EROSION AND SEDIMENT CONTROL PLAN

WIND COLEBROOK SOUTH COLEBROOK, CONNECTICUT

Prepared for:



BNE Energy 29 South Main Street Town Center, Suite 200 West Hartford, CT 06107

by:

CIVIL 1
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APPENDICES

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Appendix B	Inspection and Maintenance Records
Appendix C	Supporting Calculations

Contact Information / Responsible Parties:

Permittee(s): BNE Energy 29 South Main Street Town Center, Suite 200 West Hartford, CT 06107 (800) 450-0503

Contractor Co-Permittee:

To be determined

Contractor Operator(s): To be determined

Stormwater Manager and SWPPP Contact(s): BNE Energy 29 South Main Street Town Center Suite 200 West Hartford, CT 06107 (800) 450-0503

This SWPPP was prepared by: Curtis Jones, P.E., LEED AP CIVIL 1 43 Sherman Hill Road Suite D-101 Woodbury, CT 06798

Section 1.0 PROJECT INTRODUCTION

Civil 1 Project No.: 3092

1.0 PROJECT INTRODUCTION

Project/Site Information:

Project/Site Name: Wind Colebrook South

Location: 17 & 29 Flagg Hill Road

Colebrook, Connecticut

Latitude/Longitude: Longitude: Longitude:

41° 57' 50" N 73° 08' 46" W

Method for determining latitude/longitude: Google Earth

1.1 SITE SUMMARY

1.1.1 Existing Conditions

The project is located at 17 and 29 Flagg Hill Road and consists of approximately 80 acres and is undeveloped with the exception of two existing houses at 17 and 29 Fl agg Hill Road. The Property is located along the Norfolk town line and approxim ately 600 feet from the Winsted/Winchester town line. Though the surrounding land uses ar e mixed, consisting of both commercial and residential development, the property is located in the R-2 residential zone. The Colebrook zoning regulations do not address wind tu rbine installations. The Property is abutted by the undeveloped land owned by the Nature Conservancy to the west, land owned by the Gun Club to the north and residen tial properties to the east and s outh. The site is cu rrently accessed via Flagg Hill Road. This access point will be maintained throughout the construction process. Currently, there are no structural stormwater discharge points. All stormwater flows over land to discharge points off site.

1.1.2 Project Description

The Project consists of three GE 1.6MW wind turbines, associated ground equipment, the installation of an access driveway and an electrical connection. The installation of the turbines will require the construction of temporary equipment lay-down areas for the turbines, crane assembly area, access road and associated ground equipment including an electrical collector yard and associated utility infrastructure so that the turbines can be interconnected to the electrical grid. Following completion of the project, all temporary structures will be removed and the site returned to pre-construction conditions as far as practicable. The existing structure at 29 Flagg Hill Road will serve as a temporary construction office and in the future will serve as a permanent maintenance facility for the project.

1.1.3 Site Specific Concerns

The terrain and existing topography of the project site is such that during construction special care will be required to ensure that all BMPs remain intact and are functional.

1.1.4 Construction Schedule

Currently specific dates for construction have not been determined but anticipate construction to begin in Late Fall 2011. Specific dates will be provided to reviewing officials.

1.2 PROJECT OWNER AND OPERATOR

The project owner and operator, BNE Energy, will be the responsible entity for completing the project. The address and telephone is:

BNE Energy 29 South Main Street Town Center Suite 200 West Hartford, CT 06107 (800) 450-0503

1.3 Soils, Slopes, Vegetation, And Current Drainage Patterns

1.3.1 Soil type(s)

Based upon a review of typical geologic conditions and the National Soil Cooperative Survey, the soils have been classified as (1) Bice- Millsite complex soils slopes 3 to 45 percent slopes – very rocky; (2) Westminster- Millsite- Rock Outcrop complex 3 to 15 percent slopes; (3) Bice fine sandy loams ranging from 3 to 15 percent slopes – very stony; (4) Schroon fine sandy loams ranging from 2 to 15 percent slopes – very stony; (5) Shelburne fine sandy loam, 8 to 35 percent slopes – extremely stony; (6)Ashfield fine sandy loam, 8 to 15 percent slopes – very stony, (7) Wonsqueak mucky peat; and (8) Brayton-loonmeadow complex – extremely stony.

1.3.2 Slopes

The project site consists of varying slope conditions ranging from relatively flat conditions in the central portion of the site and moderately steepe to steeper slopes in the extreme easterly and westerly portion of the site.

1.3.3 Drainage Patterns

Existing site topography is such that runoff migrates, typically via overland sheet flow, through the site to either the existing pond or to an existing ditch line along Flagg Hill Road. An unnamed perennial watercourse outlets from the pond in the vicinity of the southern Property boundary, flowing south.

1.3.4 Vegetation

The property is generally characterized by second growth and upland hardwood forest. Forested uplands in the eastern portion of the Property are dominated by deciduous pole timber (trees 4.0 to

11.9 inches diameter at breast height [DBH]) and small sawtimber size trees (12 to 15 inches DBH). While in the northwest and southwest corners of the property is characterized as red oak- northern hardwood forest.

1.4 SITE FEATURES AND SENSITIVE AREAS TO BE PROTECTED

1.4.1 Receiving Waters and TMDL Applicability

There are currently no impaired waterways on the most current 303(d) listing of impaired waterways within the vicinity of the project site.

1.4.2 Wetlands

Wetlands soils within the property boundary have been identified and delineated. Mitigation and impacts are discussed in the environmental assessment completed by VHB, Inc.

Section 2.0 **CONSTRUCTION ACTIVITIES**

2.0 CONSTRUCTION ACTIVITIES

2.1 DESCRIPTION OF CONSTRUCTION ACTIVITY

Construction will typically consist of activities such as:

- Surveys to stake access roads, structural locations and limits of clearing
- Installation of sediment and erosion control devices
- Clearing of property necessary for construction
- Establishment of construction staging area
- Excavation and installation of access roads
- Excavation and installation of lay-down and equipment assembly areas
- Excavation and installation of foundations and erection of new structures
- Installation of conductors
- Restoration of site, including re-establishment of vegetative areas

2.2 CONSTRUCTION SITE ESTIMATES

The following are estimates of the construction site:

Property Area: +/- 80 acres

Area to be disturbed: 12.91 acres

Total estimated cut- 14,950 cubic yards Total estimated fill- 23,250 cubic yards Fill to be brought on site- 8,300 cubic yards*

^{*}Fill to be brought on site includes road gravel, asphalt and stone

Section 3.0 BEST MANAGEMENT PRACTICES

3.0 BEST MANAGEMENT PRACTICES

Soil erosion and sediment controls are measures that are used to reduce the amount of soil particles that are carried from a land area and deposited in receiving waters. This section provides a general description of the most appropriate control measures proposed for the Project. The permittee's construction contractor(s) and their subcontractors will be responsible for amending the erosion and sediment controls in the SWPPP for their portion(s) of the project as needed. Based on field conditions at the time of construction, the contractors or subcontractors may adjust the locations and types of BMPs so that erosion and sedimentation are controlled to the maximum extent practicable. However, in no case will modifications to the SWPPP result in any less stringent erosion and sedimentation control measures than specified herein.

3.1 STRUCTURAL CONTROL PRACTICES

Structural control practices divert flows from exposed soils, store water flow, or otherwise limit runoff from exposed areas of the site. Such practices may include silt fences, drainage swales, sediment traps, check dams, subsurface drains, rock outlet protection (rip-rap), reinforced soil retaining systems, and temporary or permanent sediment basins. Some of these practices may be used as both temporary and permanent control measures. Structural control practices should be placed in upland areas to the degree practicable to prevent erosion and reduce sedimentation in lower elevation areas. See Appendix A for additional information.

3.2 TEMPORARY EROSION CONTROL PRACTICES

Erosion and sediment control measures will be in place prior to the initiation of soil disturbing activities and will be maintained throughout construction. The contractor may need erosion control measures in other locations of the project as work progresses to keep sediment from leaving the construction site. These measures will be determined by the contractor in the field; if measures are changed in the field, the SWPPP must be modified accordingly. All temporary erosion controls will be removed after the protected area is finally stabilized. The minimum temporary erosion and sediment control practices that will be used for the Project are discussed in the following sections. See Appendix D for additional information.

3.2.1 Sediment Fence (GSF)

Sediment fence will retain sediment from small disturbed areas. Sediment fence will be placed along slopes as shown on the Erosion Control Plans and in accordance with the construction details. The contractor will use his best judgment to install additional sediment fence as necessary to prevent loss of sediment. Refer to section 5-11 of 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

Maintenance: Inspect the silt fence at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inches or greater to determine maintenance needs. When used for dewatering operations, inspect frequently before, during and after pumping operations. Remove the sediment deposits, or if room allows, install a second silt fence up slope from the existing fence when deposits reach approximately one half the height of the existing fence. Replace or repair within 24 hours of an observed failure. Refer to Connecticut Guidelines for Soil Erosion and

Sediment Control figure GF-5 for troubleshooting failures. Maintain silt fence until the contributing area is stabilized.

3.2.2 Hay Bale Barrier (HB)

Hay bale barriers will retain sediment from small disturbed areas. Hay bales will be placed along slopes as shown on the Erosion Control Plans and in accordance with the construction details. The contractor will use his best judgment to install additional hay bales as necessary to prevent loss of sediment. Refer to section 5-11 of 2002 Connecticut Guidelines for Soil and Sediment Control.

Maintenance: Inspect the hay bale barrier at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inches or greater to determine maintenance needs. When used for dewatering operations, inspect frequently before, during and after pumping operations. Remove the sediment deposits, or if room allows, install a secondary barrier up slope from the existing barrier when deposits reach approximately one half the height of the barrier. Replace or repair within 24 hours of an observed failure. Refer to Connecticut Guidelines for Soil Erosion and Sediment Control figure HB-5 for troubleshooting failures. Maintain hay bale barrier until the contributing area is stabilized.

3.2.3 Stone Check Dam (SCD)

Stone Check DamsWill be used to reduce velocity of concentrated flows, thus reducing erosion of the drainage way.

Maintenance: Inspect the stone check dam at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inches or greater to determine maintenance needs. Remove the sediment deposits when deposits reach approximately one half the height of the Check dam. Replace or repair within 24 hours of an observed failure. Maintain until the contributing area is stabilized.

3.2.4 Water Bars (WB)

The Water Bar is a non-engineered measure consisting of a channel with a supporting earthen ridge used on access and construction roads to intercept flows in the roadway that have a drainage area less than 1 acre and to force these flows off the roadway.

Maintenance: For water bars receiving drainage from disturbed areas, inspect and perform any repair work at the end of each day that the water bar is exposed to vehicular traffic and within 24 hours of the end of a storm with a rainfall amount of 0.5 inch or greater. For water bars receiving drainage from stable areas inspect and perform any repair work at the end of each day that the water bar is

exposed to vehicular traffic or annually, whichever comes first. Immediately reshape and repair any observed damage to the water bar. If sediment deposits reach approximately one-half the height of the water bar, remove the accumulated sediments. When the water bars have served their usefulness they may be removed.

3.2.5 Temporary Diversion (TD)

Will be used to divert sediment laden runoff from a disturbed area to a sediment trapping facility.

Maintenance: When the temporary diversion is located within close proximity to on going construction activities, inspect the diversion at the end of each work day and immediately repair damage caused by construction equipment. Otherwise, inspect the temporary diversion and associated measures at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inches or greater to determine maintenance needs. Repair within 24 hours of an observed failure.

3.2.6 Temporary Fill Berm (TFB)

Will be used to divert runoff from unprotected fill slopes during construction to a stabilized outlet or sediment trapping facility.

Maintenance: Inspect the temporary fill berm and associated controls at the end of each work day to ensure the criteria for installing the measures have been met. Determine if repair or modification is needed. This measure is temporary and under most situations will be covered the next work day. Maintenance requirements should be minimal. The contractor should avoid placing other material over the berm and construction traffic should not be allowed to cross.

3.2.7 Temporary Sediment Trap (TST)

Will be used to detain sediment laden runoff from small disturbed areas long enough to allow the majority of sediment to settle out.

Maintenance: Inspect the temporary sediment trap and associated controls at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inches or greater to determine maintenance needs. Check the outlet to verify that it is structurally sound and has not been damaged by erosion or construction equipment. The height of the stone outlet should be maintained at least 1 foot below the crest of the embankment. When sediment has accumulated more than one quarter of the minimum wet storage volume, dewater and remove sediment as necessary to restore the trap to its original dimensions.

3.2.8 Construction Entrance (CE)

Will be used to reduce tracking of sediment off site to paved areas.

Maintenance: Maintain the entrance in a condition which will prevent tracking and washing of sediment onto paved surfaces. Provide periodic top dressing with additional stone or additional length as required. Immediately remove all sediment spilled, dropped, washed or tracked onto paved surfaces.

3.2.9 Temporary Erosion Control Blankets (ECB)

Will be used to provide temporary surface protection to disturbed soils to absorb raindrop impact and to reduce sheet and rill erosion until vegetation is established.

Maintenance: Inspect temporary erosion control blankets at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inches or greater to determine maintenance needs. Repair any dislodged or failed blankets immediately.

3.3 SOIL STABILIZATION PRACTICES

Soil stabilization involves covering disturbed soils with grass, mulch, straw, geotextiles, trees, vines, or shrubs. Stabilization practices for exposed disturbed soils are extremely important while conducting construction activities. Vegetative cover serves to reduce the erosion potential by absorbing the energy of raindrops, promoting infiltration in lieu of runoff, and reducing the velocity of runoff. Stabilization measures shall be initiated as soon as practicable, but no more than 14 days after construction activities have temporarily or permanently ceased on any portion of the site.

3.4 MAINTENANCE AND INSPECTIONS

All erosion and sediment control devices shall be installed pursuant to the specifications in the construction details and in accordance with the Connecticut General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities . They will be maintained so that they remain effective at all times.

Erosion and sediment control devices will be inspected by qualified personnel at least once every seven calendar days and within 24 hours of each 0.5-inch or greater rainfall event. During each inspection, the construction inspector will complete the Inspection and Maintenance Report Form located in the appendix. This form will be copied and used as necessary. Ineffective temporary erosion control measures will be repaired or replaced before the next storm event or as soon as practicable. The permittee will immediately install additional temporary erosion control devices in any area deemed in need of protection.

Following temporary or final stabilization, inspections must be conducted at least once a month. If construction has been halted due to frozen conditions, regular inspections are not mandatory until one month before the expected thaw. If vegetation establishment is not satisfactory, special steps to correct the problem will be implemented such as over seeding, mulching, sodding, or the use of erosion control blankets. Once a definable area of the construction site has been finally stabilized, no further inspection requirements apply to that area.

3.5 FINAL STABILIZATION

3.5.1 Seeding

The contractor will be responsible for labor, materials, tools, equipment, and other related items required for preparing ground, providing for sowing of seeds, fertilizing, mulching and top dressing, and other management practices required for erosion control and to achieve final stabilization. It will be the contractor's responsibility to make sure that the soil seedbed is not blown, washed, or otherwise removed from the site. The contractor will make repairs (including replacement of lost topsoil and mulch) to the seedbed preparation site in the event of heavy rain, wind, or other natural events that cause damage. When practicable, native plant species should be used for landscaping.

3.5.2 Fertilizer

Soil in areas of disturbance may need supplementation from fertilizer. Soil tests may be necessary to determine the most appropriate fertilizer for each location. Once applied, the fertilizer will be

worked into the soil to limit exposure to stormwater. Fertilizer spills will be cleaned up immediately and will not be applied along or in a waterway.

3.5.3 Mulching

Mulching will be used in conjunction with both temporary and permanent seeding practices to enhance success by providing erosion protection prior to the onset of vegetative growth. Mulches enhance plant establishment by moderating soil temperatures and conserving moisture. After seeding, straw or hay mulch will be applied at a rate of two to three tons per acre on the disturbed areas. Other forms of mulch will be applied at a rate designated by the Project Engineer. Mulch will not be applied in wetlands, on lawns, and areas where hydro-mulch is used. Mulch will be anchored immediately after placement on steep slopes and stream banks. Mulch will be held in place by a very thin covering of topsoil, small brush, pins, stakes, wire mesh, asphalt binder, or other adhesive material approved by the project engineer.

3.5.4 Topsoiling

Topsoil should be applied in areas where the subsoil or existing surface soil does not provide an adequate growth medium for the desired vegetation, where soil is too shallow to provide adequate rooting depth, or where the soil contains substances toxic to the desired vegetation. Topsoil shall be reasonably free from subsoil and stumps, roots, brush, stones, and clay lumps or similar objects.

3.5.5 Temporary Control Removal

Temporary erosion controls will be left in place until the Project site is stabilized with a uniform vegetative cover of 70 percent density of the native background vegetative cover on all unpaved areas. Following re-vegetation, the permittee will conduct periodic site visits to make sure that vegetation establishment is satisfactory. If sufficient vegetative cover has not been achieved, additional restoration measures will be implemented. Inspection results will be documented using the Inspection and Maintenance Report Form found in the appendix. All temporary soil erosion and sediment control measures will be removed and disposed of after final site stabilization is achieved and before submitting the Notice of Termination (NOT) to the CT DEP.

Section 4.0 EROSION CONTROL PLAN APPENDICES

4.0 SWPPP APPENDICES

Attach the following documentation to the SWPPP in the following appendices.

Appendix A – Maps and Drawings

- Erosion Control Plans
- Post Construction Grading Plans
- Erosion Control Narrative and Details

Appendix B – Inspection and Maintenance Records

- Inspection & Maintenance Log
- Inspection Report
- Maintenance Report

Appendix C – Supporting Calculations

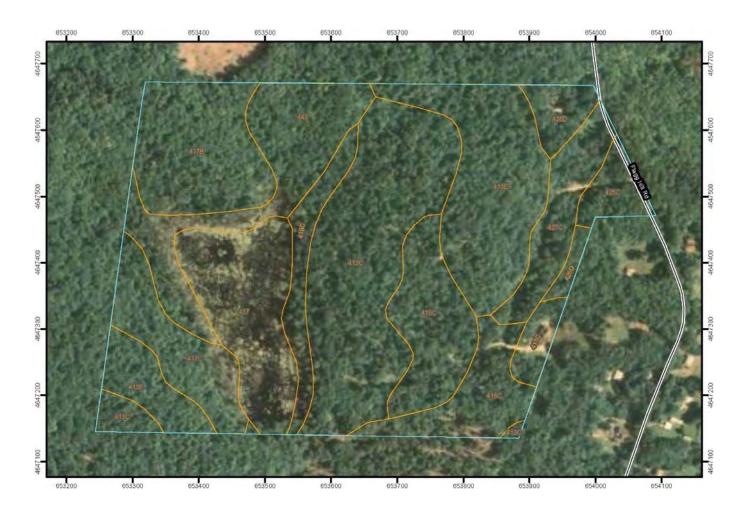
• Calculations for Outlet Protection and Temporary Sediment Traps

Appendix A MAPS AND DRAWINGS



CIVIL 1 July 2012

Soils Map



Soil Map-State of Connecticut (Wind Colbrook South)

MAP LEGEND

Area of Interest (AOI)

1 A

Area of Interest (AOI)

Soils

Soi

Soil Map Units

SpecialPoint Features

<:; Blowout

Borrow Pit

X Clay Spot

Closed Depression

X GravelPit

.. Gravelly Spot

@ Landfill

Α

Lava Flow

Marsh or swamp

Mine or Quarry

@ Miscellaneous Water

PerennialWater

Rock Outcrop

Saline SpotSandy Spot

_ Severely Eroded Spot

Slide or Slip

jd Sodic Spot

SpoilArea

() Stony Spot

() J Very Stony Spot

₩et Spot

Other

SpecialLine Features

?√ Gully

Short Steep Slope

--> Other

PoliticalFeatures

O Cities

WaterFe<tures

Oceans

Streams and Canals

Transportation

+++ Rails

Interstate Highways

US Routes

Major Roads

MAP INFORMATION

Map Scale: 1:4,700 if printed on A size (8.5" x 11") sheet.

