A

Is there existing data on the quality of the known discharges?

☐ Yes ☒ No

If yes, provide data:

- N/A

3.2 Prohibited Discharges

Per RI SESC Handbook – Part D

The following discharges are prohibited at the construction site:

- Contaminated groundwater, unless specifically authorized by the DEM. These types of discharges may only be authorized under a separate DEM RIPDES permit.
- Wastewater from washout of concrete, unless the discharge is contained and managed by appropriate control measures.
- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials.
- Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance. Proper storage and spill prevention practices must be utilized at all construction sites.
- Soaps or solvents used in vehicle and equipment washing.

- Toxic or hazardous substances from a spill or other release.

All types of waste generated at the site shall be disposed of in a manner consistent with State Law and/or regulations.

Will any of the above listed prohibited discharges be generated at the site?

☒ Yes ☐ No

If Yes, provide a list of those that will be generated at the site and provide a discussion of how they will be managed, including references to the specific SESC Site Plans where such control measures are specified.

All prohibited discharges will be captured in a manner meeting Rhode Island requirements. Concrete washout will be captured in a concrete washout pit to be constructed during Phase I installation. Fuels, oils and other pollutants will be contained within an equipment maintenance location to be determined by the contractor within the construction staging area shown on sheet SESC-2. Other discharges (if any)remain to be determined.

If No, discuss rationale.

N/A

3.3 Proper Waste Disposal

Per RI SESC Handbook – Part D

Building materials and other construction site wastes must be properly managed and disposed of in a manner consistent with State Law and/or regulations.

- A waste collection area shall be designated on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a waterbody or storm drain.
- All waste containers shall be covered to avoid contact with wind and precipitation.
- Waste collection shall be scheduled frequently enough to prevent containers from overfilling.
- All construction site wastes shall be collected, removed, and disposed of in accordance with applicable regulatory requirements and only at authorized disposal sites.
- Equipment and containers shall be checked for leaks, corrosion, support or foundation failure, or other signs of deterioration. Those that are found to be defective shall be immediately repaired or replaced.

Is waste disposal a significant element of the proposed project?

☒ Yes ☐ No

If Yes, identify potential building materials and other construction wastes and document how these wastes will be properly managed and disposed of at the construction site (i.e., trash disposal, sanitary

wastes, recycling, and proper material handling). Include references to the specific SESC Site Plans where such control measures are specified.

Anticipated wastes for this project include refuse concrete, municipal wastes (rubbish), scrap steel, erosion control devices, and construction related plastic. All wastes shall attempt to be recycled at a DEM approved facility first; failing recycling, all wastes shall be disposed of an a DEM approved refuse site.

If No, discuss rationale.

N/A

3.4 Spill Prevention and Control

Per RI SESC Handbook – Part D

All chemicals and/or hazardous waste material must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. All areas where potential spills can occur and their accompanying drainage points must be described. The owner and operator must establish spill prevention and control measures to reduce the chance of spills, stop the source of spills, contain and clean-up spills, and dispose of materials contaminated by spills. The operator must establish and make highly visible location(s) for the storage of spill prevention and control equipment and provide training for personnel responsible for spill prevention and control on the construction site.

Are spill prevention and control measures required for this particular project?

☒ Yes ☐ No

If Yes, describe all areas where potential spills can occur, and their accompanying drainage points, and describe the spill prevention and control plan to reduce the chance of spills, stop the source of spills, contain and clean up spills, dispose of materials contaminated by spills, and train personnel responsible for spill prevention and control. Provide the method of establishing and making highly visible the location(s) for the storage of spill prevention equipment. Refer to the RI SESC Handbook, Spill Prevention and Control Plan for guidance.

- Refer to SPC Plan prepared by ESS Group, Inc. located in Appendix C.

If No, discuss rationale.

N/A

3.5 Control of Allowable Non-Stormwater Discharges

Per RIPDES Construction General Permit – Part III.J.2.e:

Discharges not comprised of stormwater are allowed under the RIPDES Construction General Permit but are limited to the following: discharges which result from the washdown of vehicles where no detergents are used; external building wash-down where no detergents are used; the use of water to control dust; firefighting activities; fire hydrant flushing; natural springs; uncontaminated groundwater; lawn watering; potable water sources including waterline flushing; irrigation drainage; pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled materials have been removed) and where detergents are not used; and foundation or footing drains where flows are not contaminated with process materials such as solvents, or contaminated by contact with soils where spills or leaks of toxic or hazardous materials has occurred. If any of these discharges may reasonably be expected to be present and to be mixed with stormwater discharges, they must be specifically listed here.

Are there allowable non-Stormwater discharges present on or near the project area?

☐ Yes ☒ No

If yes, list the sources of allowable non-Stormwater discharge(s) associated with construction activity. For each of the allowable non-stormwater discharge(s) identified, describe the controls and measures that will be implemented at those locations to minimize pollutant contamination of these discharges and to separate them from temporary discharges of stormwater during construction.

List of allowable non-stormwater discharge(s) and the associated control measure(s):

- N/A

If any existing or proposed discharges consist of contaminated groundwater, such discharges are not authorized under the RIPDES Construction General Permit. These discharges must be permitted separately by seeking coverage to treat and discharge under a separate RIPDES individual permit or under the RIPDES Remediation General Permit. Contact the RIDEM Office of Water Resources RIPDES Permitting Program at 401-222-4700 for application requirements and additional information.

Are there any known or proposed contaminated discharges, including anticipated contaminated dewatering operations, planned on or near the project area?

☐ Yes ☒ No

If yes, list the discharge types and the RIPDES individual permit number(s) or RIPDES Remediation General Permit Authorization number(s) associated with these discharges.

- Discharge Type and RIPDES Individual Permit number : N/A
- Discharge Type and RIPDES Remediation General Permit Authorization number: N/A

3.6 Control Dewatering Practices

Per RI SESC Handbook – Part D

Site owners and operators are prohibited from discharging groundwater or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, unless such waters are first effectively managed by appropriate control measures.

Examples of appropriate control measures include, but are not limited to, temporary sediment basins or sediment traps, sediment socks, dewatering tanks and bags, or filtration systems (e.g. bag or sand filters) that are designed to remove sediment. Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control.

At a minimum the following discharge requirements must be met for dewatering activities:

1. Do not discharge visible floating solids or foam.
2. To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area.
3. At all points where dewatering water is discharged, utilize velocity dissipation devices.
4. With filter backwash water, either haul it away for disposal or return it to the beginning of the treatment process.
5. Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

6. Dewatering practices must involve the implementation of appropriate control measures as applicable (i.e. containment areas for dewatering earth materials, portable sediment tanks and bags, pumping settling basins, and pump intake protection.)

Is it at all likely that the site operator will need to implement construction dewatering in order to complete the proposed project?

☐ Yes ☒ No

If Yes, describe all areas where construction dewatering may be required and the proposed control measures that will be used to treat and manage dewatering fluids including all proposed discharge points. Proposed control measures must comply with the RI SESC Handbook. Include references to all relevant SESC Site Plans.

- N/A

If No, discuss rationale.

No dewater activities beyond temporary sed basins is anticipated on the project. If any arise an appropriate plan will be developed.

3.7 Establish Proper Building Material Staging Areas

Per RI SESC Handbook – Part D

All construction materials that have the potential to contaminate stormwater must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. Designated areas shall be approved by the site owner/engineer. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in the discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

Describe construction materials expected to be stored on-site and procedures for storage of materials to minimize exposure of the materials to stormwater. Include references to all relevant SESC Site Plans.

Material typical in the construction of a power plant facility will be stored onsite. These will include typical building materials such as steel, wood, drywall, insulation, plastics, piping, wiring, finishing materials such as paints and other associated materials. Contractor will provide for appropriate protection of stored materials to prevent exposure to precipitation necessary to prevent discharge of pollutants from the storage area. Storage of materials will be typically located within the construction staging area shown on Sheet SESC-2.

3.8 Minimize Dust

Per RI SESC Handbook – Part D

Dust control procedures and practices shall be used to suppress dust on a construction site during the construction process, as applicable. Precipitation, temperature, humidity, wind velocity and direction will determine amount and frequency of applications. However, the best method of controlling dust is to prevent dust production. This can best be accomplished by limiting the amount of bare soil exposed at one time. Dust Control measures outlined in the *RI SESC Handbook* shall be followed. Other dust control methods include watering, chemical application, surface roughening, wind barriers, walls, and covers.

Describe dust control practices that will be used to suppress dust and limit its generation (i.e. applying water, limiting the amount of bare soil exposed at one time etc.).

Dust Control will be performed through the application of water, if needed.

3.9 Designate Washout Areas

Per RI SESC Handbook – Part D

At no time shall any material (concrete, paint, chemicals) be washed into storm drains, open ditches, streets, streams, wetlands, or any environmentally sensitive area. The site operator must ensure that construction waste is properly disposed of, to avoid exposure to precipitation, at the end of each working day.

Will washout areas be required for the proposed project?

☒ Yes ☐ No

If Yes, describe location(s) and control measures that will be used to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, washout areas for concrete mixers, paint, stucco, etc. The recommended location(s) of washout areas should be identified, or at a minimum the locations where these washout areas should not be sited should be called out.

Concrete washout pit or pits will be established for site construction. Any additional washout features (i.e. paints and or chemicals) will have to be determined by the contractor as he develops his construction plan.

If No, discuss rationale.

N/A

3.10 Establish Proper Equipment/Vehicle Fueling and Maintenance Practices

Per RI SESC Handbook – Part D

Vehicle fueling shall not take place within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Designated areas shall be depicted on the SESC Site Plans, or shall be approved by the site owner.

Vehicle maintenance and washing shall occur off-site, or in designated areas depicted on the SESC Site Plans or approved of by the site owner. Maintenance or washing areas shall not be within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Maintenance areas shall be clearly designated, and barriers shall be used around the perimeter of the maintenance area to prevent stormwater contamination.

Construction vehicles shall be inspected frequently for leaks. Repairs shall take place immediately. Disposal of all used oil, antifreeze, solvents and other automotive-related chemicals shall be according to applicable regulations; at no time shall any material be washed down the storm drain or in to any environmentally sensitive area.

Describe equipment/vehicle fueling and maintenance practices that will be implemented to prevent pollutants from mixing with stormwater (e.g., secondary containment, drip pans, spill kits, etc.) Provide recommended location(s) of fueling/maintenance areas, or, at minimum, locations where fueling/maintenance should be avoided.

The contractor will establish appropriate fueling/maintenance areas within the construction staging area near the Wallum Lake Road entrance at his or her discretion in accordance with Rhode Island governing regulations

3.11 Chemical Treatment for Erosion and Sediment Control

Per RI SESC Handbook – Appendix J

Chemical stabilizers, polymers, and flocculants are readily available on the market and can be easily applied to construction sites for the purposes of enhancing the control of erosion, runoff, and sedimentation. The following guidelines should be adhered to for construction sites that plan to use treatment chemicals as part of their overall erosion, runoff, and sedimentation control strategy.

The U.S. Environmental Protection Agency has conducted research into the relative toxicity of chemicals commonly used for the treatment of construction stormwater discharges. The research conducted by the EPA focused on different formulations of chitosan, a cationic compound, and both cationic and anionic polyacrylamide (PAM). In summary, the studies found significant toxicity resulting from the use of chitosan and cationic PAM in laboratory conditions, and significantly less toxicity associated with using anionic PAM. EPA's research has led to the conclusion that the use of treatment chemicals for erosion, runoff, and sedimentation control requires proper operator training and appropriate usage to avoid risk to aquatic species. In the case of cationic treatment chemicals additional safeguards may be necessary.

Application/Installation Minimum Requirements

If a site operator plans to use polymers, flocculants, or other treatment chemicals during construction the SESC plan must address the following:

1. Treatment chemicals shall not be applied directly to or within 100 feet of any surface water body, wetland, or storm drain inlet.

2. Use conventional erosion, runoff, and sedimentation controls prior to and after the application of treatment chemicals. Use conventional erosion, runoff, and sedimentation controls prior to chemical addition to ensure effective treatment. Chemicals may only be applied where treated stormwater is directed to a sediment control (e.g. temporary sediment basin, temporary sediment trap or sediment barrier) prior to discharge.

3. Sites shall be stabilized as soon as possible using conventional measures to minimize the need to use chemical treatment.

4. Select appropriate treatment chemicals. Chemicals must be selected that are appropriately suited to the types of soils likely to be exposed during construction and to the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or treatment area. **Soil testing is essential. Using the wrong form of chemical treatment will result in some form of performance failure and unnecessary environmental risk.**

5. Minimize discharge risk from stored chemicals. Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures (e.g., spill berms, decks, spill containment pallets), or provide equivalent measures, designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means (e.g., storing chemicals in covered areas or having a spill kit available on site).

6. Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier. You must also use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment

removal design specifications provided by the supplier of the applicable chemicals, or document specific departures from these practices or specifications and how they reflect good engineering practice.

Will chemical stabilizers, polymers, flocculants or other treatment chemicals be utilized on the proposed construction project?

☐ Yes ☒ No

If Yes, create a Treatment Chemical Application Plan and describe how the owner or SESC Plan preparer/designer intends to educate the designated operator prior to the application of such treatment chemicals.

Treatment Chemical Application Plan Required Elements

Insert information listed below:

1. *List Manufacturer's name and product name for each treatment chemical proposed for use at the site.*
2. *Attach a copy of applicable Material Safety Data Sheets (MSDSs) or Safety Data Sheets (SDS) for each proposed treatment chemical.*
3. *Provide the results of third party toxicity testing of the materials proposed for use at the site.*
4. *Provide a certification from the site owner and operator that all proposed treatment chemicals are the same as those used in the toxicity tests and will not be altered in any way.*
5. *Provide an explanation as to why conventional erosion, runoff, and sediment control measures, alone or in combination, will not be sufficient to prevent turbidity impacts and sedimentation in downstream receptors.*
6. *Provide a plan prepared in consultation with the chemical treatment manufacturer(s) or authorized manufacturer's representative which includes the following:*
    a. *Identification of the areas of the site where treatment chemicals will be applied and the name, location, and distance to all downstream receptors that have the potential to be impacted from the discharges from the treatment areas.*
    b. *List the expected start and end dates or specific phases of the project during which each treatment chemical will be applied.*
    c. *Provide test results for representative soils from the site, and any recommendations from the manufacturer based on the soil tests, indicating the type of treatment chemical and the recommended application rate.*
    d. *List the frequency, method, and rates of application which are designed to ensure that treatment chemical concentrations will not exceed 50% of the IC25 or NOEC toxicity values, whichever is less, for each treatment chemical proposed.*
    e. *Provide the frequency of inspection and maintenance of the treatment chemical application system.*
    f. *List the method proposed for the collection, removal, and disposal or stabilization of settled particles to prevent re-suspension.*
    g. *Describe the training that will be provided to all persons who will handle and use treatment chemicals at the construction site. Training must include appropriate, product-specific training and proper dosing requirements for each product.*

Treatment Chemical SESC Plan Weekly Inspection Report Documentation Requirements

1. Document the type and quantity of treatment chemicals applied.

2. List the date, duration of discharge, and estimated discharge rate.

3. Provide an estimate of the volume of water treated.

4. Provide an estimate of the concentration of treatment chemicals in the discharge, with supporting calculations.

3.12 Construction Activity Pollution Prevention Control Measure List

Complete the following table for each Phase of construction where Pollution Prevention Control Measures will be implemented. This table is to be used as part of the SESC Plan Inspection Report – please fill out accordingly.

It is expected that this table will be amended as needed throughout the construction project.

Phase No. #		
Location/Station	**Control Measure Description/Reference**	**Maintenance Requirement**
Near Construction Staging Area and possibly on the main facility site as needed	Concrete Washout.. Used to contain concrete washout during concrete pouring operations. Section Three: Pollution Prevention and Good Housekeeping, Concrete Washouts, *RI SESC Handbook*.	Verify that concrete washout facility is in place prior to pouring concrete. Inspect daily to verify continued proper performance. Check remaining capacity during pouring operations. Check for leaks periodically.
Within Construction Staging Area	Vehicle Maintenance Area. Section Three: Pollution Prevention and Good Housekeeping, Vehicle Fueling, Maintenance and Washing, *RI SESC Handbook*.	Enclose or cover stored fuel. Use a covered, paved area dedicated to vehicle maintenance and washing. Develop a spill prevention and cleanup plan. Prevent hazardous chemical leaks by properly maintaining vechles and equipmenet Properly cover and provide secondary containment for fuel drums and toxic materials. Properly handle and dispose of vehicle wastes and wash water. Train employees and subcontractors in proper procedures.

Insert a new table for each additional construction phase.

SECTION 4: CONTROL MEASURE INSTALLATION, INSPECTION, and MAINTENANCE

4.1 Installation

Per RI SESC Handbook – Part D:

Complete the installation of temporary erosion, runoff, sediment, and pollution prevention control measures by the time each phase of earth-disturbance has begun. All stormwater control measures must be installed in accordance with good judgment, including applicable design and manufacturer specifications. Installation techniques and maintenance requirements may be found in manufacturer specifications and/or the *RI SESC Handbook*.

Include references to SESC Site Plans where installation requirements are located.

Phase I (Sheet 01C904) – Complete installation of LOD construction fencing, perimeter silt fencing and construction entrance and inspect these installations. If acceptable continue to install staging area, Sediment Basin A and associated diversion ditches.

Phase II (Sheet 01C905) – Begin mass grading, construct Sediment Basin B, as runoff is able to be diverted into basin B from Basin A, then filling in Basin A can begin. Diversion ditches will move to the east as basin A is filled to divert runoff into basin B. Place topsoil in soil stockpile area designated and provide silt fence protection as the toe of the stockpile slope. Continue to maintain perimeter silt fence installations and construction entrance.

Phase III (01C906) – Begin facility construction. As storm drainage system is installed, provide Silt Fence inlet protection. Provide silt fence protection for off site utility construction. Continue to maintain perimeter silt fences and construction entrance.

Phase IV (01C907) – As areas are stabilized and paved, replace Silt Fence Inlet protection with inlet filter protection within the inlets. Complete finish grading and install permanent seeding, sodding and planting. Convert Basin B into final Water Quality/Detention Basin. Remove all temporary erosion and sediment control devices when contributing areas are stabilized. Distribute remaining topsoil over the staging areas not to remain. Clean up construction staging area to remain for future use and top dress with gravel where needed.

4.2 Monitoring Weather Conditions

Per RI SESC Handbook – Part D:

Anticipating Weather Events - Care will be taken to the best of the operator's ability to avoid disturbing large areas prior to anticipated precipitation events. Weather forecasts must be routinely checked, and in the case of an expected precipitation event of over 0.25-inches over a 24-hour period, it is highly recommended that all control measures should be evaluated and maintained as necessary, prior to the weather event. In the case of an extreme weather forecast (greater than one-inch of rain over a 24-hour period), additional erosion/sediment controls may need to be installed.

Storm Event Monitoring For Inspections - At a minimum, storm events must be monitored and tracked in order to determine when post-storm event inspections must be conducted. Inspections must be conducted and documented at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event, which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff or snowmelt.

In order for an operator to successfully satisfy this requirement list the weather gauge station that will be utilized to monitor weather conditions on the construction site. See www.wunderground.com or www.weather.gov for available stations.

The weather gauge station and website that will be utilized to monitor weather conditions on the construction site is as follows:

• Utilize the Whipple (KRIHARRI30 rain gage station for rainfall monitoring. Website, https://www.wunderground.com/history/airport/KSFZ/2016/09/12/DailyHistory.html?req_city=Burrillville&req_state=RI&reqdb.zip=02830&reqdb.magic=2&reqdb.wmo=99999

4.3 Inspections

Per RI SESC Handbook – Part D:

Minimum Frequency - Each of the following areas must be inspected by or under the supervision of the owner and operator at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event, which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff or snowmelt:

a. All areas that have been cleared, graded, or excavated and where permanent stabilization has not been achieved;

b. All stormwater erosion, runoff, and sediment control measures (including pollution prevention control measures) installed at the site;

c. Construction material, unstabilized soil stockpiles, waste, borrow, or equipment storage, and maintenance areas that are covered by this permit and are exposed to precipitation;

d. All areas where stormwater typically flows within the site, including temporary drainage ways designed to divert, convey, and/or treat stormwater;

e. All points of discharge from the site;

f. All locations where temporary soil stabilization measures have been implemented;

g. All locations where vehicles enter or exit the site.

Reductions in Inspection Frequency - If earth disturbing activities are suspended due to frozen conditions, inspections may be reduced to a frequency of once per month. The owner and operator must document the beginning and ending dates of these periods in an inspection report.

Qualified Personnel – The site owner and operator are responsible for designating personnel to conduct inspections and for ensuring that the personnel who are responsible for conducting the inspections are “qualified” to do so. A “qualified person” is a person knowledgeable in the principles and practices of erosion, runoff, sediment, and pollution prevention controls, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of the permit.

Recordkeeping Requirements - All records of inspections, including records of maintenance and corrective actions must be maintained with the SESC Plan. Inspection records must include the date and time of the inspection, and the inspector's name, signature, and contact information.

General Notes

- A separate inspection report will be prepared for each inspection.
- The Inspection Reference Number shall be a combination of the RIPDES Construction General Permit No - consecutively numbered inspections. ex/ Inspection reference number for the **4**th inspection of a project would be: RIR10#####-**4**
- Each report will be signed and dated by the Inspector and must be kept onsite.
- Each report will be signed and dated by the Site Operator.
- The corrective action log contained in each inspection report must be completed, signed, and dated by the site operator once all necessary repairs have been completed.
- It is the responsibility of the site operator to maintain a copy of the SESC Plan, copies of all completed inspection reports, and amendments as part of the SESC Plan documentation at the site during construction.

Failure to make and provide documentation of inspections and corrective actions under this part constitutes a violation of your permit and enforcement actions under 46-12 of R.I. General Laws may result.

4.4 Maintenance

Per RI SESC Handbook – Part D:

Maintenance procedures for erosion and sedimentation controls and stormwater management structures/facilities are described on the SESC Site Plans and in the *RI SESC Handbook*.

Site owners and operators must ensure that all erosion, runoff, sediment, and pollution prevention controls remain in effective operating condition and are protected from activities that would reduce their effectiveness. Erosion, runoff, sedimentation, and pollution prevention control measures must be maintained throughout the course of the project.

Note: It is recommended that the site operator designates a full-time, on-site contact person responsible for working with the site owner to resolve SESC Plan-related issues.

4.5 Corrective Actions

Per RI SESC Handbook – Part D:

If, in the opinion of the designated site inspector, corrective action is required, the inspector shall note it on the inspection report and shall inform the site operator that corrective action is necessary. The site operator must make all necessary repairs whenever maintenance of any of the control measures instituted at the site is required.

In accordance with the *RI SESC Handbook*, the site operator shall initiate work to fix the problem immediately after its discovery, and complete such work by the close of the next work day, if the problem

does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

When installation of a new control or a significant repair is needed, site owners and operators must ensure that the new or modified control measure is installed and made operational by no later than seven (7) calendar days from the time of discovery where feasible. If it is infeasible to complete the installation or repair within seven (7) calendar days, the reasons why it is infeasible must be documented in the SESC Plan along with the schedule for installing the control measures and making it operational as soon as practicable after the 7-day timeframe. Such documentation of these maintenance procedures and timeframes should be described in the inspection report in which the issue was first documented. If these actions result in changes to any of the control measures outlined in the SESC Plan, site owners and operators must also modify the SESC Plan accordingly within seven (7) calendar days of completing this work.

SECTION 5: AMENDMENTS

Per RIPDES Construction General Permit – Part III.F:

This SESC Plan is intended to be a working document. It is expected that amendments will be required throughout the active construction phase of the project. **Even if practices are installed on a site according to the approved plan, the site is only in compliance when erosion, runoff, and sedimentation are effectively controlled throughout the entire site for the entire duration of the project.**

The SESC Plan shall be amended within seven (7) days whenever there is a change in design, construction, operation, maintenance or other procedure which has a significant effect on the potential for the discharge of pollutants, or if the SESC Plan proves to be ineffective in achieving its objectives (i.e. the selected control measures are not effective in controlling erosion or sedimentation).

In addition, the SESC Plan shall be amended to identify any new operator that will implement a component of the SESC Plan.

All revisions must be recorded in the Record of Amendments Log Sheet, which is contained in Attachment G of this SESC Plan, and dated red-lined drawings and/or a detailed written description must be appended to the SESC Plan. Inspection Forms must be revised to reflect all amendments. Update the Revision Date and the Version # in the footer of the Report to reflect amendments made.

All SESC Plan Amendments, except minor non-technical revisions, must be approved by the site owner and operator. Any amendments to control measures that involve the practice of engineering must be reviewed, signed, and stamped by a Professional Engineer registered in the State of RI.

The amended SESC plan must be kept on file at the site while construction is ongoing and any modifications must be documented.

Attach a copy of the Amendment Log.

Reference RI Model SESC Plan ATTACHMENT G

SECTION 6: RECORDKEEPING

RIPDES Construction General Permit – Parts III.D, III.G, III.J.3.b.iii, & V.O

It is the site owner and site operator's responsibility to have the following documents available at the construction site and immediately available for RIDEM review upon request:

- A copy of the fully signed and dated SESC Plan, which includes:
  - A copy of the General Location Map
    INCLUDED AS ATTACHMENT A
  - A copy of all SESC Site Plans
    INCLUDED AS ATTACHMENT B
  - A copy of the RIPDES Construction General Permit *(To save paper and file space, do not include in DEM/CRMC submittal, for operator copy only)*
    INCLUDED AS ATTACHMENT C
  - A copy of any regulatory permits (RIDEM Freshwater Wetlands Permit, CRMC Assent, RIDEM Water Quality Certification, RIDEM Groundwater Discharge Permit, RIDEM RIPDES Construction General Permit authorization letter, etc.)
    INCLUDED AS ATTACHMENT D
  - The signed and certified NOI form or permit application form *(if required as part of the application, see RIPDES Construction General Permit for applicability)*
    INCLUDED AS ATTACHMENT E
  - Completed Inspection Reports w/Completed Corrective Action Logs
    INCLUDED AS ATTACHMENT F
  - SESC Plan Amendment Log
    INCLUDED AS ATTACHMENT G

SECTION 7: PARTY CERTIFICATIONS

RIPDES Construction General Permit – Part V.G

All parties working at the project site are required to comply with the Soil Erosion and Sediment Control Plan (SESC Plan including SESC Site Plans) for any work that is performed on-site. The site owner, site operator, contractors and sub-contractors are encouraged to advise all employees working on this project of the requirements of the SESC Plan. A copy of the SESC Plan is available for your review at the following location: Insert Onsite Location Here, or may be obtained by contacting the site owner or site operator.

The site owner and site operator and each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement.

I acknowledge that I have read and understand the terms and conditions of the Soil Erosion and Sediment Control (SESC) Plan for the above designated project and agree to follow the control measures described in the SESC Plan and SESC Site Plans.

Site Owner:

Insert Company or Organization Name
Insert Name & Title
Insert Address
Insert City, State, Zip Code
Insert Telephone Number, Insert Fax/Email

_____
signature/date

Site Operator:

Insert Company or Organization Name
Insert Name & Title
Insert Address
Insert City, State, Zip Code
Insert Telephone Number, Insert Fax/Email

_____
signature/date

Designated Site Inspector:

Insert Company or Organization Name
Insert Name & Title
Insert Address
Insert City, State, Zip Code
Insert Telephone Number, Insert Fax/Email

_____
signature/date

SubContractor SESC Plan Contact:

Insert Company or Organization Name
Insert Name & Title
Insert Address
Insert City, State, Zip Code
Insert Telephone Number, Insert Fax/Email

_____
signature/date

Insert more contact/signature lines as necessary

LIST OF APPENDICES

LIST OF ATTACHMENTS

Appendix A

Temporary Sediment Basin A

Project:		Computed:	Date:
Subject:	Basin A Calcs	Checked:	Date:
Task:		Page: 1	of: 9
Job #:		No:	

Basin A:

Contributing Area = DA#1 + DA#2 + DA#3

= 5.11 Ac + 5.40 Ac + 3.20 Ac = 13.71 Ac

Assume No Grass cover on All Areas - Worst Case.

Assume Newly Graded Area Soil type D - CN = 94

Pre Developed Conditions:

DA# 1 has 1.43 Acres that does not drain to Basin A

DA# 1 Pre-grade = 5.11 - 1.43 = 3.68 Ac

DA# 2 has 0.43 Acres that does not drain to Basin A

DA# 2 Pre-grade = 5.40 - 0.43 = 4.97 Ac

Assume Wooded Grass Combination, Soil D, CN = 79
in good condition

Project:	Computed:	Date:
Subject:	Checked:	Date:
Task:	Page: 2	of: 9
Job #:	No:	

Basin A:

Sediment Storage Volume = $[DA \times A \times DR \times TE \times 2000] / y.43560$

DA = 13.71 Ac = 0.021 sq. miles

A = 50, see Fig. 2 construction areas (next page)

DR = 42%, see Fig 3 (next page)
= 0.42

Based on soil type Woodbridge WoB - fine sandy loam the soil is typically 61% sand, 7% clay, remainder is rock

TE = 80% = 0.8

Since soil is predominantly sand with some clay will use sediment density y = 75 per figure 4. Any Topsoil would have been removed.

Sed. Storage Volume = $\frac{(13.71 \times 50 \times 0.42 \times 0.8 \times 2000)}{75 \times 43560}$

Sed Stor Volume = 0.14 Ac-Ft/year = 6098.4 Ft³/yr

Minimum Wet Storage = 0.14 x 2 = 0.28 Acre Feet

Min. Wet Storage Depth is 2'

Basin A

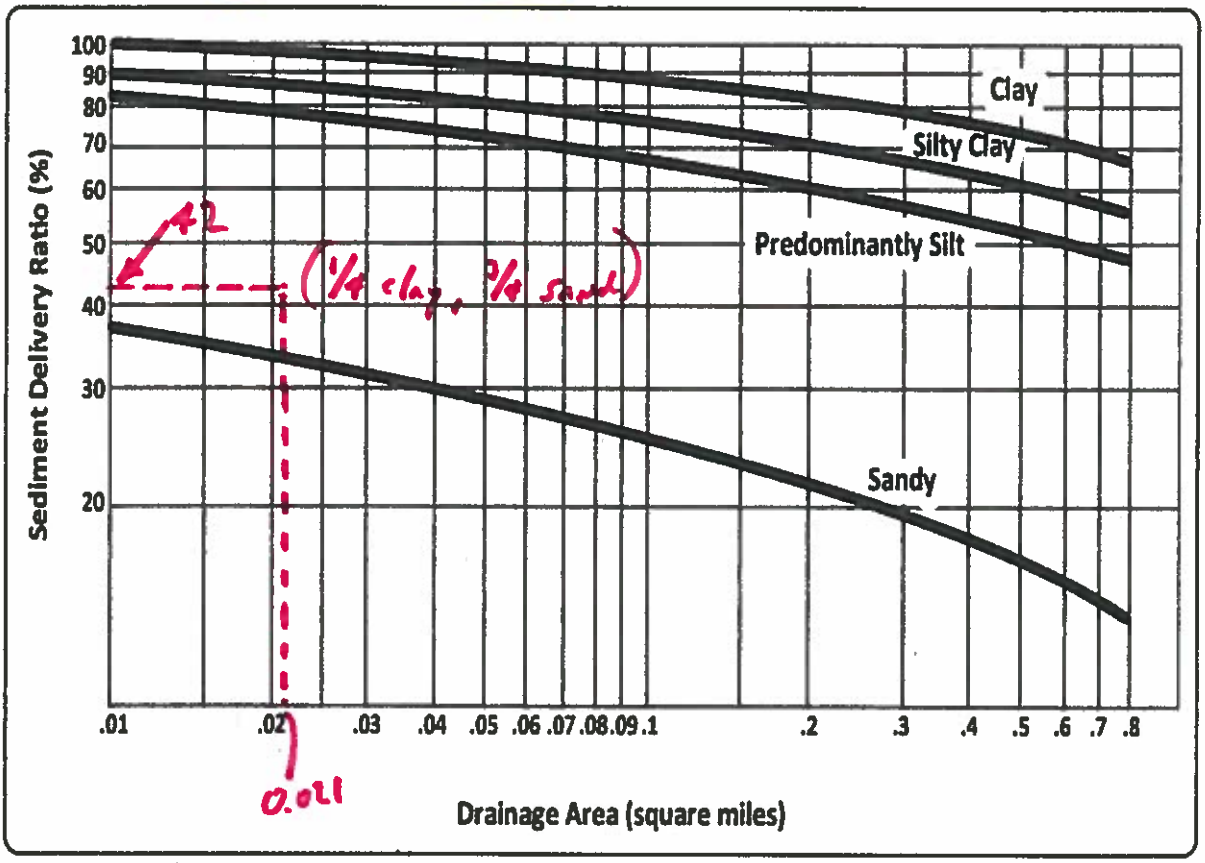
3 of 9

Figure 2. Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction areas	50 ton/ac/yr

(Credit: *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*)

Figure 3. Sediment Delivery Ratio vs. Drainage Area Graph



(Credit: *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*)

Figure 4. Estimated Sediment Density

Soil Texture*	Sediment Density (Submerged) (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

*Use USDA soil data from country soil surveys or sieve analysis to determine soil texture.

Predominantly sand use 75

(Credit: *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*)

Residence Storage is adequate volume to provide a minimum 10 hours residence time for a 10-year frequency, 24-hour duration Type III distribution storm. Residence time is defined as the volume weighted average time that an amount of flow will reside in a reservoir.

Flood routing is required to determine residence storage time. TR-55, or other generally accepted flood routing methods, will provide the minimum required residence storage volume and the maximum allowable principal spillway discharge.

Basin Shape: Depth, Width, and Effective Flow Length

The length, width, and depth of the basin are measured from the emergency spillway crest elevation.

The average depth shall be 4 feet or greater.

The minimum width shall be:

$W = 10 (Q_5)^{1/2}$

where: W = width in feet

Q_5 = peak discharge from a 5-year frequency storm in cfs.

When the downstream area is highly sensitive to sediment impacts, the minimum width shall be:

$W = 10 (Q_{25})^{1/2}$

where: W = width in feet

Q_{25} = peak discharge from a 25-year frequency storm in cfs.

The effective flow length shall be equal to at least two times the effective flow width. When site constraints prohibit the design of an adequate length, baffles are required to provide for the creation of an adequate flow length (see **Figure 5a and 5b**).

