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DH

September 12, 2013

Mr. Dan Courtemanch, Project Manager
Maine Department of Environmental Protection
Division of Land Resource Regulation
17 State House Station
Augusta, ME 04333-0017

Subject: Bingham Wind Project
Response to Additional Stormwater Review Comments
L-25973-24-A-N/L-25973-B-N, Bingham Wind Project, Bingham et al.

Dear Mr. Courtemanch:

We are pleased to provide the accompanying responses to Art McGlauflin's additional stormwater review comments dated August 28, 2013 for the proposed Bingham Wind Project. For ease of reference, we have repeated the comments below (*italics*) followed by our response **(bold)**.

14.0 Basic Standards (Bingham Wind Project)

2. *We will need to discuss the permit language for construction modification allowances with department management. In my opinion, the construction changes allowed without the department's pre-approval on the Oakfield and Hancock projects are too broad. An allowance permitting increases in the size or small changes in the location of approved stormwater management structures seems reasonable. An allowance permitting the elimination or substitution of approved stormwater structures does not.*

   Per our conversation on September 10, 2013 during the site tour in Bingham, First Wind still requests the construction modification allowances as described in Section 14.2 of Section 14 of the application. Any modifications that results in changes to the stormwater management system design will be approved in advance by the Engineer of Record to ensure compliance with the Chapter 500 Stormwater Standards. See attached Section 14.0 Basic Standards.

4. *Plan sheet C-9.2, Section 14.5.1 – The applicant should revise the second bullet item under "Permanent Seeding and Mulching Plan" to delete the phase "unless otherwise approved by the engineer." The 7-day permanent stabilization standard in Appendix A of the Chapter 500 Rules is a performance requirement that all projects must meet.*

   This note has been deleted from Sheet C-9.2, Section 14.5.1. See attached Sheet C-9.2.

15. *Plan sheet C-7.0 – The applicant should revise the "Grassed Line Ditch Detail" to change note 6.B to require the erosion control mix used for ditch stabilization to be approved by the engineer and to change note 6.C to require the ditch to be protected by anchored mulch or erosion control matting.*

    Note 6.A has been revised to include language specifying that erosion control mixes used shall be approved by the engineer of record.
    Note 6.B has been revised to require approval of the erosion control blanket by the Engineer of Record.
    Note 6.C has been revised.
    See attached Sheet C-7.0.

12.0 Stormwater Management - General Standard (Bingham Wind Project)

The applicant has now chosen to apply the general standard on a project basis for the Bingham Wind Project. This is acceptable.

37. *The applicant should correct the treatment calculations for the Fall Brook watershed to eliminate roadside buffer AD-S11 treating runoff from South Crane Road 1 station 68+00 to station 71+50. This buffer is no longer on the project plans (see plan sheet C-S1.08).*

    The treatment calculations have been revised. The total number of turbine pads requiring treatment in the General Standard Watersheds has been increased to a total of 37. Refer to attached Sheet C-9.1 and the Revised Treatment Calculations.

53. *The South Crane Road 5 ditch length draining to DT-S31 exceeds 190 feet (the maximum I am willing to allow for ditch turnout buffers with silt-loam soil). An additional turnout buffer will be needed along this road section or the buffer redesigned to be a buffer with stone berm level lip spreader (see plan sheet C-S1.19).*

    DT-S31A has been added to provide an additional turnout buffer. See attached Sheet C-S1.19.

58. *The applicant should correct the treatment analysis for the Rift Brook watershed to limit AD-S26 treatment of South Crane Road 6 runoff to that from station 410+50 to station 412+50 and from station 413+00 to station 415+00 (see plan sheet C-S1.15). I got the station limits wrong in my original comment. My apology.*

    The treatment calculations have been revised and are appended to this response.

61. *The North Crane Road 11 ditch length draining to DT-N27 exceeds 190 feet (the maximum I am willing to allow for ditch turnout buffers with silt-loam soil). An additional turnout will be needed along this road section or the buffer redesigned to be a buffer with stone berm level lip spreader (see plan sheet C-N1.10).*

    DT-N27 has been changed to a stone berm level spreader. Treatment calculations have been revised; this treatment along North Crane Road 11 is now labeled as LS-N27. See attached Sheet C-N1.10.

65. *AD-N14A needs to be shown on plan sheet C-N1.10. This roadside buffer treats runoff from North Crane Road 11 from station 832+00 to 833+50 in the treatment calculations for the Baker Flowage.*

    AD-N14A is shown on the attached plan sheet C-N1.10.

70. *DT-N70 and DT-N70A don't appear to have ditches draining to them (see plan sheet C-N1.21). It appears that DT-N70 and DT-N70A could be replaced by extending roadside buffer AD-N30. This would allow treatment of runoff from North Crane Road 16 from station 1201+00 to station 1202+50 (but not from station 1200+00 to station 1201+00) in AD-N30.*

    DT-N70 and DT-N70A have been removed and replaced with AD-N30. Treatment calculations have been revised and are attached.