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

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

Source of Map: Natural Resources Conservation Service Web Soil Survey URL: http://iwebsoilsurvey.nrcs.usda.gov Coordinate System: UTM Zone 18N NAD83

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

Soil Survey Area: State of Connecticut Survey Area Data: Version 7, Dec 3, 2009

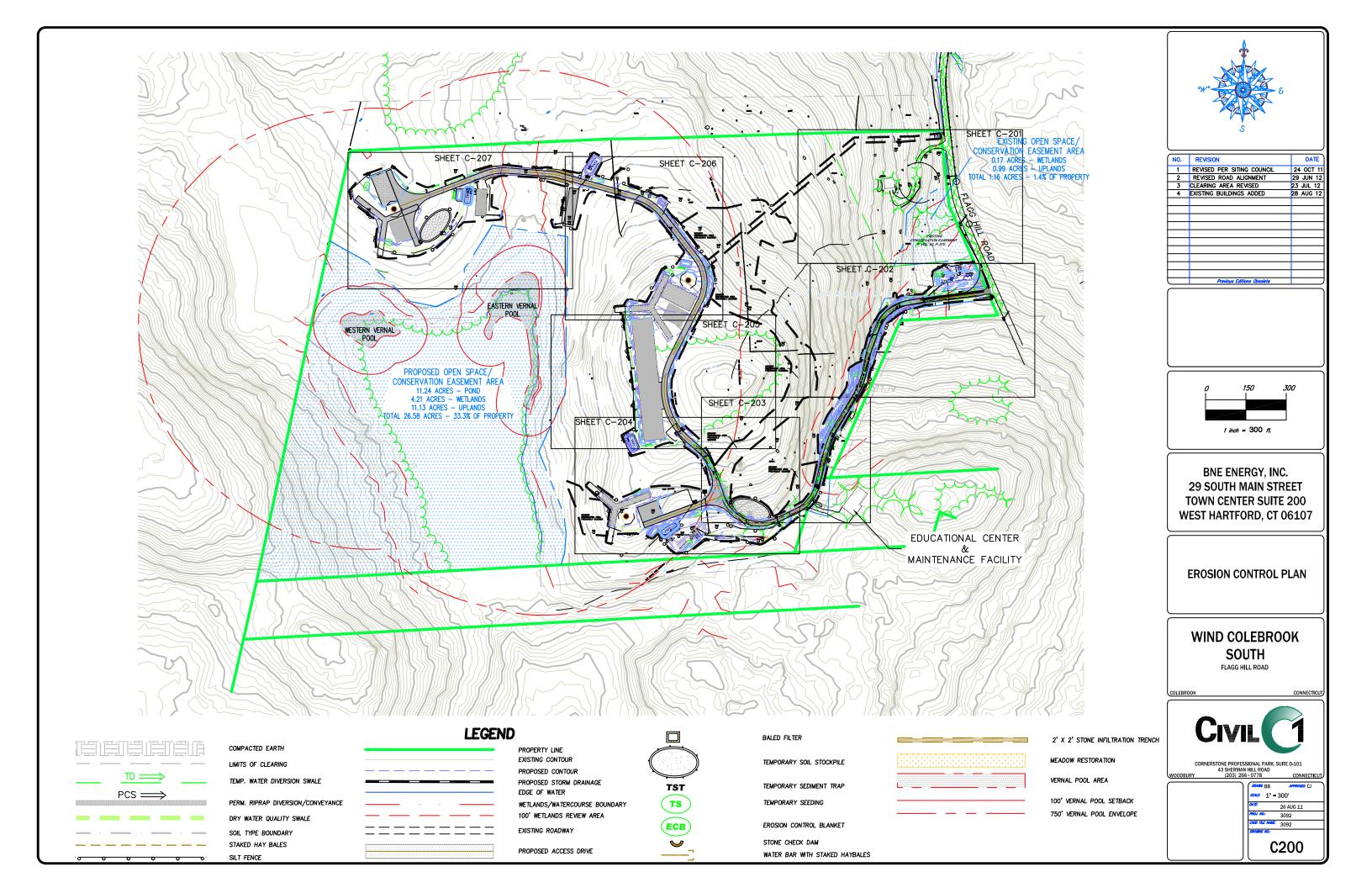
Date(s) aerial images were photographed: 8/14/2006

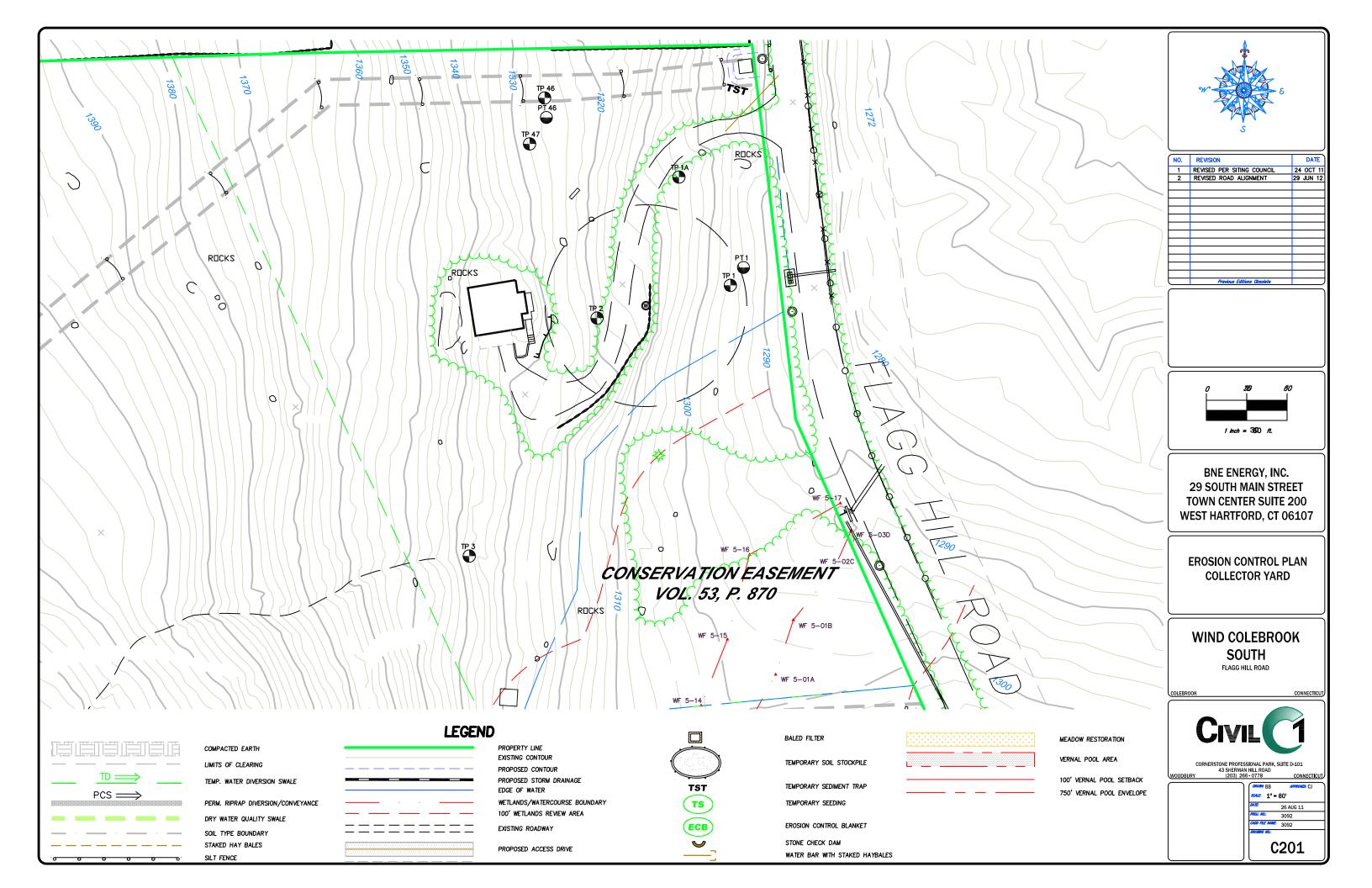
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

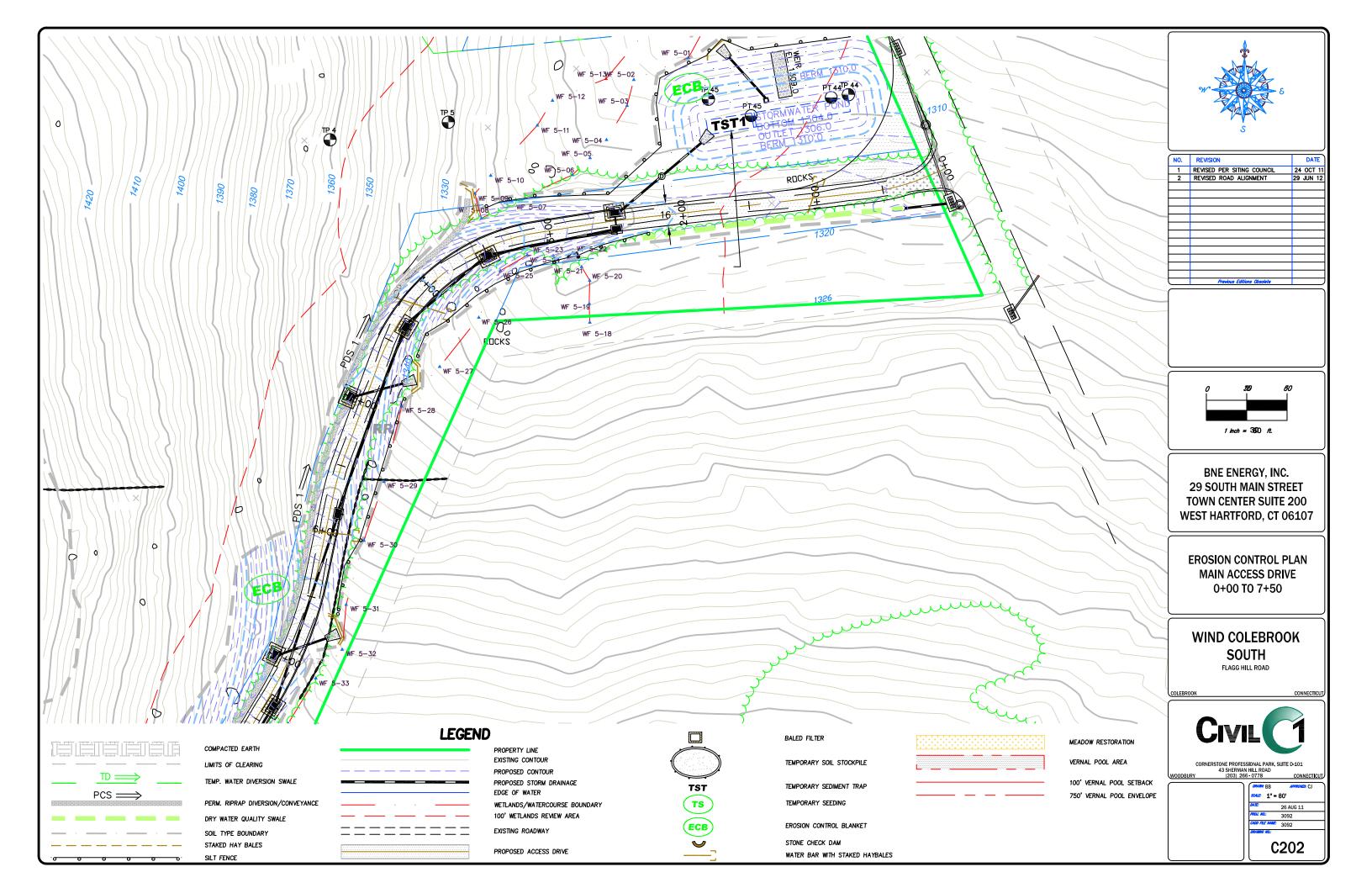
Map Unit Legend

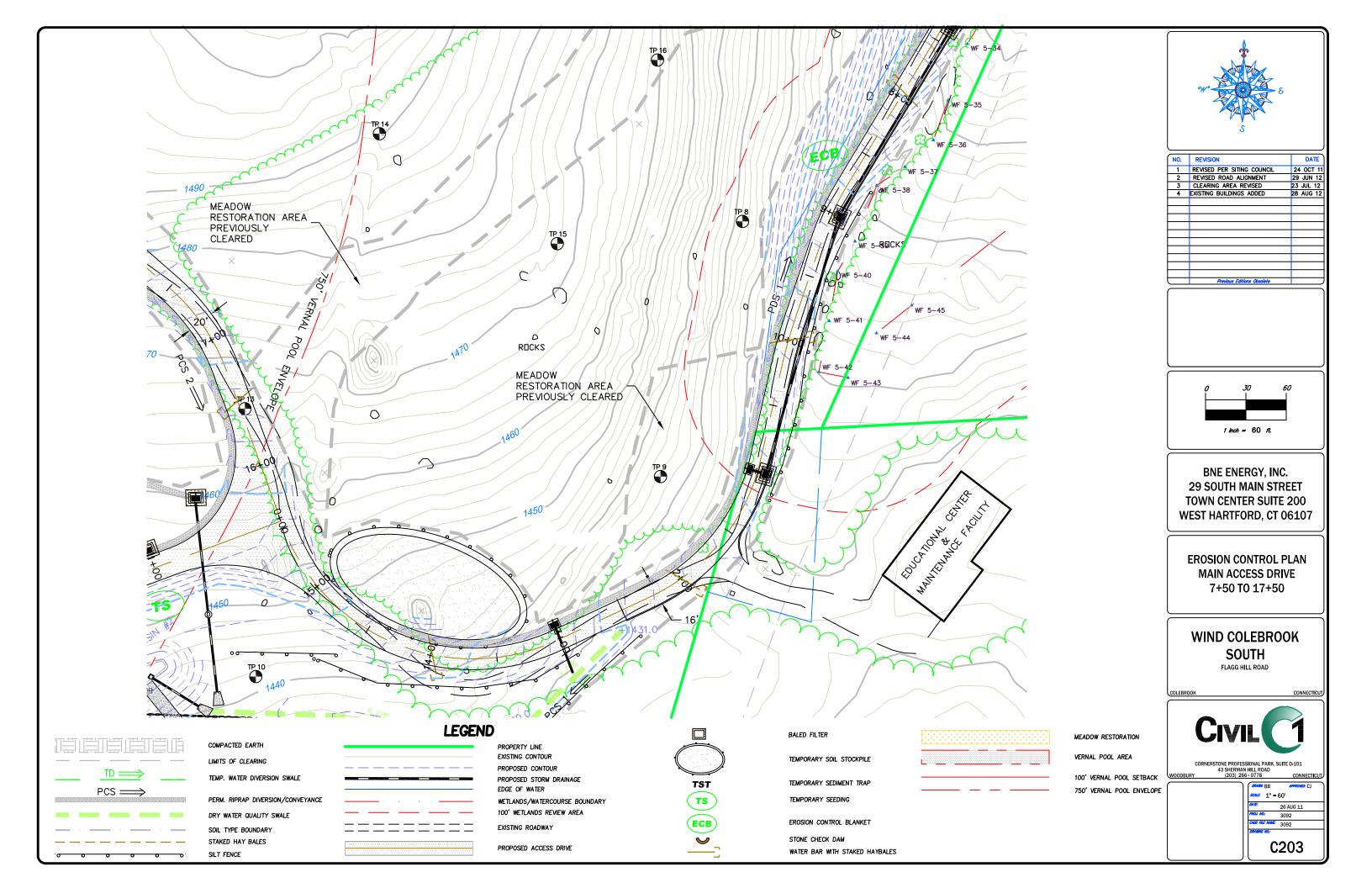
	State of Connecticut (CT6	00)	
Map Unit Symbol	Map Unit Name	Acres In AOI	Percent of AOI
413C	Bice-Millsite complex.3 to 15 percent slopes. very rocky	20.1	22.0%
413E	Bice-Milsite complex, 15 to 45 percent slopes, very rocky	14.5	15.8%
415C	Westminster-Millsite-Rock outcrop complex.3 to 15 percent slopes	6.4	7.0%
4178	Bice fine sandy loam, 3 to 8 percent slopes, very stony	8_9	9.7%
417C	Bice fine sandy loam,8 to 15 percent slopes, very stony	5.5	6.0%
418C	Schroon fine sandy loam 2 to 15 percent slopes, very stony	8.3	9.0%
425C	Shelburne fine sandy loam - 8 to 15 percent slopes, very stony	2.0	2.2%
4260	Shelburne fine sandy loam. 15 to 35 percent slopes. extremely stony	2.6	2.9%
427C	Ashfield fine sandy loam, 8 to 15 percent slopes, very stony	4.6	5.0%
437	Wonsqueak mucky peat	9.1	9.9%
443	Brayton-loonmeadow complex, extremely stony	9.5	10.4%
Totals for Area of Intere	est	91.8	100.0%