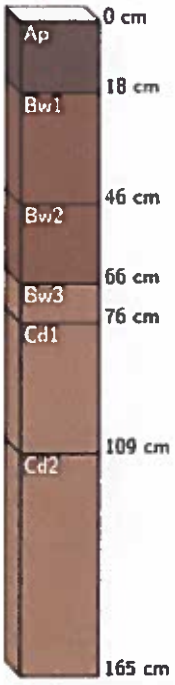
Messinger, Keith

From: Bender, Rockne
Sent: Tuesday, August 30, 2016 11:55 AM
To: Messinger, Keith
Subject: CR - soils

Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony
(SSURGO Export: 2015-09-22)

Components within map unit 286313

Woodbridge (82%)
Aquic Dystrudepts



hills / Backslope
hills / Footslope
hills / Summit

Paxton (10%)
Oxyaquic Dystrudepts

hills / Shoulder
hills / Backslope
hills / Summit

Ridgebury (8%)
Aeric Endoaquepts

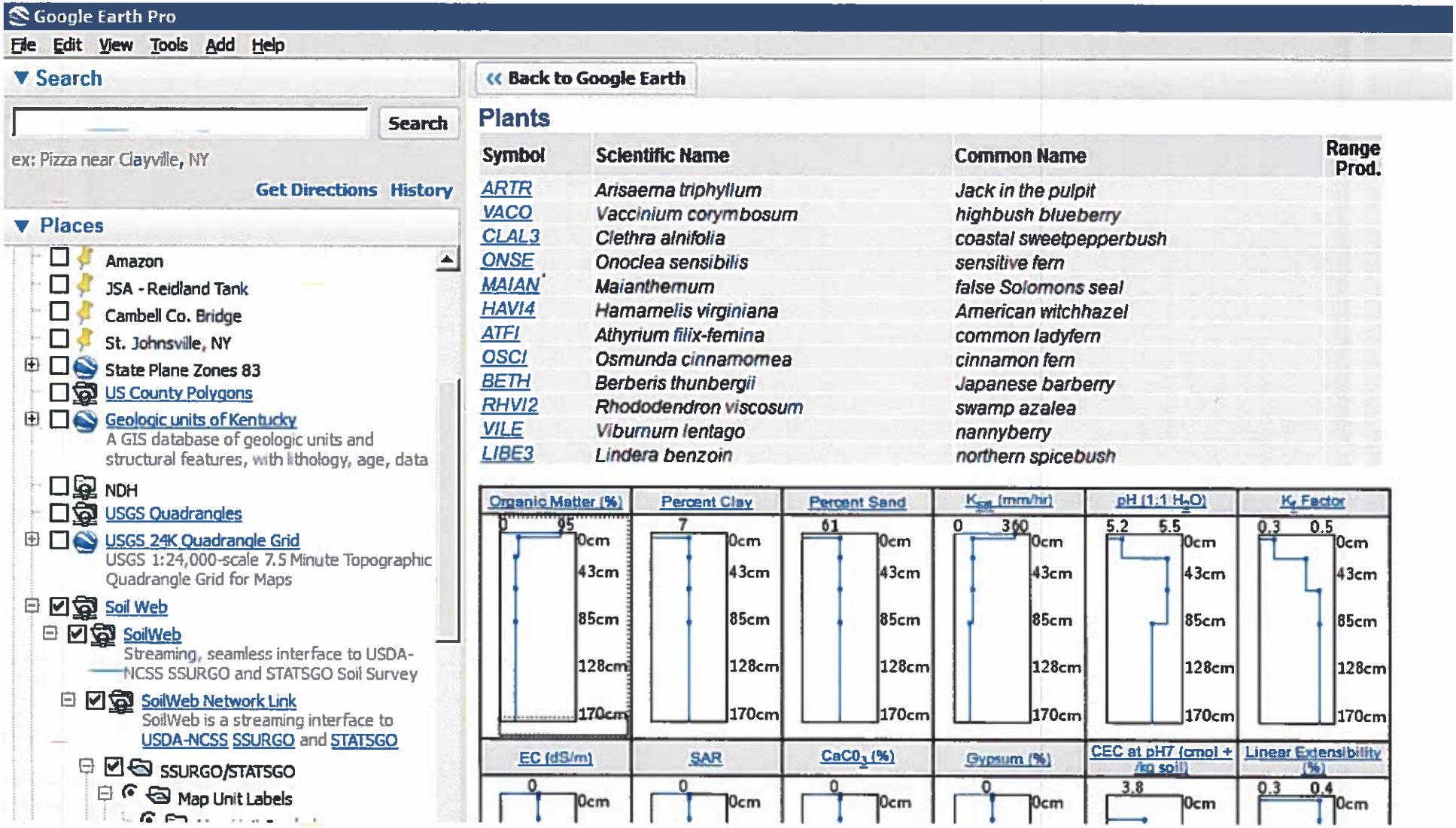
depressions

Block Diagrams: c/o NCSS Job Aids
note that these diagrams may be from multiple survey areas

1. CT-2011-05-31-09
2. CT-2011-05-31-07
3. MA-2010-09-07-03
4. CT-2011-05-31-06
5. MA-2012-02-02-17
6. MA-2010-09-07-04
7. MA-2012-02-02-11
8. MA-2012-02-02-16
9. MA-2012-02-02-03
10. MA-2012-02-02-19
11. NH-2012-02-14-01
12. MA-2010-09-10-04
13. MA-2012-02-01-10
14. MA-2012-02-02-23
15. MA-2010-09-07-08
16. MA-2012-02-03-04
17. MA-2012-02-03-06

Messinger, Keith

From: Bender, Rockne
Sent: Tuesday, August 30, 2016 12:09 PM
To: Messinger, Keith
Subject: CR-Percentage of clay & sand



1

6 of 9

Project:	Computed:	Date:
Subject:	Checked:	Date:
Task:	Page: 7	of: 9
Job #:	No:	

BASIN A shape:

Assumptions: Downstream wetlands = highly sensitive area

$\therefore W = 10(Q_{25})^{1/2}$

Using HydroCAD software to calc Q_{25}

Area = 13.71 Ac

Soil CN = 0.94, D soil Newly Graded Area

Tc = 12.3 minutes, Lag Method 700' Hyd Length
1.3% Avg Slope

$Q_{25} = 47.5$ cfs

$W = 10(47.5)^{1/2} = \boxed{68.9'}$

$L_{min} = 2 \times 68.9 = \boxed{137.8'}$

BASIN A is approx 135' wide and 530' long.
These dimensions more than meet the requirements

3.0 STORMWATER MANAGEMENT STANDARDS AND PERFORMANCE CRITERIA

3.1 OVERVIEW

Rhode Island has seen an increase in commercial and residential development over the last several decades. Controlling stormwater from development sites is a priority with regards to impacts to receiving water bodies. This chapter presents performance standards and criteria for all new and redevelopment projects in the State of Rhode Island. Project applicants are required to meet the eleven minimum standards, as well as comply with specific criteria for the site planning process, groundwater recharge, water quality, channel protection, and peak flow control requirements. In the case of restoration or retrofitting, deviation from these standards may be appropriate at the discretion of the approving agency. All applicable development proposals must include a stormwater management site plan for review by State and local government. A plan must address all of the above minimum standards through compliance with the requirements of this manual (see checklist in Appendix A of this document).

All of the minimum standards contribute to protecting the water and habitat quality of receiving waters from the negative impacts of stormwater runoff. This is achieved by using a combination of both structural controls and non-structural practices (such as LID) as part of an effective stormwater management system. In general, when a project's stormwater management system is designed, installed, and maintained in accordance with the requirements of this manual, its runoff impacts will be presumed to be in compliance with applicable state regulatory standards and requirements. In some cases, the permitting agency may require that an applicant prepare and submit a pollutant loading analysis developed in accordance with the provisions of Appendix H in order to ascertain compliance.

This manual often refers to storm events of various kinds. Unless otherwise noted, all storm events are 24 hours in duration and utilize NRCS Type III precipitation distribution. Rainfall amounts for Rhode Island for various return frequencies are provided in Table 3-1 and shall be used for design unless otherwise specified.

Table 3-1 Design Rainfall Amounts for Rhode Island

RI County	24-hour (Type III) Rainfall Amount (inches)*						
	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Providence County	2.7	3.3	4.1	4.9	6.1	7.3	8.7
Bristol County	2.8	3.3	4.1	4.9	6.1	7.3	8.6
Newport County	2.8	3.3	4.1	4.9	6.1	7.3	8.6

Project:	Computed:	Date:
Subject:	Checked:	Date:
Task:	Page: 9	of: 9
Job #:	No:	

Total Volume for a 10 yr storm event:

$$\frac{4.9\ in}{12\ in/hr} \times 13.71\ Ac = 5.598\ Ac\text{-}Ft = 243,860\ cu\ ft$$

At 2' depth, pond has storage volume = 154,313 cu ft

For min 48 Hr dewater time, Q for skimmer is:

$$Q_{skim} = \frac{154,313\ cf}{48\ Hr} \times \frac{1\ Hr}{60\ min} \times \frac{1\ min}{60\ sec} = 0.89\ cfs$$

Will use 0.85 cfs for model

@ 0.85 cfs, 24 hr Type III storm 10 yr,

Basin A has peak elev of 565.17 achieving 2' depth above sediment storage zone. Pond dewatered at 105 Hr, meeting requirements

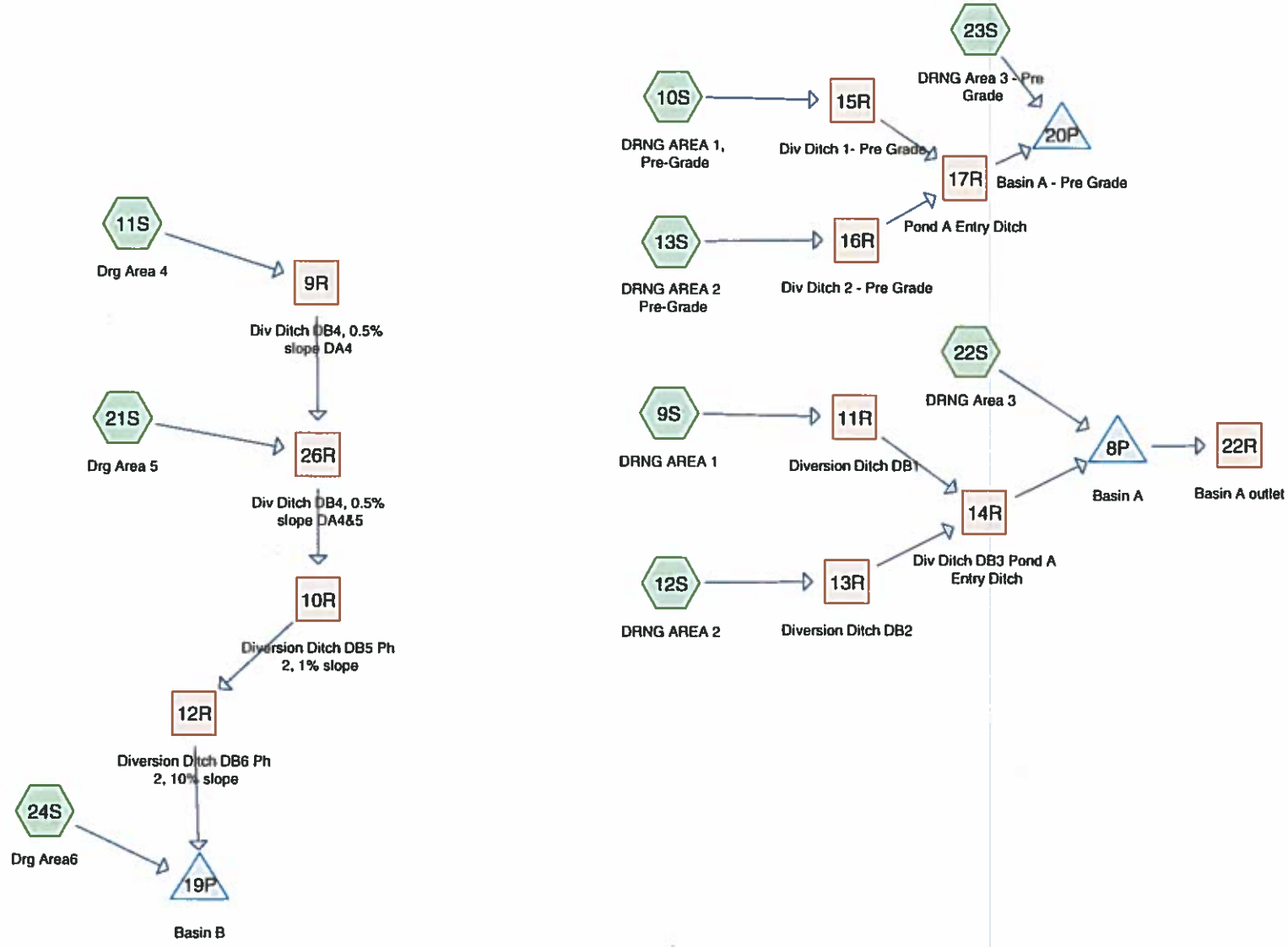
SEDIMENTATION BASIN A VOLUME

ELEVATION	DEPTH	AREA (sf)	AVG AREA (sf)	VOLUME (cf)	Cum Vol (cf)
563.00		73800			0
	0.20		74,200.00	14,840	
563.20		74600		Sediment Storage =	14,840
	0.80		76,200.00	60,960	
564.00		77800			75,800
	1.00		79,828.50	79,829	
565.00		81857			155,629
	0.30		45,083.00	13,525	
565.30	Primary Inlet	8309			169,153
	0.70		83,913.50	58,739	
566.00		85970			214,368
	0.50		87,021.00	43,511	
566.50	Emerg Inlet	88072			257,878

Wet Storage (cu ft) @ 565.3 elev (2' depth) =	154,313
Residence Storage (cu ft) @ 566.5 Elev =	88,725

Sediment Storage Req'd = 6,098 cf, 14,840 cf provided

Wet Storage Req'd = 12, 196. 8 cf or min 2' depth. This basin uses min 2' depth which allows for 154,313 cf of Wet Storage volume



Routing Diagram for Clear River Energy SWPPP

Prepared by HDR, Inc, Printed 9/8/2016

Temporary Sediment Basin A

HydroCAD Reports

10 yr. 24 Hr. Type III Storm

Summary for Pond 8P: Basin A

[62] Hint: Exceeded Reach 14R OUTLET depth by 2.13' @ 24.57 hrs

Inflow Area = 13.710 ac, 0.00% Impervious, Inflow Depth = 4.21" for 10yr T- III event
Inflow = 50.36 cfs @ 12.17 hrs, Volume= 4.809 af
Outflow = 0.85 cfs @ 11.54 hrs, Volume= 4.469 af, Atten= 98%, Lag= 0.0 min
Primary = 0.85 cfs @ 11.54 hrs, Volume= 4.469 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 565.17' @ 20.48 hrs Surf.Area= 82,549 sf Storage= 169,594 cf

Plug-Flow detention time= 1,826.0 min calculated for 4.469 af (93% of inflow)
Center-of-Mass det. time= 1,787.8 min (2,570.5 - 782.7)

Volume	Invert	Avail.Storage	Storage Description
#1	563.00'	516,270 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
563.00	73,800	1,331.8	0	0	73,800
564.00	77,800	1,352.9	75,791	75,791	78,503
565.00	81,857	1,373.9	79,820	155,611	83,260
566.00	85,970	1,395.0	83,905	239,516	88,111
567.00	90,137	1,414.7	88,045	327,561	92,734
568.00	94,351	1,432.9	92,236	419,797	97,097
569.00	98,610	1,451.2	96,473	516,270	101,538

Device	Routing	Invert	Outlet Devices
#1	Primary	562.70'	**18.0" Round Culvert** L= 4.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.70' / 562.69' S= 0.0025 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	565.30'	**4.0" Vert. Orifice/Grate X 4.00** C= 0.600
#3	Device 1	566.50'	**24.0" Horiz. Emergency Inlet** C= 0.600 Limited to weir flow at low heads
#4	Device 1	563.20'	**0.850 cfs Constant Flow/Skimmer** Phase-In= 0.30'

Primary OutFlow Max=0.85 cfs @ 11.54 hrs HW=563.50' TW=563.08' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.85 cfs of 1.93 cfs potential flow)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)
—**3=Emergency Inlet** (Controls 0.00 cfs)
—**4=Constant Flow/Skimmer** (Constant Controls 0.85 cfs)

Summary for Reach 22R: Basin A outlet

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 13.710 ac, 0.00% Impervious, Inflow Depth = 3.91" for 10yr T- III event
Inflow = 0.85 cfs @ 11.54 hrs, Volume= 4.469 af
Outflow = 0.85 cfs @ 11.55 hrs, Volume= 4.469 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.33 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.3 min

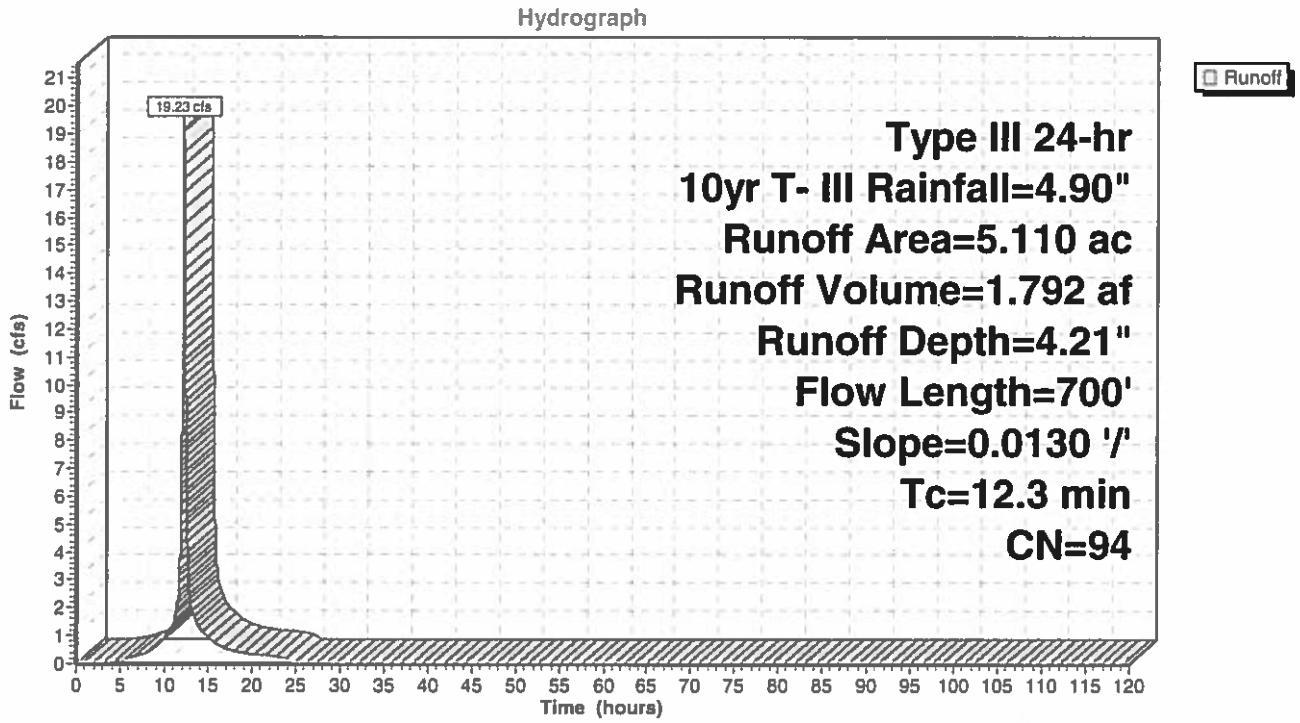
Peak Storage= 11 cf @ 11.55 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 5.75 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0030 '/'
Inlet Invert= 562.69', Outlet Invert= 562.60'

Hydrograph for Pond 8P: Basin A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	563.00	0.00
5.00	0.30	1,070	563.01	0.00
10.00	**2.47**	19,614	563.26	**0.18**
15.00	**2.66**	158,784	565.04	**0.85**
20.00	0.89	**169,560**	**565.17**	0.85
25.00	0.01	**165,454**	**565.12**	0.85
30.00	0.00	150,171	564.93	0.85
35.00	0.00	134,871	564.74	0.85
40.00	0.00	119,571	564.55	0.85
45.00	0.00	104,271	564.36	0.85
50.00	0.00	88,971	564.17	0.85
55.00	0.00	73,671	563.97	0.85
60.00	0.00	58,371	563.77	0.85
65.00	0.00	43,071	563.57	0.85
70.00	0.00	29,551	563.40	0.56
75.00	0.00	22,284	563.30	0.28
80.00	0.00	18,602	563.25	0.14
85.00	0.00	16,740	563.23	0.07
90.00	0.00	15,799	563.21	0.04
95.00	0.00	15,323	563.21	0.02
100.00	0.00	15,084	563.20	0.01
105.00	0.00	14,963	563.20	0.00
110.00	0.00	14,901	563.20	0.00
115.00	0.00	14,871	563.20	0.00
120.00	0.00	14,855	563.20	0.00
125.00	0.00	14,847	563.20	0.00
130.00	0.00	14,843	563.20	0.00
135.00	0.00	14,841	563.20	0.00
140.00	0.00	14,840	563.20	0.00
145.00	0.00	14,840	563.20	0.00
150.00	0.00	14,839	563.20	0.00
155.00	0.00	14,839	563.20	0.00
160.00	0.00	14,839	563.20	0.00
165.00	0.00	14,839	563.20	0.00

Subcatchment 9S: DRNG AREA 1



Summary for Reach 11R: Diversion Ditch 1

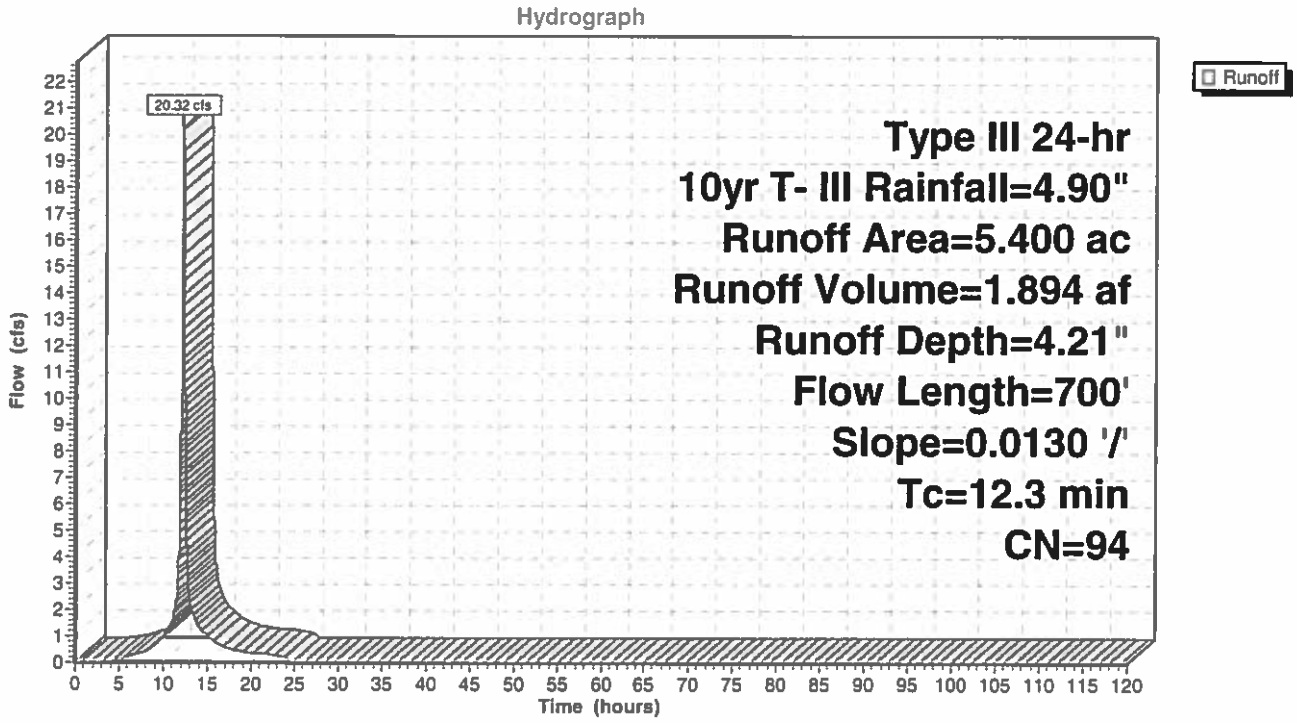
Inflow Area = 5.110 ac, 0.00% Impervious, Inflow Depth = 4.21" for 10yr T- III event
Inflow = 19.23 cfs @ 12.16 hrs, Volume= 1.792 af
Outflow = 18.63 cfs @ 12.19 hrs, Volume= 1.792 af, Atten= 3%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.78 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 8.1 min

Peak Storage= 2,875 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 61.77 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 584.0' Slope= 0.0051 '/'
Inlet Invert= 573.00', Outlet Invert= 570.00'

Subcatchment 12S: DRNG AREA 2



Summary for Reach 13R: Diversion Ditch 2

Inflow Area = 5.400 ac, 0.00% Impervious, Inflow Depth = 4.21" for 10yr T- III event
Inflow = 20.32 cfs @ 12.16 hrs, Volume= 1.894 af
Outflow = 20.02 cfs @ 12.18 hrs, Volume= 1.894 af, Atten= 1%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.28 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 5.3 min

Peak Storage= 2,058 cf @ 12.18 hrs
Average Depth at Peak Storage= 1.11'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 71.17 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 440.0' Slope= 0.0068 '/'
Inlet Invert= 573.00', Outlet Invert= 570.00'

Summary for Reach 14R: Pond A Entry Ditch

[61] Hint: Exceeded Reach 11R outlet invert by 0.63' @ 12.19 hrs
[61] Hint: Exceeded Reach 13R outlet invert by 0.63' @ 12.19 hrs

Inflow Area = 10.510 ac, 0.00% Impervious, Inflow Depth = 4.21" for 10yr T- III event
Inflow = 38.62 cfs @ 12.19 hrs, Volume= 3.687 af
Outflow = 38.62 cfs @ 12.19 hrs, Volume= 3.687 af, Atten= 0%, Lag= 0.0 min

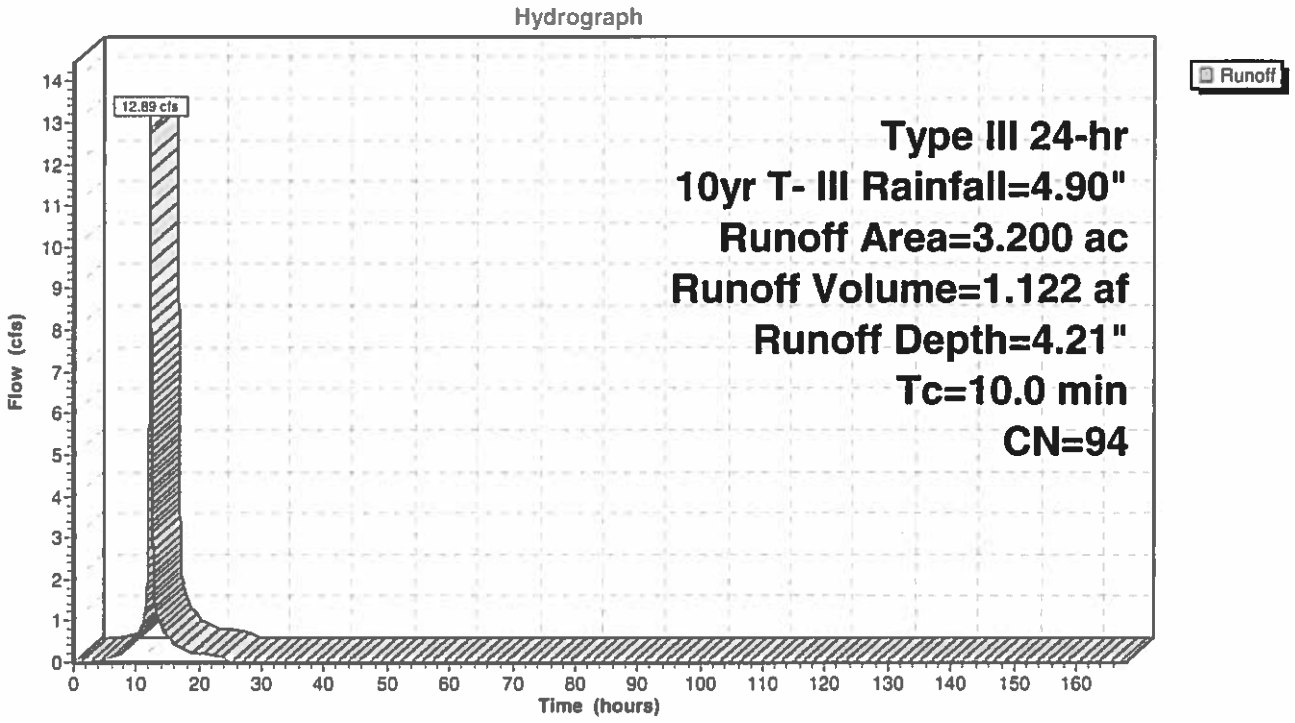
Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.42 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 0.2 min

Peak Storage= 119 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 392.70 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 32.0' Slope= 0.2188 '/'
Inlet Invert= 570.00', Outlet Invert= 563.00'

‡

Subcatchment 22S: DRNG Area 3



Temporary Sediment Basin A

HydroCAD Reports

100 yr. 24 Hr. Type III Storm

Summary for Pond 8P: Basin A

[62] Hint: Exceeded Reach 14R OUTLET depth by 3.50' @ 16.27 hrs

Inflow Area = 13.710 ac, 0.00% Impervious, Inflow Depth = 7.98" for 100yr T- III event
Inflow = 92.95 cfs @ 12.17 hrs, Volume= 9.115 af
Outflow = 3.69 cfs @ 15.80 hrs, Volume= 8.775 af, Atten= 96%, Lag= 217.7 min
Primary = 3.69 cfs @ 15.80 hrs, Volume= 8.775 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 566.64' @ 15.80 hrs Surf.Area= 88,606 sf Storage= 294,966 cf

Plug-Flow detention time= 1,755.2 min calculated for 8.774 af (96% of inflow)
Center-of-Mass det. time= 1,732.9 min (2,500.4 - 767.5)

Volume	Invert	Avail.Storage	Storage Description
#1	563.00'	516,270 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
563.00	73,800	1,331.8	0	0	73,800
564.00	77,800	1,352.9	75,791	75,791	78,503
565.00	81,857	1,373.9	79,820	155,611	83,260
566.00	85,970	1,395.0	83,905	239,516	88,111
567.00	90,137	1,414.7	88,045	327,561	92,734
568.00	94,351	1,432.9	92,236	419,797	97,097
569.00	98,610	1,451.2	96,473	516,270	101,538

Device	Routing	Invert	Outlet Devices
#1	Primary	562.70'	**18.0" Round Culvert** L= 4.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.70' / 562.69' S= 0.0025 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	565.30'	**4.0" Vert. Orifice/Grate X 4.00** C= 0.600
#3	Device 1	566.50'	**24.0" Horiz. Emergency Inlet** C= 0.600 Limited to weir flow at low heads
#4	Device 1	563.20'	**0.850 cfs Constant Flow/Skimmer** Phase-In= 0.30'

Primary OutFlow Max=3.69 cfs @ 15.80 hrs HW=566.64' TW=563.56' (Dynamic Tailwater)
↑1=**Culvert** (Passes 3.69 cfs of 14.91 cfs potential flow)
↑2=**Orifice/Grate** (Orifice Controls 1.82 cfs @ 5.21 fps)
3=**Emergency Inlet** (Weir Controls 1.02 cfs @ 1.20 fps)
4=**Constant Flow/Skimmer** (Constant Controls 0.85 cfs)

Hydrograph for Pond 8P: Basin A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	563.00	0.00
5.00	0.97	5,665	563.08	0.00
10.00	**5.06**	43,872	563.59	0.85
15.00	**4.78**	**293,173**	**566.62**	**3.45**
20.00	1.60	**282,697**	**566.50**	**2.56**
25.00	0.01	258,516	566.22	2.31
30.00	0.00	221,382	565.79	1.80
35.00	0.00	194,833	565.47	1.11
40.00	0.00	178,207	565.27	0.85
45.00	0.00	162,907	565.09	0.85
50.00	0.00	147,607	564.90	0.85
55.00	0.00	132,307	564.71	0.85
60.00	0.00	117,007	564.52	0.85
65.00	0.00	101,707	564.33	0.85
70.00	0.00	86,407	564.14	0.85
75.00	0.00	71,107	563.94	0.85
80.00	0.00	55,807	563.74	0.85
85.00	0.00	40,507	563.54	0.85
90.00	0.00	27,966	563.38	0.50
95.00	0.00	21,480	563.29	0.25
100.00	0.00	18,195	563.24	0.13
105.00	0.00	16,534	563.22	0.06
110.00	0.00	15,695	563.21	0.03
115.00	0.00	15,271	563.21	0.02
120.00	0.00	15,057	563.20	0.01
125.00	0.00	14,949	563.20	0.00
130.00	0.00	14,895	563.20	0.00
135.00	0.00	14,867	563.20	0.00
140.00	0.00	14,853	563.20	0.00
145.00	0.00	14,846	563.20	0.00
150.00	0.00	14,843	563.20	0.00
155.00	0.00	14,841	563.20	0.00
160.00	0.00	14,840	563.20	0.00
165.00	0.00	14,840	563.20	0.00

Summary for Reach 22R: Basin A outlet

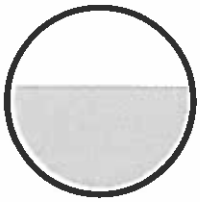
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 13.710 ac, 0.00% Impervious, Inflow Depth = 7.68" for 100yr T- III event
Inflow = 3.69 cfs @ 15.80 hrs, Volume= 8.775 af
Outflow = 3.69 cfs @ 15.80 hrs, Volume= 8.775 af, Atten= 0%, Lag= 0.1 min