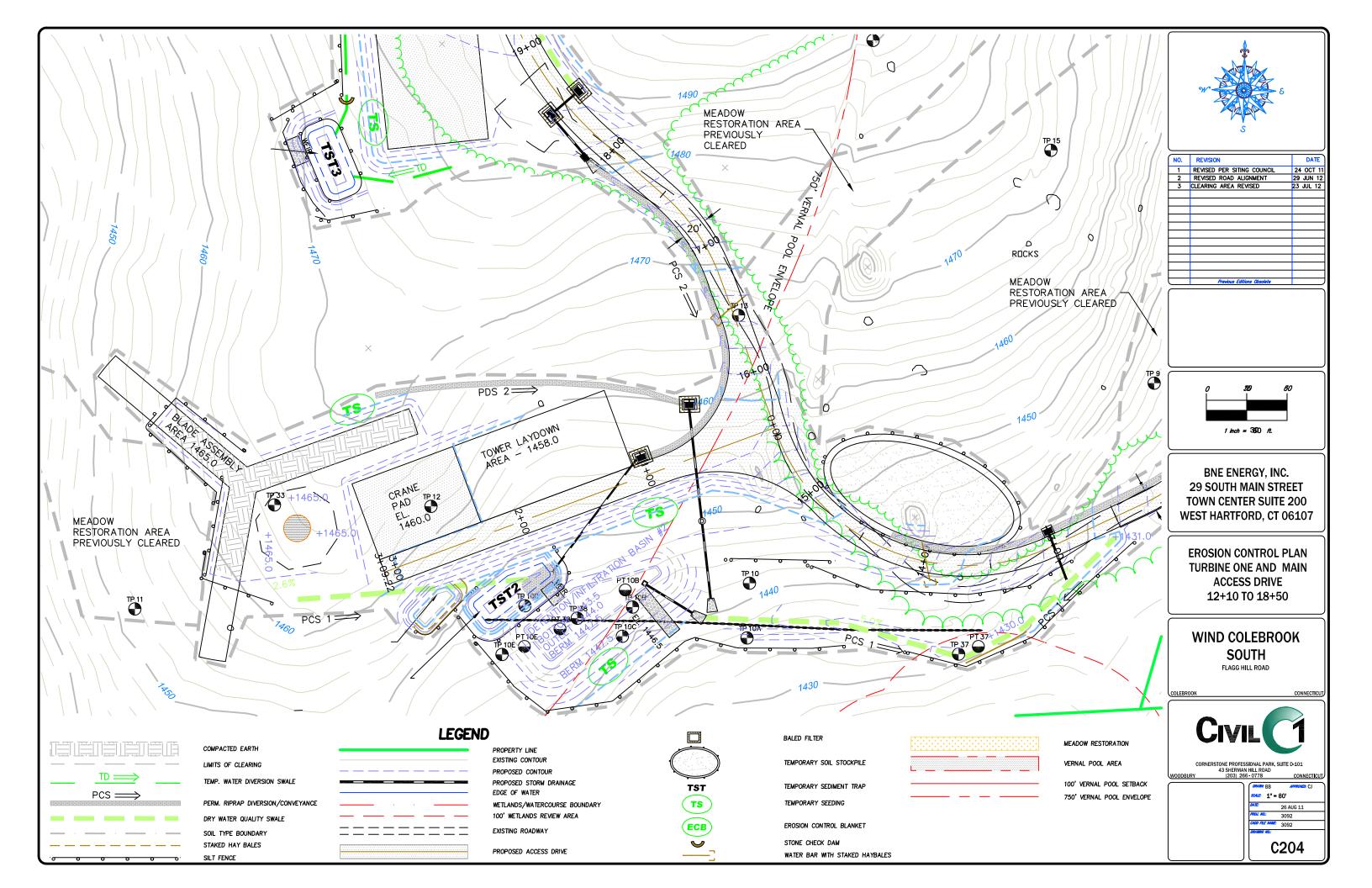
Erosion Control Plans

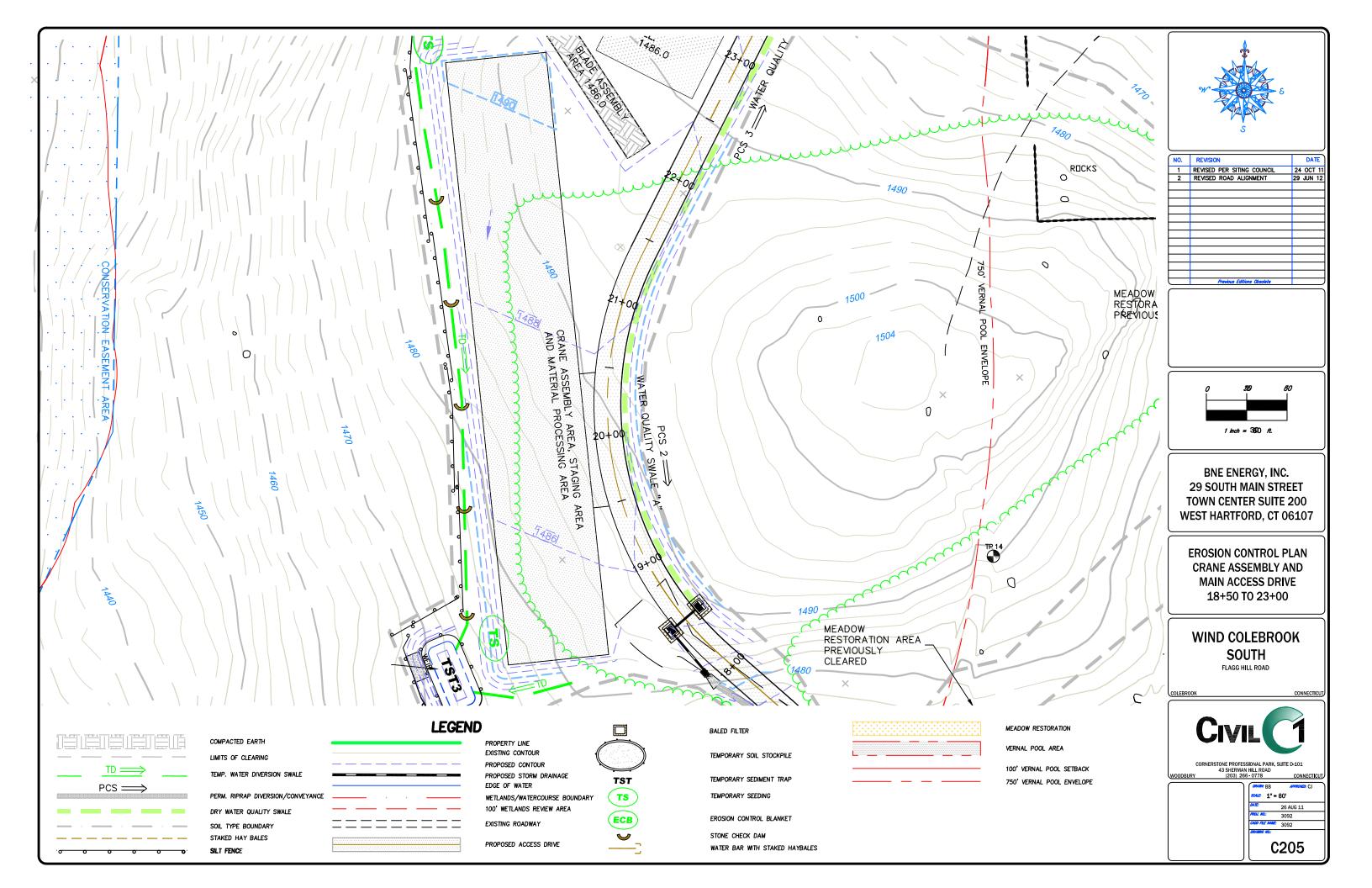


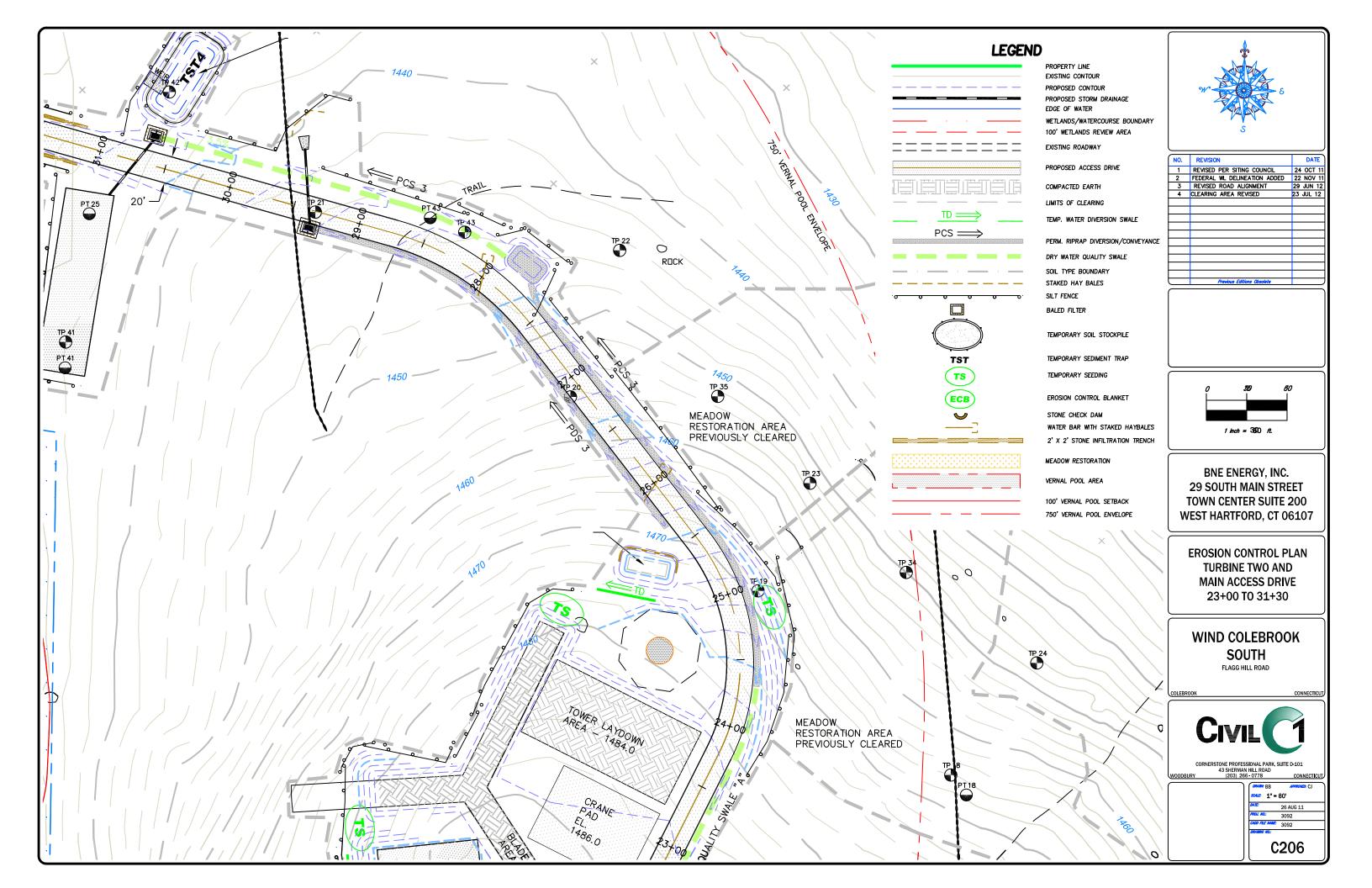


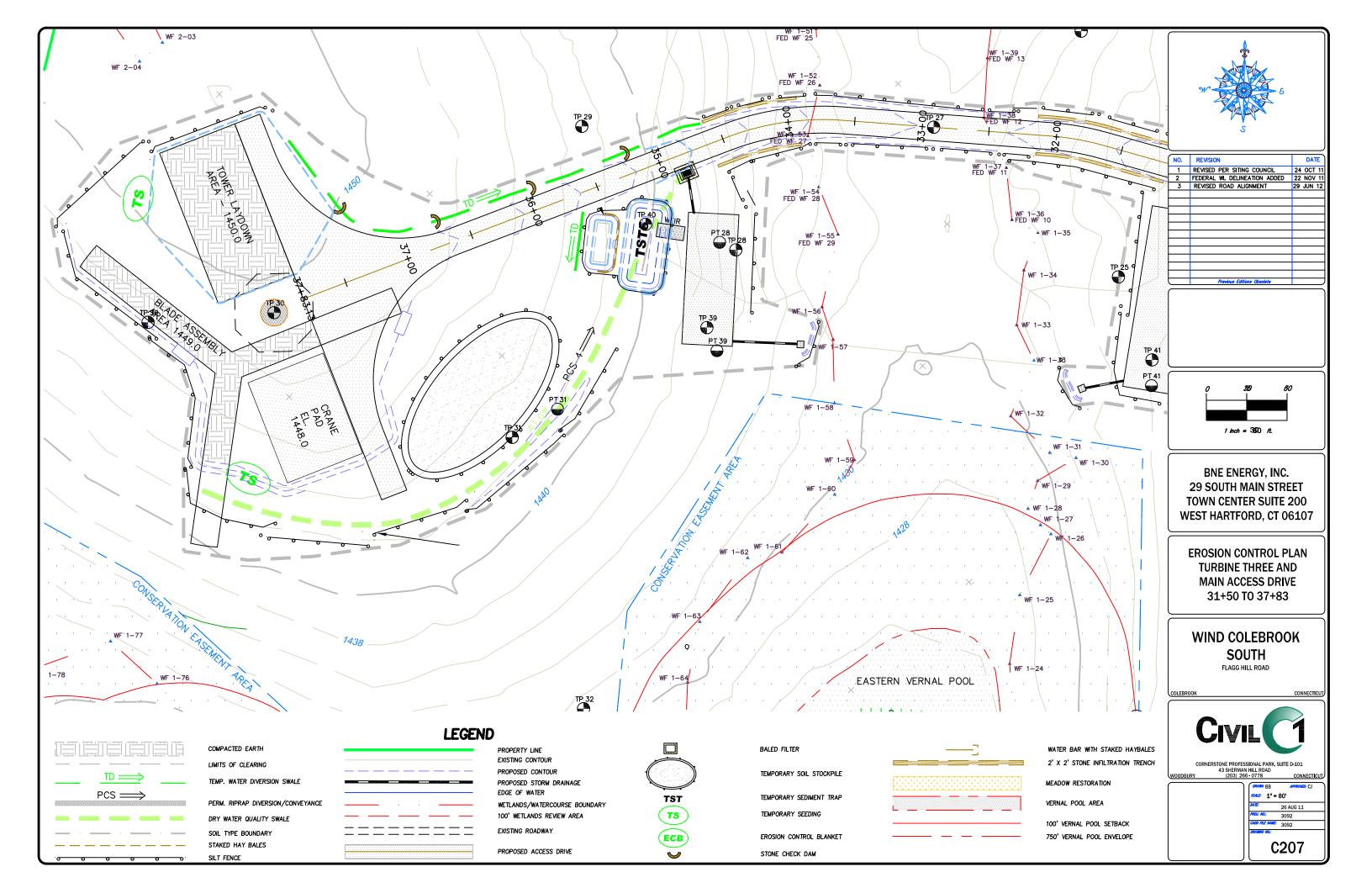




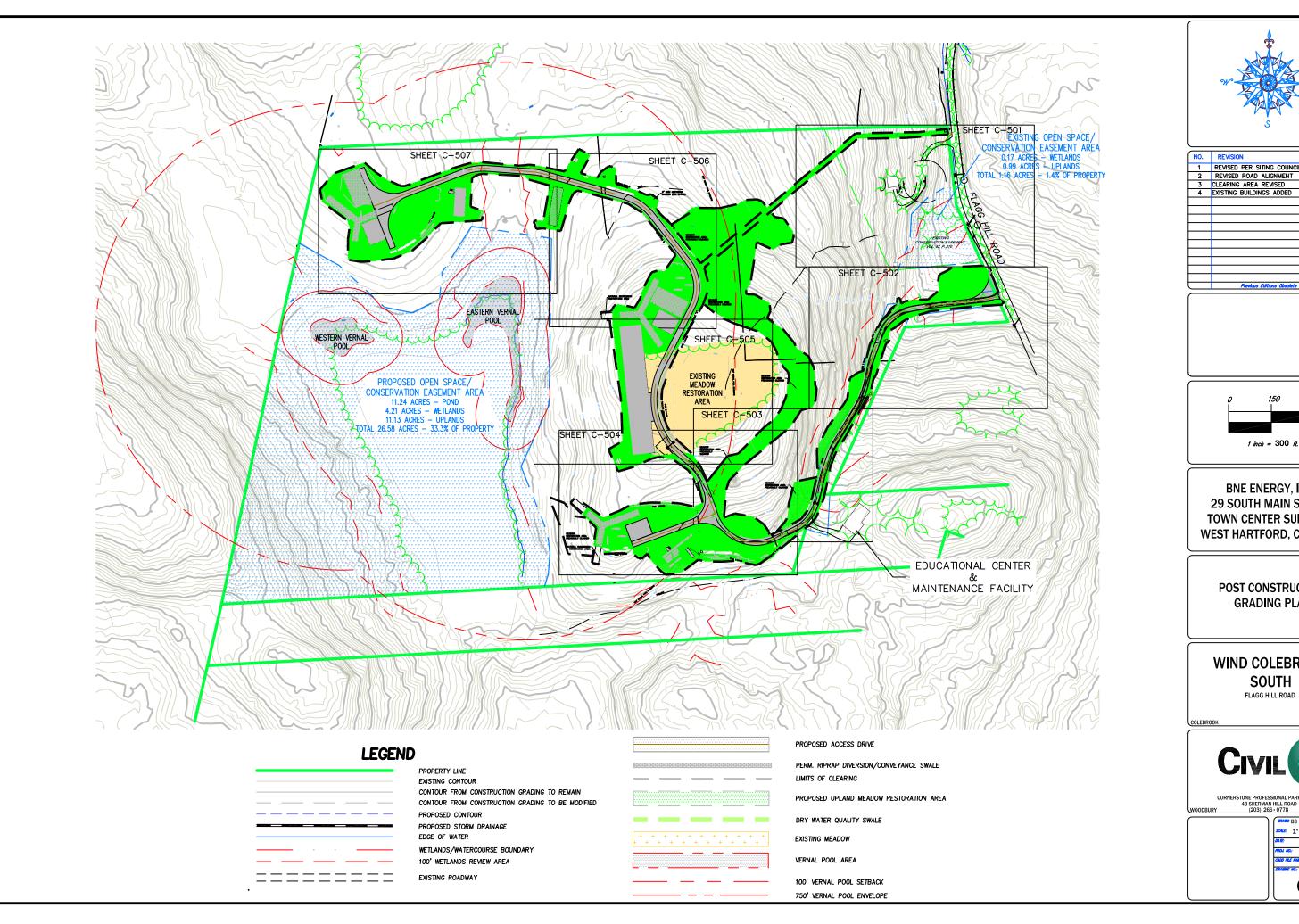


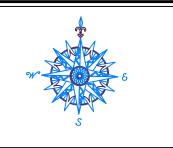




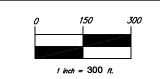


Post Construction Grading Plans





NO.	REVISION	DATE
1	REVISED PER SITING COUNCIL	24 OCT 1
2	REVISED ROAD ALIGNMENT	29 JUN 12
3	CLEARING AREA REVISED	23 JUL 12
4	EXISTING BUILDINGS ADDED	28 AUG 12
	Previous Editions Obsolete	
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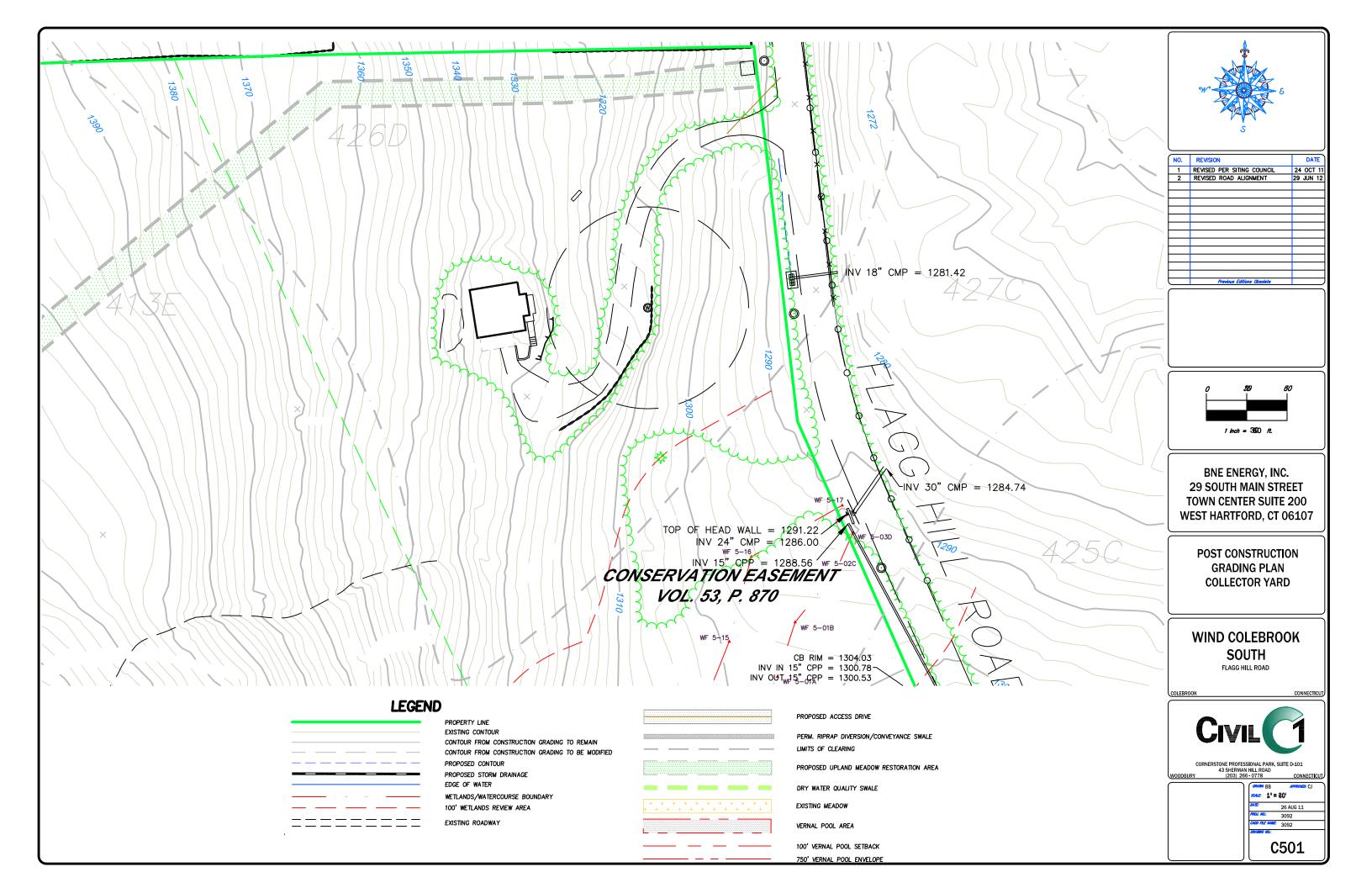
BNE ENERGY, INC. 29 SOUTH MAIN STREET **TOWN CENTER SUITE 200** WEST HARTFORD, CT 06107

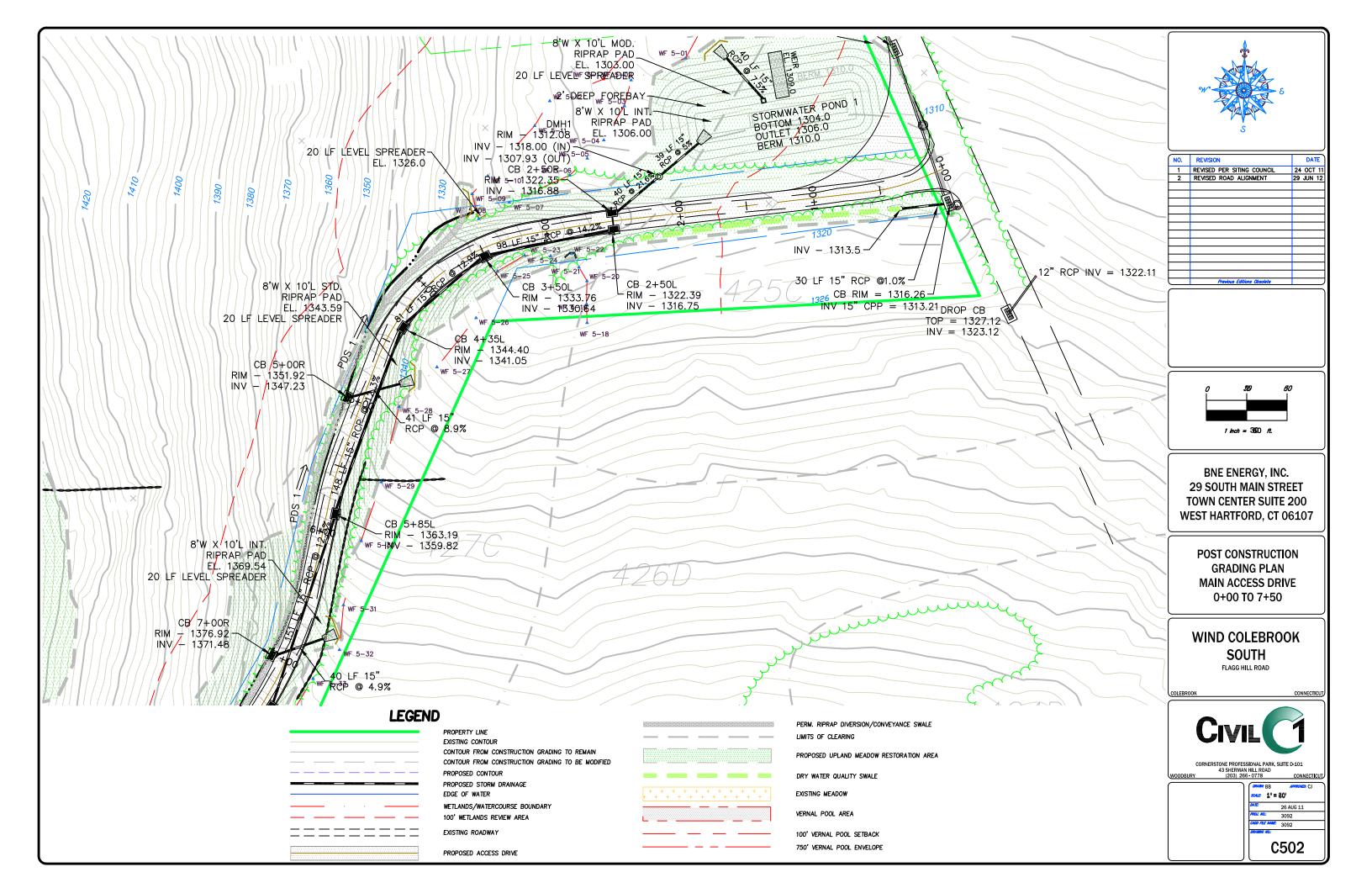
> POST CONSTRUCTION **GRADING PLAN**

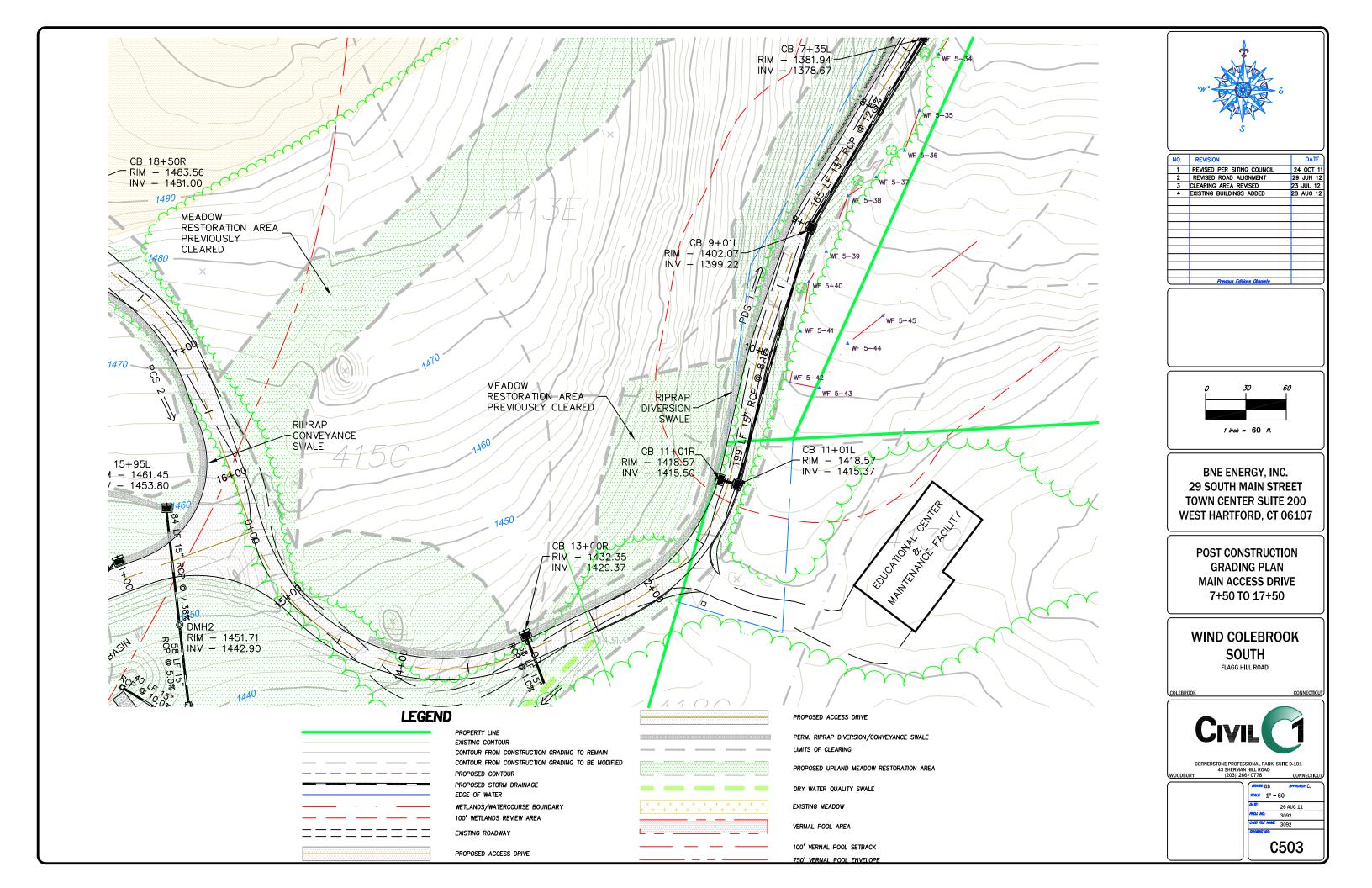
WIND COLEBROOK SOUTH

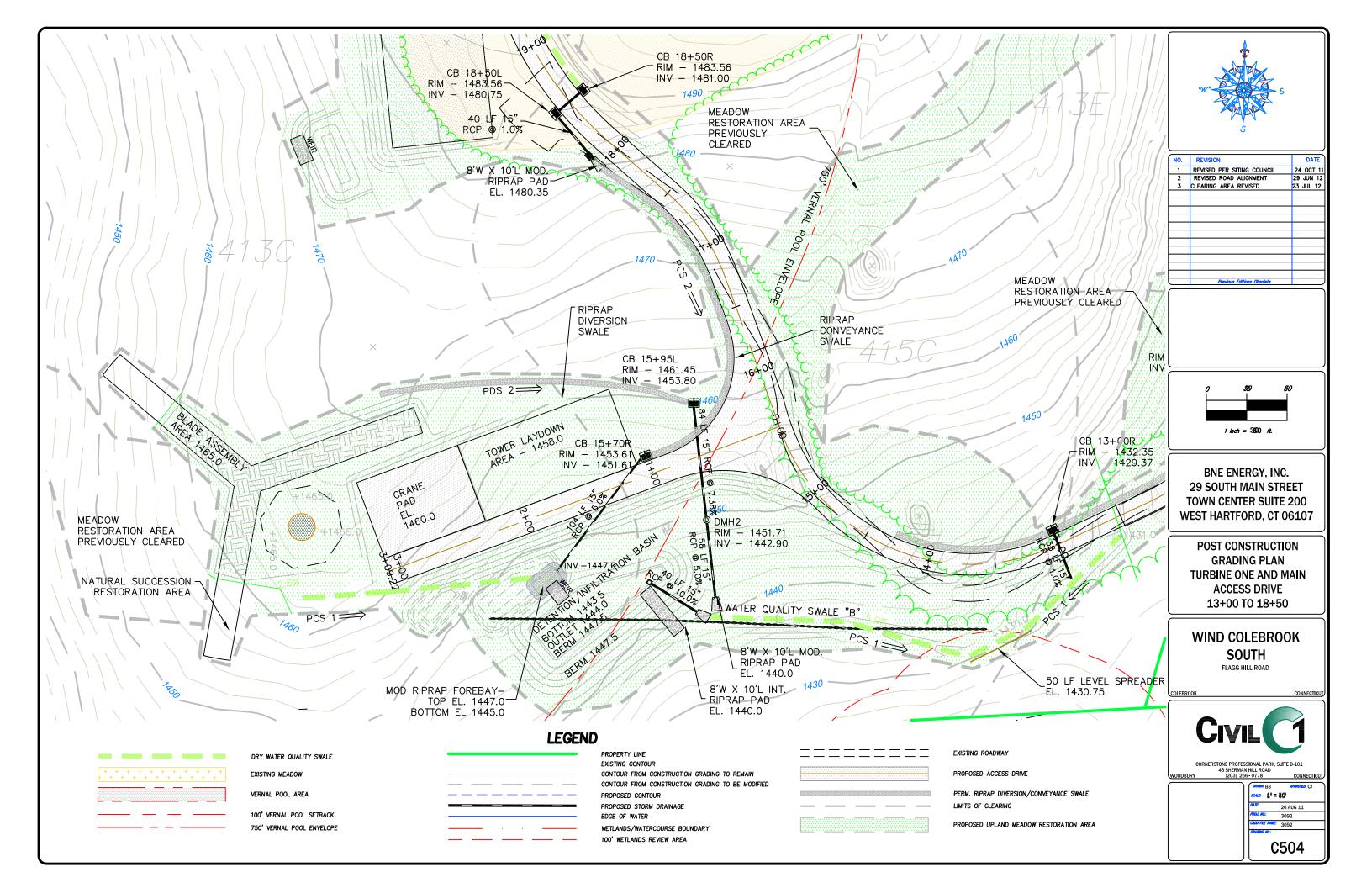


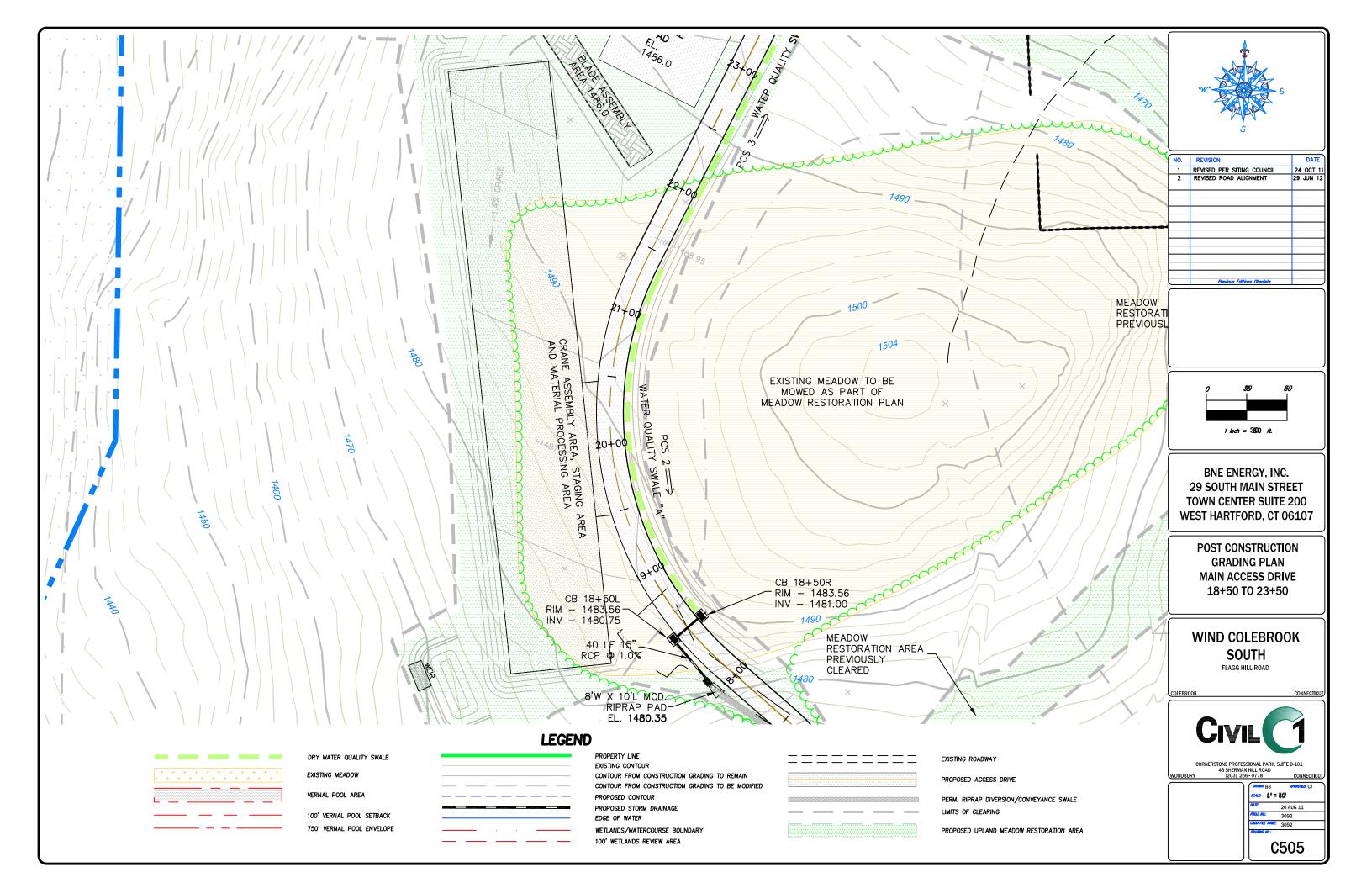
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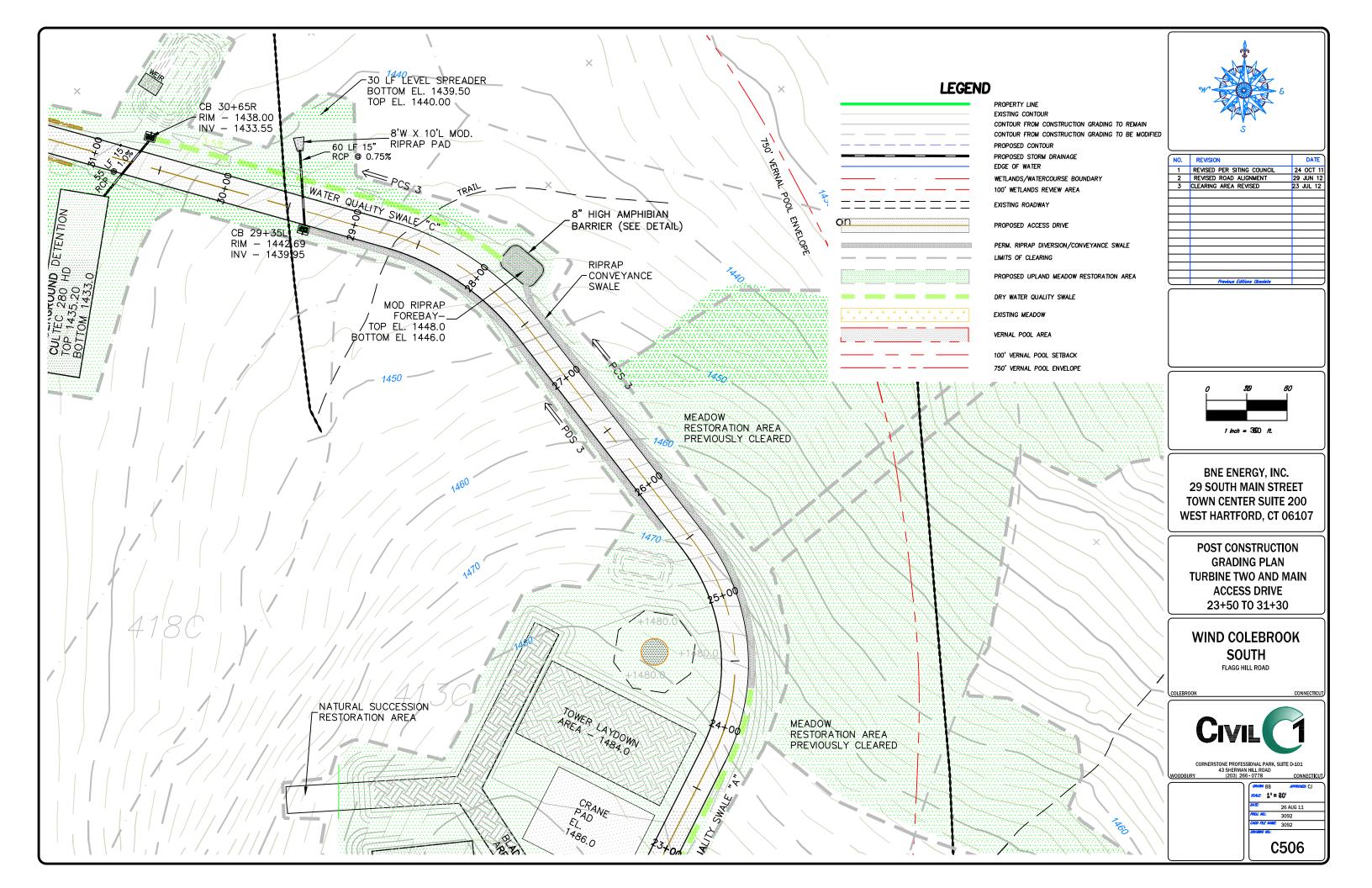