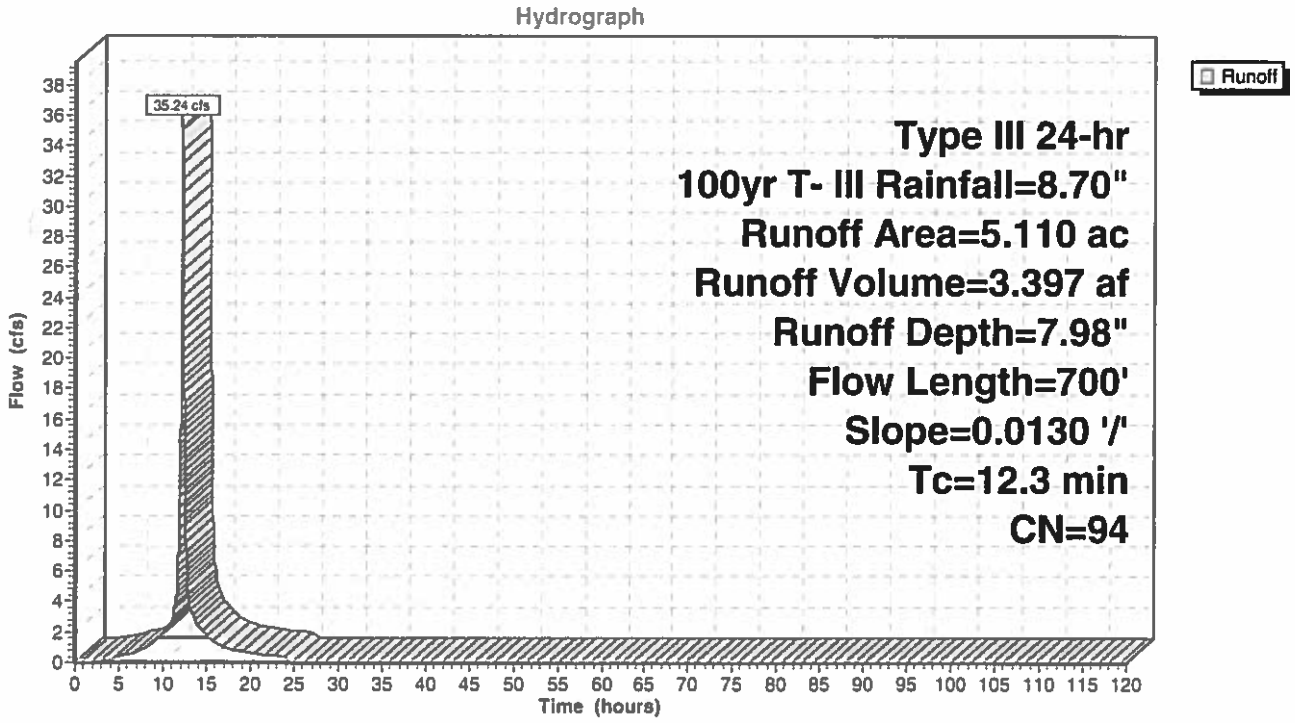
Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.46 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 0.3 min

Peak Storage= 32 cf @ 15.80 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 5.75 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0030 '/'
Inlet Invert= 562.69', Outlet Invert= 562.60'



Subcatchment 9S: DRNG AREA 1



Summary for Reach 11R: Diversion Ditch 1

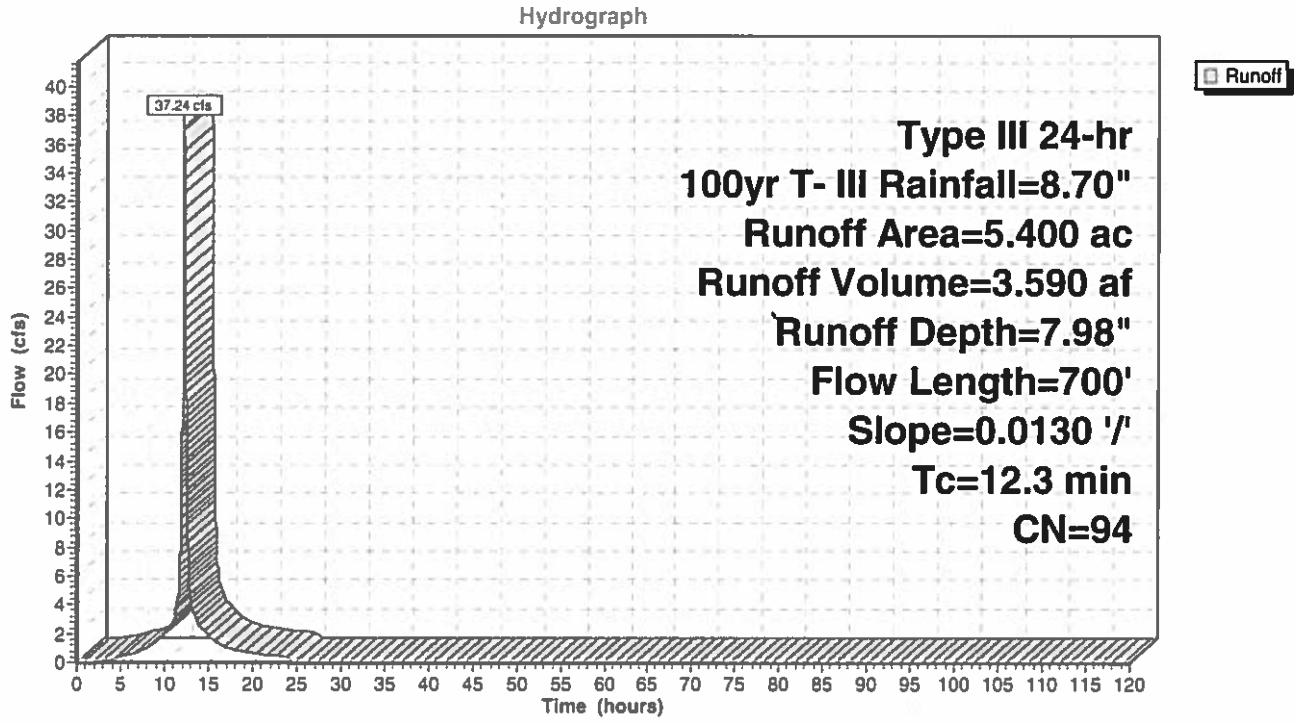
Inflow Area = 5.110 ac, 0.00% Impervious, Inflow Depth = 7.98" for 100yr T- III event
Inflow = 35.24 cfs @ 12.16 hrs, Volume= 3.397 af
Outflow = 34.40 cfs @ 12.19 hrs, Volume= 3.397 af, Atten= 2%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.43 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 6.7 min

Peak Storage= 4,531 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.53'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 61.77 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 584.0' Slope= 0.0051 '/'
Inlet Invert= 573.00', Outlet Invert= 570.00'

Subcatchment 12S: DRNG AREA 2



Summary for Reach 13R: Diversion Ditch 2

Inflow Area = 5.400 ac, 0.00% Impervious, Inflow Depth = 7.98" for 100yr T- III event
Inflow = 37.24 cfs @ 12.16 hrs, Volume= 3.590 af
Outflow = 36.83 cfs @ 12.18 hrs, Volume= 3.590 af, Atten= 1%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.01 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.69 fps, Avg. Travel Time= 4.3 min

Peak Storage= 3,233 cf @ 12.18 hrs
Average Depth at Peak Storage= 1.48'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 71.17 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 440.0' Slope= 0.0068 '/'
Inlet Invert= 573.00', Outlet Invert= 570.00'

Summary for Reach 14R: Pond A Entry Ditch

[61] Hint: Exceeded Reach 11R outlet invert by 0.87' @ 12.19 hrs
[61] Hint: Exceeded Reach 13R outlet invert by 0.87' @ 12.19 hrs

Inflow Area = 10.510 ac, 0.00% Impervious, Inflow Depth = 7.98" for 100yr T- III event
Inflow = 71.19 cfs @ 12.18 hrs, Volume= 6.988 af
Outflow = 71.19 cfs @ 12.19 hrs, Volume= 6.988 af, Atten= 0%, Lag= 0.0 min

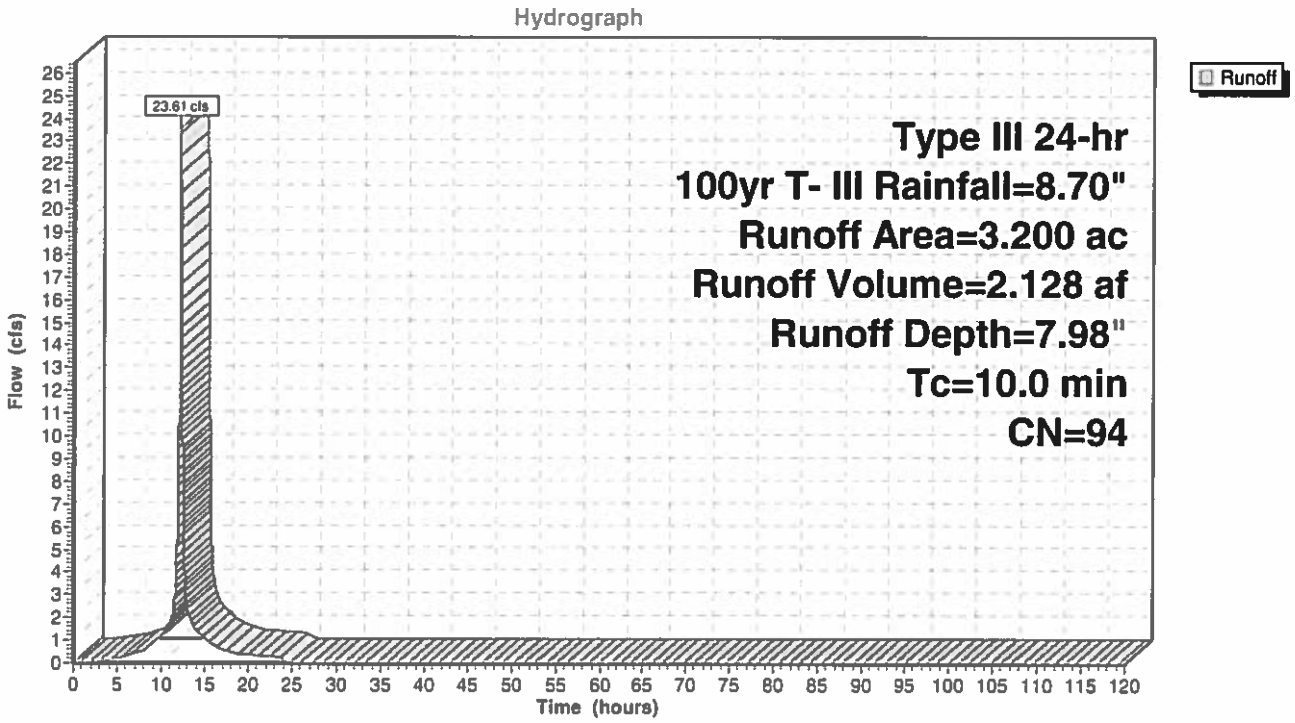
Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.41 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.70 fps, Avg. Travel Time= 0.1 min

Peak Storage= 183 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 392.70 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 32.0' Slope= 0.2188 '/'
Inlet Invert= 570.00', Outlet Invert= 563.00'

‡

Subcatchment 22S: DRNG Area 3



Temporary Sediment Basin A

HydroCAD Reports

10 yr. 24 Hr. Type III Storm

Before Mass Grading Begins

Summary for Pond 20P: Basin A - Pre Grade

[62] Hint: Exceeded Reach 17R OUTLET depth by 1.27' @ 18.94 hrs

Inflow Area = 11.850 ac, 0.00% Impervious, Inflow Depth = 3.12" for 10yr T- III event
Inflow = 26.02 cfs @ 12.23 hrs, Volume= 3.080 af
Outflow = 0.85 cfs @ 12.18 hrs, Volume= 2.739 af, Atten= 97%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.18 hrs, Volume= 2.739 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 564.32' @ 18.24 hrs Surf.Area= 79,102 sf Storage= 101,184 cf

Plug-Flow detention time= 1,163.4 min calculated for 2.739 af (89% of inflow)
Center-of-Mass det. time= 1,110.1 min (1,929.5 - 819.4)

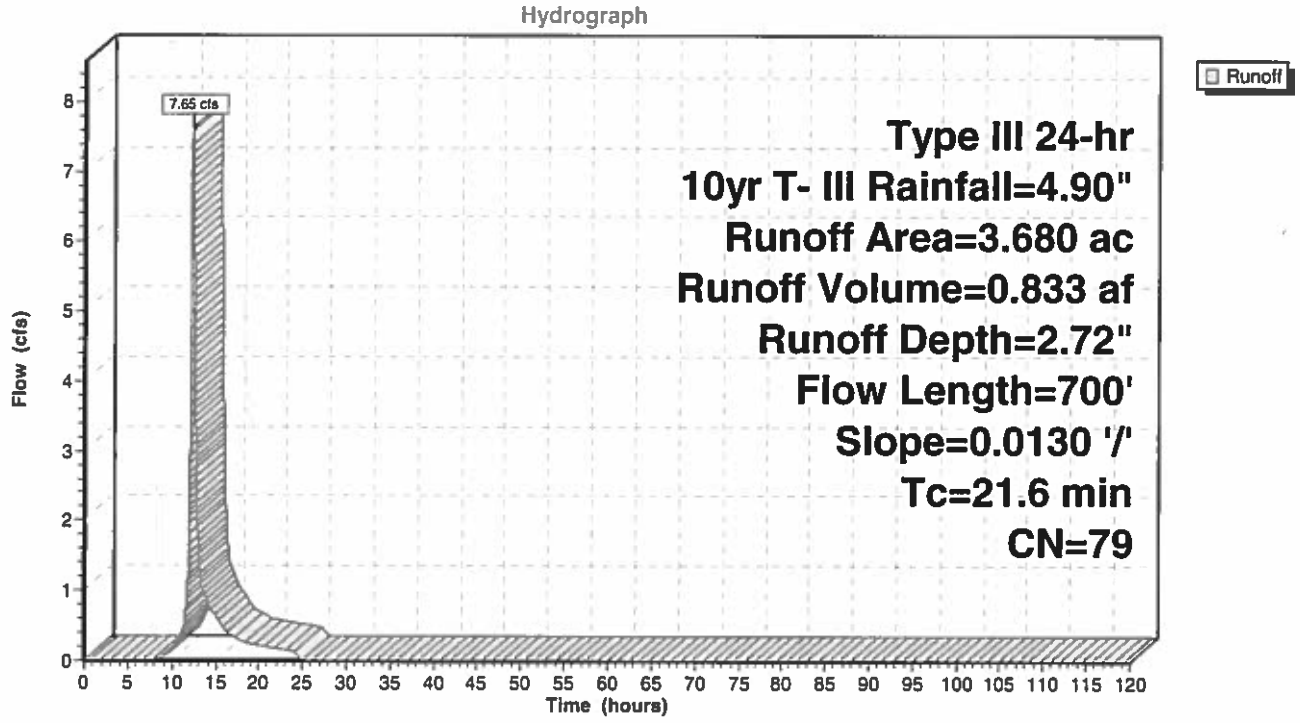
Volume	Invert	Avail.Storage	Storage Description
#1	563.00'	516,270 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
563.00	73,800	1,331.8	0	0	73,800
564.00	77,800	1,352.9	75,791	75,791	78,503
565.00	81,857	1,373.9	79,820	155,611	83,260
566.00	85,970	1,395.0	83,905	239,516	88,111
567.00	90,137	1,414.7	88,045	327,561	92,734
568.00	94,351	1,432.9	92,236	419,797	97,097
569.00	98,610	1,451.2	96,473	516,270	101,538

Device	Routing	Invert	Outlet Devices
#1	Primary	562.70'	**18.0" Round Culvert** L= 34.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.70' / 562.60' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	565.30'	**4.0" Vert. Orifice/Grate X 4.00** C= 0.600
#3	Device 1	566.50'	**18.0" Horiz. Emergency Inlet** C= 0.600 Limited to weir flow at low heads
#4	Device 1	563.20'	**0.850 cfs Constant Flow/Skimmer** Phase-In= 0.30'

Primary OutFlow Max=0.85 cfs @ 12.18 hrs HW=563.50' (Free Discharge)
└**1=Culvert** (Passes 0.85 cfs of 1.95 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  ├**3=Emergency Inlet** (Controls 0.00 cfs)
  └**4=Constant Flow/Skimmer** (Constant Controls 0.85 cfs)

Subcatchment 10S: DRNG AREA 1, Pre-Grade



Summary for Reach 15R: Div Ditch 1- Pre Grade

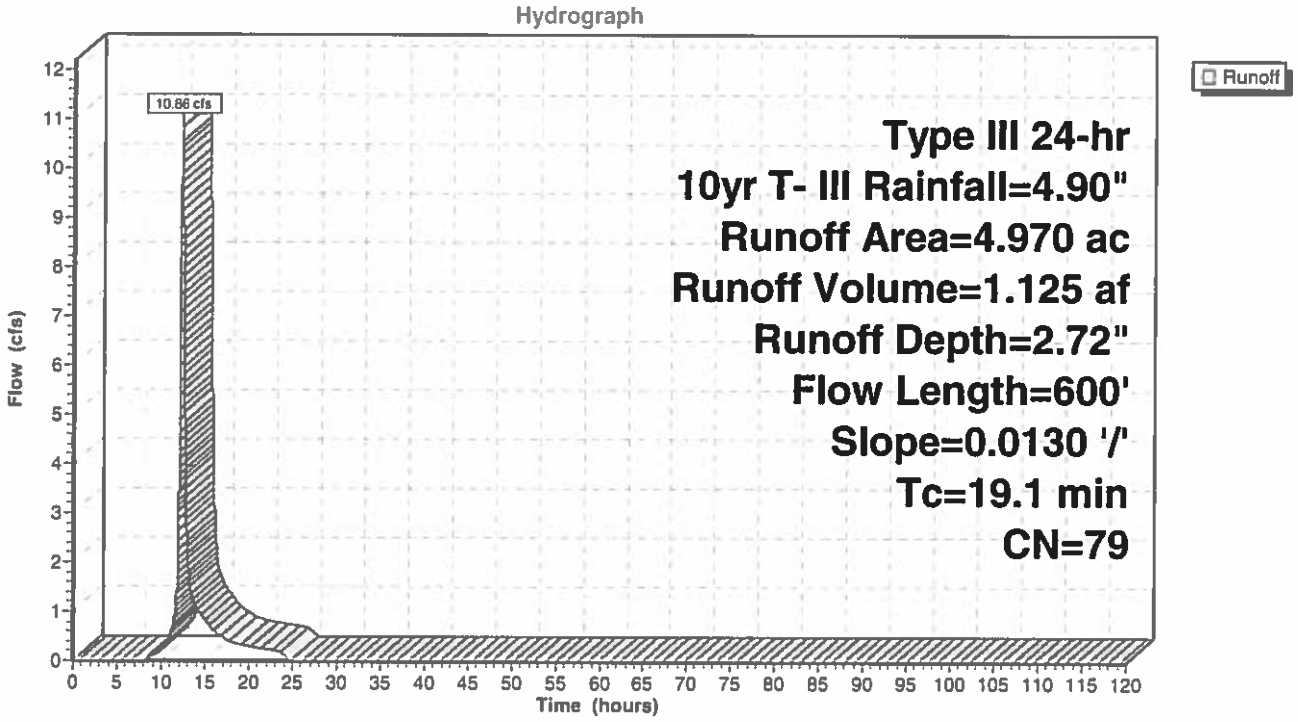
Inflow Area = 3.680 ac, 0.00% Impervious, Inflow Depth = 2.72" for 10yr T- III event
Inflow = 7.65 cfs @ 12.31 hrs, Volume= 0.833 af
Outflow = 7.49 cfs @ 12.34 hrs, Volume= 0.833 af, Atten= 2%, Lag= 2.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.97 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 9.5 min

Peak Storage= 1,475 cf @ 12.34 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 61.77 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 584.0' Slope= 0.0051 '/'
Inlet Invert= 573.00', Outlet Invert= 570.00'

Subcatchment 13S: DRNG AREA 2 Pre-Grade



Summary for Reach 16R: Div Ditch 2 - Pre Grade

Inflow Area = 4.970 ac, 0.00% Impervious, Inflow Depth = 2.72" for 10yr T- III event
Inflow = 10.86 cfs @ 12.26 hrs, Volume= 1.125 af
Outflow = 10.77 cfs @ 12.29 hrs, Volume= 1.125 af, Atten= 1%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.63 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.28 fps, Avg. Travel Time= 5.7 min

Peak Storage= 1,305 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 71.17 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 440.0' Slope= 0.0068 '/'
Inlet Invert= 573.00', Outlet Invert= 570.00'

Summary for Reach 17R: Pond A Entry Ditch

[61] Hint: Exceeded Reach 15R outlet invert by 0.42' @ 12.31 hrs
[61] Hint: Exceeded Reach 16R outlet invert by 0.42' @ 12.31 hrs

Inflow Area = 8.650 ac, 0.00% Impervious, Inflow Depth = 2.72" for 10yr T- III event
Inflow = 18.10 cfs @ 12.31 hrs, Volume= 1.958 af
Outflow = 18.10 cfs @ 12.31 hrs, Volume= 1.958 af, Atten= 0%, Lag= 0.0 min

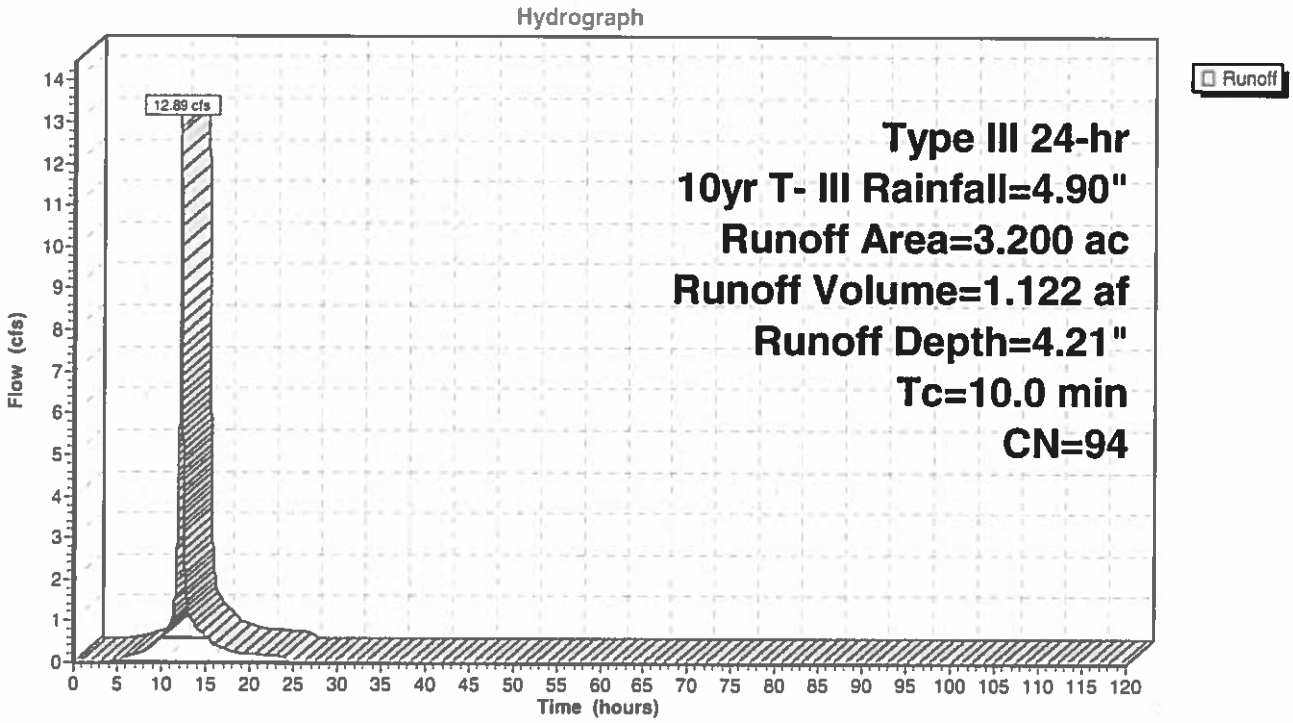
Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.29 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.66 fps, Avg. Travel Time= 0.2 min

Peak Storage= 70 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 392.70 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 32.0' Slope= 0.2188 '/'
Inlet Invert= 570.00', Outlet Invert= 563.00'

‡

Subcatchment 23S: DRNG Area 3 - Pre Grade



Appendix B

Temporary Sediment Basin B

Project:		Computed:	Date:
Subject:	Basin B Calcs	Checked:	Date:
Task:		Page: 1	of: 4
Job #:		No:	

Basin B:

Contributing Area = DA #4 + DA #5 + DA #6

= 8.44 Ac + 8.85 Ac + 7.23 Ac

= 24.22 Ac

Assume No Grass Cover on All areas - worst case

Assume Newly Graded Area Soil Type D CN = 94

No Pre developed Condition will Exist for this basin.

This basin will allow Relocation from Basin A to Mass Grade

Sediment Storage Volume:

DA = 24.22 Ac = 0.038 sq. miles

A = 50, same condition as Basin A

DR = 40% = 0.40, see Fig 3 next page

Same Soil type as used in Basin A

TE = 80% = 0.8 Y = 75 as used in Basin A

$$\text{Sed Stor. Volume} = \frac{(24.22 \times 50 \times 0.40 \times 2000)}{75 \times 43560} = 0.30 \text{ Ac-ft/yr}$$

= 13,068 cu ft/yr

Min. Wet Storage = 0.30 x 2 = 0.60 Ac ft = 26,136 cu ft

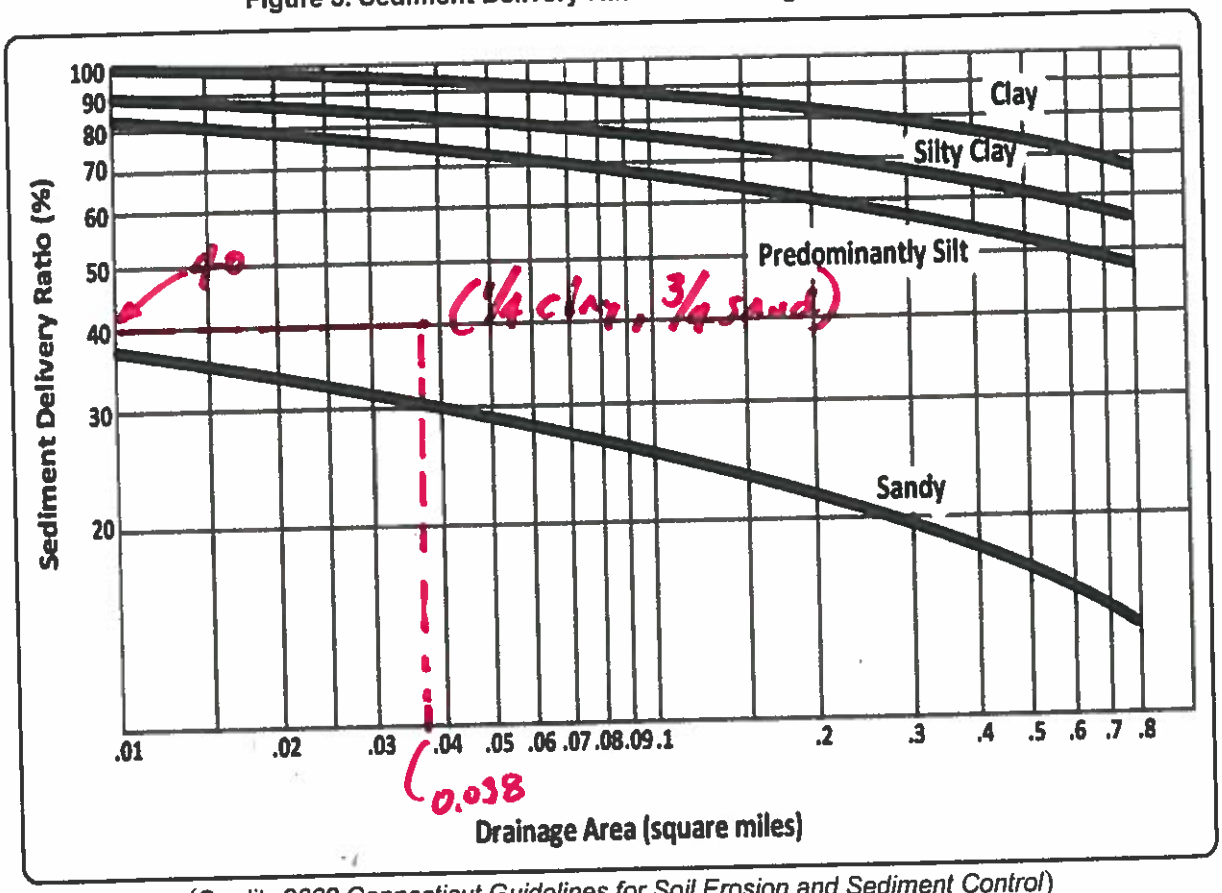
Min. Wet Storage Depth of 2' will Control This Basin

Figure 2. Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction areas	50 ton/ac/yr

(Credit: *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*)

Figure 3. Sediment Delivery Ratio vs. Drainage Area Graph



(Credit: *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*)

Project:	Computed:	Date:
Subject:	Checked:	Date:
Task:	Page: 3	of: 4
Job #:	No:	

Basin B shape

Same Assumptions as Basin A

$W = 10(Q_{LF})^{1/2}$

Using HydroCAD to calc Q_{LF}

$Q_{LF} = 112.01$ cfs

$W = 10(112.01)^{1/2} = 105.8'$

$L_{min} = 2 \times 105.8 = 211.6'$

L in Basin B = 270' ± This is OK

W in Basin B = 210' ± This is OK

Project:	Computed:	Date:
Subject:	Checked:	Date:
Task:	Page: 4	of: 4
Job #:	No:	

Total Volume for a 10yr storm event:

$$\frac{4.9\text{in}}{12\text{in/HR}} \times 24.22\ Ac = 9.890\ Ac\text{-}ft = 430,801\ cu\ ft.$$

At 2' Depth above sediment Storage, Basin B has [redacted] 151,840 cf of avail. wet storage.

For Min 48 hr drawdown time, Q for skimmer is:

$$Q_{skim} = \frac{151\,840\ cf}{48\ Hr} \times \frac{1\ Hr}{60\ min} \times \frac{1\ min}{60\ sec} = 0.88\ cfs.$$

Will use 0.85 cfs for model

@ 0.85 cfs, 24 Hr Type III storm 10yr

Basin B has a peak elev of 562.10 achieving 4' depth in Basin. This does not reach pumping outlet at 562.50'. All 10yr. water will exit through the skimmer Pond dewatters at 160 hrs. Meeting requirements

---

If we increase skimmer flow to 2 cfs, peak elev is 561.6 & dewatering completes at 85 hrs.

If we use 1.5 cfs, peak elev = 561.7 & dewater completes at 105 hrs [redacted]

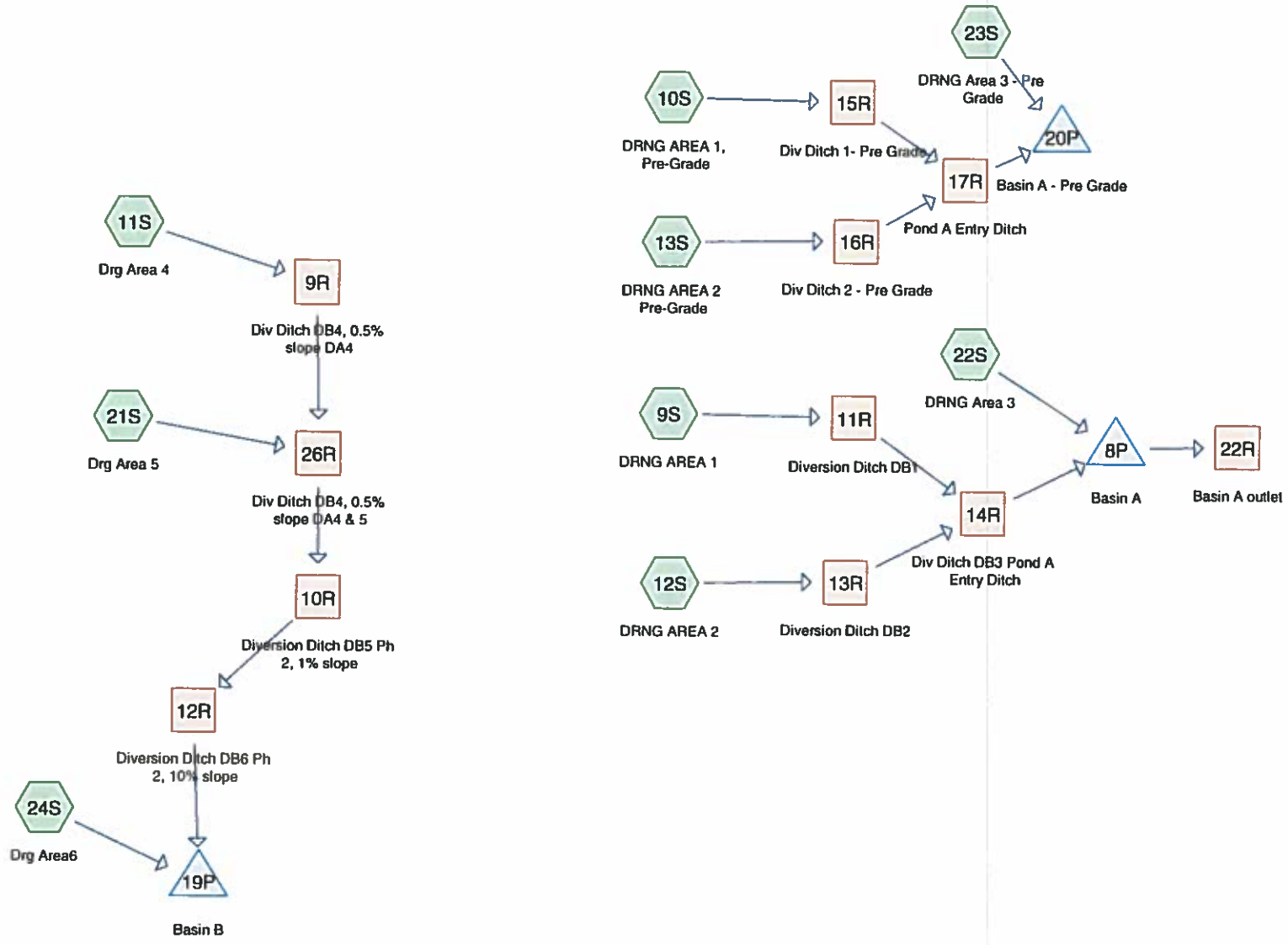
STAY WITH 0.85

SEDIMENTATION BASIN B VOLUME

ELEVATION	DEPTH	AREA (sf)	AVG AREA (sf)	VOLUME (cf)	Cum Vol (cf)
558.00		71818			0
	0.20		72,151.00	14,430	
558.20		72484		Sediment Storage =	14,430
	0.80		73,844.00	59,075	
559.00		75204			73,505
	1.00		76,954.00	76,954	
560.00		78704			150,459
	0.20		79,055.50	15,811	
560.20		79407			166,271
	0.80		80,504.00	64,403	
561.00		82304			214,863
	1.00		84,156.50	84,157	
562.00		86009			299,019
	0.50		86,967.00	43,484	
562.50	Primary Inlet	87925			342,503
	0.50		88,883.50	44,442	
563.00		89842			343,461
	1.00		91,810.50	91,811	
564.00		93779			435,271
	1.00		95,806.00	95,806	
565.00		97833			531,077
	1.00		99,951.00	99,951	
566.00		102069			631,028
	1.00		104,247.00	104,247	
567.00	Emerg Inlet	106425			735,275

Wet Storage (cu ft) @ 560.2 elev (2' depth)	=	151,840
Total Wet Storage @ 562.5 Primary Inlet	=	328,072
Residence Storage (cu ft) @ 567.0 Elev	=	392,773

Sediment Storage Req'd = 13,068 cf, 14,430 cf provided
Wet Storage Req'd = 26,136 cf or min 2' depth. This basin uses min 2' depth which allows for 151,840 cf of Wet Storage volume



Routing Diagram for Clear River Energy SWPPP
Prepared by HDR, Inc, Printed 9/8/2016

Temporary Sediment Basin B

HydroCAD Reports

10 yr. 24 Hr. Type III Storm

Summary for Pond 19P: Basin B

[62] Hint: Exceeded Reach 12R OUTLET depth by 4.07' @ 24.86 hrs

Inflow Area = 24.220 ac, 0.00% Impervious, Inflow Depth = 4.21" for 10yr T- III event
Inflow = 88.14 cfs @ 12.18 hrs, Volume= 8.496 af
Outflow = 0.85 cfs @ 10.28 hrs, Volume= 8.164 af, Atten= 99%, Lag= 0.0 min
Primary = 0.85 cfs @ 10.28 hrs, Volume= 8.164 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 562.10' @ 24.14 hrs Surf.Area= 86,405 sf Storage= 324,100 cf

Plug-Flow detention time= 3,301.6 min calculated for 8.164 af (96% of inflow)
Center-of-Mass det. time= 3,278.4 min (4,062.4 - 784.0)

Volume	Invert	Avail.Storage	Storage Description
#1	558.00'	903,394 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
558.00	71,818	1,107.7	0	0	71,818
559.00	75,204	1,140.5	73,505	73,505	77,793
560.00	78,704	1,169.0	76,947	150,452	83,156
561.00	82,304	1,198.1	80,497	230,949	88,764
562.00	86,009	1,226.2	84,150	315,099	94,319
563.00	89,842	1,254.7	87,919	403,017	100,081
564.00	93,779	1,282.5	91,803	494,821	105,835
565.00	97,833	1,313.2	95,799	590,620	112,308
566.00	102,069	1,344.8	99,944	690,563	119,123
567.00	106,425	1,376.2	104,239	794,803	126,057
568.00	110,773	1,404.0	108,592	903,394	132,362

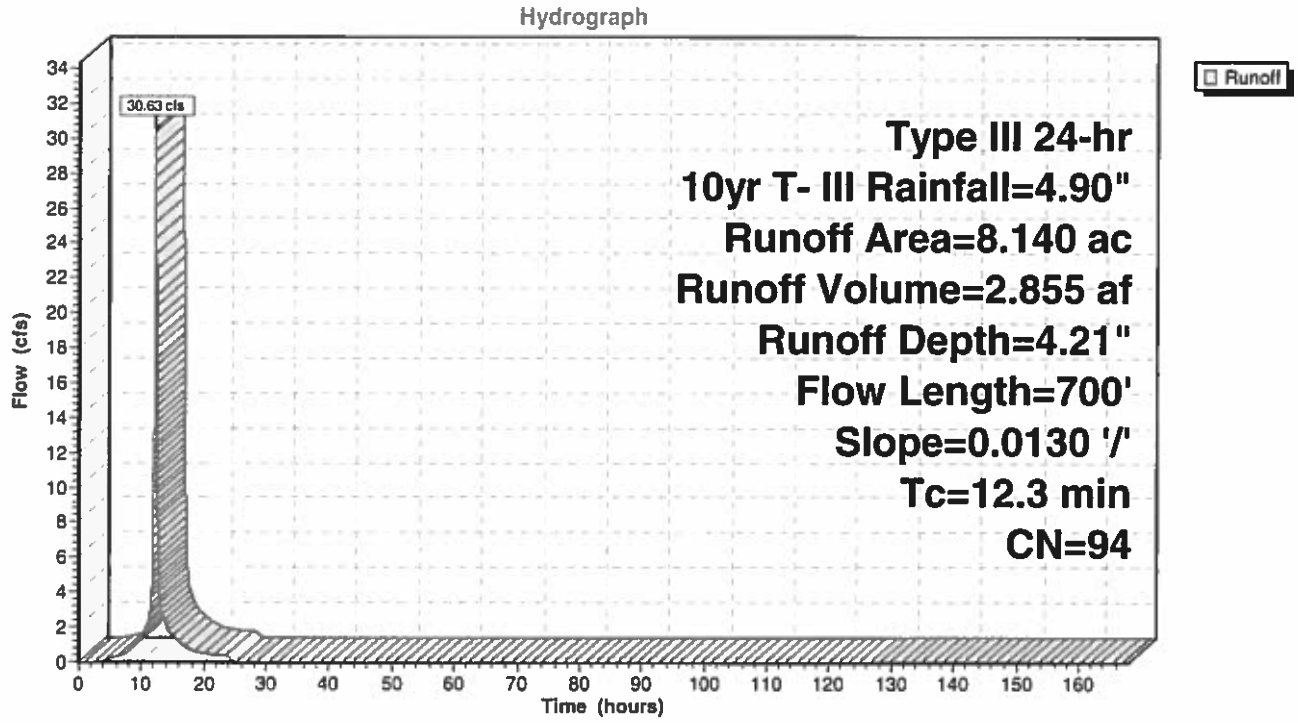
Device	Routing	Invert	Outlet Devices
#1	Primary	558.00'	**48.0" Round Culvert** L= 680.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 558.00' / 557.32' S= 0.0010 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 12.57 sf
#2	Device 1	562.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	567.00'	**60.0" x 60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.20'	**0.850 cfs Constant Flow/Skimmer** Phase-In= 0.30'

Primary OutFlow Max=0.85 cfs @ 10.28 hrs HW=558.50' (Free Discharge)
└**1=Culvert** (Passes 0.85 cfs of 0.87 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Constant Flow/Skimmer** (Constant Controls 0.85 cfs)

Hydrograph for Pond 19P: Basin B no projection

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	558.00	0.00
5.00	0.51	1,750	558.02	0.00
10.00	**4.35**	32,539	558.45	**0.69**
15.00	**4.73**	286,495	561.66	**0.85**
20.00	1.58	**317,484**	**562.03**	0.85
25.00	0.04	**322,189**	**562.08**	0.85
30.00	0.00	306,964	561.91	0.85
35.00	0.00	291,664	561.73	0.85
40.00	0.00	276,364	561.55	0.85
45.00	0.00	261,064	561.36	0.85
50.00	0.00	245,764	561.18	0.85
55.00	0.00	230,464	560.99	0.85
60.00	0.00	215,164	560.81	0.85
65.00	0.00	199,864	560.62	0.85
70.00	0.00	184,564	560.43	0.85
75.00	0.00	169,264	560.24	0.85
80.00	0.00	153,964	560.04	0.85
85.00	0.00	138,664	559.85	0.85
90.00	0.00	123,364	559.65	0.85
95.00	0.00	108,064	559.45	0.85
100.00	0.00	92,764	559.25	0.85
105.00	0.00	77,464	559.05	0.85
110.00	0.00	62,164	558.85	0.85
115.00	0.00	46,864	558.64	0.85
120.00	0.00	32,073	558.44	0.67
125.00	0.00	23,460	558.32	0.34
130.00	0.00	18,913	558.26	0.17
135.00	0.00	16,650	558.23	0.09
140.00	0.00	15,529	558.22	0.04
145.00	0.00	14,974	558.21	0.02
150.00	0.00	14,700	558.20	0.01
155.00	0.00	14,564	558.20	0.01
160.00	0.00	14,497	558.20	0.00
165.00	0.00	14,463	558.20	0.00

Subcatchment 11S: Drg Area 4



Summary for Reach 9R: Div Ditch DB4, 0.5% slope DA4

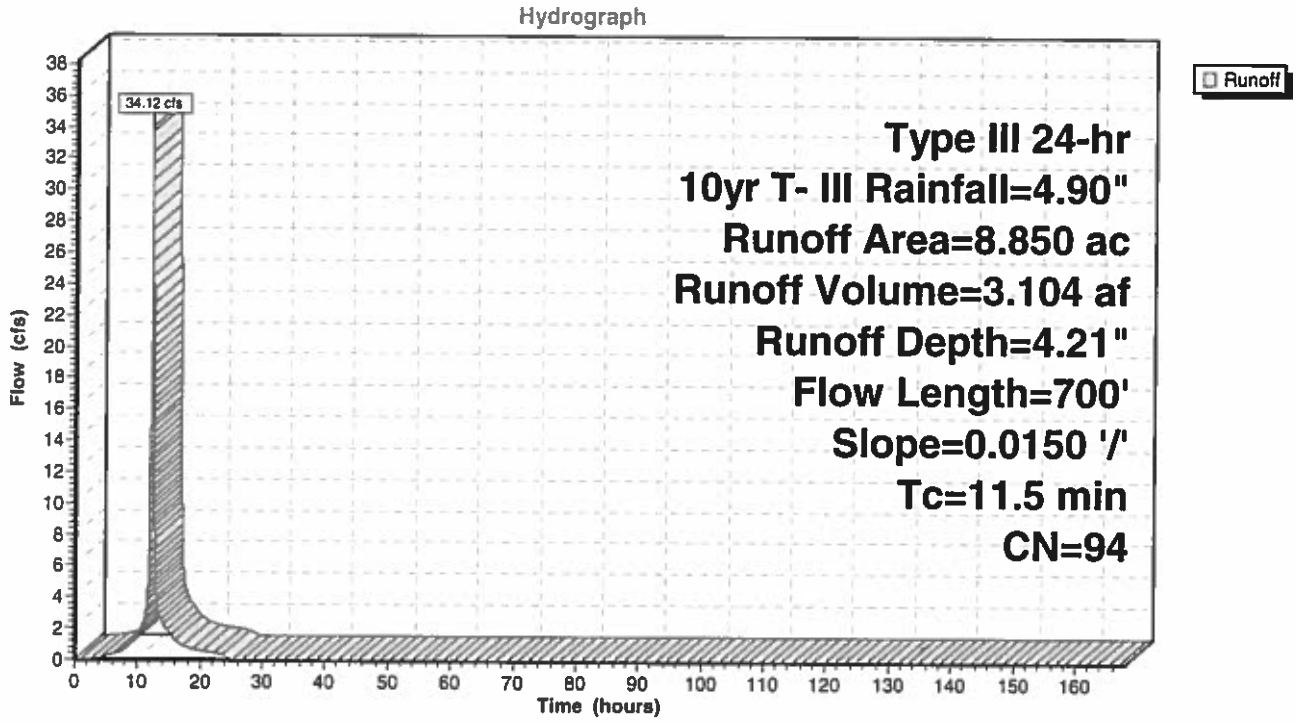
Inflow Area = 8.140 ac, 0.00% Impervious, Inflow Depth = 4.21" for 10yr T- III event
Inflow = 30.63 cfs @ 12.16 hrs, Volume= 2.855 af
Outflow = 30.18 cfs @ 12.18 hrs, Volume= 2.855 af, Atten= 1%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.78 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 6.0 min

Peak Storage= 3,190 cf @ 12.18 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 121.70 cfs

5.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 17.00'
Length= 400.0' Slope= 0.0050 '/'
Inlet Invert= 575.00', Outlet Invert= 573.00'

Subcatchment 21S: Drg Area 5



Summary for Reach 26R: Div Ditch DB4, 0.5% slope DA4 & 5

[62] Hint: Exceeded Reach 9R OUTLET depth by 0.45' @ 12.22 hrs

Inflow Area = 16.990 ac, 0.00% Impervious, Inflow Depth = 4.21" for 10yr T- III event
Inflow = 63.69 cfs @ 12.17 hrs, Volume= 5.960 af
Outflow = 62.26 cfs @ 12.19 hrs, Volume= 5.960 af, Atten= 2%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.62 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 7.4 min

Peak Storage= 8,077 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.44'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 121.70 cfs

5.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 17.00'
Length= 600.0' Slope= 0.0050 '/'
Inlet Invert= 573.00', Outlet Invert= 570.00'

Summary for Reach 10R: Diversion Ditch DB5 Ph 2, 1% slope

[61] Hint: Exceeded Reach 26R outlet invert by 1.21' @ 12.20 hrs

Inflow Area = 16.990 ac, 0.00% Impervious, Inflow Depth = 4.21" for 10yr T- III event
Inflow = 62.26 cfs @ 12.19 hrs, Volume= 5.960 af
Outflow = 62.23 cfs @ 12.20 hrs, Volume= 5.960 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.95 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 1.0 min

Peak Storage= 1,046 cf @ 12.20 hrs
Average Depth at Peak Storage= 1.21'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 172.11 cfs

5.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 17.00'
Length= 100.0' Slope= 0.0100 '/'
Inlet Invert= 570.00', Outlet Invert= 569.00'

Summary for Reach 12R: Diversion Ditch DB6 Ph 2, 10% slope

[61] Hint: Exceeded Reach 10R outlet invert by 0.91' @ 12.20 hrs

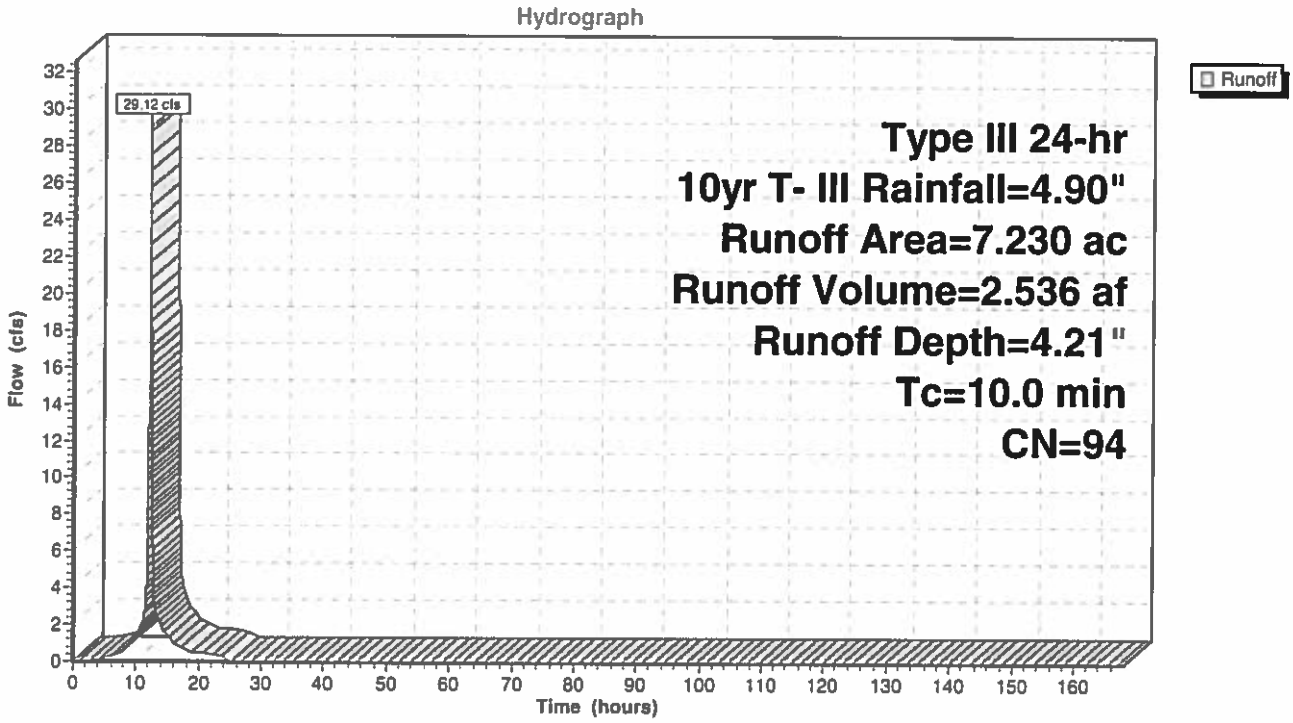
Inflow Area = 16.990 ac, 0.00% Impervious, Inflow Depth = 4.21" for 10yr T- III event
Inflow = 62.23 cfs @ 12.20 hrs, Volume= 5.960 af
Outflow = 62.22 cfs @ 12.20 hrs, Volume= 5.960 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.85 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.49 fps, Avg. Travel Time= 0.7 min

Peak Storage= 773 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.91'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 299.35 cfs

5.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 17.00'
Length= 110.0' Slope= 0.1000 '/'
Inlet Invert= 569.00', Outlet Invert= 558.00'

Subcatchment 24S: Drg Area6



Temporary Sediment/Detention Basin B

HydroCAD Reports

100 yr. 24 Hr. Type III Storm

Summary for Pond 19P: Basin B

[62] Hint: Exceeded Reach 12R OUTLET depth by 6.21' @ 17.00 hrs

Inflow Area = 24.220 ac, 0.00% Impervious, Inflow Depth = 7.98" for 100yr T- III event
Inflow = 163.50 cfs @ 12.17 hrs, Volume= 16.103 af
Outflow = 5.32 cfs @ 16.41 hrs, Volume= 15.742 af, Atten= 97%, Lag= 254.4 min
Primary = 5.32 cfs @ 16.41 hrs, Volume= 15.742 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 564.40' @ 16.41 hrs Surf.Area= 95,371 sf Storage= 532,192 cf

Plug-Flow detention time= 2,862.3 min calculated for 15.742 af (98% of inflow)
Center-of-Mass det. time= 2,848.0 min (3,616.6 - 768.5)

Volume	Invert	Avail.Storage	Storage Description
#1	558.00'	903,394 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
558.00	71,818	1,107.7	0	0	71,818
559.00	75,204	1,140.5	73,505	73,505	77,793
560.00	78,704	1,169.0	76,947	150,452	83,156
561.00	82,304	1,198.1	80,497	230,949	88,764
562.00	86,009	1,226.2	84,150	315,099	94,319
563.00	89,842	1,254.7	87,919	403,017	100,081
564.00	93,779	1,282.5	91,803	494,821	105,835
565.00	97,833	1,313.2	95,799	590,620	112,308
566.00	102,069	1,344.8	99,944	690,563	119,123
567.00	106,425	1,376.2	104,239	794,803	126,057
568.00	110,773	1,404.0	108,592	903,394	132,362

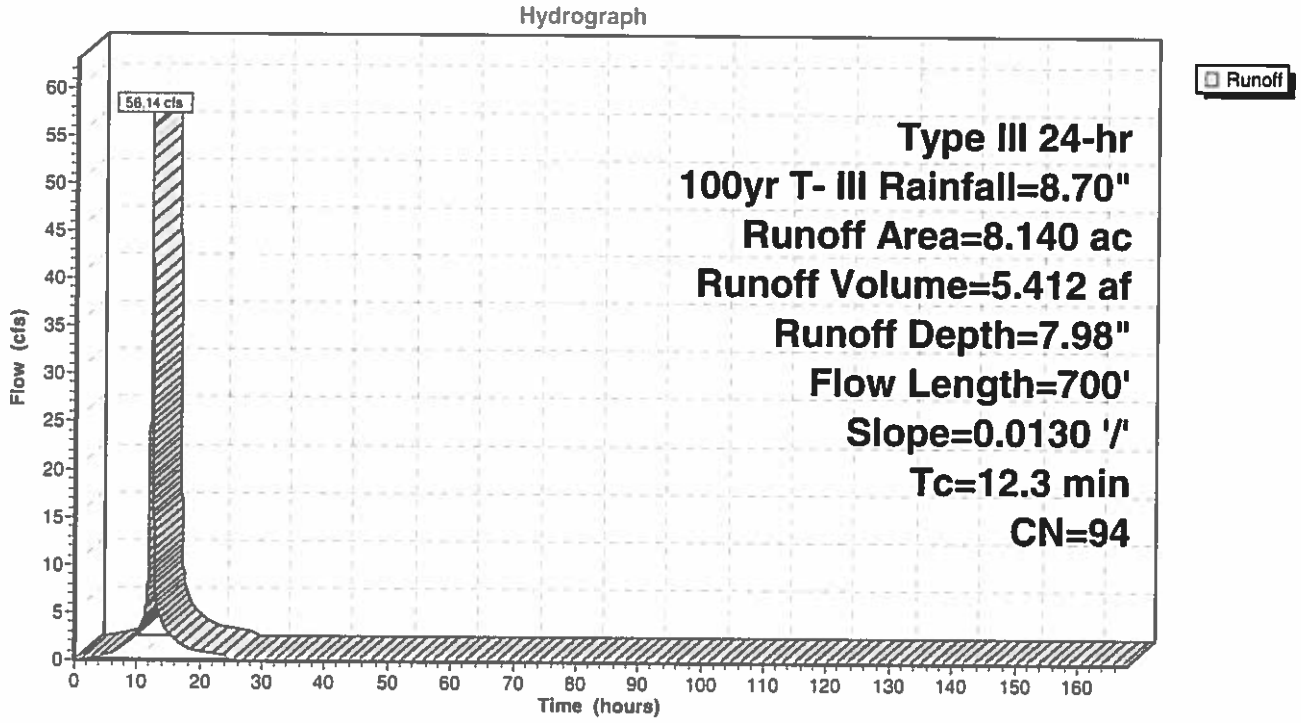
Device	Routing	Invert	Outlet Devices
#1	Primary	558.00'	**48.0" Round Culvert** L= 680.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 558.00' / 557.32' S= 0.0010 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 12.57 sf
#2	Device 1	562.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	567.00'	**60.0" x 60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.20'	**0.850 cfs Constant Flow/Skimmer** Phase-In= 0.30'

Primary OutFlow Max=5.32 cfs @ 16.41 hrs HW=564.40' (Free Discharge)
└─**1=Culvert** (Passes 5.32 cfs of 80.18 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 4.47 cfs @ 5.69 fps)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Constant Flow/Skimmer** (Constant Controls 0.85 cfs)

Hydrograph for Pond 19P: Basin B no projection

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	558.00	0.00
5.00	1.70	9,726	558.13	0.00
10.00	**8.90**	76,204	559.04	0.85
15.00	**8.47**	**524,484**	**564.31**	**5.19**
20.00	2.83	**513,406**	**564.20**	**4.99**
25.00	0.05	466,764	563.70	4.01
30.00	0.00	411,550	563.09	2.13
35.00	0.00	383,352	562.78	1.17
40.00	0.00	365,474	562.58	0.88
45.00	0.00	350,102	562.40	0.85
50.00	0.00	334,802	562.23	0.85
55.00	0.00	319,502	562.05	0.85
60.00	0.00	304,202	561.87	0.85
65.00	0.00	288,902	561.69	0.85
70.00	0.00	273,602	561.51	0.85
75.00	0.00	258,302	561.33	0.85
80.00	0.00	243,002	561.15	0.85
85.00	0.00	227,702	560.96	0.85
90.00	0.00	212,402	560.77	0.85
95.00	0.00	197,102	560.58	0.85
100.00	0.00	181,802	560.39	0.85
105.00	0.00	166,502	560.20	0.85
110.00	0.00	151,202	560.01	0.85
115.00	0.00	135,902	559.81	0.85
120.00	0.00	120,602	559.62	0.85
125.00	0.00	105,302	559.42	0.85
130.00	0.00	90,002	559.22	0.85
135.00	0.00	74,702	559.02	0.85
140.00	0.00	59,402	558.81	0.85
145.00	0.00	44,102	558.61	0.85
150.00	0.00	30,046	558.41	0.58
155.00	0.00	22,399	558.31	0.31
160.00	0.00	18,379	558.25	0.15
165.00	0.00	16,386	558.23	0.08

Subcatchment 11S: Drg Area 4



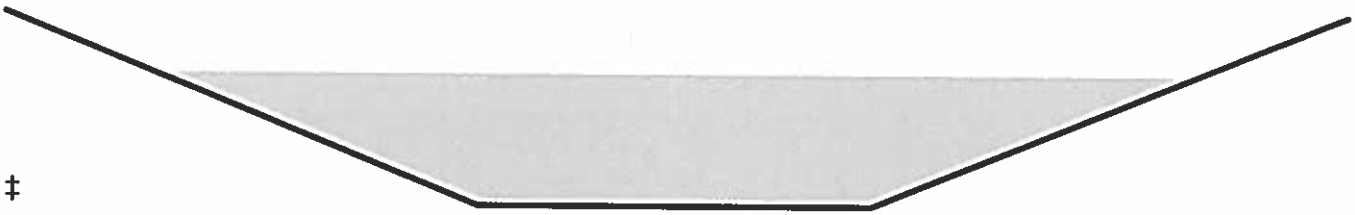
Summary for Reach 9R: Div Ditch Ph 2, 0.5% slope DA4

Inflow Area = 8.140 ac, 0.00% Impervious, Inflow Depth = 7.98" for 100yr T- III event
Inflow = 56.14 cfs @ 12.16 hrs, Volume= 5.412 af
Outflow = 55.53 cfs @ 12.18 hrs, Volume= 5.412 af, Atten= 1%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.48 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 4.9 min

Peak Storage= 4,954 cf @ 12.18 hrs
Average Depth at Peak Storage= 1.36'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 121.70 cfs

5.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 17.00'
Length= 400.0' Slope= 0.0050 '/'
Inlet Invert= 575.00', Outlet Invert= 573.00'



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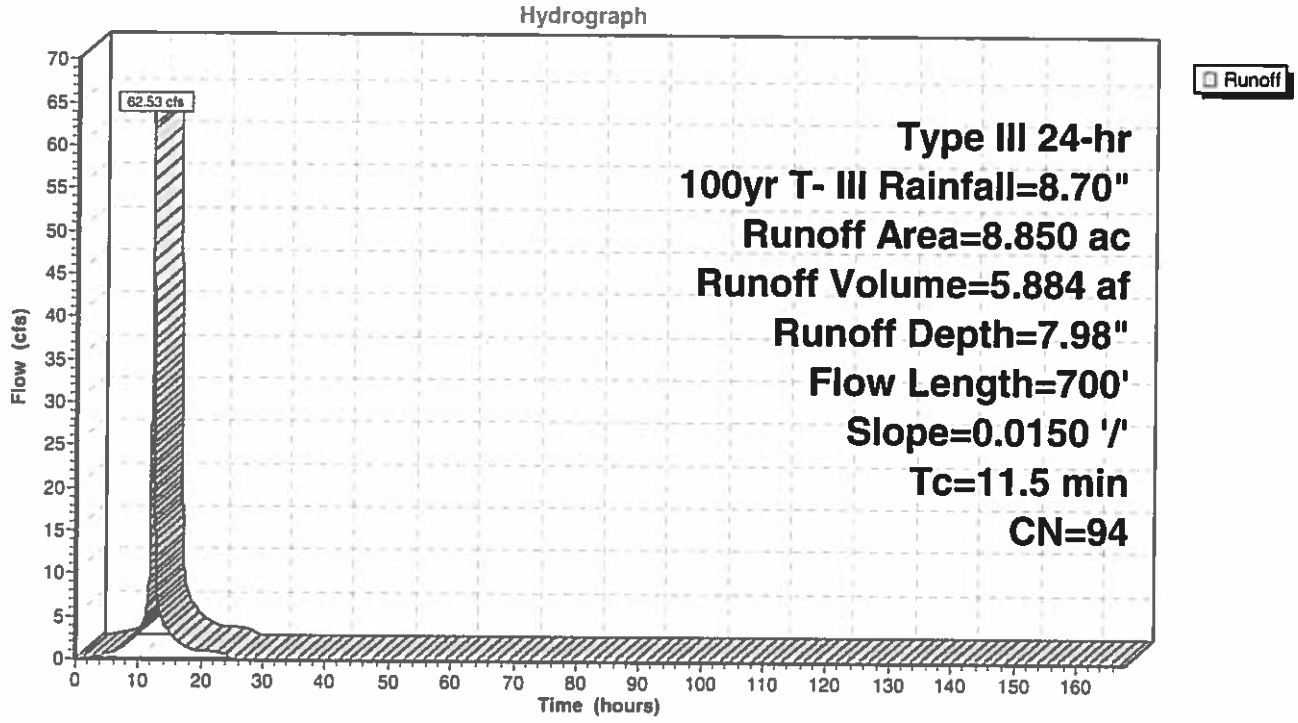
Subcatchment 21S: Drg Area 5



Summary for Reach 26R: Div Ditch DB4, 0.5% slope DA4 & 5

[62] Hint: Exceeded Reach 9R OUTLET depth by 0.59' @ 12.21 hrs

Inflow Area = 16.990 ac, 0.00% Impervious, Inflow Depth = 7.98" for 100yr T- III event
Inflow = 117.13 cfs @ 12.16 hrs, Volume= 11.296 af
Outflow = 115.12 cfs @ 12.19 hrs, Volume= 11.296 af, Atten= 2%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.45 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 6.1 min

Peak Storage= 12,670 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.95'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 121.70 cfs

5.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 17.00'
Length= 600.0' Slope= 0.0050 '/'
Inlet Invert= 573.00', Outlet Invert= 570.00'

‡

Summary for Reach 10R: Diversion Ditch Ph 2, 1% slope

[61] Hint: Exceeded Reach 26R outlet invert by 1.65' @ 12.19 hrs

Inflow Area = 16.990 ac, 0.00% Impervious, Inflow Depth = 7.98" for 100yr T- III event
Inflow = 115.12 cfs @ 12.19 hrs, Volume= 11.296 af
Outflow = 115.10 cfs @ 12.19 hrs, Volume= 11.296 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.03 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.10 fps, Avg. Travel Time= 0.8 min

Peak Storage= 1,637 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.65'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 172.11 cfs

5.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 17.00'
Length= 100.0' Slope= 0.0100 '/'
Inlet Invert= 570.00', Outlet Invert= 569.00'

‡

Summary for Reach 12R: Diversion Ditch Ph 2, 10% slope

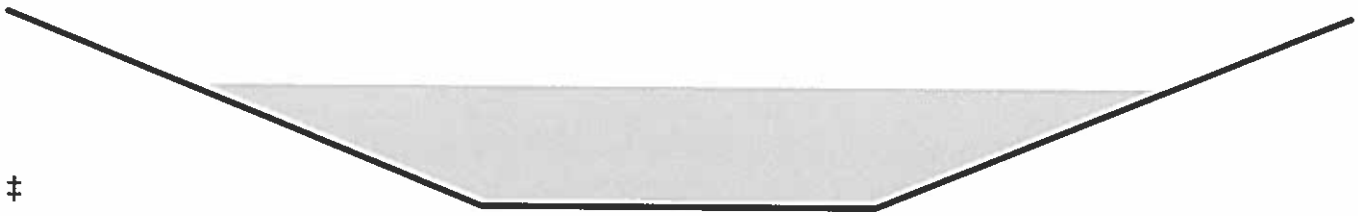
[61] Hint: Exceeded Reach 10R outlet invert by 1.25' @ 12.19 hrs

Inflow Area = 16.990 ac, 0.00% Impervious, Inflow Depth = 7.98" for 100yr T- III event
Inflow = 115.10 cfs @ 12.19 hrs, Volume= 11.296 af
Outflow = 115.08 cfs @ 12.19 hrs, Volume= 11.296 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.52 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.06 fps, Avg. Travel Time= 0.6 min

Peak Storage= 1,203 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 299.35 cfs

5.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 17.00'
Length= 110.0' Slope= 0.1000 '/'
Inlet Invert= 569.00', Outlet Invert= 558.00'



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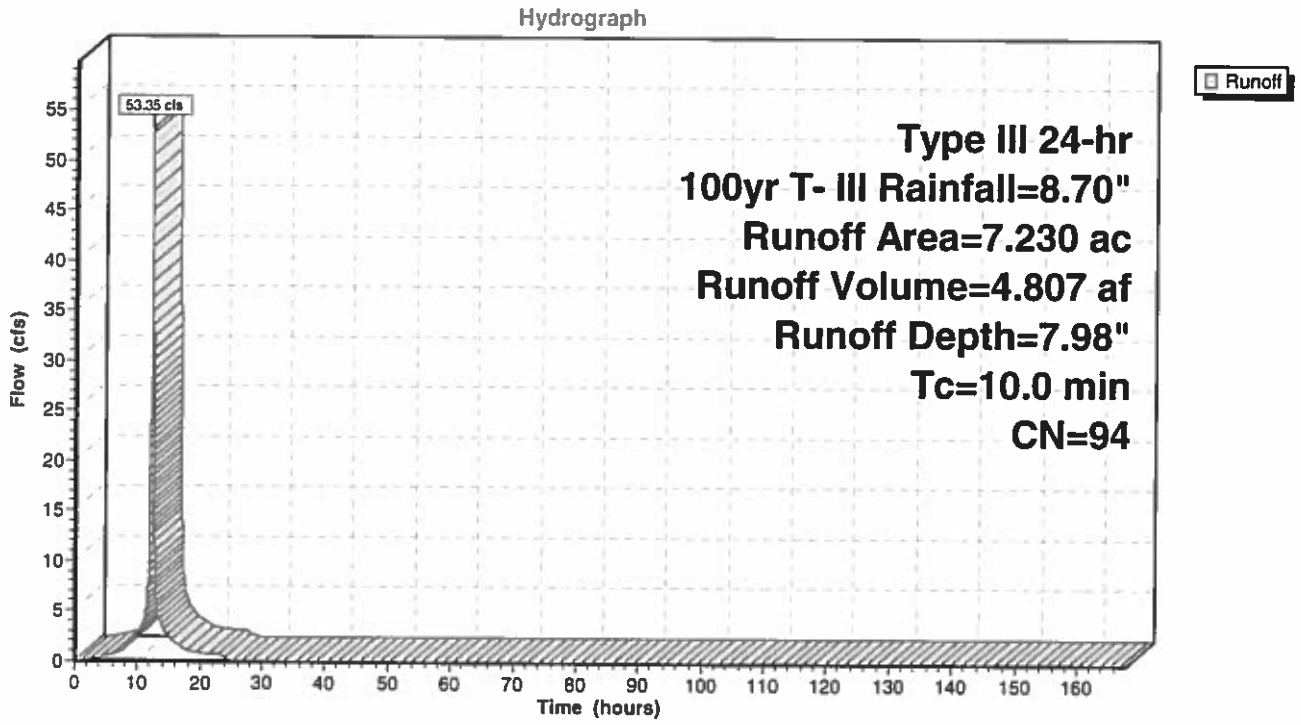
Subcatchment 24S: Drg Area6