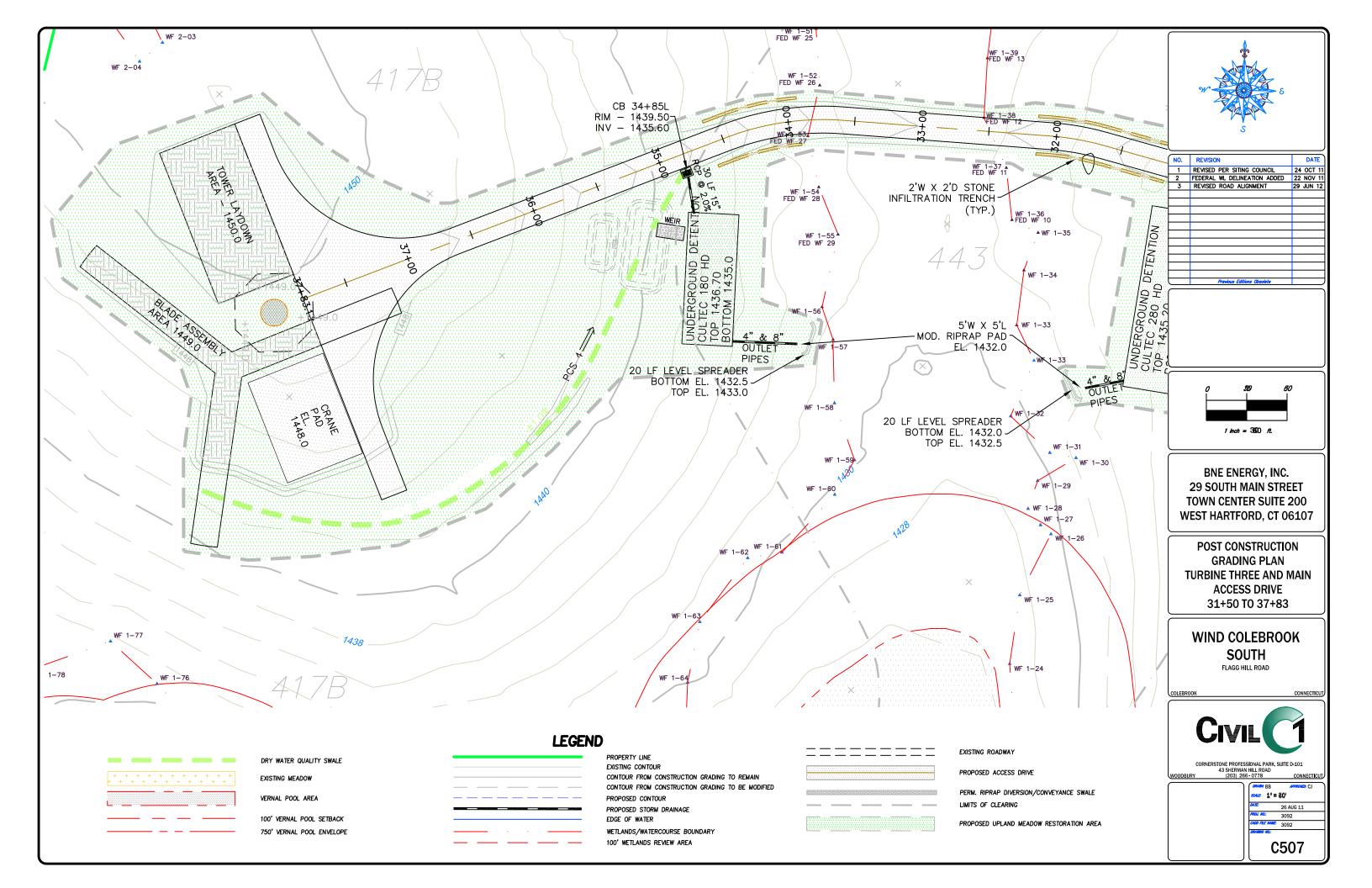












Erosion Control Narrative and Details

CIVIL 1 July 2012 Project No.: 3092

CONSTRUCTION SEQUENCE

STEPS TO BE TAKEN TO PREVENT THE SILTING OF THE WETLANDS DURING CONSTRUCTION OF THE ACCESS DRIVE AND LAYDOWN AREAS FOR THE WIND COLEBROOK SOUTH PROJECT, FLAGG HILL ROAD, COLEBROOK, CT.

THE SEQUENCE OF CONSTRUCTION WILL BE AS FOLLOWS:

Field stakeout the limits of all construction activities

Clear all vegetation within the construction area from the main access drive Sta. 0+00 to 31+83, turbine 1 access drive Sta. 0+00 to 3+09 and from all turbine laydown and assembly areas. All trees/shrubs less than 6" in diameter shall be chipped. Install silt fence, hay bales and other perimeter siltation controls as shown on the erosion and sediment control plans prior to

Remove stumps from the the main access drive from station 0+00 to 16+50, the turbine 1 access drive and the turbine 1 laydown and assembly area. Stumps shall be removed from the site. Stumps are not to be buried.

Strip topsoil material and stockpile prior to rough grading of roadways, turbine laydown and assembly areas. Stockpile material at locations shown on the plans. Ensure adequate erosion control measures are in place around stockpile areas.

Rough grade the main access drive from station 0+00 to 16+50, the turbine 1 access drive and the turbine 1 laydown and assembly area. The cuts and fills will be made and material processed on site as necessary. All finished slopes loamed, seeded and mulched unless specified to be finished with riprap.

Construct temporary sediment traps 1 & 2. Install storm drainage from Station 0+00 to 16+50 and the storm drainage in the turbine 1 access drive. Install all temporary and permanent water diversions to keep clean water away from construction areas and divert sediment laiden water toward temporary sediments traps and staked haybale barries.

Temporary diversion ditches with haybales may need to be installed to control lateral runoff along both sides of the proposed road prior to importing processed gravel.

Place gravel on drive, compact in 3-8" lifts per detail on proposed drives and crane pad #1. Pave driveway from station 0+00 to 12+50.

Remove stumps from the area of the proposed access drive from Station 16+50 to 38+13, the crane assembly area, turbine 2 location, and turbine 3 location. Stumps shall be removed from the site. Stumps are not to be buried.

Water bars, havbale traps and silt fence will be used to control erosion during rough grading of access drive as shown.

Strip topsoil material and stockpile prior to rough grading of roadway. Stockpile material at locations shown on the plans. Ensure adequate erosion control measures are in place around stockpile areas.

Rough grade access drive to station proposed access drive from Station 16+50 to 38+13, the crane assembly area, turbine 2 location, and turbine 3 location. Install Seepage Envelope at wetlands crossing per detail.

Install drainage and construct TSTs 3-5. The cuts and fills will be made and material processed on site as necessary. All finished slopes loamed, seeded and mulched unless specified to be finished with riprap.

Additional havbales shall be placed across unpayed roads at the end of each work day to prevent sedimentation and soil

Construct riprap swales, stone infiltration trenches and water quality trenches as shown on plans. The swales and water quality trenches need to be protected from sedimentation during construction. If sedimentation occurs they will need to be cleaned or reconstructed as necessary until vegetation has been established.

Provide temporary seeding measures on all exposed soils which were damaged due to construction activities and are not to be permanently restored or are outside of construction traffic zones for a period in access of 30 days.

Seed all disturbed areas. Clean all silt from drainage structures. Remove temporary sediment traps and erosion control measures after site is stabilized with vegetation.

After turbine construction is complete grade site in accordance with the post—construction grading plans and plant the upland meadow restoration areas as shown.

The starting time for the construction is unknown, however the time limit for the construction of the drive should be limited to 180 days.

RESPONSIBILITY FOR THE PLAN

Whenever sedimentation is caused by stripping vegetation and/or grading, it shall be the responsibility of the person, corporation or other entity having responsibility to remove sedimentation from all lower properties, drainage systems and watercourses and to repair any damage at their expense as quickly as possible.

All control measures will be maintained in effective condition throughout the construction period. Surface inlets shall be kept open and free of sediment and debris. The system shall be checked after every major storm and sediment shall be disposed of at an approved location consistent with the plan.

It shall be the responsibility of any person, corporation or other entity engagina in any act on or near any stream, watercourse or swale or upon the flood plain or right—of—way thereof to maintain as nearly as possible in its present state that same stream, watercourse, swale, flood plain or right—of—way for the duration of the activity and to return it to its original or equal condition after such activity

No person, corporation or other entity shall block, impede the flow of, alter, construct any structure or deposit any material or thing or commit any act which affects normal or flood flow in any communal stream or watercourse without having obtained prior approval from the Town.

SEEDING AND PLANTING REQUIREMENTS

Seedbed Preparation

Fine grade and roke surface to remove stones larger than 2° in diameter. Install needed erosion control devices such as surface water diversions. Grade stabilization structures, sediment basins or drainage channels to maintain grassed areas. Apply limestone at a rate of 2 tons/Ac. or 90 lbs/1000 SF unless otherwise required according to soil test results. Apply fertilizers with 10–10–10 at a rate of 300 lbs./Ac. or 77.5 lbs/1000 SF. At least 50% of the nitrogen shall be from organic sources. Work lime and fertilizer into soil uniformity to a depth of 4" with a whisk, springtooth harrow or other suitable equipment following the contour lines.

Seed Application

Seed Application
Apply gross mixtures at rates specified by hand, cyclone seeder or hydroseeder.
Increase seed mixture by 10% if hydroseeder is used. Lightly drag or roll the
seeded surface to cover seed. Seeding for selected fine grasses should be done
between April 1 and June 1 or between August 15 and October 15. If seeding
cannot be done during these times, repeat mulching procedure below until seeding
can take place or seed with a quick germinating seed mixture to stabilize slopes.
A quick germinating seed mixture (Domestic Rye) can be applied between June 15
through August 15 as approved by the Architect or Engineer.

Mulching Immediately following seeding, mulch the seeded surface with straw, hay or wood fiber at a rate of 1.5 to 2 tons/Ac. except as otherwise specified elsewhere. Mulches should be free of weeds and coarse matter. Spread mulch by hand or mulch Muiches should be tree or weeds and coarse matter. Spread muich by hand or multiplication or multiplication of the solid surface with track machine or disk harrow set straight up. Mulch material should be "tucked" approximately 2— 3" into the soil surface. Chemical mulch binders or netting, in combination with the straw, hay or wood fibers, will be used where difficult slopes do not allow harrowing by machines.

Grass Seed Mixtures

SS Settle MIXURES
Temporary Covers
Perennial ryegrass
Annual ryegrass
20 lbs/Ac.
Canada Bluegrass
20 lbs/Ac.
Permanent Covers
Creeping Red Fescue
40 lbs/Ac.
Canada Bluegrass
20 lbs/Ac.

WETLAND REGULATED ACTIVITY

Wetlands Impacts (Federal Wetlands): Crossing at Station 33+00 - 4.250 sf Total Activity in Wetlands - 4.250 sf

<u>Wetlands Impacts Total- (State & Federal Wetlands):</u>
Crossing at Station 33+00 - 4,250 sf
Driveway Improvements Station 3+00 to 3+50 - 360 sf

Total Activity in Wetlands - 4.610 sf

*TEMPORARY SEDIMENT TRAPS & DEWATERING BASINS WILL BE SURROUNDED TO THE MAXIMUM EXTENT PRACTICAL WITH SILT FENCE TO EXCLUDE MIGRATING AMPHIBIANS AND AVOID THESE BASINS BECOMING DECOY POOLS.

*SYNCOPATED SILT FENCING WILL BE EMPLOYED WITHIN 750' OF THE VERNAL POOLS TO FACILITATE MOVEMENT OF WETLAND-DEPENDENT AMPHIBIANS TO AND FROM THESE VERNAL POOLS DURING CONSTRUCTION.

RESPONSIBILITY FOR EROSION CONTROL PLAN

THE PARTY RESPONSIBLE FOR THE IMPLEMENTATION AND OVERSIGHT OF THE EROSION CONTROL PLAN SHALL BE BNE ENERGY, INC. TOWN CENTER, SUITE 200 WEST HARTFORD, CT 06107

UPLAND RESTORATION AND THIRD PARTY MONITORING NARRATIVE

Wind Colebrook South - Upland Restoration Plan

Disturbed upland areas will be restored following construction with New England Conservation/Wildlife Mix, a native herbaceous seed mixture that will form a permanent, maintenance free cover of grasses, forbs, wildflowers and legumes. This seed mixture will provide erosion control and wildlife habitat value. Areas that will not be subject to annual mowing will revert to forest through the natural process of succession.

Upland Restoration Plan Construction Sequence and Planting Schedule

- 1. Prior to all work, erosion control barriers will be installed as detailed on the Erosion
- 2. Where adequate topsoil (±6 inches) does not exist, disturbed areas shall be backfilled to a minimum depth of 6 inches with clean topsoil. Once final topsoil is in place, these areas will be planted with New England Conservation/Wallife Mix after the completion of final grading. The seed mix will be applied at a rate of 1 lb/1.750 square feet. Soil conditioning activities, including raking, will be combined with the seed application process.
- 3. Where 2:1 slopes are utilized for final grading, or in areas specified on the plan sheets, biodegradable erosion control matting will be installed over the seed mixture to promote establishment of vegetation and aid in stabilization. The contractor will use "SC2" erosion control matting, available at New England Wetland Plants Inc.
- The contractor will be responsible for the careful installation, maintenance (including watering) and establishment of native plant material in these areas.
- 5. The erosion control barriers shall be disassembled following successful stabilization these areas. Sediment collected by these devices will be removed and disposed o in a manner that prevents erosion and transport to a wetland or watercourse.

- 6. Monitoring of revegetated areas will be conducted as follows by a qualified third party inspector. These areas will be monitored the first three growing seasons following establishment. Monitoring reports will be submitted to the Connecticut Siting Council no later than December 15 of each year. The reports will provide details on the three success standards described below. In the event that remediation measures are required, recommendations will be provided. The first year of monitoring will be the first year that the site has been through a full growing season after completion of construction and planting. For monitoring purposes, a growing season starts no later than May 31.
- 7. Revegetated areas will be assessed using three success standards. Each standard is described below. Success Standard 1: At least 75% of the surface area of these areas should be reestablished with indigenous species within three growing seasons. Success Standard 2: Vegetation should be checked to ensure that no invasive species colonize in these areas. Success Standard 3: Slopes within and adjacent to the revegetated areas are stabilized.
- 8. In the event that remediation measures are recommended, BNE Energy, Inc. will initiate these measures with the assistance of the qualified third party inspector.
- 9. If necessary to control invasive species, herbicide applications will be conducted by a state-licensed individual. If applications are required in proximity to site wetlands, the herbicide RODEO® [glyphosate (53.8% active ingredient)] shall be utilized as it is the only herbicide approved by CTDEP for application in aquatic environments.
- Fertilizers will not be used to promote growth within these areas. The proposed seed mixture contains a variety of native herbaceous species adept at colonizing recently disturbed greas.

Planting Schedule 1: Upland Restoration Areas

Disturbed areas will be planted with New England Conservation/Wildlife Mix (or equivalent) at 1750 sq.ft./lb. or as recommended by manufacturer. This mix

includes the following species: big bluestem (Andropogon gergrdii), fringed brome grass (Bromus ciliates), creeping red fescue (Festuca rubra), Canada wild rye (Elymus Canadensis), Virginia wild rye (Elymus virginicus), switchgrass (Panicur virgatum), deer tongue grass (Panicum clandestinum), little bluestem (Schizachyrium scoparium), Indian grass (Sorghastrum nutans), common milkweed (Asclepias scopularini, initial grass (congression in licens), common initial executions, some England aster (Aster novae-anglice), partridge pea (Chamaecrista fasciculate), showy tick-trefoli (Desmodium Canadense), grass leaved goldenrod (Euthamia graminifolia), gray goldenrod (Solidago nemoralis).

Wind Colebrook South - Third Party Environmental Inspections

- A qualified third party environmental inspector shall inspect the installation of erosion and sedimentation controls prior to the start of construction activities. A pre-construction meeting shall be held with the third party environmental inspector and general contractor prior to the start of construction.
- 2. The gualified third party environmental inspector will monitor erosion and sedimentation controls throughout the construction period to ensure that controls are properly maintained and any recommendations to remediate falling controls or removal accumulated sediment are implemented by the contro
- 3. The qualified third party environmental inspector shall monitor erosion and sedimentation controls on a weekly basis or within 24 hours of a rainfall event of 0.5 inches or greater.
- 4. Erosion and sedimentation control monitoring reports will be prepared by the third party environmental inspector on a bi-weekly basis and submitted to the Connecticut Siting Council.
- The on-site erosion and sediment controls shall be montiored by a qualified third party environmental inspector to ensure establishment of appropriate environmental safeguards protective of amphiblon and reprtile species.

EROSION CONTROL NARRATIVE

The following general principles shall be maintained as effective means of minimizing erosion and sedimentation during the development process.

Stripping away of vegetation, regrading or other development shall be done in

Grading and development plans shall preserve important natural features, keep cut and fill operations to a minimum, and insure conformity with topography so at to create the least erosion potential and adequately handle the volume and velocity of surface water runoff.

Whenever feasible, natural vegetation shall be retained, protected and supplemented wherever indicated on the site development plan.

The undisturbed area and the duration of exposure shall be kept to a practical minimum

Disturbed soils shall be stabilized as quickly as possible

Temporary vegetation and/or mulching shall be used to protect exposed critical areas during development when expected to be exposed in excess of 30 days

The permanent (final) vegetation and mechanical erosion control measures shall be installed as soon as practical during construction.

ent in the runoff water shall be trapped until the disturbed areas is stabilized by the use of debris basins, sediment basins, silt traps or similar

Concentration of surface runoff shall be only permitted by piping and/or through

Excavation and Fills --

Slopes created by cuts or fills shall not be steeper than 1.5:1 and shall be restabilized by temporary or permanent measures, as required during the development process and shown on the site plans.

Adequate provisions shall be made to prevent surface water from damaging the cut face of excavations or the sloping surfaces of fills.

Cut and fills shall not endanger adjoining property.

All fills shall be compacted to provide stability of material and to prevent undesirable settlement. The fill shall be spread in a series of layers each not exceeding twelve (12) inches in thickness and shall be compacted by a sheep roller or other approved method after each layer is spread.

regulated flood plain areas, unless permitted by license or permit from authority having jurisdiction in accordance with approved site plans.

Fills placed adjacent to natural watercourses, constructed channels or flood plains shall have suitable protection against erosion during periods of flooding.

Grading shall not be done in such a way as to divert water onto the property of

During grading operations, necessary measures for dust control shall be

Sedimentation and erosion control shall be implemented in accordance with the Guidelines for Soil Erosion and Sediment Control (2002) — State of Connecticut DEP Bulletin 34.

The following general specifications will also be adhered to:

Land disturbance will be kept to a minimum. Restabilization will be scheduled

*TEMPORARY SEDIMENT TRAPS WILL BE SURROUNDED TO THE MAXIMUM EXTENT PRACTICAL WITH SILT FENCE TO EXCLUDE MIGRATING AMPHIBIANS AND AVOID THESE BASINS BECOMING DECOY POOLS.

Haybale filters will be installed at all culvert outlets and along the toe of

Culvert discharge areas will be protected with riprap channels. Energy dissipaters will be provided as necessary.

Catch basins will be protected with haybale filters throughout the construction period and until all disturbed areas are thoroughly stabilized.

All erosion and sediment control measures will be constructed in accordance with the standards and specifications of the Guidelines for Soil Erosion and Sediment Control (2002) — State of Connecticut DEP Bulletin 34. *SYNCOPATED SILT FENCING WILL BE EMPLOYED WITHIN 750' OF THE VERNAL POOLS TO FACILITATE MOVEMENT OF

WETLAND-DEPENDENT AMPHIBIANS TO AND FROM THESE VERNAL POOLS DURING CONSTRUCTION. Erosion and sediment control measures will be installed prior to construction

All control measures will be maintained in effective condition throughout the construction period.

Additional control measures will be installed during construction if necessary

All erosion control measures shall be inspected weekly and within 24 hours of a rainfall event of 0.5 inches or greater.

EARTHWORK QUANTITY ESTIMATE

TOTAL CUT - 14,950 C.Y. TOTAL FILL - 23,250 C.Y.

COMMON CLEAN FILL REQUIRED (TOPSOIL AND SUBSOIL) - 14,450 C.Y.

RIPRAP TO BE PROCESSED FROM ON-SITE MATERIAL - 500 C.Y.

PROCESS GRAVEL, ASPHALT AND STONE TO BE IMPORTED - 8,300 C.Y.