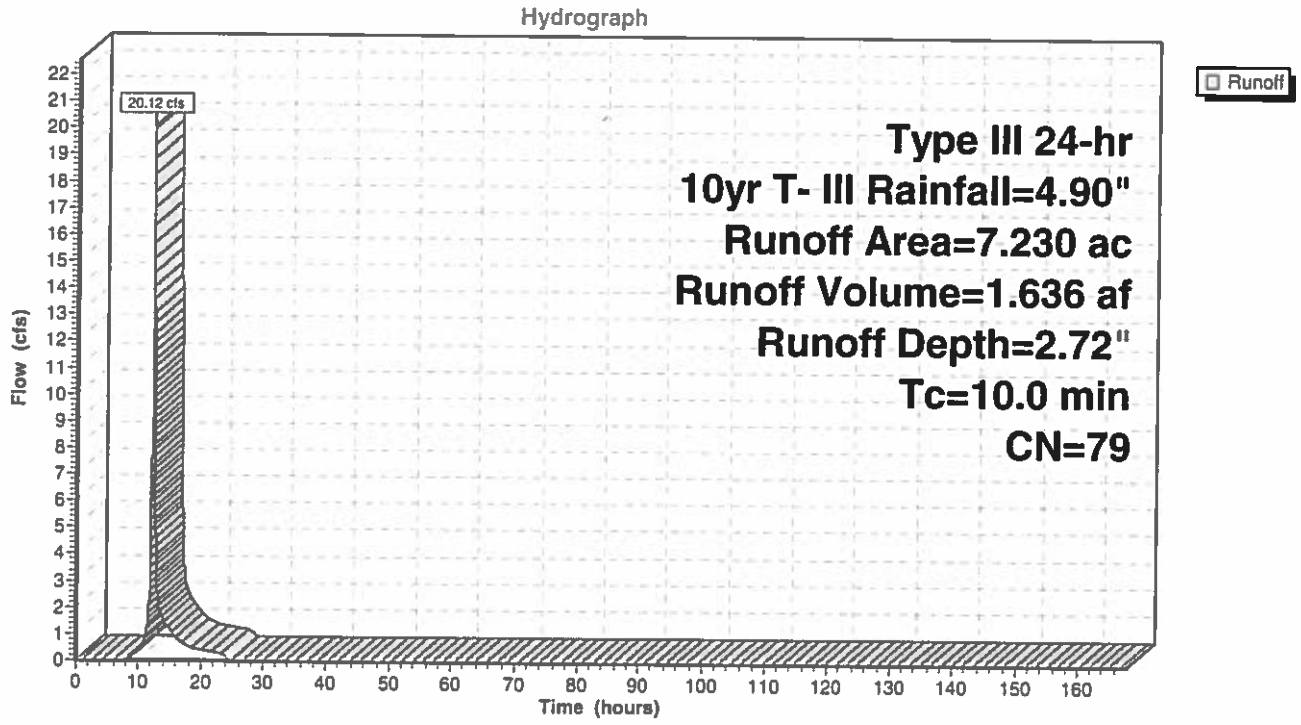
Temporary Sediment/Detention Basin B

HydroCAD Reports

10 yr. 24 Hr. Type III Storm

Before Mass Grading Begins

Subcatchment 25S: Drg Area6 Pre-Grade

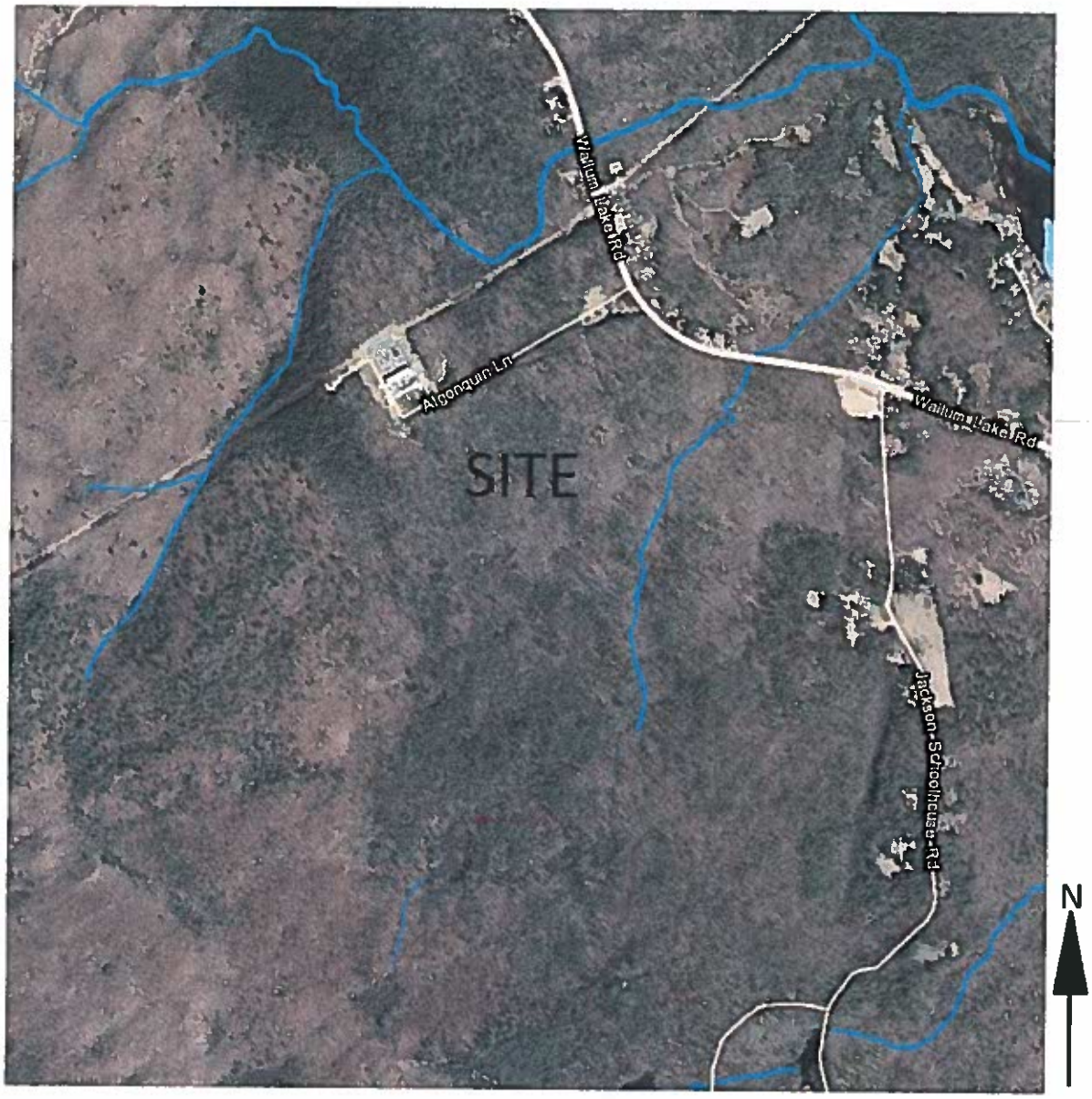


Appendix C

Spill Prevention Plan

Attachment A

General Location Map



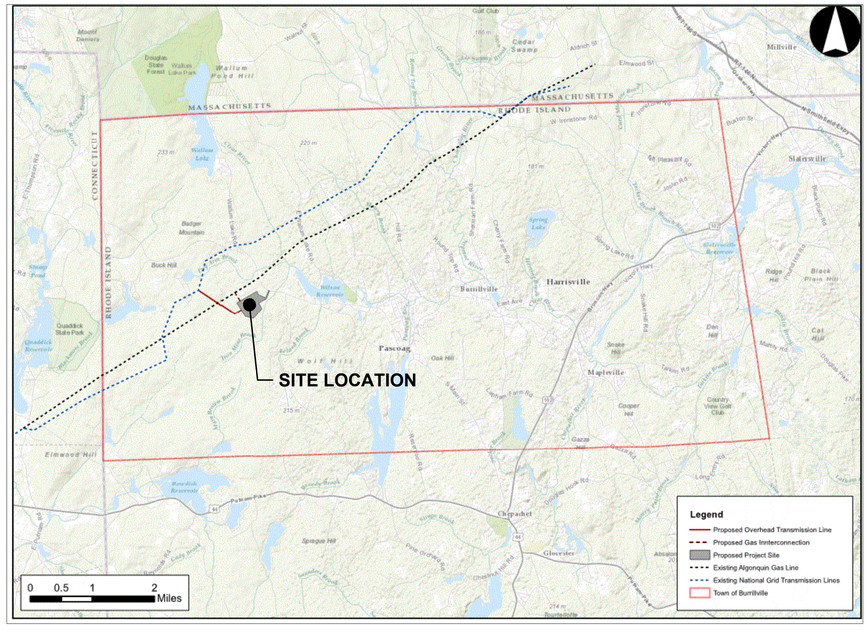
SITE LOCATION MAP

(Not to Scale)

Clear River Energy Center

Wallum Lake Road (RI Route 100)

Burrillville, RI



Drawing Package For

SESC Permit Package

Clear River Energy LLC

Project No.
000000000238926

Burrillville, Rhode Island
September, 2016

INDEX OF DRAWINGS

CIVIL MAPPING SYMBOLOGY

Symbol	Description
IP6	SILT FENCE INLET PROTECTION
	DIRECTION OF OVERLAND FLOW DURING & AFTER MASS GRADING
X.XX	DIRECTION OF OVERLAND FLOW W/ GRADE
SB	SEDIMENT BASIN
CE	TEMPORARY STONE CONSTRUCTION EXIT
DB	TEMPORARY DIVERSION DITCH/BERM
OP1	OUTLET PROTECTION RIP-RAP PAD (FOR SIZE SEE DETAIL)
(11R)	HYDROCAD REFERENCE NODE FOR CALCS
	WETLAND
	SPECIAL AQUATIC SITE
	PROPOSED STORM STRUCTURE
D	EXISTING POINT OF DISCHARGE
D	PROPOSED POINT OF DISCHARGE
	LIMITS OF DRAINAGE SUB-BASIN
	EXISTING LIGHT POLE
S	EXISTING SIGN

UTILITY/CIVIL LINE SYMBOLOGY

Symbol	Description
	PROPERTY LINE SETBACK
	PROPERTY LINE
500	EXISTING CONTOUR ELEVATIONS
500	PROPOSED CONTOUR ELEVATIONS
LOD	LIMITS OF DISTURBANCE (SILT FENCE INSTALLATION, SEE NOTE ABOVE)
SF	PROPOSED SILT FENCE
	PROPOSED STORM DRAIN
	WETLAND
	WETLAND BUFFER
	EXISTING STREAM
	EXISTING STREAM BANK
	100' STREAM BUFFER
	200' STREAM BUFFER
	RIGHT OF WAY
	DRAINAGE AREAS
>	DRAINAGE PATHS
	TREELINE
G	EXISTING GAS LINE

GENERAL NOTES:

1. THIS IS A STANDARD CIVIL SYMBOLOGY SHEET. ALL SYMBOLS ARE NOT NECESSARILY USED ON THIS PROJECT.

2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.

HDR

ISSUE	DATE	DESCRIPTION
	8/17/2016	SOIL EROSION SEDIMENT CONTROL PLAN

PROJECT MANAGER: C. JACOBS
PROJECT NUMBER: 000000000238926

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

LEGEND

SCALE IN FEET 0 1 2

FILENAME: 01C901.dwg
SCALE: AS SHOWN

SHEET 01C901

MAINTENANCE

ALL MEASURES STATED ON THIS EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLANATION, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON A MINIMUM OF ONCE EVERY SEVEN (7) DAYS OR 24 HOURS AFTER A 0.25 INCH RAINFALL EVENT AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED IN ACCORDANCE WITH THE FOLLOWING:

1. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING, OR DETERIORATION.
2. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDED AS NEEDED.
3. SILT FENCES SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCES WHEN IT REACHES ONE-HALF THE HEIGHT OF THE SILT FENCE.
4. THE CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE CONSTRUCTION ENTRANCES AS CONDITIONS DEMAND.
5. THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE). THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE TEMPORARY PARKING AS CONDITIONS DEMAND.
6. OUTLET STRUCTURES IN THE SEDIMENTATION BASINS SHALL BE MAINTAINED IN OPERATIONAL CONDITIONS AT ALL TIMES.
7. TEMPORARY SEDIMENT BASINS SHALL HAVE SEDIMENT REMOVED SEMI-ANNUALLY (TWICE A YEAR) OR IF SEDIMENT REACHES THE TOP OF THE STONE RESTING PAD FOR THE FAIRCLOTH SKIMMERS.

SEQUENCE OF CONSTRUCTION

PHASE I SHEET 01C904

1. INSTALL TEMPORARY STONE CONSTRUCTION EXIT.
2. INSTALL ORANGE CONSTRUCTION SAFETY FENCING ALONG THE LIMITS OF DISTURBANCE TO DEFINE CONSTRUCTION ZONE AND PROTECT ADJACENT VEGETATION/WETLANDS.
3. INSTALL THE SILT FENCES AND CONCRETE WASHOUT PIT.
4. PREPARE TEMPORARY PARKING AND STORAGE AREA.

"HALT"
PERFORM INSPECTION OF BMPs. GENERAL CONTRACTOR SHALL SCHEDULE AND CONDUCT STORM WATER PRE-CONSTRUCTION MEETING WITH ENGINEER AND ALL GROUND DISTURBING CONTRACTORS BEFORE PROCEEDING WITH CONSTRUCTION.

5. CONSTRUCT TEMPORARY SEDIMENT/DETENTION BASIN "A", DIVERSION DITCHES, OUTLET STRUCTURES, OUTLET PROTECTIONS AND SEED BASIN.

PHASE II SHEET 01C905

1. CLEAR AND GRUB THE SITE.
2. STRIP TOPSOIL AND STOCKPILE IN LOCATION SHOWN ON PLANS. INSTALL TEMPORARY SEEDING ON STOCKPILE AT END OF TOPSOIL STRIPPING ACTIVITIES.
3. CONSTRUCT SEDIMENT/DETENTION BASIN "B". OUTLET STRUCTURE AND OUTLET PROTECTION. SEED BASIN. CONSTRUCT DIVERSION DITCH/CONTAINMENT BERM. STORM RUNOFF WILL BE DIVERTED TO BASIN B AS THE SITE GRADING PROGRESSES TO FACILITATE THE EVENTUAL REMOVAL OF BASIN "A".
4. BEGIN GRADING THE SITE. TEMPORARY SEDIMENT BASIN "A" SIZE WILL BE REDUCED AS GRADING DIVERTS RUNOFF TO BASIN B THROUGH THE NEW DIVERSION DITCH. MOVE DITCH TO THE EAST AS NEEDED TO FACILITATE MASS GRADING. ONCE RUNOFF FROM AREAS THAT WERE ENTERING SEDIMENT BASIN A HAVE BEEN DIVERTED TO BASIN B, BASIN A CAN BE REMOVED TO FACILITATE FINAL MASS GRADING OF THE SITE.
5. BEGIN CONSTRUCTION OF RETAINING WALLS AND ENTRANCE ROAD CONSTRUCTION.

PHASE III SHEET 01C906

1. INSTALL STORM DRAINAGE SYSTEM. INSTALL INLET PROTECTIONS AROUND ALL STORM SEWER STRUCTURES AS THEY ARE INSTALLED.
2. INSTALL UTILITIES AND BEGIN BUILDING PAD CONSTRUCTION.
3. PERFORM FINISH GRADING.
4. INSTALL PERMANENT SEEDING ON ALL PERIMETER AREAS.
5. INSTALL GRAVEL STABILIZATION TO ALL AREAS AS FINISH GRADING IS COMPLETED IN PREPARATION FOR PAVING.

PHASE IV SHEET 01C907

1. PAVE SITE.
2. INSTALL INLET PROTECTION DEVICES IN PAVED AREAS. USE INLET FILTERS FOR ALL INLETS.
3. COMPLETE FINISH GRADING AND INSTALL PERMANENT SEEDING, SODDING AND PLANTING.
4. CONVERT BASIN "B" INTO FINAL WATER QUALITY/DETENTION BASIN.
5. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES (ONLY IF SITE IS STABILIZED AND APPROVED BY CONSTRUCTION MANAGER AND GOVERNING AGENCIES).
6. DISTRIBUTE REMAINING TOPSOIL STOCK PILE OVER STAGING AREAS NOT TO REMAIN. INSTALL PERMANENT SEEDING.
7. CLEAN UP CONSTRUCTION STAGING AREA TO REMAIN FOR FUTURE USE AND TOP DRESS WITH GRAVEL WHERE NEEDED.

ACREAGE SUMMARY in ACRES	
IMPERV. AREA	17.18 AC±
SEEDED AREA	17.96 AC±
TOTAL DISTURBED	35.14 AC±

TEMPORARY SEEDING

SEED: MIXTURE 70% RYEGRASS/ 30% WINTER WHEAT – 4 LBS/ 1000 S.F.

PERMANENT SEEDING

SEED: KY 31 FESCUE @ 6 LBS./ 1000 S.F.

GENERAL EROSION NOTES

A. THE STORM WATER POLLUTION PREVENTION PLAN IS COMPRISED OF SHEETS SESC 1 "EXISTING CONDITIONS AND CONTRAINT MAP", SESC 2 "PHASE I EROSION AND SEDIMENT CONTROL PLAN/SITE MAP", SESC 3 " PHASE II EROSION AND SEDIMENT CONTROL SITE MAP", SESC 4 " PHASE III EROSION AND SEDIMENT CONTROL SITE MAP", SESC 5 " PHASE IVI EROSION AND SEDIMENT CONTROL SITE MAP", SESC 6 "EROSION AND SEDIMENTATION CONTROL DETAILS", THE PLAN NARRATIVE, ATTACHMENTS INCLUDED IN THE WRITTEN STORM WATER POLLUTION PREVENTION PLAN ("SWPPP"), PLUS THE PERMIT AND ALL SUBSEQUENT REPORTS AND RELATED DOCUMENTS.

B. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH STORM WATER POLLUTION PREVENTION SHALL OBTAIN A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN AND THE STATE OF RHODE ISLAND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT (NPDES PERMIT) AND BECOME FAMILIAR WITH THEIR CONTENTS.

C. CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES AS REQUIRED BY THE SWPPP. ADDITIONAL BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED AS DICTATED BY SITE CONDITIONS ENCOUNTERED AT NO ADDITIONAL COST TO THE OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION.

D. BEST MANAGEMENT PRACTICES (BMP'S) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE, OR LOCAL REQUIREMENTS OR MANUAL OF PRACTICE, AS APPLICABLE CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY PERMITTING AGENCY OR OWNER.

E. SEE SITE MAP FOR DELINEATION OF ALL STATE WATERS. PERMITS FOR ANY CONSTRUCTION ACTIVITY IMPACTING STATE WATERS OR REGULATED WETLANDS MUST BE MAINTAINED ON SITE AT ALL TIMES.

F. CONTRACTOR SHALL MINIMIZE CLEARING TO THE MAXIMUM EXTENT PRACTICAL OR AS REQUIRED BY THE GENERAL PERMIT. ALL WORK SHALL REMAIN WITHIN THE LIMITS OF DISTURBED SHOWN ON THE PLANS. ANY WORK OUTSIDE THE LIMIT OF DISTURBANCE MUST BE APPROVED BY THE APPROPRIATE GOVERNING AGENCIES BEFORE ANY DISTURBANCE OUTSIDE THE LIMITS OF DISTURBANCE OCCURS.

G.) GENERAL CONTRACTOR SHALL DENOTE ON PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.

H. ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) SHALL BE DETAINED ONSITE AND PROPERLY TREATED OR DISPOSED OF IN ACCORDANCE WITH THE APPROPRIATE GOVERNING REGULATIONS.

I. SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.

J. DUST ON THE SITE SHALL BE CONTROLLED. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.

K. RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DEPOSITED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE PREMISES THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.

L. ALL STORM WATER POLLUTION PREVENTION MEASURES PRESENTED ON THIS PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLAN, SHALL BE INITIATED AS SOON AS PRACTICABLE.

M. DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS STOPPED FOR AT LEAST 14 DAYS, SHALL BE TEMPORARILY SEEDED. THESE AREAS SHALL BE SEEDED NO LATER THAN 21 DAYS FROM THE LAST CONSTRUCTION ACTIVITY OCCURRING IN THESE AREAS.

N. DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS PERMANENTLY STOPPED SHALL BE PERMANENTLY SEEDED. THESE AREAS SHALL BE SEEDED NO LATER THAN 14 DAYS AFTER THE LAST CONSTRUCTION ACTIVITY OCCURRING IN THESE AREAS. REFER TO THE GRADING PLAN AND/OR LANDSCAPE PLAN FOR DETAILS.

O. IF THE ACTION OF VEHICLES TRAVELING OVER THE GRAVEL CONSTRUCTION ENTRANCES IS NOT SUFFICIENT TO REMOVE THE MAJORITY OF DIRT OR MUD, THEN THE TIRES MUST BE WASHED BEFORE THE VEHICLES ENTER A PUBLIC ROAD. IF WASHING IS USED, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFF THE SITE.

P. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

Q. CONTRACTORS OR SUBCONTRACTORS WILL BE RESPONSIBLE FOR REMOVING SEDIMENT IN THE TEMPORARY SEDIMENT BASIN, THE DETENTION POND AND ANY SEDIMENT THAT MAY HAVE COLLECTED IN THE STORM SEWER DRAINAGE SYSTEMS IN CONJUNCTION WITH THE STABILIZATION OF THE SITE.

R. ON-SITE & OFF-SITE SOIL STOCKPILE AND BORROW AREAS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION THROUGH IMPLEMENTATION OF BEST MANAGEMENT PRACTICES. STOCKPILE AND BORROW AREA LOCATIONS SHALL BE NOTED ON THE SITE MAP AND PERMITTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS.

S. SLOPES SHALL BE LEFT IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION.

T. DUE TO THE GRADE CHANGES DURING THE DEVELOPMENT OF THE PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE EROSION CONTROL MEASURES (SILT FENCES, DIVERSION DITCHES , ETC.) TO PREVENT EROSION.

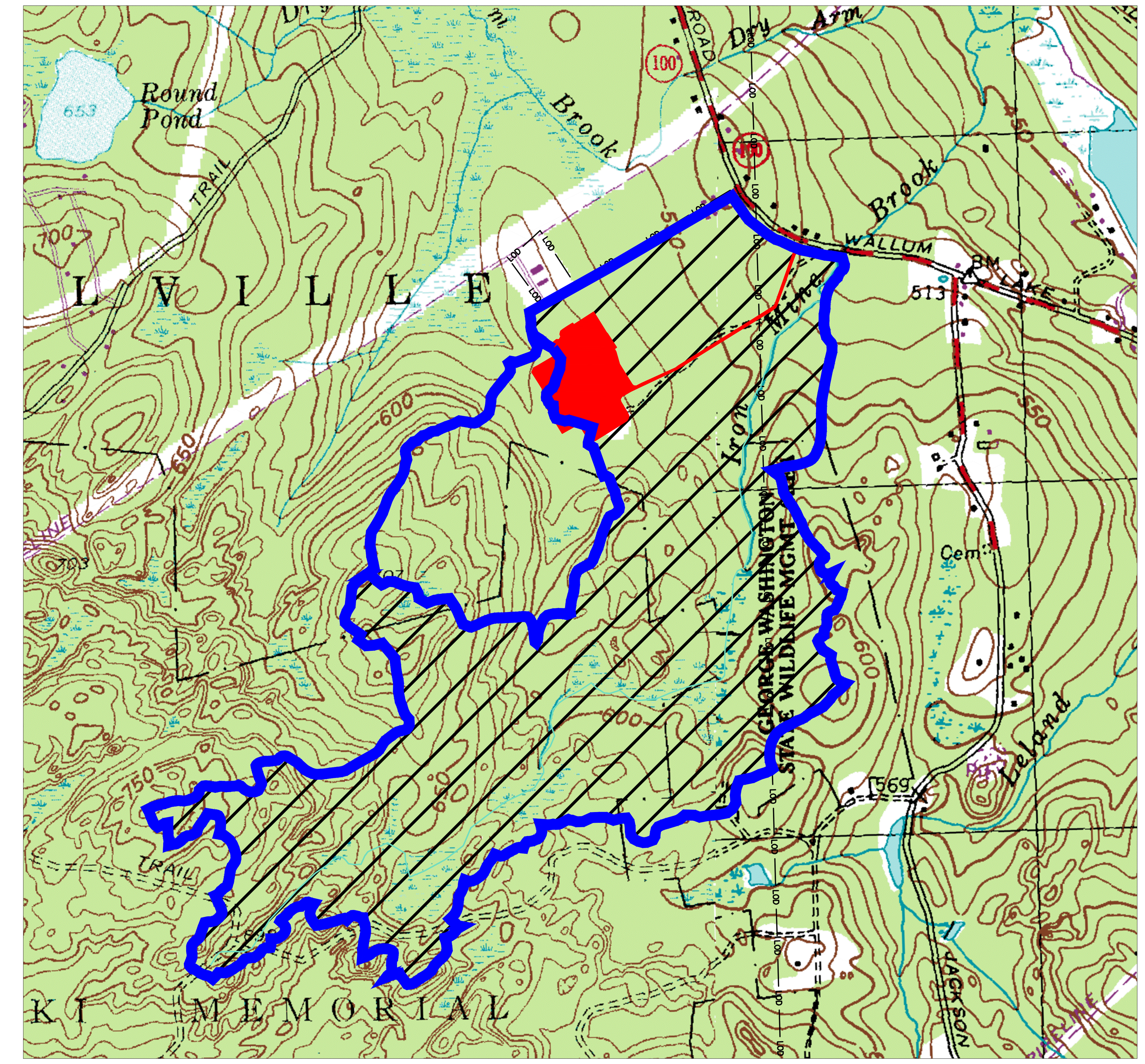
U. ALL CONSTRUCTION SHALL BE STABILIZED AT THE END OF EACH WORKING DAY, THIS INCLUDES BACKFILLING OF TRENCHES FOR UTILITY CONSTRUCTION AND PLACEMENT OF GRAVEL OR BITUMINOUS PAVING FOR ROAD CONSTRUCTION.

CAUTION NOTICE TO CONTRACTOR

IF PROPERLY IMPLEMENTED, THIS PLAN WILL PROVIDE AN EFFECTIVE MEANS FOR CONTROLLING EROSION. HOWEVER, IT IS ACKNOWLEDGED THAT NO ONE PLAN CAN BE PREPARED THAT WILL DEPICT ALL POSSIBLE CONTROL MEASURES NECESSARY FOR VARIOUS STAGES OF CONSTRUCTION. THE CONTRACTOR SHALL INCLUDE IN THE BASE BID ADEQUATE FUNDS TO PROVIDE ALL EROSION CONTROL MEASURES NECESSARY TO COMPLY WITH CODES FOR THE DURATION OF THE CONSTRUCTION PROJECT.

SPECIFICATION REQUIREMENTS

THE REQUIREMENTS SHOWN ON THIS PLAN ARE SUPPLEMENTED BY THE SWPPP CONTAINED WITHIN THE PROJECT SPECIFICATIONS. IN CASE OF CONFLICTS BETWEEN THE PLANS, SWPPP SPECIFICATIONS AND THE ACTUAL GENERAL PERMIT, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.



SOIL EROSION/SEDIMENTATION CONTROL OPERATION TIME SCHEDULE

NOTE: GENERAL CONTRACTOR TO COMPLETE TABLE WITH THEIR SPECIFIC PROJECT SCHEDULE

CONSTRUCTION SEQUENCE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
INSTALL TEMP. CONSTRUCTION ENTRANCE																		
INSTALL CONSTRUCTION LIMIT OF DISTURBANCE FENCING																		
INSTALL SILT FENCES AND CONCRETE WASHOUT PIT																		
INSPECTION BY GOVERNING AGENCY (IF REQ'D)																		
CONSTRUCT CONSTRUCTION STAGING AREA																		
CONSTRUCT TEMP. SEDIMENT BASIN "A" AND OUTLET																		
STRIP & STOCKPILE TOPSOIL, BEGIN MASS GRADING																		
CONSTRUCT TEMP. SEDIMENT BASIN "B" AND OUTLET																		
REMOVE SEDIMENTATION POND "A"																		
BEGIN CONSTRUCTION OF RETAINING WALLS																		
BEGIN CONSTRUCTION OF ENTRANCE ROAD																		
INSTALL UTILITIES AND STORM SEWER SYSTEM																		
BEGIN BUILDING PAD CONSTRUCTION																		
INSTALL RETAINING WALLS																		
INSTALL RIP RAP ON OUTLETS AND INLET PROTECTION																		
PREPARE SITE FOR PAVING																		
FINISH GRADING OF SITE																		
LANDSCAPING/SEED/SOD/FINAL STABILIZATION																		
CONVERT BASIN "B" INTO WATER QUAL/DETENTION BASIN																		
REMOVE TEMP. EROSION AND SED. CONTROL DEVICES																		

ISSUE	DATE	DESCRIPTION
	8/17/2016	SOIL EROSION SEDIMENT CONTROL PLAN

PROJECT MANAGER C. JACOBS

PROJECT NUMBER 000000000238926

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

SOIL EROSION AND SEDIMENT CONTROL NOTES

SCALE IN FEET 0 100 200

FILENAME 01C902.dwg

SCALE NONE

SHEET 01C902

PROJECT MANAGER	C. JACOBS
PROJECT NUMBER	000000000238926

ISSUE	DATE	DESCRIPTION
	8/17/2016	SOIL EROSION SEDIMENT CONTROL PLAN

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

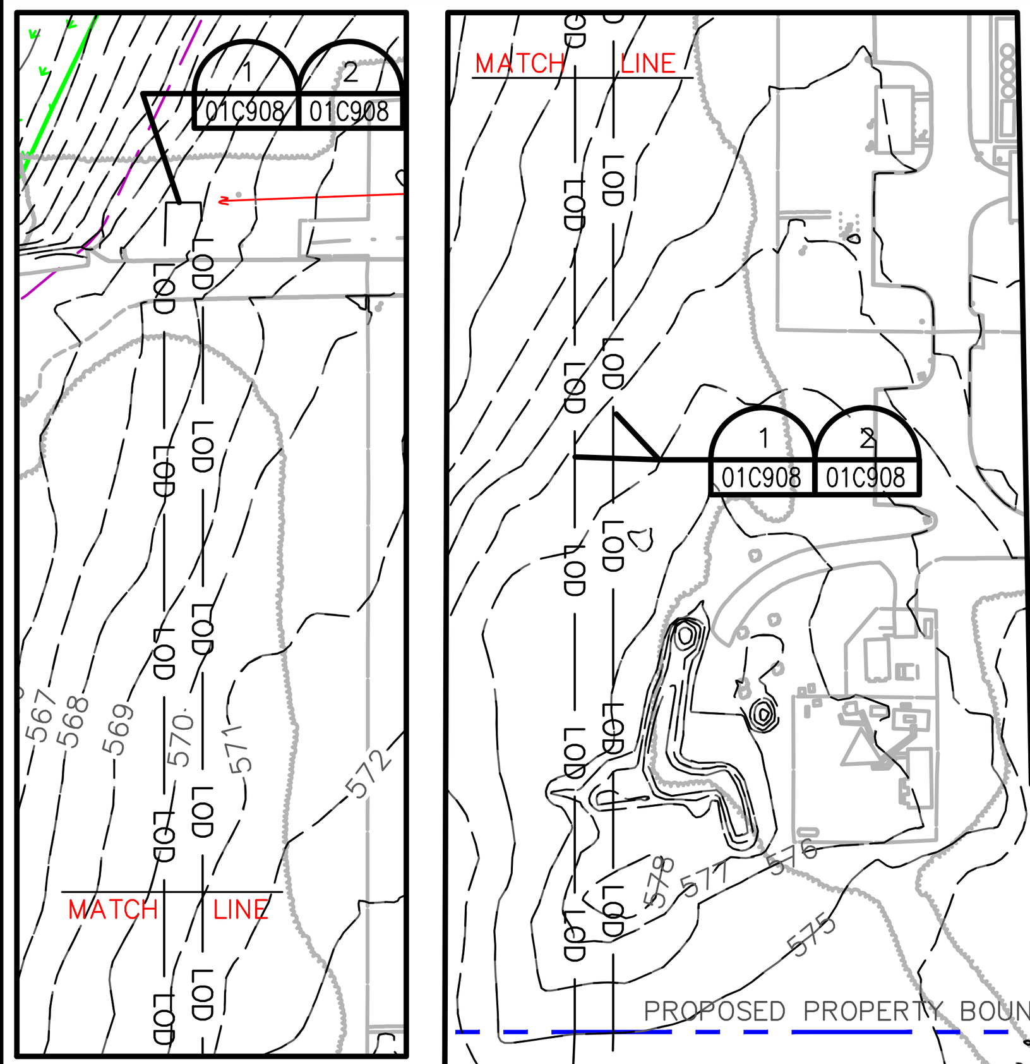
SOIL EROSION & SEDIMENT CONTROL EXISTING CONDITIONS AND SITE CONSTRAINTS MAP

SCALE IN FEET 0 100 200

FILENAME 01C903.dwg

SCALE AS SHOWN

SHEET 01C903



SEQUENCE OF CONSTRUCTION

PHASE I

1. INSTALL TEMPORARY STONE CONSTRUCTION EXIT.
2. INSTALL ORANGE CONSTRUCTION SAFETY FENCING ALONG THE LIMITS OF DISTURBANCE TO DEFINE CONSTRUCTION ZONE AND PROTECT ADJACENT VEGETATION/WETLANDS.
3. INSTALL THE SILT FENCES AND CONCRETE WASHOUT PIT.
4. PREPARE TEMPORARY PARKING AND STORAGE AREA.

"HALT"
PERFORM INSPECTION OF BMPs. GENERAL CONTRACTOR SHALL SCHEDULE AND CONDUCT STORM WATER PRE–CONSTRUCTION MEETING WITH ENGINEER AND ALL GROUND DISTURBING CONTRACTORS BEFORE PROCEEDING WITH CONSTRUCTION.

5. CONSTRUCT TEMPORARY SEDIMENT/DETENTION BASIN "A", DIVERSION DITCHES, OUTLET STRUCTURES, OUTLET PROTECTIONS AND SEED BASIN.

PERIMETER SILT FENCE INSTALLATION NOTES;

1. INSTALL TEMPORARY SILT FENCES ALONG AND INSIDE OF LIMITS OF DISTURBANCE FENCING.
2. PERIMETER SILT FENCING IS NOT ACTUALLY SHOWN ON DRAWINGS DUE TO PROXIMITY TO LOD FENCING FOR CLARITY. TYPICALLY FENCING SHOULD BE INSTALLED 3 FEET INSIDE LOD FENCING FOR MAINTENANCE ACCESS. HOWEVER, THERE ARE AREAS WHERE THE SILT FENCE WILL HAVE TO BE DIRECTLY ADJACENT TO LOD FENCING FOR CONSTRUCTION PURPOSES. LOCATION OF SILT FENCE WILL BE AT CONTRACTORS DISCRETION.
3. ADDITIONAL SILT FENCE INSTALLATIONS (OTHER THAN PERIMETER) WILL BE NOTED ON PLANS.

TEMP. DIVER. DITCH DB #1 (11R)
@ 0.5% SLOPE MAX.
DA=5.1 AC.
Q_{10}=18.6 CFS
V_{10}=3.8 FPS
NORMAL DEPTH=1.15 FT
TRAPEZOID CHANNEL
BOTTOM WIDTH=2 FT.
SIDESLOPES 2:1
TOTAL BERM DEPTH 2 FT
Q_{CAP}=61.8 CFS

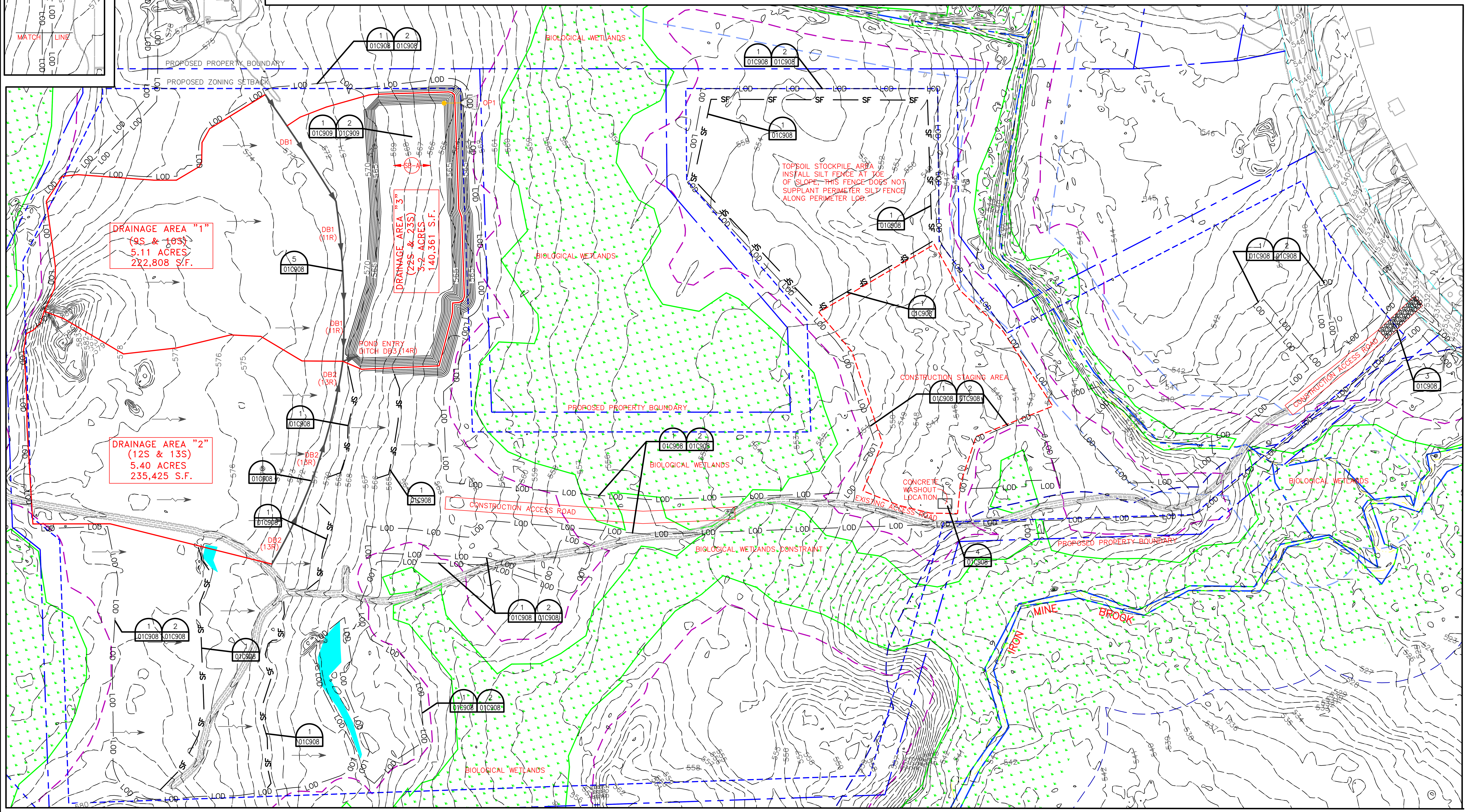
TEMP. DIVER. DITCH DB #2 (13R)
@ 0.7% SLOPE MAX.
DA=5.4 AC.
Q_{10}=20.0 CFS
V_{10}=4.3 FPS
NORMAL DEPTH=1.11 FT
TRAPEZOID CHANNEL
BOTTOM WIDTH=2 FT.
SIDESLOPES 2:1
TOTAL BERM DEPTH 2 FT
Q_{CAP}=71.2 CFS

POND ENtRY DITCH DB #3 (14R)
@ 21.9% SLOPE MAX.
DA=10.5 AC.
Q_{10}=38.6 CFS
V_{10}=10.4 FPS
NORMAL DEPTH=0.63 FT
TRAPEZOID CHANNEL
BOTTOM WIDTH=4 FT.
SIDESLOPES 3:1
TOTAL BERM DEPTH 2 FT
Q_{CAP}=392.7 CFS

LINE POND ENTRY DITCH WITH NON–WOVEN FILTER FABRIC, 6 INCHES OF #2 STONE WITH RIP–RAP ON TOP CONSISTING OF STONE WITH AN AVERAGE DIAMETER OF 20 INCHES FROM TOP OF BASIN ENBANKMENT TO BOTTOM

TSB "A" (8P) POND DATA

TOP=569.00
BOTTOM=563.00
SIDE SLOPES=3:1
PRIMARY INLET ELEV (4–4" Dia Holes) =565.5'
EMERGENCY OVERFLOW 18" RISER ELEV = 566.5'
Q_{IN} (10 YR. STORM)= 50.4 CFS
Q_{OUT} (10 YR. STORM)= 0.85 CFS
VELOCITY (10 YR. STORM)=2.3 FPS
SED. VOLUME REQ'D, 1 YEAR STORAGE = 6,098 CF
SED. VOLUME PROV. (TO ELEV. 563.20')=14,480 CF
WATER SURFACE ELEV. (10 YR. STORM)=565.17'



MAINTENANCE

ALL MEASURES STATED ON THIS EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLANATION, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON A MINIMUM OF ONCE EVERY SEVEN (7) DAYS OR 24 HOURS AFTER A 0.25 INCH RAINFALL EVENT AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED IN ACCORDANCE WITH THE FOLLOWING:

1. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING, OR DETERIORATION.
2. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDED AS NEEDED.
3. SILT FENCES SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCES WHEN IT REACHES ONE–HALF THE HEIGHT OF THE SILT FENCE.
4. THE CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE CONSTRUCTION ENTRANCES AS CONDITIONS DEMAND.
5. THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE). THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE TEMPORARY PARKING AS CONDITIONS DEMAND.
6. OUTLET STRUCTURES IN THE SEDIMENTATION BASINS SHALL BE MAINTAINED IN OPERATIONAL CONDITIONS AT ALL TIMES. SEDIMENT SHALL BE REMOVED FROM SEDIMENT BASINS ANNUALLY OR IF CONDITIONS WARRANT EARLIER REMOVAL.

ACREAGE SUMMARY in ACRES	
TOTAL DISTURBED	35.14 AC±

TEMPORARY SEEDING

SEED: MIXTURE 70% RYEGRASS/ 30% WINTER WHEAT – 4 LBS/ 1000 S.F.

CAUTION NOTICE TO CONTRACTOR

IF PROPERLY IMPLEMENTED, THIS PLAN WILL PROVIDE AN EFFECTIVE MEANS FOR CONTROLLING EROSION. HOWEVER, IT IS ACKNOWLEDGED THAT NO ONE PLAN CAN BE PREPARED THAT WILL DEPICT ALL POSSIBLE CONTROL MEASURES NECESSARY FOR VARIOUS STAGES OF CONSTRUCTION. THE CONTRACTOR SHALL INCLUDE IN THE BASE BID ADEQUATE FUNDS TO PROVIDE ALL EROSION CONTROL MEASURES NECESSARY TO COMPLY WITH CODES FOR THE DURATION OF THE CONSTRUCTION PROJECT.

SPECIFICATION REQUIREMENTS

THE REQUIREMENTS SHOWN ON THIS PLAN ARE SUPPLEMENTED BY THE SWPPP SPECIFICATIONS. IN CASE OF CONFLICTS CONTAINED WITHIN THE PROJECT BETWEEN THE PLANS, SWPPP SPECIFICATIONS AND THE ACTUAL GENERAL PERMIT, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.

HDR

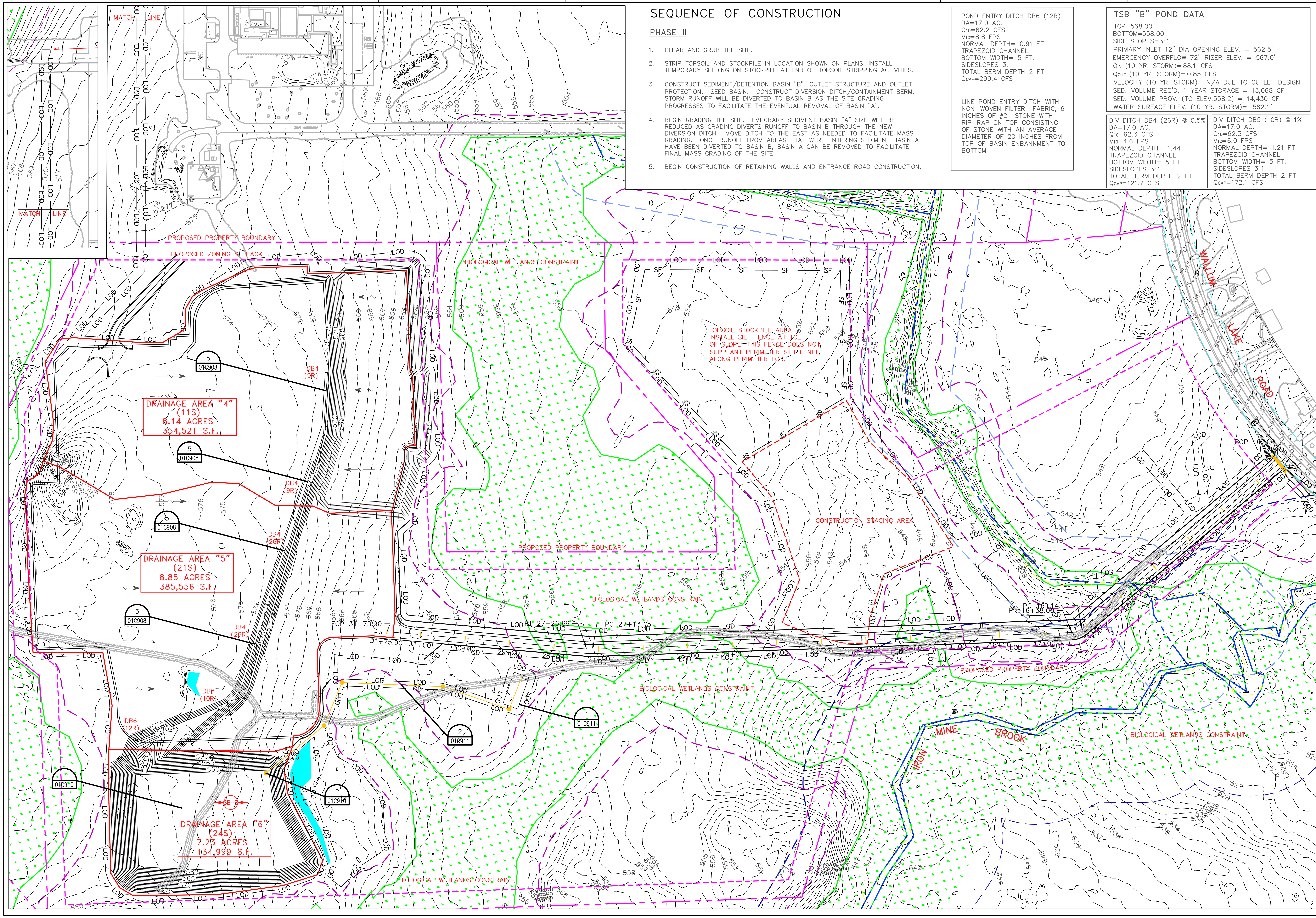
ISSUE	DATE	DESCRIPTION
	8/17/2016	SOIL EROSION SEDIMENT CONTROL PLAN

PROJECT MANAGER C. JACOBS
PROJECT NUMBER 000000000238926

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

SOIL EROSION AND SEDIMENT CONTROL PHASE I PLAN

SCALE IN FEET 0 100 200
FILENAME 01C904.dwg
SCALE AS SHOWN
SHEET 01C904



SEQUENCE OF CONSTRUCTION

PHASE II

1. CLEAR AND GRUB THE SITE.
2. STRIP TOPSOIL AND STOCKPILE IN LOCATION SHOWN ON PLANS. INSTALL TEMPORARY SEEDING ON STOCKPILE AT END OF TOPSOIL STRIPPING ACTIVITIES.
3. CONSTRUCT SEDIMENT/DETENTION BASIN "B". OUTLET STRUCTURE AND OUTLET PROTECTION. SEED BASIN. CONSTRUCT DIVERSION DITCH/CONTAINMENT BERM. STORM RUNOFF WILL BE DIVERTED TO BASIN B AS THE SITE GRADING PROGRESSES TO FACILITATE THE EVENTUAL REMOVAL OF BASIN "A".
4. BEGIN GRADING THE SITE. TEMPORARY SEDIMENT BASIN "A" SIZE WILL BE REDUCED AS GRADING DIVERTS RUNOFF TO BASIN B THROUGH THE NEW DIVERSION DITCH. MOVE DITCH TO THE EAST AS NEEDED TO FACILITATE MASS GRADING. ONCE RUNOFF FROM AREAS THAT WERE ENTERING SEDIMENT BASIN A HAVE BEEN DIVERTED TO BASIN B, BASIN A CAN BE REMOVED TO FACILITATE FINAL MASS GRADING OF THE SITE.
5. BEGIN CONSTRUCTION OF RETAINING WALLS AND ENTRANCE ROAD CONSTRUCTION.

POND ENTRY DITCH DB6 (12R)
DA=17.0 AC.
Q_{10}=62.2 CFS
V_{10}=8.8 FPS
NORMAL DEPTH= 0.91 FT
TRAPEZOID CHANNEL
BOTTOM WIDTH= 5 FT.
SIDESLOPES 3:1
TOTAL BERM DEPTH 2 FT
Q_{CAP}=299.4 CFS

LINE POND ENTRY DITCH WITH NON-WOVEN FILTER FABRIC, 6 INCHES OF #2 STONE WITH RIP-RAP ON TOP CONSISTING OF STONE WITH AN AVERAGE DIAMETER OF 20 INCHES FROM TOP OF BASIN ENBANKMENT TO BOTTOM

TSB "B" POND DATA

TOP=568.00
BOTTOM=558.00
SIDE SLOPES=3:1
PRIMARY INLET 12" DIA OPENING ELEV. = 562.5'
EMERGENCY OVERFLOW 72" RISER ELEV. = 567.0'
Q_{IN} (10 YR. STORM)= 88.1 CFS
Q_{OUT} (10 YR. STORM)= 0.85 CFS
VELOCITY (10 YR. STORM)= N/A DUE TO OUTLET DESIGN
SED. VOLUME REQ'D, 1 YEAR STORAGE = 13,068 CF
SED. VOLUME PROV. (TO ELEV.558.2) = 14,430 CF
WATER SURFACE ELEV. (10 YR. STORM)= 562.1'

DIV DITCH DB4 (26R) @ 0.5%
DA=17.0 AC.
Q_{10}=62.3 CFS
V_{10}=4.6 FPS
NORMAL DEPTH= 1.44 FT
TRAPEZOID CHANNEL
BOTTOM WIDTH= 5 FT.
SIDESLOPES 3:1
TOTAL BERM DEPTH 2 FT
Q_{CAP}=121.7 CFS

DIV DITCH DB5 (10R) @ 1%
DA=17.0 AC.
Q_{10}=62.3 CFS
V_{10}=6.0 FPS
NORMAL DEPTH= 1.21 FT
TRAPEZOID CHANNEL
BOTTOM WIDTH= 5 FT.
SIDESLOPES 3:1
TOTAL BERM DEPTH 2 FT
Q_{CAP}=172.1 CFS

MAINTENANCE

ALL MEASURES STATED ON THIS EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLANATION, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON A MINIMUM OF ONCE EVERY SEVEN (7) DAYS OR 24 HOURS AFTER A 0.25 INCH RAINFALL EVENT AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED IN ACCORDANCE WITH THE FOLLOWING:

1. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING, OR DETERIORATION.
2. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDED AS NEEDED.
3. SILT FENCES SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCES WHEN IT REACHES ONE-HALF THE HEIGHT OF THE SILT FENCE.
4. THE CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE CONSTRUCTION ENTRANCES AS CONDITIONS DEMAND.
5. THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE). THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE TEMPORARY PARKING AS CONDITIONS DEMAND.
6. OUTLET STRUCTURES IN THE SEDIMENTATION BASINS SHALL BE MAINTAINED IN OPERATIONAL CONDITIONS AT ALL TIMES. SEDIMENT SHALL BE REMOVED FROM SEDIMENT BASINS ANNUALLY OR IF CONDITIONS WARRANT EARLIER REMOVAL.

ACREAGE SUMMARY in ACRES	
TOTAL DISTURBED	35.14 AC±

TEMPORARY SEEDING

SEED: MIXTURE 70% RYEGRASS/ 30% WINTER WHEAT – 4 LBS/ 1000 S.F.

CAUTION NOTICE TO CONTRACTOR

IF PROPERLY IMPLEMENTED, THIS PLAN WILL PROVIDE AN EFFECTIVE MEANS FOR CONTROLLING EROSION. HOWEVER, IT IS ACKNOWLEDGED THAT NO ONE PLAN CAN BE PREPARED THAT WILL DEPICT ALL POSSIBLE CONTROL MEASURES NECESSARY FOR VARIOUS STAGES OF CONSTRUCTION. THE CONTRACTOR SHALL INCLUDE IN THE BASE BID ADEQUATE FUNDS TO PROVIDE ALL EROSION CONTROL MEASURES NECESSARY TO COMPLY WITH CODES FOR THE DURATION OF THE CONSTRUCTION PROJECT.

SPECIFICATION REQUIREMENTS

THE REQUIREMENTS SHOWN ON THIS PLAN ARE SUPPLEMENTED BY THE SWPPP SPECIFICATIONS. IN CASE OF CONFLICTS CONTAINED WITHIN THE PROJECT BETWEEN THE PLANS, SWPPP SPECIFICATIONS AND THE ACTUAL GENERAL PERMIT, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.

ISSUE	DATE	DESCRIPTION
	8/17/2016	SOIL EROSION SEDIMENT CONTROL PLAN

PROJECT MANAGER C. JACOBS
PROJECT NUMBER 000000000238926

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

SOIL EROSION AND SEDIMENT CONTROL PHASE II PLAN

SCALE IN FEET 0 100 200
FILENAME 01C905.dwg
SCALE AS SHOWN
SHEET 01C905

SEQUENCE OF CONSTRUCTION

PHASE III

1. INSTALL STORM DRAINAGE SYSTEM. INSTALL INLET PROTECTIONS AROUND ALL STORM SEWER STRUCTURES AS THEY ARE INSTALLED.
2. INSTALL UTILITIES AND BEGIN BUILDING PAD CONSTRUCTION.
3. PERFORM FINISH GRADING.
4. INSTALL PERMANENT SEEDING ON ALL PERIMETER AREAS.
5. INSTALL GRAVEL STABILIZATION TO ALL AREAS AS FINISH GRADING IS COMPLETED IN PREPARATION FOR PAVING.

MAINTENANCE

ALL MEASURES STATED ON THIS EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLANATION, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON A MINIMUM OF ONCE EVERY SEVEN (7) DAYS OR 24 HOURS AFTER A 0.25 INCH RAINFALL EVENT AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED IN ACCORDANCE WITH THE FOLLOWING:

1. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING, OR DETERIORATION.
2. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDED AS NEEDED.
3. SILT FENCES SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCES WHEN IT REACHES ONE-HALF THE HEIGHT OF THE SILT FENCE.
4. THE CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE CONSTRUCTION ENTRANCES AS CONDITIONS DEMAND.
5. THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE). THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE TEMPORARY PARKING AS CONDITIONS DEMAND.
6. OUTLET STRUCTURES IN THE SEDIMENTATION BASINS SHALL BE MAINTAINED IN OPERATIONAL CONDITIONS AT ALL TIMES. SEDIMENT SHALL BE REMOVED FROM SEDIMENT BASINS ANNUALLY OR IF CONDITIONS WARRANT EARLIER REMOVAL.
7. MAINTAIN PHASE I SILT FENCE PERIMETER INSTALLATION.

ACREAGE SUMMARY in ACRES	
IMPERV. AREA	17.18 AC±
SEEDED AREA	17.96 AC±
TOTAL DISTURBED	35.14 AC±

TEMPORARY SEEDING

SEED: MIXTURE 70% RYEGRASS/ 30% WINTER WHEAT – 4 LBS/ 1000 S.F.

PERMANENT SEEDING

SEED: KY 31 FESCUE @ 6 LBS./ 1000 S.F.

CAUTION NOTICE TO CONTRACTOR

IF PROPERLY IMPLEMENTED, THIS PLAN WILL PROVIDE AN EFFECTIVE MEANS FOR CONTROLLING EROSION. HOWEVER, IT IS ACKNOWLEDGED THAT NO ONE PLAN CAN BE PREPARED THAT WILL DEPICT ALL POSSIBLE CONTROL MEASURES NECESSARY FOR VARIOUS STAGES OF CONSTRUCTION. THE CONTRACTOR SHALL INCLUDE IN THE BASE BID ADEQUATE FUNDS TO PROVIDE ALL EROSION CONTROL MEASURES NECESSARY TO COMPLY WITH CODES FOR THE DURATION OF THE CONSTRUCTION PROJECT.

SPECIFICATION REQUIREMENTS

THE REQUIREMENTS SHOWN ON THIS PLAN ARE SUPPLEMENTED BY THE SWPPP SPECIFICATIONS. IN CASE OF CONFLICTS CONTAINED WITHIN THE PROJECT BETWEEN THE PLANS, SWPPP SPECIFICATIONS AND THE ACTUAL GENERAL PERMIT, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.

MATCH LINE

MATCH LINE

PROPOSED PROPERTY BOUNDARY

PROPOSED ZONING SETBACK

"BIOLOGICAL" WETLANDS" CONSTRAINT

TOPSOIL STOCKPILE AREA
INSTALL SILT FENCE AT TOE OF SLOPE, THIS FENCE DOES NOT SUPPLANT PERIMETER SILT FENCE ALONG PERIMETER LOD.

CONSTRUCTION STAGING AREA

PROPOSED PROPERTY BOUNDARY

BIOLOGICAL WETLANDS CONSTRAINT

PROPOSED PROPERTY BOUNDARY

BIOLOGICAL WETLANDS CONSTRAINT

BIOLOGICAL WETLANDS CONSTRAINT

BIOLOGICAL WETLANDS CONSTRAINT

WALLUM LANE

ROAD

IRON MINE BROOK

LOD

IP6

574

570

560

550

545

540

535

ISSUE	DATE	DESCRIPTION
	8/17/2016	SOIL EROSION SEDIMENT CONTROL PLAN

PROJECT MANAGER	C. JACOBS
PROJECT NUMBER	000000000238926

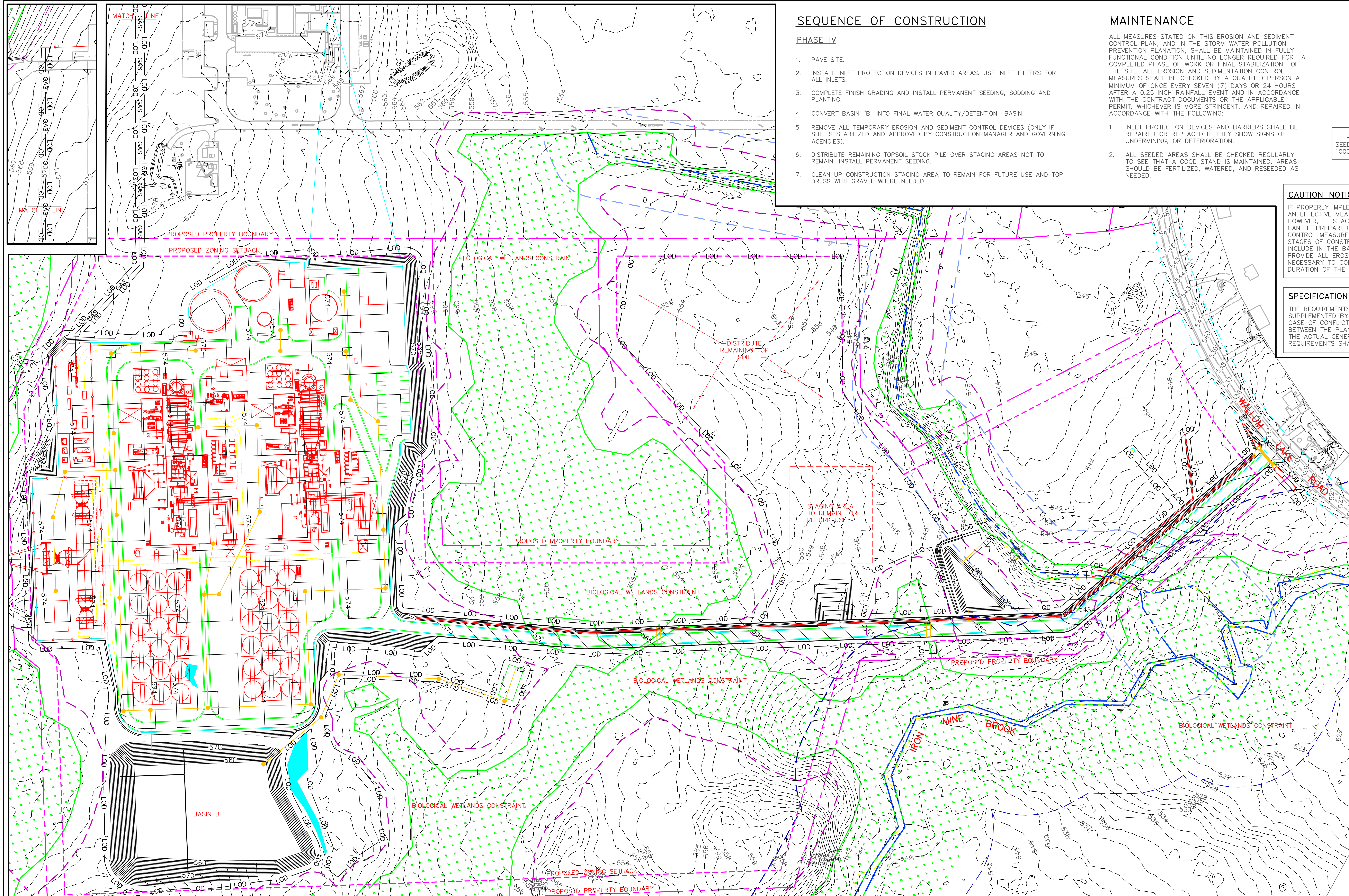
CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

SOIL EROSION AND SEDIMENT CONTROL PHASE III PLAN

SCALE IN FEET
0 100 200

FILENAME	01C906.dwg
SCALE	AS SHOWN

SHEET 01C906



SEQUENCE OF CONSTRUCTION

PHASE IV

1. PAVE SITE.
2. INSTALL INLET PROTECTION DEVICES IN PAVED AREAS. USE INLET FILTERS FOR ALL INLETS.
3. COMPLETE FINISH GRADING AND INSTALL PERMANENT SEEDING, SODDING AND PLANTING.
4. CONVERT BASIN "B" INTO FINAL WATER QUALITY/DETENTION BASIN.
5. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES (ONLY IF SITE IS STABILIZED AND APPROVED BY CONSTRUCTION MANAGER AND GOVERNING AGENCIES).
6. DISTRIBUTE REMAINING TOPSOIL STOCK PILE OVER STAGING AREAS NOT TO REMAIN. INSTALL PERMANENT SEEDING.
7. CLEAN UP CONSTRUCTION STAGING AREA TO REMAIN FOR FUTURE USE AND TOP DRESS WITH GRAVEL WHERE NEEDED.

MAINTENANCE

ALL MEASURES STATED ON THIS EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLANATION, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON A MINIMUM OF ONCE EVERY SEVEN (7) DAYS OR 24 HOURS AFTER A 0.25 INCH RAINFALL EVENT AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED IN ACCORDANCE WITH THE FOLLOWING:

1. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING, OR DETERIORATION.
2. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDED AS NEEDED.

PERMANENT SEEDING

SEED: KY 31 FESCUE @ 6 LBS./ 1000 S.F.

CAUTION NOTICE TO CONTRACTOR

IF PROPERLY IMPLEMENTED, THIS PLAN WILL PROVIDE AN EFFECTIVE MEANS FOR CONTROLLING EROSION. HOWEVER, IT IS ACKNOWLEDGED THAT NO ONE PLAN CAN BE PREPARED THAT WILL DEPICT ALL POSSIBLE CONTROL MEASURES NECESSARY FOR VARIOUS STAGES OF CONSTRUCTION. THE CONTRACTOR SHALL INCLUDE IN THE BASE BID ADEQUATE FUNDS TO PROVIDE ALL EROSION CONTROL MEASURES NECESSARY TO COMPLY WITH CODES FOR THE DURATION OF THE CONSTRUCTION PROJECT.

SPECIFICATION REQUIREMENTS

THE REQUIREMENTS SHOWN ON THIS PLAN ARE SUPPLEMENTED BY THE SWPPP SPECIFICATIONS. IN CASE OF CONFLICTS CONTAINED WITHIN THE PROJECT BETWEEN THE PLANS, SWPPP SPECIFICATIONS AND THE ACTUAL GENERAL PERMIT, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.