NOTE: ALL EXCAVATED (CUT) MATERIAL TO BE REUSED ON-SITE. OVERALL SITE DISTURBANCE ASSOCIATED WITH THE PROPOSED IMPROVEMENTS - 16.07 ACRES 1 CLEARING AREA REVISED 23 JUL 12

BNE ENERGY. INC. 29 SOUTH MAIN STREET **TOWN CENTER SUITE 200** WEST HARTFORD, CT 06107

EROSION CONTROL NARRATIVE AND CONSTRUCTION SEQUENCE

WIND COLEBROOK SOUTH

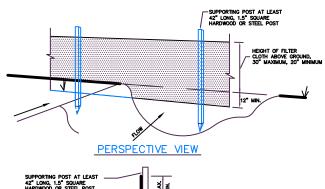
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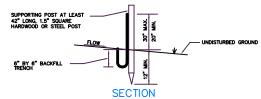
COLEBROOK CONNECTICUT



CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
(203) 266 - 0778 CONI WOODBURY CONNECTICUT

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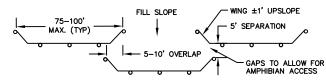


CONSTRUCTION NOTES FOR SILT FENCE

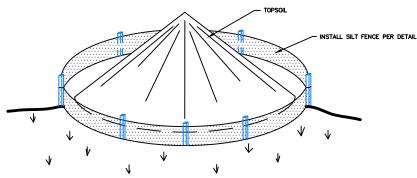
3. STAPLE OR SECURE THE GEOTEXTILE TO THE SUPPORT POSTS PER MANUFACTURER'S INSTRUCTIONS SUCH THAT AT LEAST 6 INCHES OF GEOTEXTILE LIES WITHIN THE TRENCH.

4. BACKFILL THE TRENCH WITH TAMPED SOIL OR AGGREGATE OVER THE GEOTEXTILE.

SILT FENCE DETAIL



SYNCOPATED SILT FENCE INSTALLATION



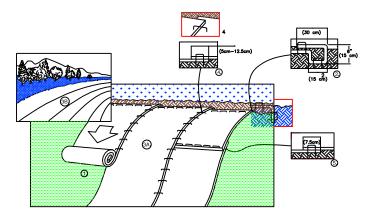
STOCKPILE MANAGEMENT PER 2002 CT GUIDELINES FOR E & S CONTROL:

- 1. LOCATE STOCKPILE SO THAT NATURAL DRAINAGE IS NOT OBSTRUCTED.
 2. DIVERT RUNOFF WATER AWAY FROM OR AROUND THE STOCKPILE.
 3. INSTALL A GEDTEXTILE SLIT FERCE OR HAY BALE BARRIER AROUND THE STOCKPILE AREA APPROXIMATELY 10 FEET FROM PROPOSED TOE OF THE SLOPE.
 4. THE SIDE SLOPES OF STOCKPILED MATERIAL SHOULD BE NO STEEPER THAN 2:1.
 5. STOCKPILES THAT ARE NOT TO BE USED WITHIN 30 DAYS NEED TO BE SEEDED AND MULCHED IMMEDIATELY AFTER FORMATION OF THE STOCKPILE.
 6. AFTER STOCKPILE HAS BEEN REMOVED, THE SITE SHOULD BE GRADED AND PERMANENTLY STABILIZED.

TEMPORARY TOPSOIL STOCKPILE

MIRAFI 140N NON-WOVEN FILTER FABRIC

SEEPAGE ENVELOPE DETAIL



- 1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.

 NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.

 BEGIN AT THE TOP OF THE SLOPE BY MACHORING THE BLANKET IN A 6" (15cm) DEED, 6" (15cm) LEDE, 7" (1
- STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE BLANKET.

 3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE BLANKETS WILL URROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE ALL BLANKETS MUST BE SCUPIELY FASTENED TO SOIL SURFACE BY PLACED STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SOINN IN THE STAPLE PATTERN QUIDE. WHAT USING OPPORTUNAL DOT SYSTEM, "STAPLES/STAKES HOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.

 4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5cm-12.5cm) OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET BLANKET BLANKET BLANKET BLANKET STAPLED DEDON THE PREVIOUSLY INSTALLED BLANKET. BLANKET SPLICED DOWN THE SLOPE MUST BE PLACED BND OVER END OWNED STATLE) WITH AN APPROXIMATE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE BLANKET WIDTH.

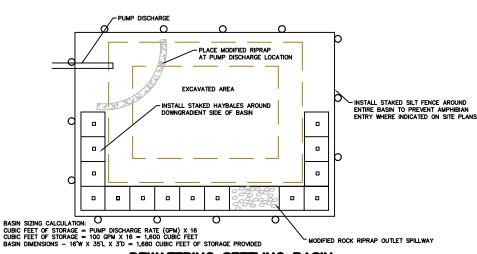
NOILE: "IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15cm) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

EROSION CONTROL BLANKETS

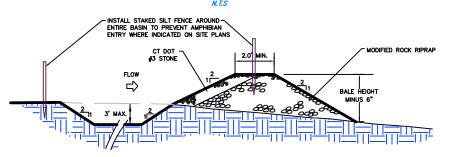
100% Straw fiber matrix sewn between two bio-degradable nets.

Net: Temporary lightweight bio-degradable (Both sides)

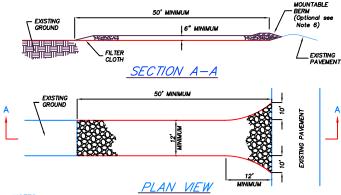
EROSION CONTROL BLANKET



DEWATERING SETTLING BASIN



DEWATERING SETTLING BASIN OUTLET



- STONE SIZE USE 1" 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.

- STONE SIZE USE 1" 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.

 LENGTH AS REQUIRED, BUT NOT LESS THAN 50 FEET.

 THICKNESS NOT LESS THAN SIX (5) INCHES.

 WIDTH 12 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24 FOOT MINIMUM IS SINGLE ENTRANCE TO SITE.

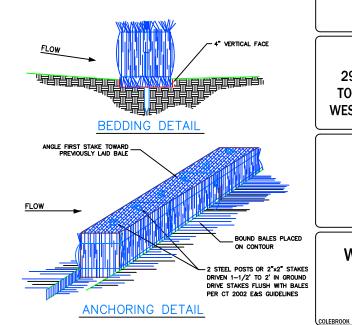
 FILTER CLOTH TO BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.

 SURFACE WATER ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERN WITH 5:1 SLOPES WILL BE PERMITTED.

 MAINTENANCE THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF FLOWING OF SEDIMENT ONTO PUBLIC RICHTS—OF—WAY. THIS MAY REQUIRE PERIODIC TOP PRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURE USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DRIPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS—OF—WAY WUST BE REMOVED MINEDITELY.

 WASHING WHELS SHALL BE CLEANED TO REMOVE SEDIMENT FROOT O ENTRANCE ONTO PUBLIC RICHTS—OF—WAY, WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

STABILIZED CONSTRUCTION ENTRANCE



NOTES:

- 1. BALES SHALL BE EITHER STRAW OR HAY.
- 2. BALES SHALL BE PLACED AT THE TOE OF SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
- 3. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4 INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
- 4. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
- 5. INSPECTION SHALL BE FREQUENT, AND REPAIR AND/OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDEI TO MAINTAIN EFFECTIVENESS OF INSTALLATION.
- 6. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

STAKED HAY BALE BARRIER

BNE ENERGY, INC. 29 SOUTH MAIN STREET **TOWN CENTER SUITE 200** WEST HARTFORD, CT 06107

NO. REVISION

1 REVISED PER SITING COUNCIL

24 OCT 11

DETAILS

WIND COLEBROOK SOUTH

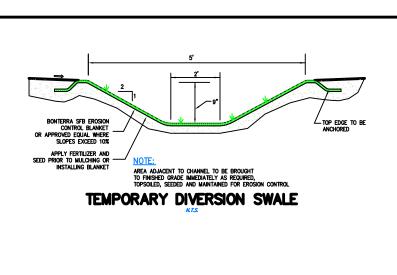
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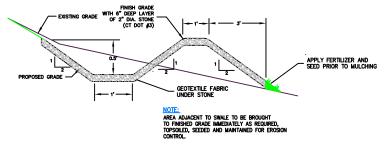
CORNERSTONE PROFESSIONAL PARK, SUITE D-101 43 SHERMAN HILL ROAD (203) 266-0778 CONN

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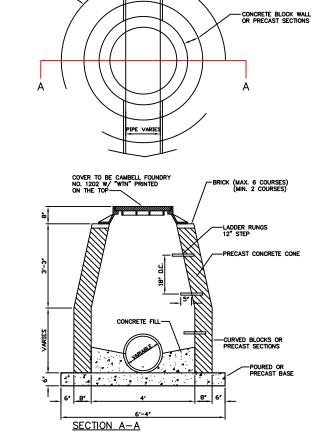
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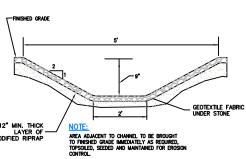


LEVEL SPREADER DETAIL

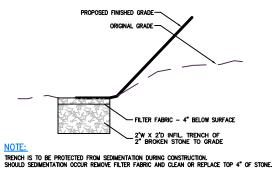
CURVED EDGE OF CONCRETE FOOTIN



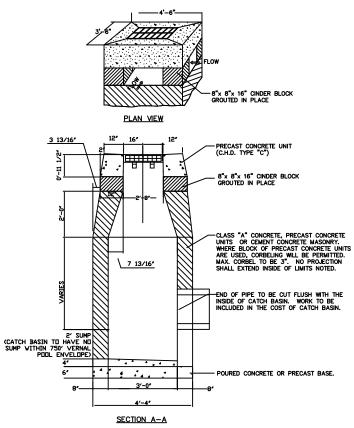




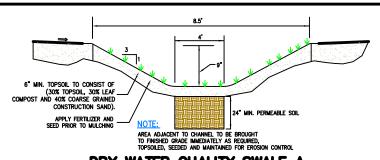
RIPRAP DIVERSION/CONVEYANCE SWALE



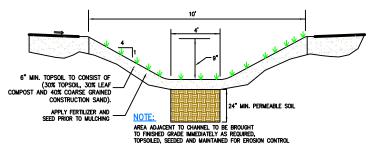
STONE INFILTRATION TRENCH



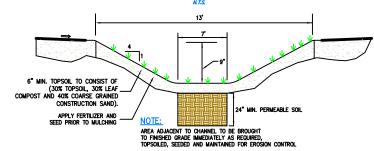
STANDARD TYPE "CL" CATCH BASIN



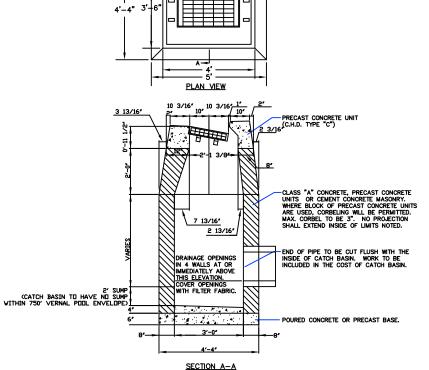
DRY WATER QUALITY SWALE A



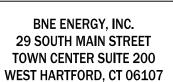
DRY WATER QUALITY SWALE B



DRY WATER QUALITY SWALE C



STANDARD TYPE "C" CATCH BASIN



NO. REVISION

DETAILS

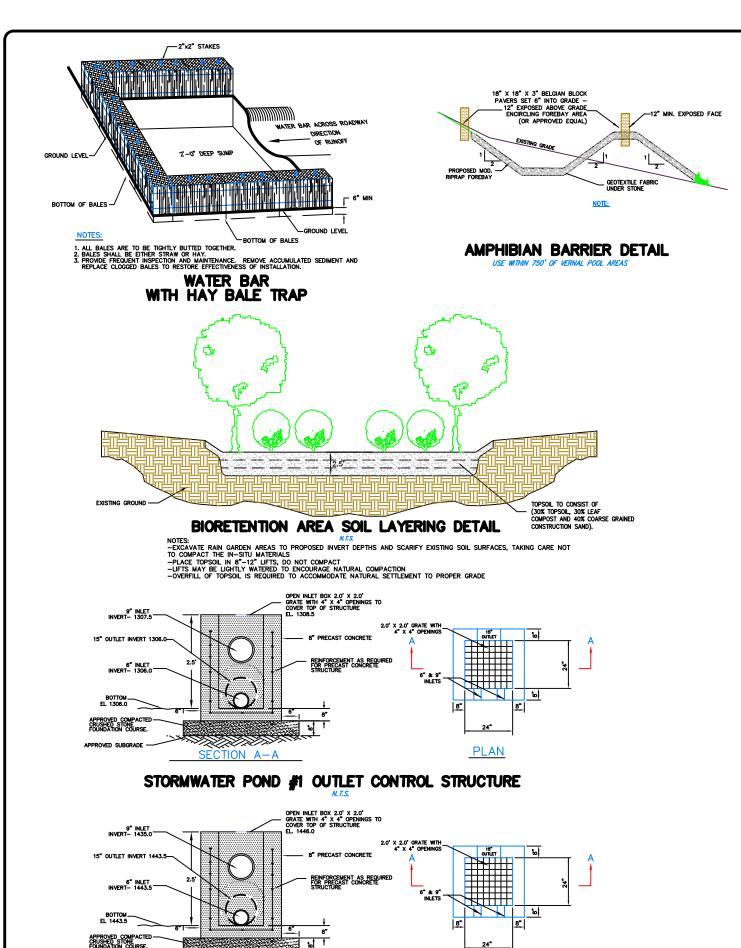
WIND	COLEBROOI	4
	SOUTH	

FLAGG HILL ROAD

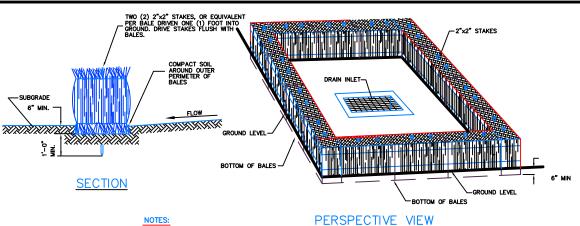


CORNERSTONE PROFESSIONAL PARK, SUITE D-101 43 SHERMAN HILL ROAD Y (203) 266 - 0778 CONN

SOME N.T.S. 26 AUG 11 3092 CADO FILE NAME 3092 C602

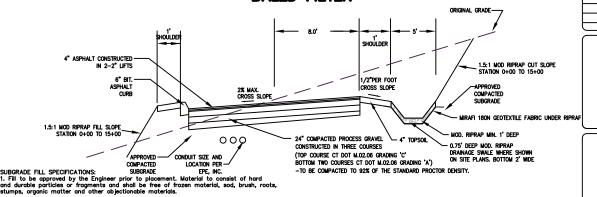


DETENTION/INFILTRATION BASIN #2 OUTLET CONTROL STRUCTURE



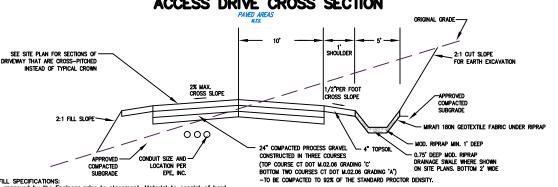
ALL BALES ARE TO BE TIGHTLY BUTTED TOGETHER.
 BALES SHALL BE EITHER STRAW OR HAY.
 PROVIDE FREQUENT INSPECTION AND MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AND REPLACE CLOGGED BALES TO RESTORE EFFECTIVENESS OF INSTALLATION.

BALED FILTER



Subbase and fill specifications to be confirmed and modified as necessary after site analysis by geotechnical engineer. Access drive design must be able to accommodate a proposed construction vehicles including crawler crane.

ACCESS DRIVE CROSS SECTION



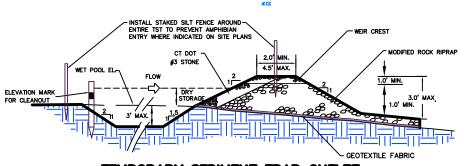
SUBGRADE FILL SPECIFICATIONS:

1. Fill to be approved by the Engineer prior to placement. Material to consist of hard and durable particles or fragments and shall be free of frozen material, sod, brush, roots, stumps, organic matter and other objectionable materials.

Subbase fill material shall be compacted to 90% of the standard proctor density until the required elevation is obtained.

Subbase and fill specifications to be confirmed and modified as necessary after site analysis by geotechnical engineer. Access drive design must be able to accommodate proposed construction vehicles including crawler crane.

ACCESS DRIVE CROSS SECTION



TEMPORARY SEDIMENT TRAP OUTLET

BNE ENERGY. INC. 29 SOUTH MAIN STREET **TOWN CENTER SUITE 200** WEST HARTFORD, CT 06107

NO. REVISION

1 REVISED PER ENV. CONSULTANT

DATE

28 AUG 12

DETAILS

WIND COLEBROOK SOUTH

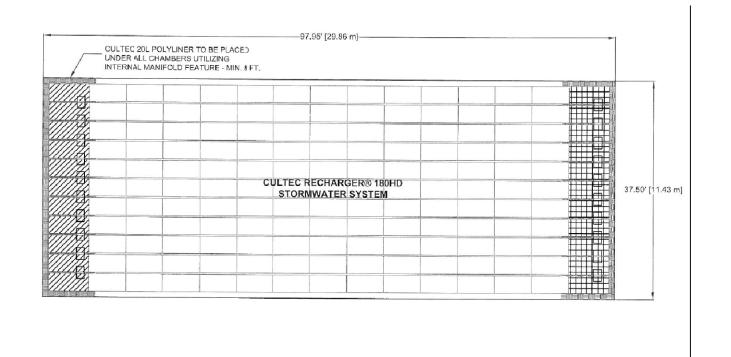
FLAGG HILL ROAD



CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
Y (203) 266 - 0778 CONF SOME N.T.S. 26 AUG 11

> 3092 C603

3092



MATERIALS LIST				
REGHARGER 1803HD STARTER	11	PIECES		
RECHARGER 1801HD INTERMEDIATE	163	PIECES		
RECHARGER 1806HD END	31	PIECES		
HVLV FC-24 FEED CONNECTORS	20	Plēces		
CULTEC No. 410 FILTER FABRIC 7.5'× 300	4	ROULS		
CULTEC No. 201 POLYETHYLENE LINER	150	LINEAL FEET		
1 1/2 - 2 INCH DIAMETER BROKEN STONE	234	CUBIC YARDS		

CULTEC RECHARGER® 180HD LEGEND

RECHARGER 1808HD STARTER

RECHARGER 1801HD INTERMEDIATE

RECHARGER 180EHD END

HVLV FC-24 FEED CONNECTORS

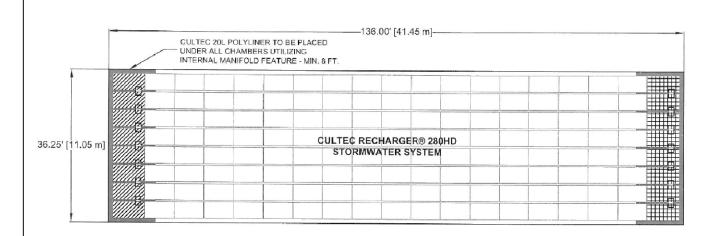
CULTEC NO. 20L POLYETHYLENE LINER

CULTEC STORMWATER MANAGEMENT SYSTEM STORAGE REQUIRED: 6,000 c.f.

STORAGE PROVIDED: 6,164 c.f.

*INSTALLED USING TYPICAL STONE REQUIREMENTS
OF 6 NICHES AROVE AND BELOW CHAMPERS AND A

OF 6 INCHES ABOVE AND BELOW CHAMBERS AND A 1 FT. BORDER SURROUNDING



MATERIALSUST				
RECHARGER 200SHD STARTER	8	PIECES		
RECHARGER 260IND INTERMEDIATE	138	PIECES		
RECHARGER 200EHD END	. 8	PIECES		
HVLV FC-24 FEED COMNECTORS	14	PIECES		
CULTED No. 450 FILTER FABRIC 7,5 x 300°	5	ROLLS		
CULTEC No. 20L POLYETHYLENE LINER	145	LINEAL FEET		
1 1/2 - 2 INCH DIAMETER BROXEN STONE	344	CUBIC YARDS		
VOLUME OF EXCAVATION	708	CUBIC YARDS		

CULTEC RECHARGER® 280HD LEGEND



HVLV FC-24 FEED CONNECTORS

CULTEC NO. 20L POLYETHYLENE LINER

CULTEC STORVWATER MANAGEMENT SYSTEM
STORAGE REQUIRED: 10,000 c.f.
STORAGE PROVIDED: 10,240 c.f.

'INSTALLED USING TYPICAL STONE REQUIREMENTS OF 6 INCHES AEOVE AND BELOW CHAMBERS AND A 1 FT. BORDER SURROUNDING BNE ENERGY, INC. 29 SOUTH MAIN STREET TOWN CENTER SUITE 200 WEST HARTFORD, CT 06107

NO. REVISION

DETAILS CULTEC DETENTION BEDS

WIND COLEBROOK SOUTH

FLAGG HILL ROAD

CONNECTICUT



CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
DBURY (203) 266-0778 CONNI

Appendix B INSPECTION AND MAINTENANCE RECORDS

CIVIL 1 Project No.: 3092

INSPECTOR CERTIFICATION

Project:	Wind Colebrook North
Project Location:	Winsted- Norfolk Road
3	Colebrook North
Contractor:	
Address:	
Phone:	
Fax:	

CONSTRUCTION INSPECTION & MAINTENANCE LOG

Date	Activity	Description	(1) Report No.
	☐ Inspection		
		By:	
	Maintenance		
	☐ Inspection		
		By:	
	Maintenance		
	☐ Inspection		
		By:	
	Maintenance		
	☐ Inspection		
		By:	
	Maintenance		
	☐ Inspection		
		By:	
	Maintenance		
	☐ Inspection	_	
		By:	
	Maintenance		
	☐ Inspection	-	
		By:	
	Maintenance		
	☐ Inspection	70	
		By:	
	Maintenance		
	☐ Inspection	70	
	<u> </u>	By:	
	Maintenance		
	☐ Inspection	D	
	 	By:	
	Maintenance		1

CONSTRUCTION SITE INSPECTION REPORT

General Information				
Project Name:	Wind Colebrook North	h		
Location:	Winsted- Norfolk Road			
	Colebrook, Connecticut			
CT DEP Tracking No.		(1) Report	No.	1
Date of Inspection:		Start / End Time:		
Inspector's Name(s):				
Inspector's Title(s):				
Inspector's Contact Information:				
Describe present phase of construction:				
Type of Inspection: ☐ Regular ☐ Pre-store	rm event	storm event \square Pos	st-storm event	
Weather Information				
Has it rained since the las □Yes □No	st inspection?			
If yes, provide: Storm Start Date & Time (in):	e: Storm Dura	ation (hrs):	Approxim	ate Rainfall
Weather at time of this in	ispection?			
Discharge Information ((A)			
Do you suspect that discharges may have occurred since the last inspection? Yes No				
Are there any discharges at the time of inspection? Yes No				
Describe location of any	discharges from the site	:: 		

SITE-SPECIFIC BMPs

(B)	BMP Description	BMP Installed and Operating Properly?	Corrective Action Needed	Date for corrective action / responsible party
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		
16		□Yes □No		
17		□Yes □No		
18		□Yes □No		
19		□Yes □No		

OVERALL SITE ISSUES

(C)	BMP/activity	Implemented?	Maintained?	Corrective Action	Date for corrective action/responsible person
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	□Yes □No	□Yes □No		
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	□Yes □No	□Yes □No		
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	□Yes □No	□Yes □No		
4	Are discharge points and receiving waters free of sediment deposits?	□Yes □No	□Yes □No		
5	Are storm drain inlets properly protected?	□Yes □No	□Yes □No		
6	Is there evidence of sediment being tracked into the street?	□Yes □No	□Yes □No		
7	Is trash/litter from work areas collected and placed in covered dumpsters?	□Yes □No	□Yes □No		

(C)	BMP/activity	Implemented?	Maintained?	Corrective Action	Date for corrective action/responsible person
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	□Yes □No	□Yes □No		
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	□Yes □No	□Yes □No		
10	Are materials that are potential stormwater contaminants stored inside or under cover?	□Yes □No	□Yes □No		
11	Are non- stormwater discharges (e.g., wash water, dewatering) properly controlled?	□Yes □No	□Yes □No		
12	(Other)	□Yes □No	□Yes □No		
13	(Other)	□Yes □No	□Yes □No		

Corrective

Date for corrective

action/responsible

		Implemented?	Maintained?	Action	action/responsible person
3EN	I JERAL INSPECTIO	N COMMENTS A	AND EXPLAN	ATION	
	ral Inspection Comm				
	ner descriptive inform	nation attached to	this inspection i	report?	
ı y e	s 🗖 No				
	n Information (E)				
Pla: We	n Information (E) re all current plan Bl	MP's in place at th	ne time of inspec	ction?	
Plan We	n Information (E) re all current plan BN 'es □No	_	ne time of inspec	etion?	
Plan We DY Are	n Information (E) re all current plan BN es □No e additional BMP's re es □No	equired?	ne time of inspec	etion?	
Plan We Ye Are Doe	n Information (E) re all current plan BN res No e additional BMP's re res No es the plan need to be	equired?	e time of inspec	etion?	
Plan We Ye Are Doe	n Information (E) re all current plan BN es □No e additional BMP's re es □No	equired?			
Plan We Ye Are Doe	n Information (E) re all current plan BN es □No e additional BMP's re es □No es the plan need to be es □No	equired?			
Plan We Ye Are Doe	n Information (E) re all current plan BN es □No e additional BMP's re es □No es the plan need to be es □No	equired?			
Plan We Ye Are Doe	n Information (E) re all current plan BN es □No e additional BMP's re es □No es the plan need to be es □No	equired?			
We DY	n Information (E) re all current plan BN es □No e additional BMP's re es □No es the plan need to be es □No	equired?			

Implemented? | Maintained?

Certification statement:

(C) BMP/activity

I certify that I have thoroughly and completely reviewed the Stormwater Pollution Control Plan for the site. I further certify, based on such review and in my professional judgment, that the

Stormwater Pollution Control Plan has been prepared in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, and the conditions for the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities issued on October 1, 2002 (or as reissued or modified), and the controls required for such Plan are appropriate for the site. I am aware that there are significant penalties for false statements in this certification, including the possibility of fine and imprisonment for knowingly making false statements.

Name:	
(Please print)	
Signature:	
Title:	Date:

CONSTRUCTION SITE MAINTENANCE REPORT

General Information				
Project Name:	Wind Colebrook North			
Location:	Winsted- Norfolk Road			
	Colebrook, Connecticut			
CT DEP Tracking No.:	(1) Report No.			
Date of Maintenance:	Start / End Time:			
Describe present phase of construction:				
Type of Maintenance: ☐ Regular ☐ Pre-stor Maintenance Information				
Inspection Report	Maintenance performed:			
Reference (No., Item)	mamenance performed.			
Performed by:				
Inspection Report Reference (No., Item)	Maintenance performed:			
Performed by:				
Inspection Report Reference (No., Item)	Maintenance performed:			
Performed by:				
Inspection Report Reference (No., Item)	Maintenance performed:			
Performed by:				
Inspection Report Reference (No., Item)	Maintenance performed:			
Performed by:				
1 CHOTHICA Dy.				

Inspection Report Reference (No., Item)	Maintenance performed:
Performed by:	
Inspection Report	Maintenance performed:
Reference (No., Item)	F
Performed by:	
Inspection Report	Maintenance performed:
Reference (No., Item)	-
Performed by:	
Inspection Report	Maintenance performed:
Reference (No., Item)	
Performed by:	
Inspection Report	Maintenance performed:
Reference (No., Item)	
Performed by:	
Inspection Report	Maintenance performed:
Reference (No., Item)	
Performed by:	
Inspection Report	Maintenance performed:
Reference (No., Item)	Transcrimed.
(110., 11011)	-
Performed by:	
Inspection Report	Maintenance performed:
Reference (No., Item)	
Performed by:	

Certification statement:

I certify that I have thoroughly and completely reviewed the Stormwater Pollution Control Plan for the site. I further certify, based on such review and in my professional judgment, that the Stormwater Pollution Control Plan has been prepared in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, and the conditions for the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities issued on October 1, 2002 (or as reissued or modified), and the controls required for such Plan are appropriate for the site. I am aware that there are significant penalties for false statements in this certification, including the possibility of fine and imprisonment for knowingly making false statements.

Name:	
Signature:	
Title:	Date:

Appendix C SUPPORTING CALCULATIONS

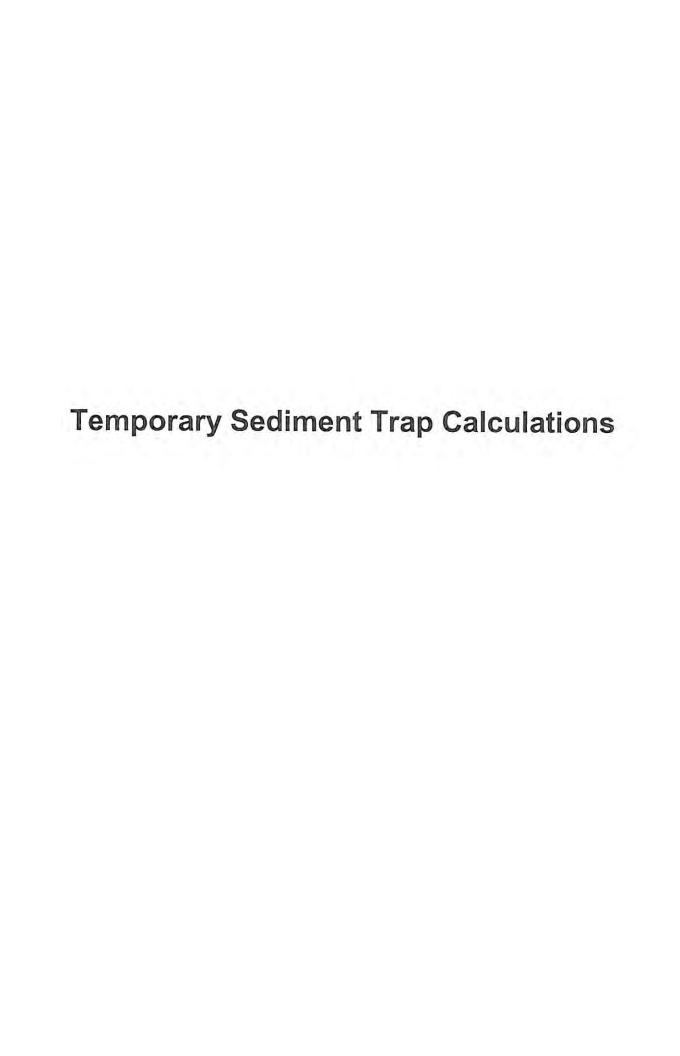
CIVIL 1 July 2012 Project No.: 3092

CALCULATIONS FOR TEMPORARY SEDIMENT TRAPS AND OUTLET PROTECTION

CIVIL 1 Project No.: 3092

Temporary Sediment Trap Calculations

CIVIL 1 Project No.: 3092



TEMPORARY SEDIMENT TRAP SIZING PER 2002 CT DEP E&S MANUAL 6-28-12

TST 1 (MAIN ACCESS DRIVE - STATION 0+00 TO 12+50) - STORMWATER POND #1

Initial Storage Volume = 134 cubic yards per acre of drainage area
V = 134 cubic yards x 1.40 acres = 188 cubic yards
Half of Storage Volume will be wet and half dry = 188 / 2 = 94 cubic yards = 2,532 cubic feet

Vwet = provided in Pond below outlet elevation = 3,782 cubic feet

Vdry = provided in Pond above outlet elevation and below weir = 12,072 cubic feet

TST 2 (TURBINE 1 LOCATION):

Initial Storage Volume = 134 cubic yards per acre of drainage area V = 134 cubic yards x 1.82 acres = 244 cubic yards Half of Storage Volume will be wet and half dry = 244 / 2 = 122 cubic yards = 3,294 cubic feet

Vwet = 0.85 x Awet x Dwet

If trap is 3.0' deep: 3,294 cubic feet = 0.85 x Awet x 3.0'

Awet required = 1,292 square feet

Use dimension of 20' x 65' for Wet Surface Area = Awet = 1,300 square feet

Vdry = (Awet + Adry)/2 x Ddry If dry area is 2.0' high, Adry = 28' x 73' = 2,044 sf Vdry = (1,300 + 2,044)/2 x 2.0' = 3,344 cubic feet Use dimension of 28' x 73' for Dry Surface Area

TST 3 (CRANE PAD ASSEMBLY AREA):

Initial Storage Volume = 134 cubic yards per acre of drainage area V = 134 cubic yards x 1.30 acres = 174 cubic yards
Half of Storage Volume will be wet and half dry = 174/2 = 87 cubic yards = 2,349 cubic feet

Vwet = 0.85 x Awet x Dwet

If trap is 3.0' deep: 2,349 cubic feet = 0.85 x Awet x 3.0'

Awet required = 921 square feet

Use dimension of 20' x 50' for Wet Surface Area = Awet = 1,000 square feet

Vdry = (Awet + Adry)/2 x Ddry If dry area is 2.0' high, Adry = 28' x 58' = 1,624 sf Vdry = (1,000 + 1,624)/2 x 2.0' = 2,624 cubic feet Use dimension of 28' x 58' for Dry Surface Area

TST 4 (MAIN ACCESS DRIVE - STATION 31+50):

Initial Storage Volume = 134 cubic yards per acre of drainage area V = 134 cubic yards x 1.48 acres = 198 cubic yards Half of Storage Volume will be wet and half dry = 198 / 2 = 99 cubic yards = 2,673 cubic feet

Vwet = 0.85 x Awet x Dwet

If trap is 3.0' deep: 2,673 cubic feet = 0.85 x Awet x 3.0'

Awet required = 1,048 square feet

Use dimension of 20' x 55' for Wet Surface Area = Awet = 1,100 square feet

Vdry = (Awet + Adry)/2 x Ddry If dry area is 2.0' high, Adry = 28' x 63' = 1,764 sf Vdry = (1,100 + 1,764)/2 x 2.0' = 2,764 cubic feet Use dimension of 28' x 63' for Dry Surface Area

TST 5 (MAIN ACCESS DRIVE - STATION 35+75):

Initial Storage Volume = 134 cubic yards per acre of drainage area V = 134 cubic yards x 1.45 acres = 194.3 cubic yards Half of Storage Volume will be wet and half dry = 194/2 = 97 cubic yards = 2,619 cubic feet

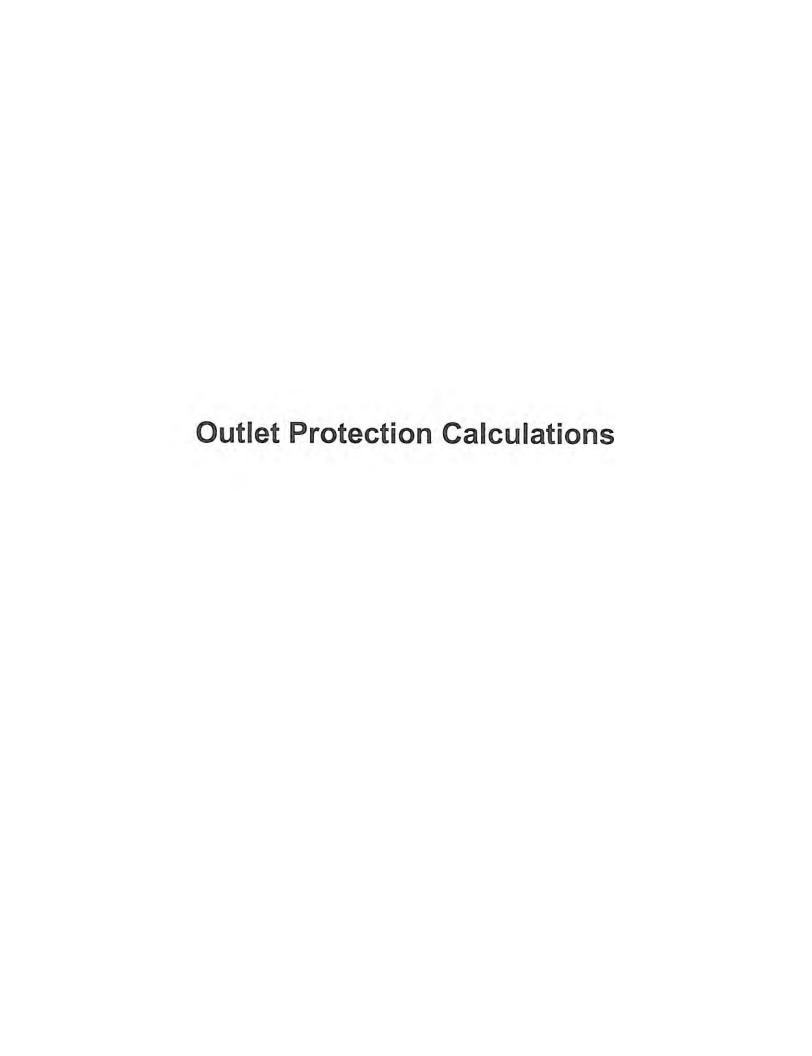
Vwet = 0.85 x Awet x Dwet

If trap is 3.0' deep: 2,619 cubic feet = 0.85 x Awet x 3.0'

Awet required = 1,027 square feet

Use dimension of 20' x 55' for Wet Surface Area = Awet = 1,100 square feet

Vdry = (Awet + Adry)/2 x Ddry If dry area is 2.0' high, Adry = 28' x 63' = 1,764 sf Vdry = (1,100 + 1,764)/2 x 2.0' = 2,864 cubic feet Use dimension of 28' x 63' for Dry Surface Area



Project Description	n
Worksheet	Pond #1-In (25
Flow Element	Circular Channe
Method	Manning's Form
Solve For	Channel Depth

Input Data			
Mannings Coeffic	0.013		
Channel Slope	050000	ft/ft	
Diameter	15.0	in	
Discharge	2.60	cfs	

Results	
Depth	0.36 ft
Flow Area	0.3 ft ²
Wetted Perime	1.41 ft
Top Width	0.00 ft
Critical Depth	0.65 ft
Percent Full	28.7 %
Critical Slope	0.005787-ft/ft
Velocity	8.92 ft/s
Velocity Head	1.24 ft
Specific Energ	1.60 ft
Froude Numbe	3.10
Maximum Disc	15.54 cfs
Discharge Full	14.44 cfs
Slope Full	0.001620 ft/ft
Flow Type 3	upercritical

			OU	TLET P	PIPE DI	AMET	EROR	SPAN (ir	1)	
DISCHARGE	12	15	18	24	30	36	42	48	54	60
(cfs)										
0-5	10	10) in this little	USE		DE LA	创建分类	建 (2004)		1488
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14		The second	Allowed Street	16	14	Jan Alexandria		THE SECTION ASSESSMENT	278	70.72
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18			100000	18	16	15				
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110				ALL VALS		1177				27
125		143.7		14716			HOLE	A CONTRACT	- 1	29
130	THE	新疆	的是新				X L	Table 1		30

Table 8-6.1 - Length - La (feet)

Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum La to be used for a given pipe diameter or span.

2. Rounding and interpolating are acceptable.

W= 35p+0.4La=7.8'=8' V=8.9 Fps. use Intermediate Riprop

Project Description	n
Worksheet	Pond #1-Out (25
Flow Element	Circular Channe
Method	Manning's Form
Solve For	Channel Depth

Input Data						
	Mannings Coeffic	0.013	F			
	Channel Slope	075000	ft/ft			
	Diameter	15.0	in			
	Discharge	0.90	cfs			

Results		
Depth	0.19	ft
Flow Area	0.1	ft ²
Wetted Perime	1.01	ft
Top Width	0.00	ft
Critical Depth	0.37	ft
Percent Full	15.3	%
Critical Slope	0.005212	ft/ft
Velocity	(7.55	ft/s
Velocity Head	0.89	ft
Specific Energ	1.08	ft
Froude Numbe	3.66	
Maximum Disc	19.03	cfs
Discharge Full	17.69	cfs
Slope Full	0.000194	ft/ft
Flow Type 3	upercritical	

				_		7	ER OR	SPAN (in)	
DISCHARGE	12	15	18	24	30	36	42	48	54	60
(cfs)	Miller Co.									
0-5	10	[10]	2	USE	多。	The same of the same		计算 说:	9.12	100
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9		支統	14	13	是是是				200	
10	and the second		15	13	La Calendaria	100			250	11.5
11	3.00		16	14				LEN	GTH	14. A.
12		題出		14,	等模型		42.0	治院量		
14				16	14				100	10
16	44	11.7		17	15	14			OUTI	INED
18				18	16	15				國語和
20			,		17	15	14	Secretary of the secret		SARD ROOM
22	2000年	TICE	2 13763		18	16	15	16725	174	10.00
24				100	A STATE	17	15	14	12.8	
26	dans SS		Zi zi		***	17	16	15	- 7700	
28		5.5			100	18	16	15		
30	Section	100		a ilea		19	17	16		Maria.
35					Tan-	20	18	17	16	ris it ing
40	ALCOHOL: N	是"军"	PRE	FORM	ED		20	18	17	16
45			No.	10.52		na panaga sahi	21	19	18	16
50	5200		200	2043	7/11/6		22	20	18	17
55					道沙唐	经 申请		21	19	18
60	2.00 P.S.							22	20	19
• 65			CILLIE					24	21	20
70	科的	***		MAR TO	SCO	UR	40.00	25	22	20
75				4445			14.	26	23	21
80	第一章		er de la company	2 10	60年	美国			24	22
90	Partie 1	Majorusina :		12.75			10 mm (1)	and the second second	26	24
100	Tour State		La leave w					Magra Co.	28	25
110									- 1	27
125		45517	With the	ACKES S			HOLE			29
130	120 E	和 吾 ②					建设基础			30

Table 8-6.1 - Length - La (feet)

Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum La to be used for a given pipe diameter or span.