HDR

ISSUE	DATE	DESCRIPTION
	8/17/2016	SOIL EROSION SEDIMENT CONTROL PLAN

PROJECT MANAGER C. JACOBS

PROJECT NUMBER 000000000238926

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

SOIL EROSION AND SEDIMENT CONTROL PHASE IV PLAN

SCALE IN FEET 0 100 200

FILENAME 01C907.dwg

SCALE AS SHOWN

SHEET 01C907

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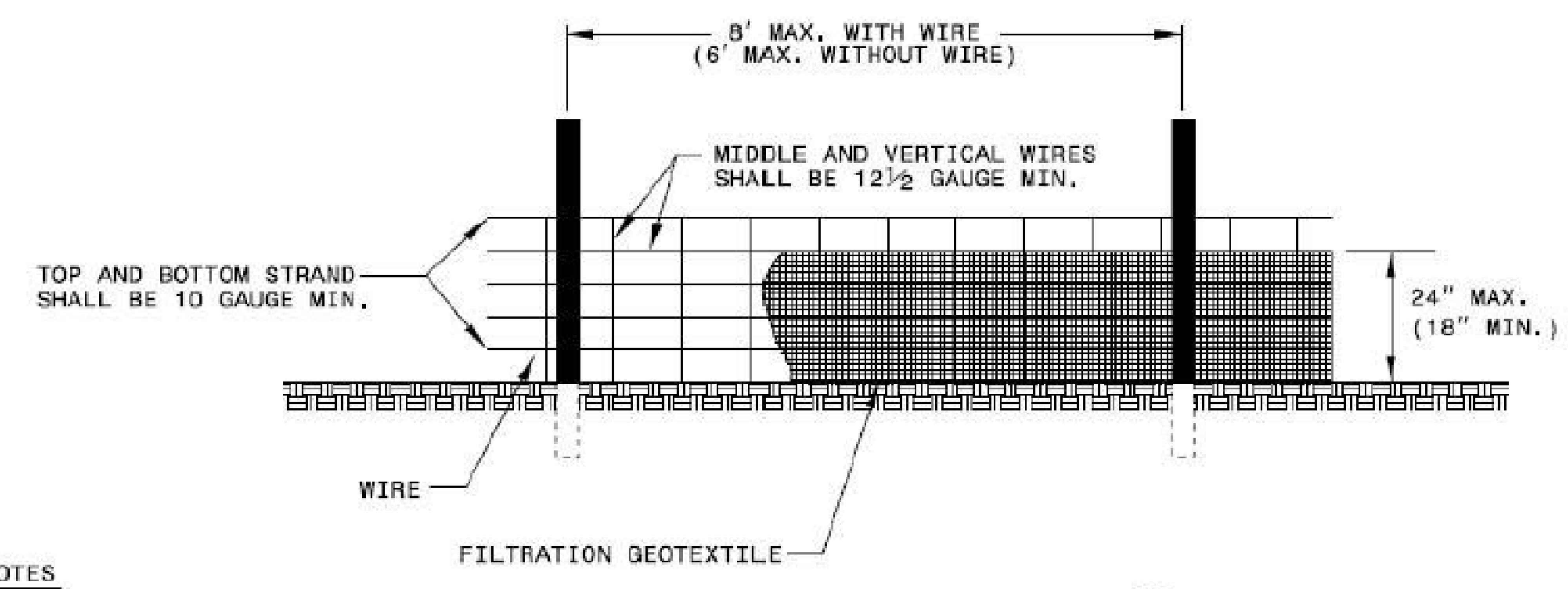


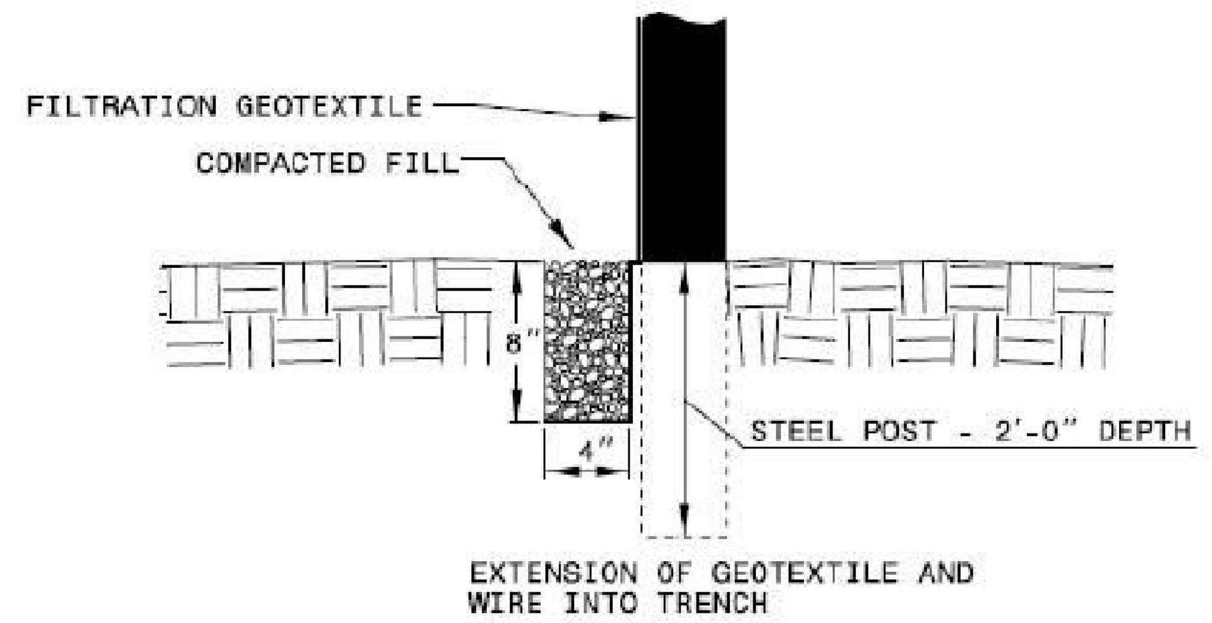
NOTES

USE WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.

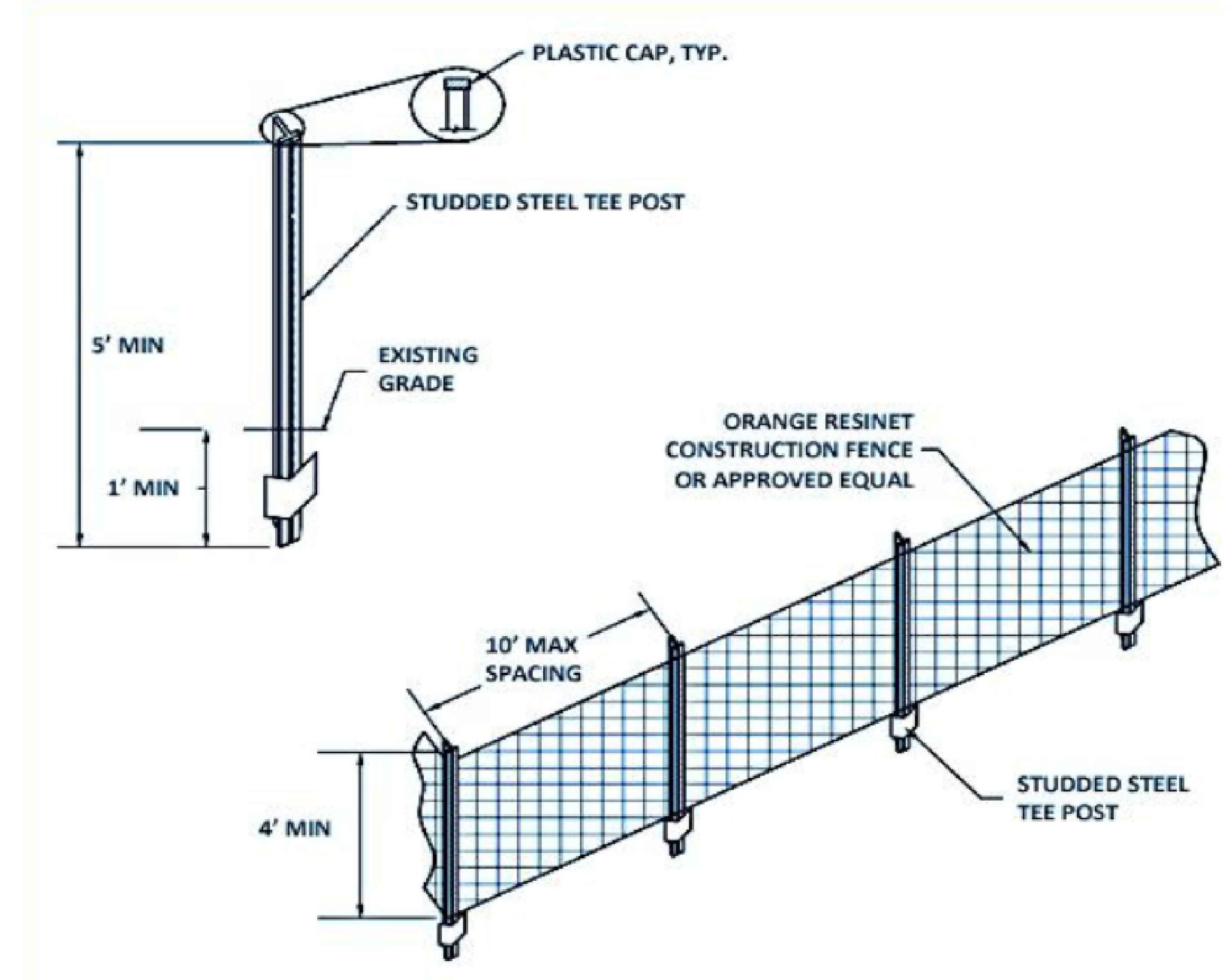
USE FILTRATION GEOTEXTILE A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE WIRE AS DIRECTED.

PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.

FOR MECHANICAL SLICING METHOD INSTALLATION, GEOTEXTILE SHALL BE A MAXIMUM OF 18" ABOVE GROUND SURFACE.

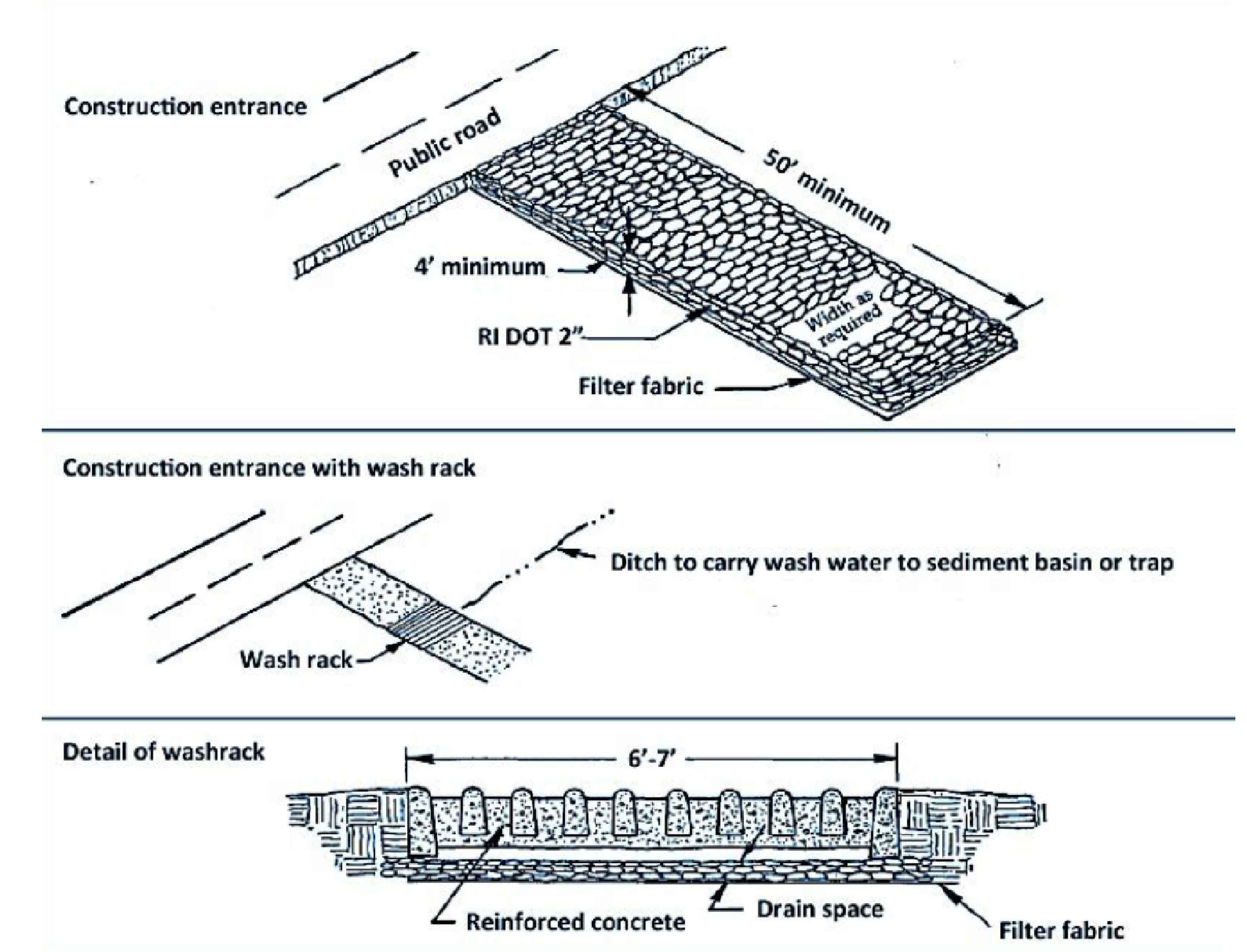


SILT FENCE DETAIL 1 01C908
SCALE: NTS

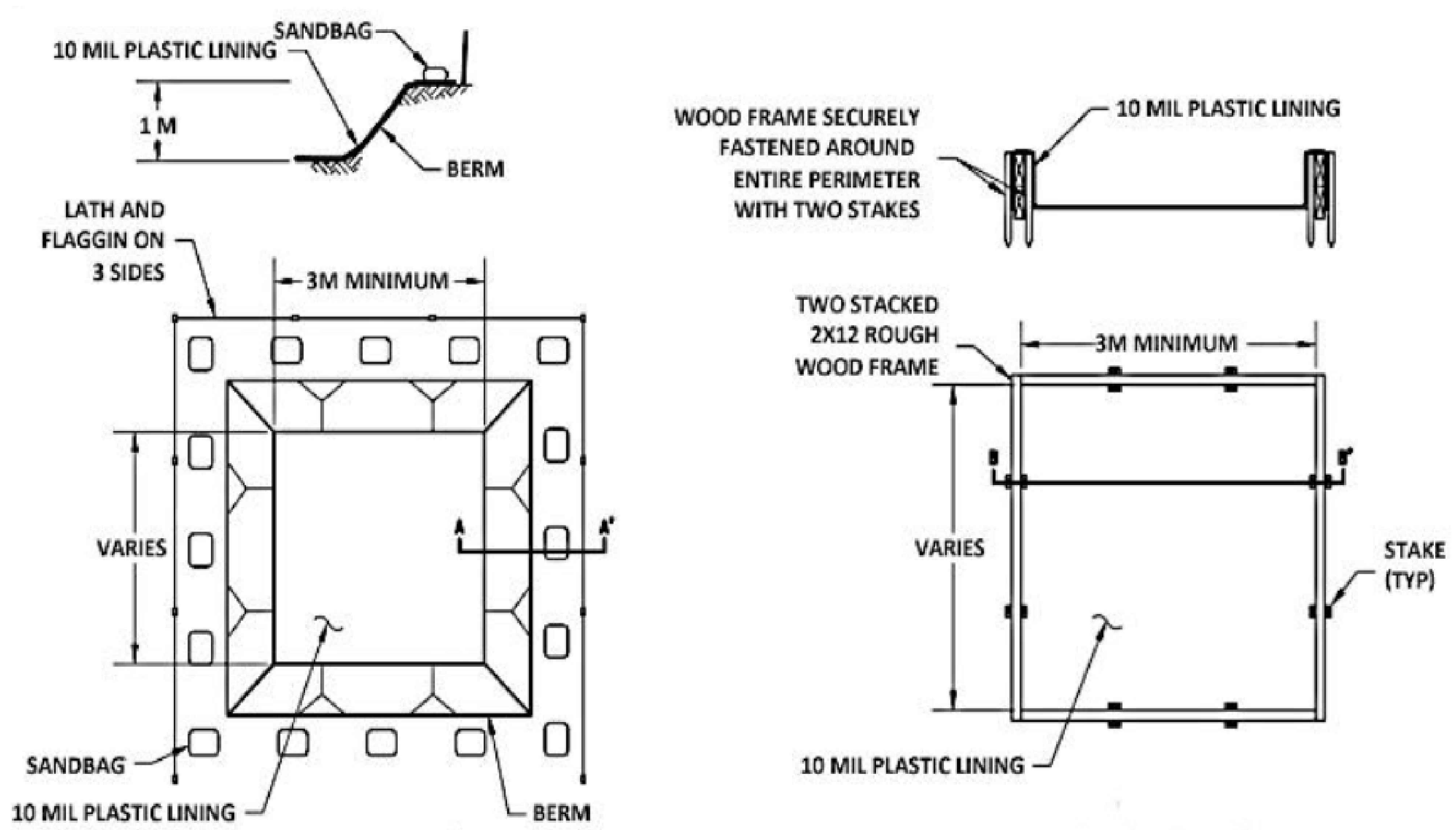


FOR REFERENCE PURPOSES ONLY. NOT FOR CONSTRUCTION PURPOSES.

CONSTRUCTION FENCE DETAIL 2 01C908
SCALE: NTS



CONSTRUCTION ENTRANCE 3 01C908
SCALE: NTS

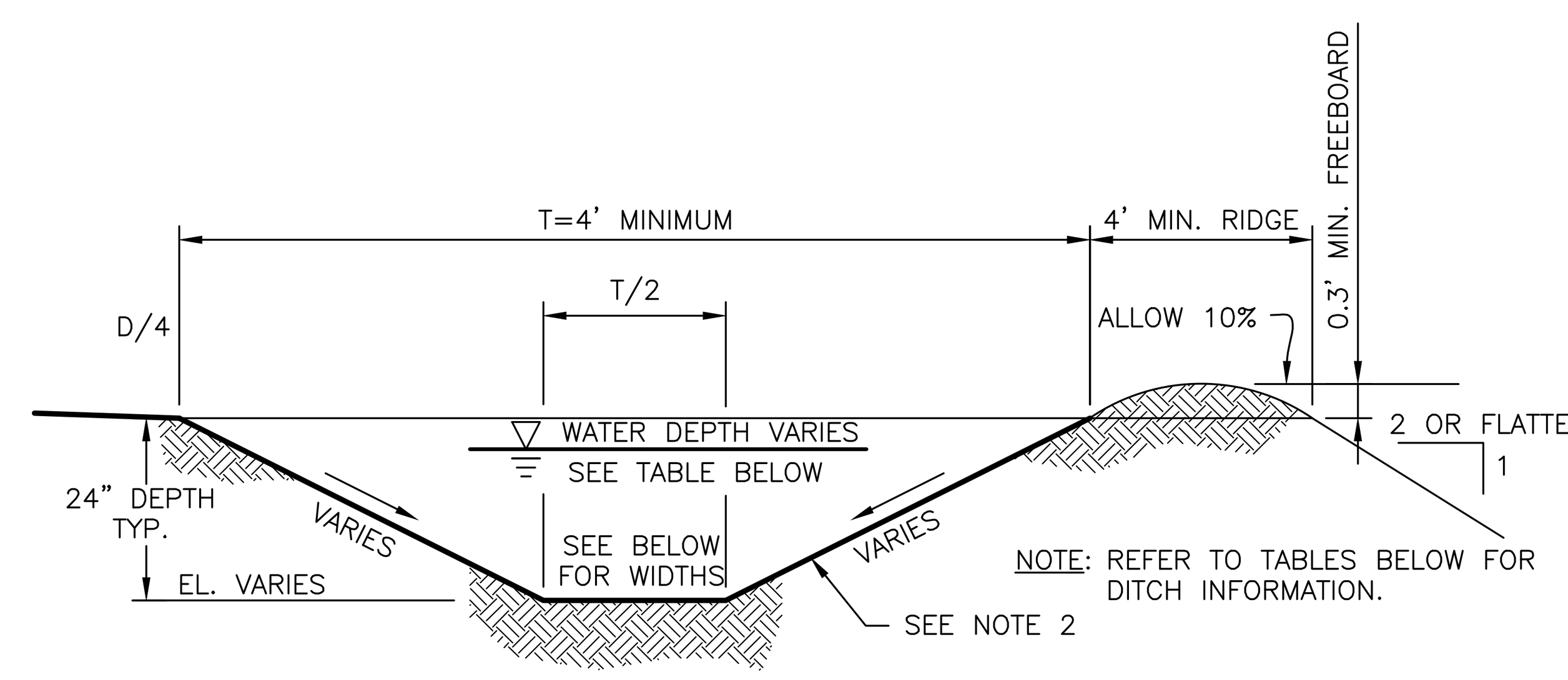


PLAN
NOT TO SCALE
TYPE "BELOW GRADE"
SECTION A-A'
NOT TO SCALE

PLAN
NOT TO SCALE
TYPE "ABOVE GRADE" WITH WOOD PLANKS
SECTION B-B'
NOT TO SCALE

NOTES:
1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. FOR REFERENCE PURPOSES ONLY. NOT FOR CONSTRUCTION PURPOSES.

CONCRETE WASHOUT DETAIL 4 01C908
SCALE: NTS



NOTES:
1. MINIMUM DESIGN CAPACITY SHALL CONVEY A 10 YR.-24 HR. PEAK FLOW WITHOUT EROSION.
2. INSTALL EROSION CONTROL BLANKETS OR TURF REINFORCEMENT MATS AS NEEDED FOR EROSION RESISTANCE.

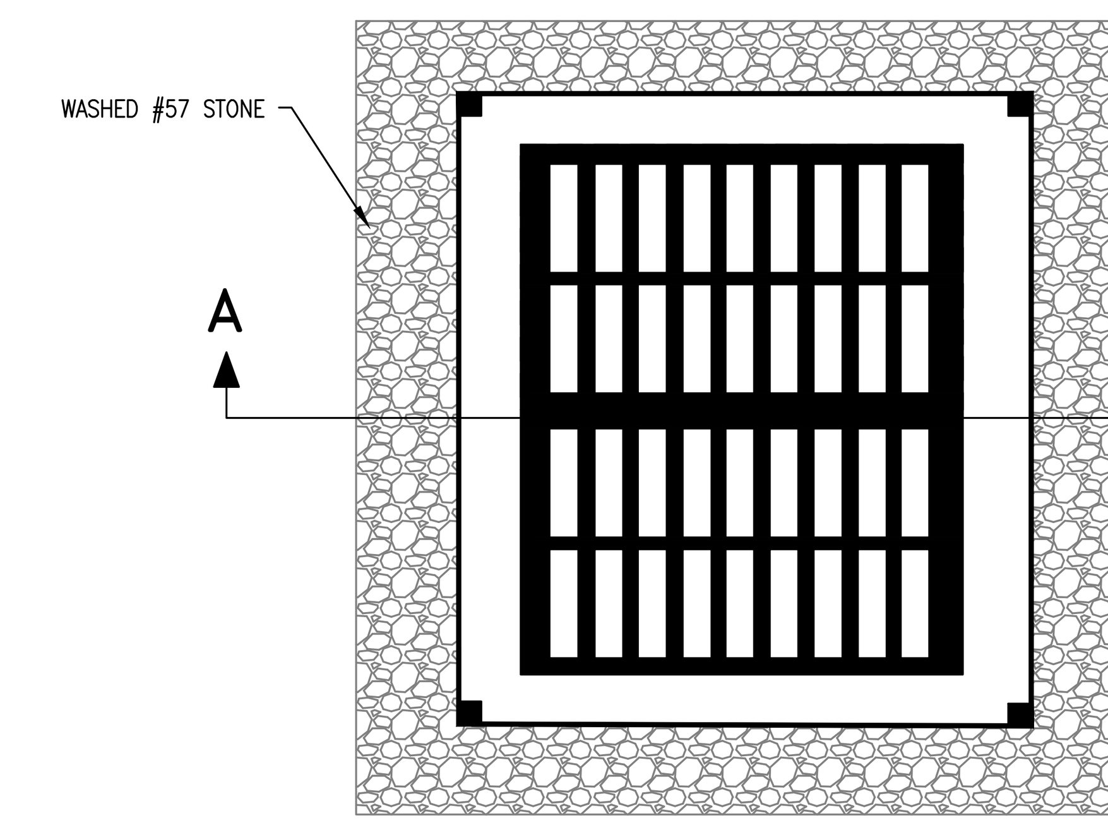
DIVERSION DITCH INFORMATION

DITCH NO.	BOTTOM WIDTH (FT.)	SIDE SLOPES	HEIGHT (FT.)	DITCH SLOPE	LINING	WATER DEPTH 10 YR. STORM	WATER DEPTH 100 YR. STORM
DB1	2	2 TO 1	2	0.5%	NONE	1.15'	1.53'
DB2	2	2 TO 1	2	0.7%	NONE	1.11'	1.48'
DB3	4	3 TO 1	2	21.9%	RIP-RAP	0.63'	0.87'
DB4	5	3 TO 1	2	0.5%	NONE	1.44'	1.95'
DB5	5	3 TO 1	2	1.0%	NONE	1.21'	1.65'
DB6	5	3 TO 1	2	10.0%	RIP-RAP	0.91'	1.25'

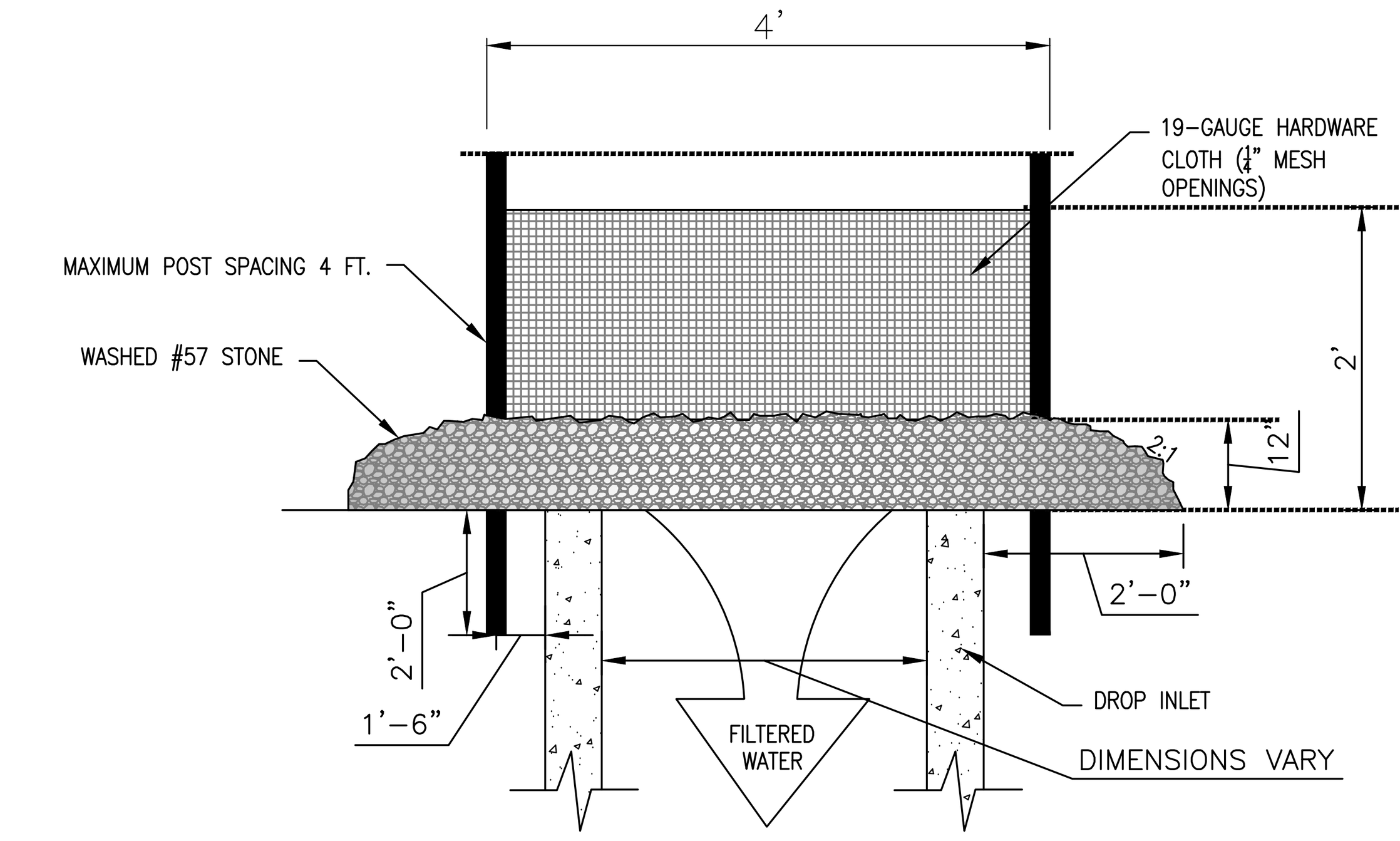
DIVERSION DITCH DETAIL 5 01C908
SCALE: NTS

GENERAL NOTES:

1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
2. LAND SLOPE IMMEDIATELY SURROUNDING THIS DEVICE SHOULD NOT EXCEED 1 PERCENT.
3. SUPPORT STAKES FOR FABRIC SHALL BE A MINIMUM OF 3 FEET LONG, SPACED A MAXIMUM OF 4 FEET APART. THEY SHOULD BE DRIVEN CLOSE TO THE INLET SO ANY OVERFLOW DROPS INTO THE INLET AND NOT ON UNPROTECTED SOIL.
4. SURROUND THE POSTS WITH REINFORCED FILTER FABRIC. SECURE THE FABRIC TO THE POSTS AT THE TOP, MIDDLE, AND BOTTOM.
5. PLACE CLEAN GRAVEL, #57 STONE ON A 2:1 SLOPE WITH A HEIGHT OF 12 INCHES AROUND THE FABRIC, AND SMOOTH TO AN EVEN GRADE.
6. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.



TOP VIEW



SIDE VIEW
(NO SCALE)

FABRIC DROP INLET PROTECTION 6 01C908
SCALE: NTS

D C B A

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HDR

PROJECT MANAGER	C. JACOBS
PROJECT NUMBER	000000000238926

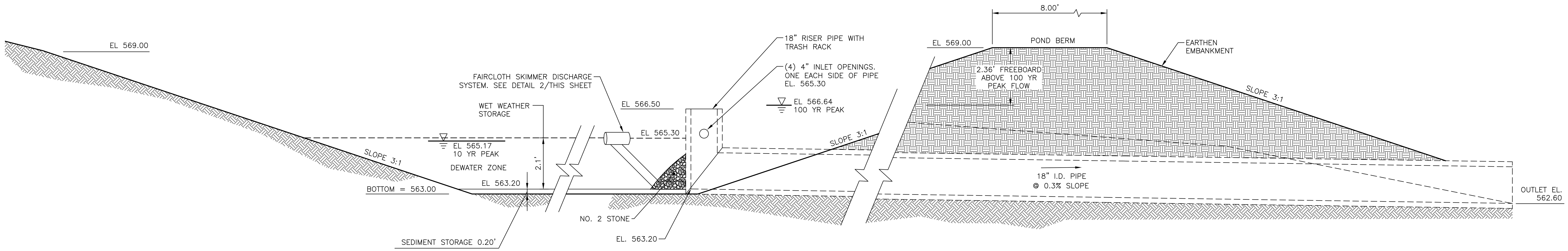
ISSUE DATE DESCRIPTION

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

SOIL EROSION AND SEDIMENT CONTROL DETAILS

SCALE IN FEET 0 1000 2000

FILENAME 01C908.dwg
SCALE AS SHOWN
SHEET 01C908



BASIN A DETAIL

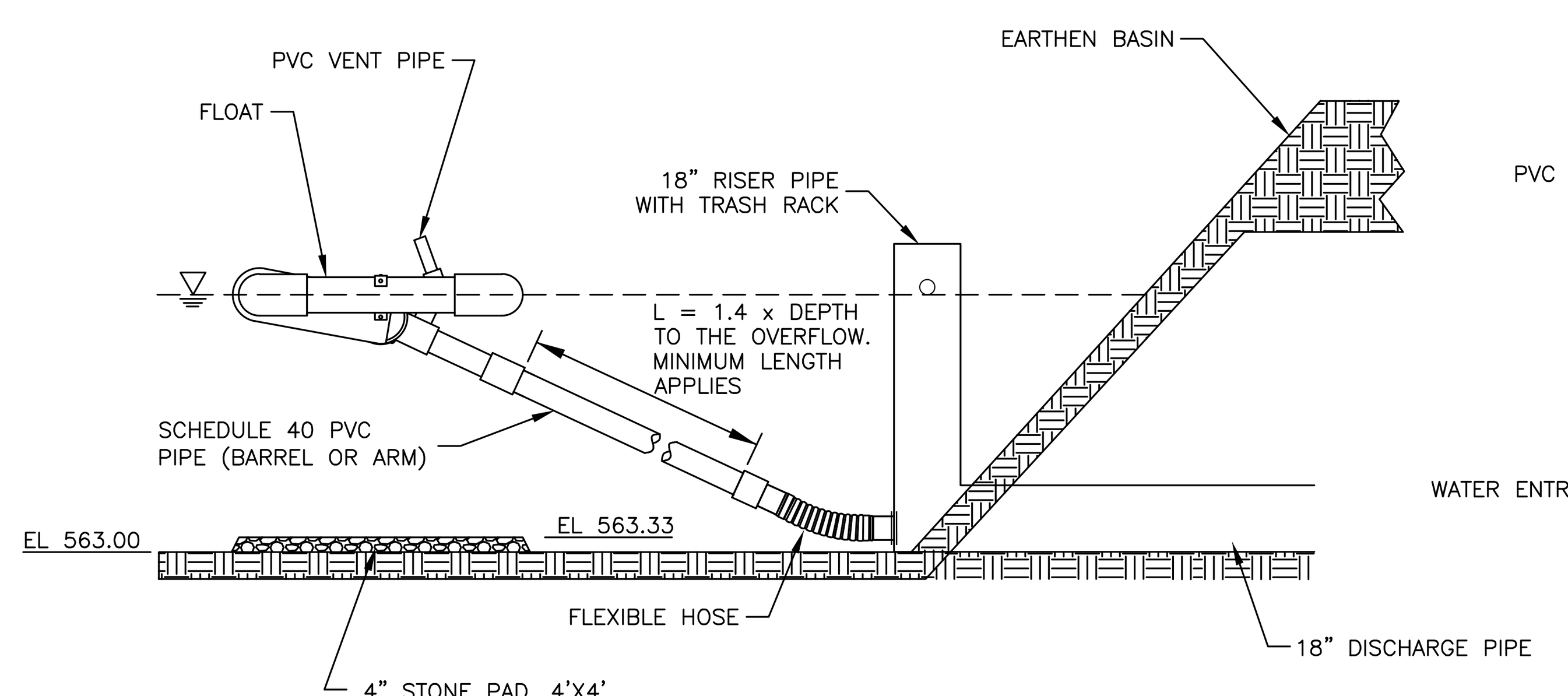
SCALE: 1/2"=1'-0"

1 / 01C909

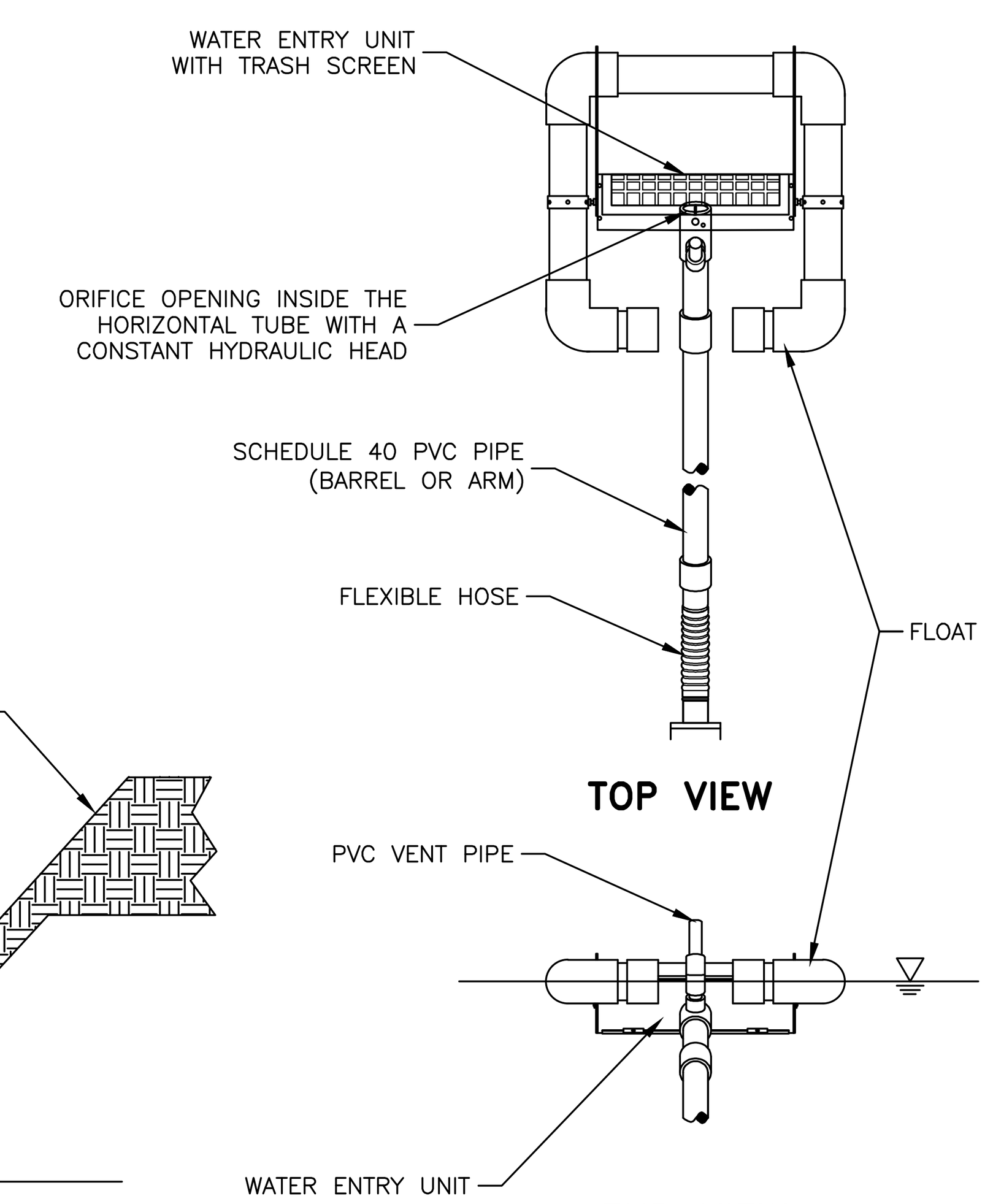
GENERAL NOTES:

1. PROPER DESIGN MUST BE COMPLETED TO MINIMIZE PIPING AROUND DISCHARGE PIPE.
2. PROPER ORIFICE OPENING MUST BE SELECTED TO ENSURE POND DRAINS IN CORRECT AMOUNT OF TIME. MODIFICATIONS MAY BE REQUIRED IF FIELD CONDITIONS WARRANT A CHANGE.
3. EMBANKMENT MUST BE COMPACTED TO DESIGN SPECIFICATIONS.
4. EMERGENCY SPILLWAY MUST BE CORRECTLY SIZED AND EROSION PROTECTION INSTALLED.
5. EROSION PROTECTION MUST BE INSTALLED ALONG THE EMBANKMENT AND AT THE DISCHARGE END OF THE PIPE.
6. INSPECT SYSTEM REGULARLY TO ENSURE IT IS FUNCTIONING IN A CORRECT MANNER.

NOTE: SIZE SKIMMER FOR 0.85 CFS OUTFLOW.



SIDE VIEW
(NO SCALE)



FAIRCLOTH® SKIMMER DISCHARGE SYSTEM WITH EMBANKMENT – BASIN A

SCALE: NTS

2 / 01C909

HDR

ISSUE	DATE	DESCRIPTION

PROJECT MANAGER C. JACOBS

PROJECT NUMBER 000000000238926

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

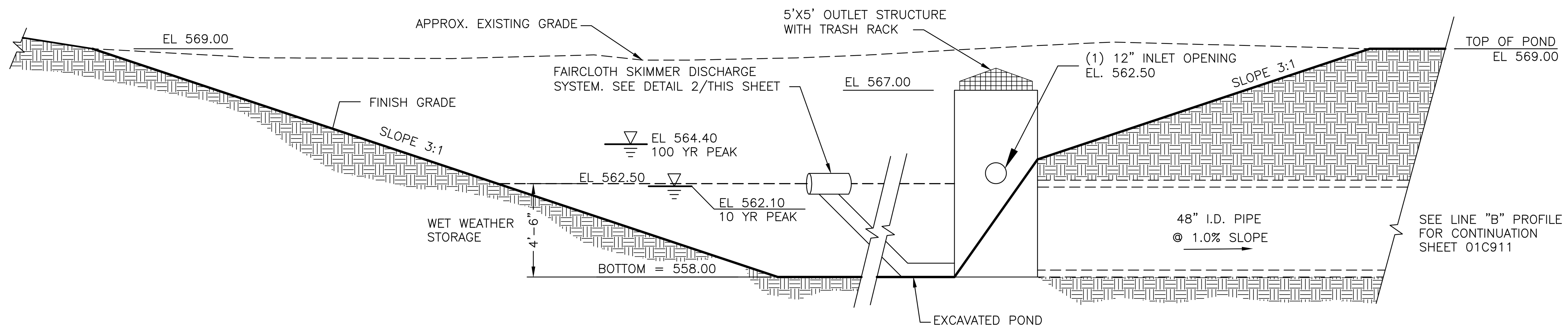
PROPOSED SWPP DETAILS

SCALE IN FEET 0 1 2

FILENAME 01C909.dwg

SCALE AS SHOWN

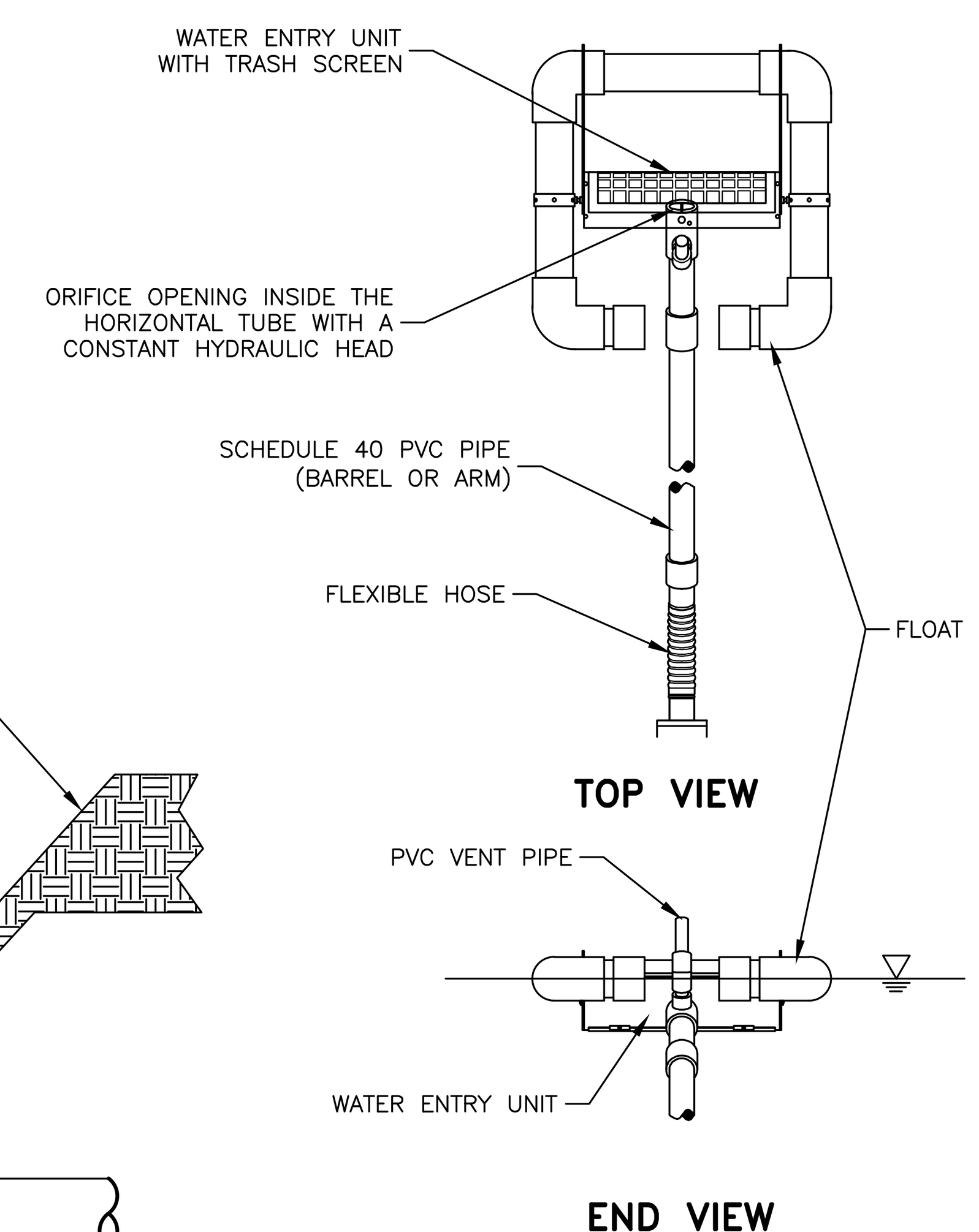
SHEET **01C909**



BASIN B DETAIL

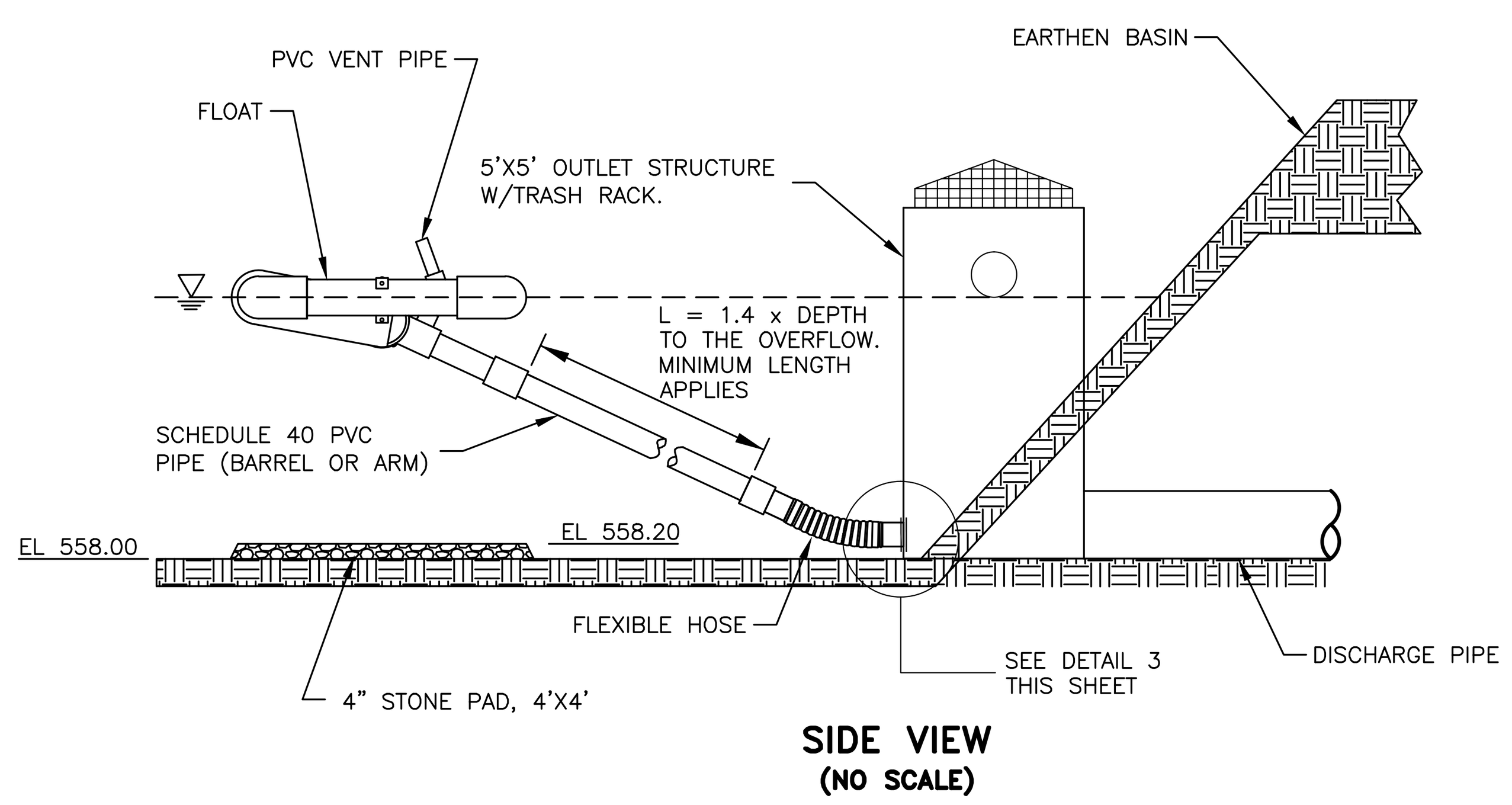
SCALE: 1/2"=1'-0"

1 / 01C910



GENERAL NOTES:
1. PROPER DESIGN MUST BE COMPLETED TO MINIMIZE PIPING AROUND DISCHARGE PIPE.
2. PROPER ORIFICE OPENING MUST BE SELECTED TO ENSURE POND DRAINS IN CORRECT AMOUNT OF TIME. MODIFICATIONS MAY BE REQUIRED IF FIELD CONDITIONS WARRANT A CHANGE.
3. EMBANKMENT MUST BE COMPACTED TO DESIGN SPECIFICATIONS.
4. EMERGENCY SPILLWAY MUST BE CORRECTLY SIZED AND EROSION PROTECTION INSTALLED.
5. EROSION PROTECTION MUST BE INSTALLED ALONG THE EMBANKMENT AND AT THE DISCHARGE END OF THE PIPE.
6. INSPECT SYSTEM REGULARLY TO ENSURE IT IS FUNCTIONING IN A CORRECT MANNER.

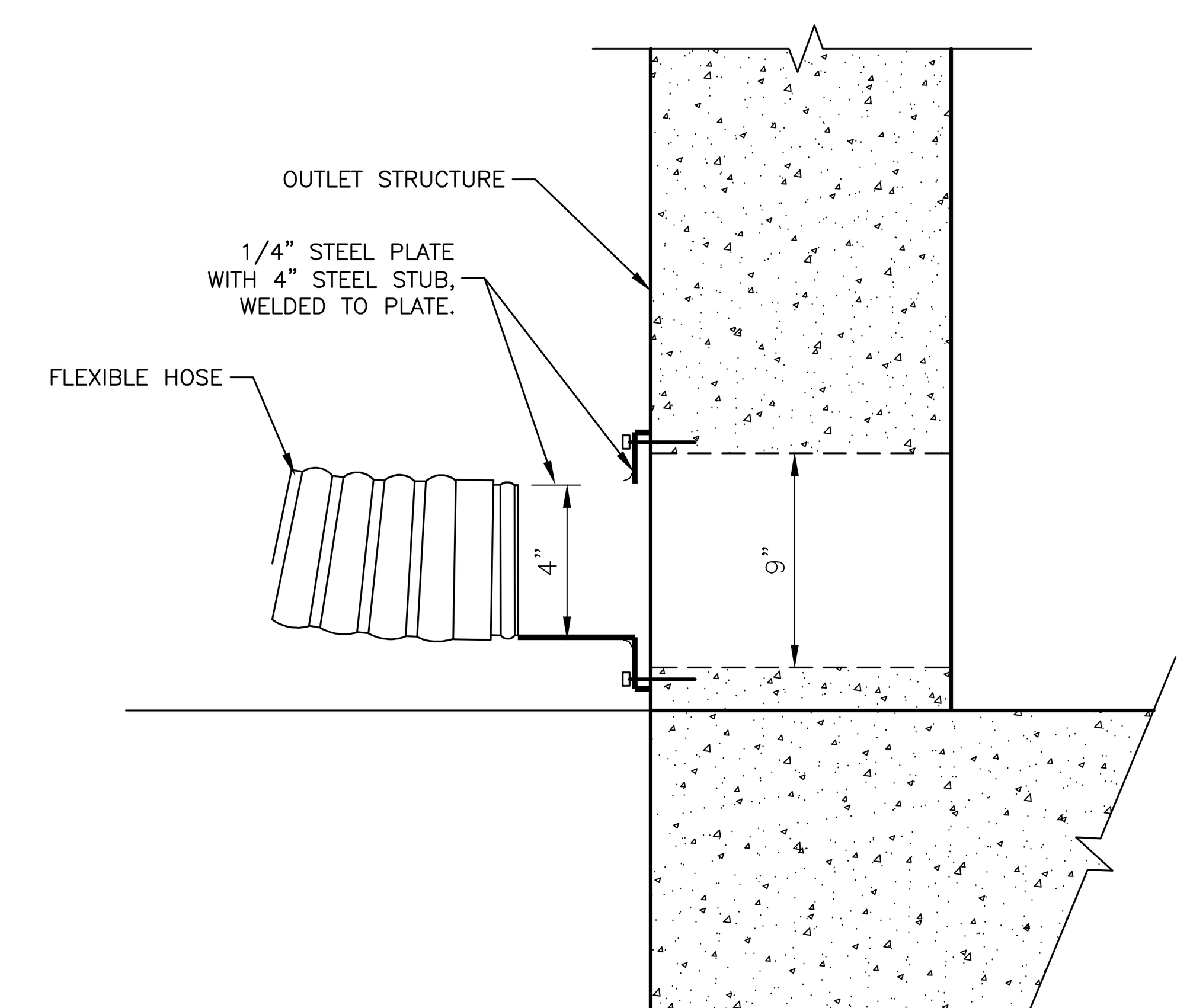
NOTE: SIZE SKIMMER FOR 0.85 CFS OUTFLOW.



FAIRCLOTH® SKIMMER DISCHARGE SYSTEM WITH EMBANKMENT – BASIN B

SCALE: NTS

2 / 01C910



SKIMMER CONNECTION DETAIL

SCALE: NTS

3 / 01C910

PROJECT MANAGER C. JACOBS

ISSUE	DATE	DESCRIPTION

PROJECT NUMBER 000000000238926

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

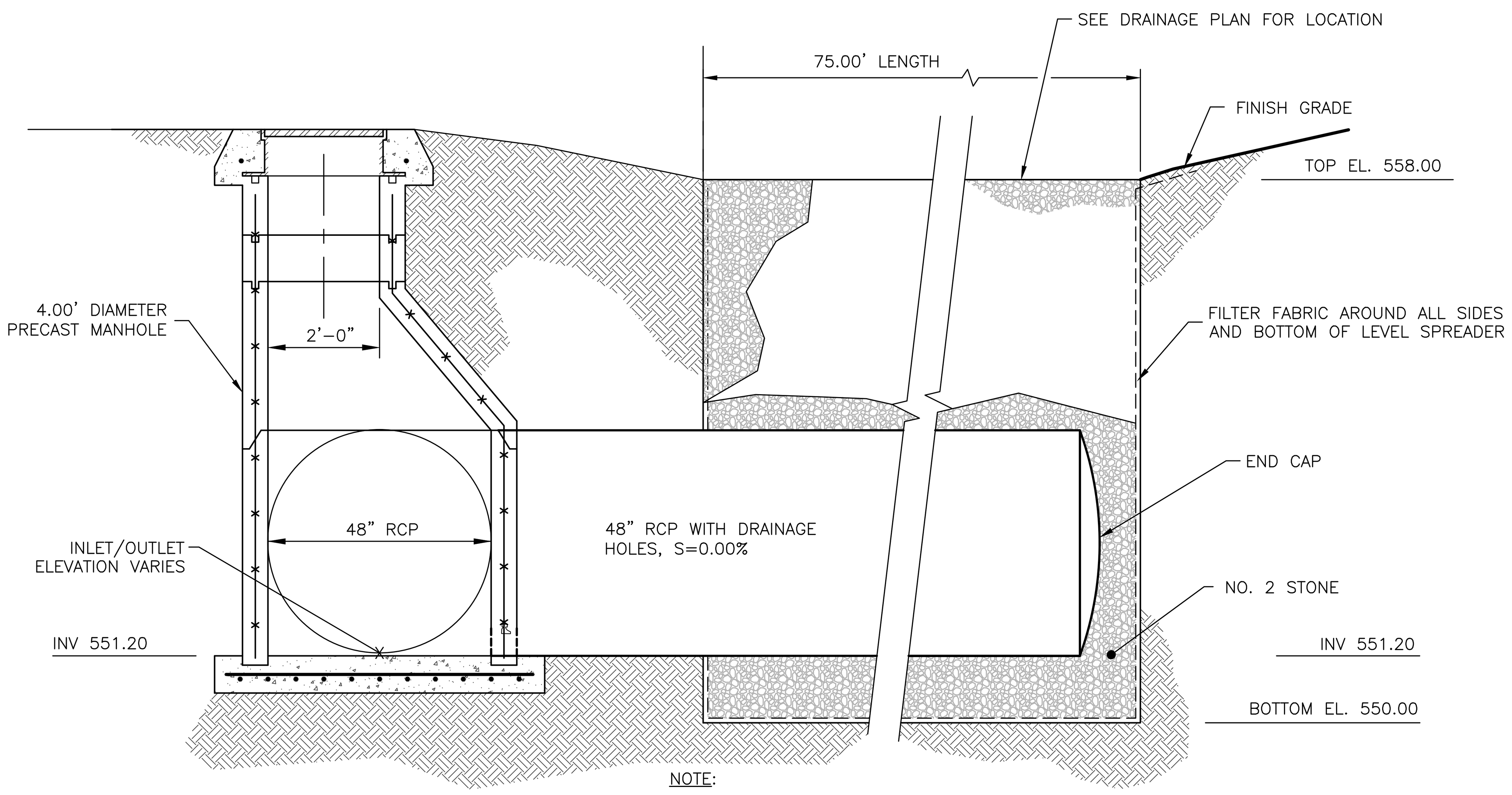
PROPOSED SWPP DETAILS

SCALE IN FEET 0 1 2

FILENAME 01C910.dwg

SCALE AS SHOWN

SHEET 01C910



NOTE:

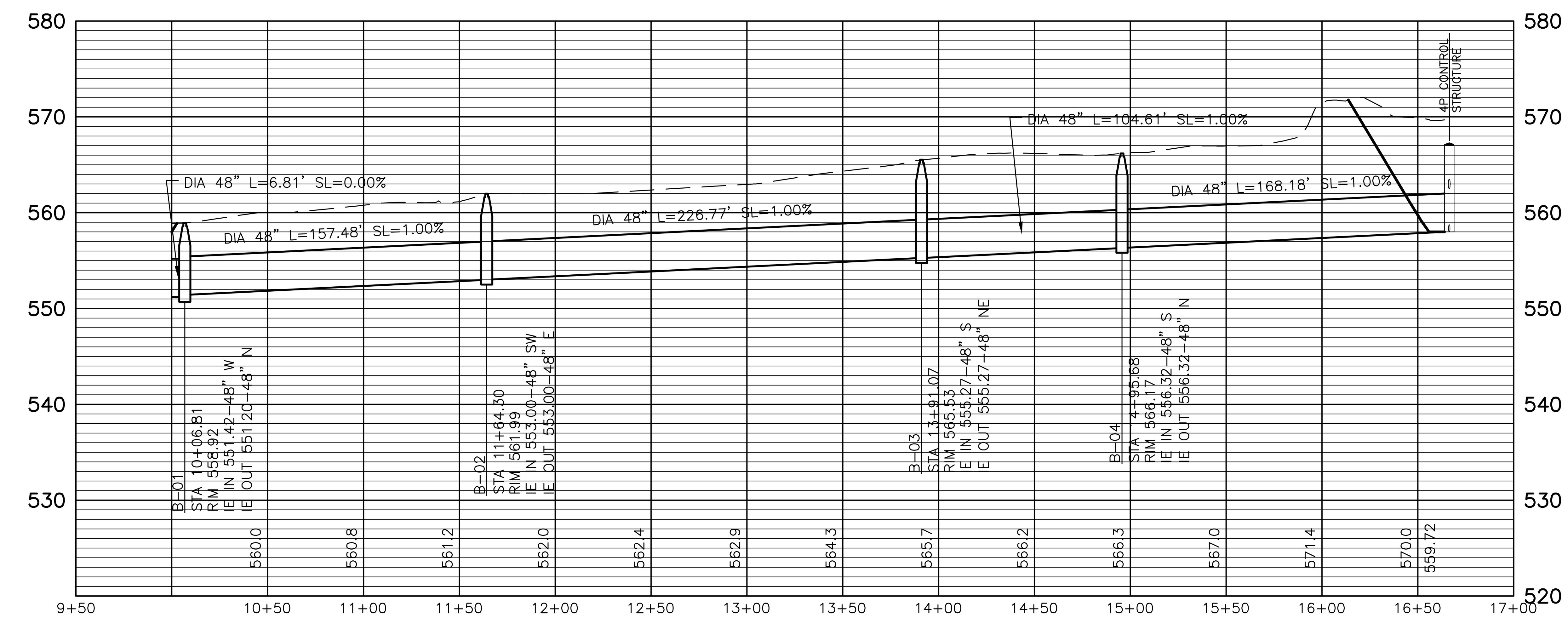
1) 48" I.D. PERFORATED UNDERDRAIN WITH FILTER SOCK. LAY PIPE WITH PERFORATIONS ON BOTTOM OF PIPE AND CAP END OF PIPE. LAY UNDERDRAIN AT 0.00% SLOPE FROM MANHOLE INVERT AND THRU BOTTOM OF LEVEL SPREADER.

2) WATER DEPTH MEASURED FROM TOP OF LEVEL SPREADER = EL 558.00.

LEVEL SPREADER DETAIL (18P)

SCALE: 1/2"=1'-0"

1 / 01C911



PROFILE OF LINE B

SCALE: HOR- 1"=50' VER- 1" = 5'

2 / 01C911

PROJECT MANAGER	C. JACOBS
ISSUE DATE DESCRIPTION	
PROJECT NUMBER	000000000238926

CLEAR RIVER ENERGY CENTER
TOWN OF BURRILLVILLE,
PROVIDENCE COUNTY, RHODE ISLAND

PROPOSED SITE DRAINAGE DETAILS

SCALE IN FEET 0 1 2

FILENAME 01C911.dwg
SCALE AS SHOWN
SHEET **01C911**

Attachment B

SESC Site Plans

Attachment C

Copy of RIPDES Construction General Permit and Authorization to Discharge

Attachment D

Copy of Other Regulatory Permits

Additional Regulatory Permits for this project site are pending and will be included once issued by respective Agencies

Attachment E

Copy of RIPDES NOI

Attachment F

Inspection Reports w/ Corrective Action Log

SWPPP Inspection Report

Project Information			
Name/Location	**Clear River Energy Center/Wallum Lake Road (RI Route 100), Burrillville, RI**		
Project Manager		**Resident Engineer**	
Contractor		**SWPPP Contact**	
E&S Sub-Contractor		**SWPPP Contact**	

Inspection Information			
Inspector			
Inspection Date		**Start/End Time**	

Inspection Type
❑ **Weekly** ❑ **Pre-storm event** ❑ **During storm event** ❑ **Post-storm event** ❑ **Violation**

Weather Information

Rain Gauge:

Last Rain Event
Date: Duration (hrs): Approximate Rainfall (in):

Current Weather at time of this inspection:

Weather Forecast at time of this inspection: (when is next precipitation or wind event anticipated?)

Certification Statements

Inspector: (check one)
☐ I, as the designated Inspector, certify that this site has been inspected and is in compliance with the site-specific SWPPP.

☐ I, as the designated Inspector, certify that this site has been inspected and I have made the determination that the site requires corrective actions before it will be compliant with the site-specific SWPPP. The required corrective actions are noted within this inspection report.

Print Name:	Signature:	Date:

Resident Engineer:
I, the Resident Engineer, acknowledge the receipt of this SWPPP inspection report, and understand the requirements set forth in the Site Specifications and the Contract Documents regarding the implementation and maintenance of erosion and sedimentation controls.

Print Name:	Signature:	Date:

Contractor:
I, the designated Contractor representative, acknowledge the receipt of this SWPPP inspection report, and understand the requirements set forth in the Site Specifications and the Contract Documents regarding the implementation and maintenance of erosion and sedimentation controls.

Print Name:	Signature:	Date:

Site-specific BMPs

Number the structural and non-structural BMPs identified in the SWPPP on the site map and list them below (add as necessary). Bring a copy of this inspection form and numbered site map with you during your inspections. This list will help ensure that you are inspecting all required BMPs at your site.

	Location/Station	BMP Description	Installed & Operating Properly?	Assoc. Photo/ Figure #	Corrective Action
1			❑Yes ❑No		
2			❑Yes ❑No		
3			❑Yes ❑No		
4			❑Yes ❑No		
5			❑Yes ❑No		
6			❑Yes ❑No		
7			❑Yes ❑No		
8			❑Yes ❑No		
9			❑Yes ❑No		
10			❑Yes ❑No		
11			❑Yes ❑No		
12			❑Yes ❑No		
13			❑Yes ❑No		
14			❑Yes ❑No		
15			❑Yes ❑No		

(add more as necessary)

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Please customize this list as needed for conditions at the site. If item is not applicable, please note why.

EROSION AND SEDIMENTATION BMP INSPECTION	Installed & Operating correctly?	Assoc. Photo/ Figure #	CORRECTIVE ACTION
Are **Limits of Disturbance** clearly marked?	❑Yes ❑No ❑ N/A		
Are **natural resource areas** (e.g., streams, wetlands, trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No ❑ N/A		
Is **construction sequencing** being followed?	❑Yes ❑No ❑ N/A		
Are **structural BMPs** properly installed to control stormwater flow on the construction site?	❑Yes ❑No ❑ N/A		
Is **clearing/grubbing** only occurring in areas that will have active work within 21-days?	❑Yes ❑No ❑ N/A		
Do **unstabilized areas** have appropriate controls in place?	❑Yes ❑No ❑ N/A		
Are all **slopes** protected from concentrated stormwater flow?	❑Yes ❑No ❑ N/A		
Are storm drain **inlets** properly protected?	❑Yes ❑No ❑ N/A		
Are storm drain **outfalls** properly protected?	❑Yes ❑No ❑ N/A		
Are **perimeter controls** and sediment barriers adequately installed and maintained?	❑Yes ❑No ❑ N/A		
Are discharge points and **receiving waters** free of sediment deposits?	❑Yes ❑No ❑ N/A		
Is **weather** forecast being checked regularly?	❑Yes ❑No ❑ N/A		
Notes on Erosion and Sediment Controls:			

GOOD HOUSEKEEPING BMP INSPECTION	Installed & Operating correctly?	Assoc. Photo/ Figure #	CORRECTIVE ACTION
Are BMPs effectively limiting **sediment** from being tracked into the street?	❑Yes ❑No ❑ N/A		
Is **trash/litter** from work areas collected and placed in covered containers regularly?	❑Yes ❑No ❑ N/A		
Are on-site **equipment**, vehicles, containers, and storage areas free from leaks?	❑Yes ❑No ❑ N/A		
Are **materials** that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No ❑ N/A		
Are **non-storm water discharges** free from contamination?	❑Yes ❑No ❑ N/A		
Are **stockpiles** covered (either with temporary vegetation or tarps), ringed with barrier BMPs, and located at least 50 feet away from natural resources and storm drains?	❑Yes ❑No ❑ N/A		
Are **washout facilities** (e.g. paint, concrete) available, clearly marked, and maintained and located at least 50-feet away from natural resources and storm drains?	❑Yes ❑No ❑ N/A		
Are **vehicle and equipment** fueling, cleaning, and maintenance areas free from leaks and located at least 50-feet away from natural resources and storm drains?	❑Yes ❑No ❑ N/A		
Is **dust** being controlled on-site?	❑Yes ❑No ❑ N/A		
Is **sweeping** being used to keep sediment off roads and parking lots?	❑Yes ❑No ❑ N/A		

PROCEURAL BMP INSPECTION	Installed & Operating correctly?	Assoc. Photo/ Figure #	Corrective Action
Are **permanent BMPs** being protected during the active construction phase?	❑Yes ❑No ❑ N/A		
Are all **structural BMPs** being maintained in accordance with RI SESC Handbook?	❑Yes ❑No		
Are **inspections** taking place every 7-days & after storm events?	❑Yes ❑No		
Have previous **Corrective Actions** been initiated & completed by the Contractor?	❑Yes ❑No ❑ N/A		
Are SWPPP **Amendments** being logged?	❑Yes ❑No ❑ N/A		
Are the SWPPP and ALL inspection **reports** being kept at the site construction office?	❑Yes ❑No		

Photo Log:

(Associated photos – each photo should be dated and have a unique identification # and written description indicating where it is located within the project area. If a close up photo is required, it should be preceded with a photo including both the detail area and some type of visible fixed reference point. Photos should be annotated with Station numbers and other identifying information where needed.)

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

(add more as necessary)

General Field Comments:

NOTICE TO CONTRACTOR	
This SWPPP Inspection Report, completed by a certified inspector, indicates that this construction site is:	
☐ **COMPLIANT**	• No immediate actions are required, other than keeping up the good work! • **Work is required to maintain Site compliance**
☐ **NON-COMPLIANT**	**This document serves as your directive to proceed with corrective actions that have been outlined above.** The SWPPP, Construction Contract documents, and the RI DEM requirements state that non-compliance issues shall be addressed no later than (7) seven calendar days from date of inspection. In accordance with the SWPPP, the contractor shall commence with the requisite cleaning and maintenance measures no later than the next calendar day after receiving such a directive from the engineer.
	Date work to begin:
	Date work to be completed:
R.E. initials: _____ Date: _____	R.E. Comments:

Attachment G

SESC Plan Amendment Log

SESC Plan Amendment Log

Rev. No.	Date	Revision Notes
Original Submittal	Sept. 12, 2016	