2. Rounding and interpolating are acceptable.

W=35p=0.4La=8' Velocity=7.6fps, use Modified Ripap.

Project Description	n
Worksheet	Cross Culvert 5+00 (2
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data			
Mannings Coeffic	0.013	4	
Channel Slope	089000	ft/ft	
Diameter	15.0	in	
Discharge	1.84	cfs	

Results		
Depth	0.26	ft
Flow Area	0.2	ft²
Wetted Perime	1.19	ft
Top Width	0.00	ft
Critical Depth	0.54	ft
Percent Full	20.9	%
Critical Slope	0.005419	ft/ft
Velocity	(9.91	ft/s
Velocity Head	1.53	ft
Specific Energ	1.79	ft
Froude Numbe	4.08	
Maximum Disc	20.73	cfs
Discharge Full	19.27	cfs
Slope Full	0.000811	ft/ft
Flow Type	upercritical	

	OUTLET PIPE DIAMETER OR SPAN (in)									
DISCHARGE	12	15	18	24	30	36	42	48	54	6
(cfs)										
0-5	10	10	1	USE	2435	以基础:	alch 文章	建筑 地。		133
6	12	11	過過程	\$4.120				Section 1	1 0000	
7	那题	13 '	12		134				1	(4)
8		14	13	12		MIN	IMUM	District View		
9	200	超過程	14	13	质性	11.56	经需要		and and	
10	13		15	13	1 PEAN		**************************************			
11		100	16	14	1	1	no Saber	LE	VGTH	4.
12	299.00	建建		14,				THE WAR		
14	and the second			16	14	700-4017 (44) 		1274	3.4	成式
16				17	15	14			OUTI	
18			300	18	16	15	1500			
20				in the second	17	15	14		- 0	Charles Carte
22		USE		43.5	18	16	15		70	WARRENCE ALL
24					1.100	17	15	14		100
26	440/20		Kay All Inc.		and the state of	17	16	15	79.7	
28					The state of	18	16	15	125	
30	16.3		7.5	A 18		19	17	16		W.
35	500				新班	20	18	17	16	2-12-13-13
40		是是"别	PRE	FORM	ED		20	18	17	10
45				de comingado		e Jensym i r	21	19	18	16
50	多更加的			不知 主	100		22	20	18	17
55	1,000	· 一	a conti	4.21	金包	1		21	19	18
60				Sept. 10			的。但是	22	20	19
• 65		100						24	21	20
70	所放 新	4		A DE	SCO	UR	7	25	22	20
75		E ME		1273	A SEC	學是次	100	26	23	21
80			A SA	文學等	新新疆		語遊桐	Constant of	24	22
90	2 W	And the second		A THE STATE OF					26	24
100	734E3		Laz		2000			district -	28	25
110		4								27
125		essiri.	A FEEL	LANGE CO.	12.56	Carl Lines	HOLE			29
130	THE PERSON		N S I I I				L Spir	The Second of	~ £	30

Table 8-6.1 - Length - La (feet)

Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum La to be used for a given pipe diameter or span.

2. Rounding and interpolating are acceptable.

W=35p+0.4 La = 8' V= 9.9 fps. use Standard Rigrap

Project Descript	ion				
Worksheet	Cros	s Culve	rt 7+00 (25	Y/Z	STORM)
Flow Element	Circ	ular Cha	nnel		
Method	Man	ning's F	ormula		
Solve For	Cha	nnel De	oth		
Input Data					
Mannings Coeff	ic 0.013				
Channel Slope	048000	ft/ft			
Diameter	15.0	in			
Discharge	1.84	cfs			
Results					
Depth	0.30) ft			
Flow Area	0.2	ft²			
Wetted Perime	1.29	ft			
Top Width	0.00	ft			
Critical Depth	0.54	ft			
Percent Full	24.4	%			
Critical Slope	0.005419	ft/ft			
Velocity	7.96	ft/s			
Velocity Head	0.98	ft			
Specific Energ	1.29	ft			
Froude Numbe	3.02				
Maximum Disc	15.22	cfs			
Discharge Full	14.15	cfs			
Slope Full	0.000811	ft/ft			
Flow Type 3	upercritical				

	100		OUT	CLET P	IPE DI	AMET	ER OR	SPAN (in	1)	
DISCHARGE	12	15	18	24	30	36	42	48	54	60
(cfs)										
0-5	10	10	J. 358.25	USE	-		南海洋			133
6	12	11	进制品	CONTRACTOR OF THE PARTY OF THE	0.000	Contract States	10000	A Company		
7	2002年	13 '	12				ALC: N			
8		14	13	12		MIN	IMUM	afarrage to their meters		
9	3200		14	13		150				
10	1 A W 1	100	15	13	a Alexandra			を発展され	1	· View
11	= 12.7386		16	14	- Taled william	SALES AND A	4.0 E 4.6	LEN	VGTH	2.
12	23.5 00		All Control	14.			100	ATTENDED		
14		4		16	14				4-2	15.20
16				17	15	14				LINEL
18				18	16	15			7.5	Tanker A
20			o - A V Columbia		17	15	14	nice in the	70	Libario e
22	100000	USE		97.5	18	16	15		1-1-1-1	A MENGLANDA
24					\$36.70a	17	15	14		1
26	7052726	有意识的	Karam, San		ng ang al al a	17	16	15	7957	A Company of the last
28	44.7					18	16	15	orining.	
30	MALE.	LOUIS I				19	17	16		14
35					337	20	18	17	16	result ing
40	173.44	经验时	PRE	FORM	ED :		20	18	17	16
45			79.1	NAMES OF THE		nijetosa Sir	21	19	18	16
50	334			100	可能語		22	20	18	17
55	145		CHANGE OF THE			1.	ek († 1872)	21	19	18
60	944	14-14	1995	13.00				22	20	19
- 65		100	4.5			The San		24	21	20
70	FERRING.	ALC: I	10000		SCO	UR 🗐	-3-2-2	25	22	20
75				1.15	1999	計劃集	The Table	26	23	21
80	345				电影	有			24	22
90	120 37	A Company		19					26	24
100	The same of the contract of th	是是是					e de la re	A Company	28	25
110		4.173.3				1179			- 14	27
125	E44.07		Kent Charles		证明是	Sales Sales			15.362	29
130		新疆		Sec. 1			英国的			30

Table 8-6.1 - Length - La (feet)

Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum La to be used for a given pipe diameter or span.

2. Rounding and interpolating are acceptable.

W=35p+0.4Le=8' V=8fps, use Intermediate Riprap

Project Descript	ion	
Worksheet	Infil Basin #2 -Out (25 Y F	STORM)
Flow Element	Circular Channel	
Method	Manning's Formula	
Solve For	Channel Depth	
Input Data		
Mannings Coeff	fic 0.013	
Channel Slope	100000 ft/ft	
Diameter	15.0 in	
Discharge	1.50 cfs	
Results		
Depth	0.23 ft	
Flow Area	0.2 ft ²	
Wetted Perime	1.11 ft	
Top Width	0.00 ft	
Critical Depth	0.48 ft	
Percent Full	18.3 %	
Critical Slope	0.005312 ft/ft	
Velocity	9.72 ft/s	

1.47 ft

1.70 ft

21.97 cfs

20.43 cfs

4.29

0.000539 ft/ft

Supercritical

Velocity Head

Specific Energ

Froude Numbe

Maximum Disc

Discharge Full

Slope Full

Flow Type

			OUT	TLET P	PIPE DI	AMET	ER OR	SPAN (in	1)	
DISCHARGE	12	15	18	24	30	36	42	48	54	60
(cfs)	- 11.									
0-5	10	10	Salar Salar	USE	4 5	3012.00	南部 英国		N. S. W.	1325
6	12	11	是特別	BOSES.	TO THE STATE OF		1		1 2 - 200	
7	1999	13 '	12			电话	instru		- 4	
8	. 17. 19. 5	14	13	12		MIN	IMUM			
9		2011	14	13	建工作			4	1	143.00
10	series and the se		15	13	1	100				
11		354	16	14	3.54	G. W.		LEN	VGTH	78 16
12		植出		14,				道域。		95 TX 51
14	4	200		16	14	35 4 7 4		Equity in a	e de la companya de l	
16				17	15	14			-	LINED
18				18	16	15				建筑
20			o Aldidan	eren de la come	17	15	14	Side of the second		Links and Links
22	1000	USE	ing Sign		18	16	15			
24		7374		Seat L		17	15	14	(9)	1
26	3000000	140		4		17	16	15	1 700 00	3000
28	364012		1306		医温度	18	16	15	The state of the s	
30	Sec. 1		10.00		(75,4	19	17	16		of course
35				100		20	18	17	16	- De la city de la cit
40	1.5		PRE	FORM	ED :		20	18	17	16
45			N. J.		Jes	a displace	21	19	18	16
50	15 P. 1			200	33.5		22	20	18	17
55	建筑	6.57				47.4%	4.10年第	21	19	18
60					27 July	37.163	<i>Guide</i>	22	20	19
• 65	3500		45.1				40.4	24	21	20
70	A STATE OF	100	and the second		SCO	UR 🐇	10.00	25	22	20
75				144			1 70 74	26	23	21
80		逐渐扩张		3.85	电影		學品學		24	22
90	PARK 1	A SECTION AND A	Constant	Spirit T	20.5			and a property of	26	24
100			Lucy		100		語的影響	Prikingalis Mangride	28	25
110	经净价	PER H		The world	1 E 1 - 1	2009	(Near			27
125		的大名词	A Comme		4.00 P	at Fu	HOLE			29
130	THE P	旅舞	Wilder I				No.	E Table	- 1	30

Table 8-6.1 - Length - La (feet)

Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum La to be used for a given pipe diameter or span.

2. Rounding and interpolating are acceptable.

W=35p+0.4 La=8' V=9.7fps, use Intermediate Riprep

Project Description	n
Worksheet	CB 15+95 (25 YR STURM)
Flow Element	Circular Chann
Method	Manning's Forr
Solve For	Channel Depth

Input Data			
Mannings Coeffic	0.013		
Channel Slope	050000	ft/ft	
Diameter	15.0	in	
Discharge	0.90	cfs	

Results		
Depth	0.21	ft
Flow Area	0.1	ft²
Wetted Perime	1.06	ft
Top Width	0.00	ft
Critical Depth	0.37	ft
Percent Full	16.9	%
Critical Slope	0.005212	ft/ft
Velocity	6.55	ft/s
Velocity Head	0.67	ft
Specific Energ	0.88	ft
Froude Numbe	3.01	
Maximum Disc	15.54	cfs
Discharge Full	14.44	cfs
Slope Full	0.000194	ft/ft
Flow Type 3	upercritical	

	OUTLET PIPE DIAMETER OR SPAN (in)									
DISCHARGE	12	15	18	24	30	36	42	48	54	6
(cfs)										
0-5	10	10		USE	-				- 4	132
6	12	11		SEE CH				DATE:		- FIALL
7	建筑	13 '	12	11976	高速	a long of the last and	學物理			
8		14	13	12	3230	MIN	IMUM	Designation of the control of the co		1
9			14	13	as we put a			44		
10	14 de 1		15	13	The Dear		PART OF THE			11 48
11			16	14	and the second	Taras T		LE	VGTH	422
12	2.552	对 图图	1.65	14.	主題				14 14114	N
14	100 M27		1.1	16	14	25 - 75 - 83 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10		建		
16		in a		17	15	14			OUT	INE
18		tie Si		18	16	15			1.513	
20			T L	erie de la company	17	15	14	par street with	- 1	
22	11.7	TISE		5.50	18	16	15		7 1	
24					in the	17	15	14	4	
26	经验证	第二次	V.	1		17	16	15	- valley	274(4)
28	349692					18	16	15		
30	54.65					19	17	16	· · · · · · · · · · · · · · · · · · ·	
35		CER	416			20	18	17	16	ericing.
40			PRE	FORM	ED :	No.	20	18	17	10
45				NORTH A		n diagn bir	21	19	18	16
50							22	20	18	17
55		級多計		24. 图艺			美国新疆	21	19	18
60				50.00				22	20	19
- 65		4				30.14	4.4	24	21	20
70	后的社	4.45		KA PA	SCO	UR	170	25	22	20
75		5.76		设置的				26	23	21
80		企		o teres.	199				24	22
90	Park	Miles Auton		Jan Jan			nedate at the		26	24
100	7.54	2000年	TO LINE	E E HE				The second	28	25
110						117.4				27
125	GPS T	ESTATE OF THE PERSON NAMED IN	N. T. J.	C4785 - 5			HOLE	NOTE:		29
130		計劃		10			TO AT			30

Table 8-6.1 - Length - La (feet)

Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum La to be used for a given pipe diameter or span.

2. Rounding and interpolating are acceptable.

W=35p+0.4 La=8' V=6.6 fps. use Modified Reprap

Worksheet	CB	18+50 (25
Flow Element		ular Chan
Method	Man	ning's For
Solve For		nnel Dept
Input Data		
Mannings Coeff	ic 0.013	
Channel Slope	010000	ft/ft
Diameter	15.0	in
Discharge	2.86	cfs
Results		
Depth	0.58	3 ft
Flow Area	0.6	6 ft²
Wetted Perime	1.88	3 ft
Top Width	0.00) ft
Critical Depth	0.68	3 ft
Percent Full	46.6	6 %
Critical Slope	0.005939	ft/ft
Velocity	(5.10	ft/s
Velocity Head	0.40	ft
Specific Energ	0.99) ft
Froude Numbe	1.34	
Maximum Disc	6.95	cfs
Discharge Full	6.46	cfs
Slope Full	0.001960	ft/ft
Flow Type	upercritica	

	OUTLET PIPE DIAMETER OR SPAN (in)									
DISCHARGE	12	15	18	24	30	36	42	48	54	60
(cfs)										
0-5	10	10	治療定理	USE		建装施			- 434	1335
6	12	11	进程社			the state of the state of	6.03		, A.	(一) 出版を対象
7	到数据	13 '	12			No.	1	直接后	- 2	400
8	. 11.7	14	13	12	The same		IMUM	Contract Con		
9		数数	14	13	AND THE			ALC: NO.		
10	and the state of		15	13	100		100	THE LOCAL	100	10.76
11			16	14				LEN	VGTH	2014
12	3.5 E		44	14.				道底端	1	
14	温度	L	All was a first to	16	14	TO METAN	1 1			672
16				17	15	14	an Tender			INEL
18		100		18	16	15			133	SE SE
20		100 mm 1			17	15	14	Secretary Control		Charles of
22	是对对	TICE	45.00	De la	18	16	15		16	
24	n Marie	73.14.31			GARANCE.	17	15	14		
26	1995		WHAT IN	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		17	16	15	via flyin	e Merchania
28					147.61	18	16	15	100	
30	46.4	F 1 1 17				19	17	16		164
35		STA				20	18	17	16	Colt 10
40	25		PRE	FORM	ED :	BEPSE	20	18	17	16
45		5.60		NO HOS		i. Janusur	21	19	18	16
50	\$10 and 10 and 1			ESTATE:	阿加斯		22	20	18	17
55		M						21	19	18
60		逐步		指声				22	20	19
• 65	15.5		44-51-5	11.		1 3 4 1 1 2	Sec 7 . 175	24	21	20
70	FARMS!		西州		SCO	UR -		25	22	20
75				10.15	E MF4			26	23	21
80	台上李			3 187	种野社	e de la			24	22
90	24 K 312	HMT		100 mg/ 100 mg			the fact of posterior	1	26	24
100	J. No.		La Real S	Later D			A STATE OF	A SELECTION OF THE SELE	28	25
110	编额					型的	Such at an english			27
125	CASE OF	1515	WASH.	2078 Sep. 15		A Second	HOLE	SHIP	1 - 24	29
130		和·特·		345.			XCAP.		4.7	30

Table 8-6.1 - Length - La (feet)

Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum La to be used for a given pipe diameter or span.

2. Rounding and interpolating are acceptable.

W= 3 Sp+ O.4 La = 8' V=5.1 fps. use Mod. Fred Ripmp

Project Description	n.
Worksheet	CB 29+35 (25 YE STOREN)
Flow Element	Circular Chann
Method	Manning's Forr
Solve For	Channel Depth

Input Data									
Mannings Coeffic	0.013	1							
Channel Slope	007500	ft/ft							
Diameter	15.0	in							
Discharge	1.30	cfs							

Results		
Depth	0.41	ft
Flow Area	0.4	ft ²
Wetted Perime	1.52	ft
Top Width	0.00	ft
Critical Depth	0.45	ft
Percent Full	32.8	%
Critical Slope	0.005261	ft/ft
Velocity	3.71	ft/s
Velocity Head	0.21	ft
Specific Energ	0.62	ft
Froude Numbe	1.20	
Maximum Disc	6.02	cfs
Discharge Full	5.59	cfs
Slope Full	0.000405	ft/ft
Flow Type	upercritical	

			OUT	TLET P	IPE DI	AMET.	ER OR	SPAN (in)	
DISCHARGE	12	15	18	24	30	36	42	48	54	60
(cfs)										
0-5	10	10	To Sala	USE						1983
6	12	11	. 当然的	SCS BO		A CONTRACTOR SALVE A	244		1 10 10 10	
7	2000年	13 '	12	建一种		123	明 哲学		1/2-A	WAR.
8	. 13. 5	14	13	12			IMUM	Applicate the Labor wider of		
9		美国	14	13			1	AND THE RESERVE OF THE PERSON	-d	
10	si-reneral and	美女女	15	13					1	
11			16	14				LEN	GTH	1.74
12		模型		14,				TORK W		
14	0.00	2 TO 1 TO 1	all the state of t	16	14				11000	
16				17	15	14	a Hartman		OUTI	
18				18	16	15				金牌
20	A Care				17	15	14	story grant	1 1743	Cura press
22	建水煤料	TICE	1500	76.335	18	16	15	60 TW2-		
24			WE STATE			17	15	14		
26	142225			1-1	a di si di i	17	16	15	1/16/4p	254-4540 256-2
28	349.82			YM 法保		18	16	15	2	
30	3462h	lelen n		ets is an		19	17	16		
35						20	18	17	16	12.71
40		32.79.74	PRE	FORM	ED .	新建筑 建	20	18	17	16
45		2000		N T HE COLUMN			21	19	18	16
50	5 (4)		F-17.192	200	型信息	企 基础	22	20	18	17
55		接头上	4 44.8	4.		CA		21	19	18
60	16700			13. jul	940	1969	SUL	22	20	19
- 65								24	21	20
70	是放料。	a street			. SCO	UR 🐇		25	22	20
75				设建设			40.4	26	23	21
80				は記述	明等。			THE COL	24	22
90	Park 1	Y STANFO	Curio de	10000			dy and the		26	24
100	Transfer of	的意识			man and the		Eq.	d Schernic Language	28	25
110	學時別	TE CO		使与这		4.劳斗	Legitive at Collect and State In			27
125		Raja.	对起来	distance .		an same	HOLE			29
130	THE PARTY							2000年	- 4	30

Table 8-6.1 - Length - La (feet)

Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum La to be used for a given pipe diameter or span.

2. Rounding and interpolating are acceptable.

W=35p +0.4 La = 81 V=3.7 Fps use Medified Reprap