12.0 Stormwater Management - Phosphorus Standard (Bingham Wind Project)

Hilton Pond #1 Watershed

79. *The phosphorus budget for Hilton Pond #1 is 0.944 pounds per year, the smaller of the budgets found using the standard methodology and the small watershed threshold methodology. The project export in this watershed is still less than the allowed budget and, so, is acceptable.*

    Treatment calculations have been updated to reflect the lower phosphorous budget.

If you have any questions regarding these materials, please contact Josh Bagnato of First Wind.

Sincerely,

FIRST WIND

Josh Bagnato
Environmental Permitting and Compliance Manager
129 Middle Street, 3rd Floor
Portland, Maine 04101
Tel. 207.228-6888
Fax 207.221-1605

DeLUCA-HOFFMAN ASSOCIATES, INC.

Steven J. Blake, P.E.
Engineer
778 Main Street
Suite 8
South Portland, Maine 04106
Tel. 207.775.1121
Fax 207.879.0896

Attachments: Attachment A – Basic Standards Narrative (Section 14)
Attachment B – Revised Treatment Calculations
Revised Plan Sheets

CC: Art McGlauflin, Engineer, Division of Land Resource Regulation

ATTACHMENT A

Basic Standards Narrative (Section 14)

14.0 BASIC STANDARDS

14.1 INTRODUCTION

The following plan has been developed to provide a strategy for controlling erosion and sedimentation associated with the Bingham Wind Project (project) both during and after site construction (Maine Construction General Permit). The project is a proposed utility-scale wind energy facility located in Somerset and Piscataquis Counties, Maine, and includes 62 wind turbines (63 potential turbine locations are being permitted), existing and new access roads and crane paths, up to 5 temporary and up to 5 permanent meteorological towers, an Operations and Maintenance (O&M) building, 34.5-kilovolt electrical collector lines (the majority of which will be buried alongside project roads), a collector substation, and an approximately 17-mile electrical generator lead. This plan is based upon sound conservation practices, including as applicable, those outlined in the "Maine Erosion and Sediment Control Best Management Practices" manual published by the Bureau of Land and Water Quality, Maine Department of Environmental Protection (MDEP; March 2003), and past experience of the Applicants in constructing wind projects in Maine.

Details of erosion and sedimentation control during the construction of roadways and turbine pads can be found in the civil design plan included within Exhibit 1. Details of erosion and sedimentation control during the construction of the O&M building and substation facilities are located on sheets C-9.0 and C-9.1 of Exhibit 1. The electrical generator lead erosion and sedimentation control can be found in the electrical design plan of Exhibit 2.

14.1.1 Stormwater Management Measures

Additional measures may be required to protect new stormwater conveyance or management systems due to changes in actual site conditions. For more information on stormwater management, see Section 12. For additional information on buffers, the contractor shall reference the Maine Stormwater Best Management Practices Manual, Volume III: BMP Technical Design Manual Chapter 5, Vegetated Buffers (revised June 2010).

14.2 FIELD ADJUSTMENTS

The Applicants expect that minor adjustments will be made during final design work and during construction based on conditions encountered in the field. As described below, the Applicants have identified changes that do not require a permit modification and that may be made (a) without advance notice to MDEP or, (b) that require prior approval by the third-party inspector or MDEP staff.

The following field and/or final design adjustments are authorized under the permit provided they do not result in new impacts to protected natural resources as defined under the Natural Resources Protection Act (38 MRSA Section 480-B(8)); do not increase overall project clearing;

do not impact a new landowner; and meet the requirements of MDEP Chapter 500 Stormwater Management Standards. Any of these adjustments will be reflected in the final as-built drawings.

(a) Examples of adjustments that may be made during construction and/or final design without advance notice to MDEP:

- Reduction in clearing, impervious surface, or size of structure; elimination of a structure; or relocation of a structure;
- Location, dimension or addition of drainage culverts, level spreaders, rock sandwiches or other stormwater infrastructure, provided that the culvert does not convey a regulated stream and that the hydraulic capacity of the modified stormwater infrastructure meets design standards;
- Changes to pole or anchor locations for the electrical collector, provided that any adjustment meets the buffer requirements as defined in Section 10;
- Maintenance within the footprint of existing roads with exception of any in-stream work or wetland impacts to be used for temporary construction access;
- Changes of up to 10 feet in vertical roadway alignment and turbine pad elevation; and
- Changes of up to 300 feet in either direction in horizontal roadway alignment and associated clearing, and in turbine or met tower clearing area, and in electrical collector alignment laydown/staging areas.

(b) May be made upon prior approval by the third-party inspector or MDEP staff:

- Changes other than those identified in (a) and that do not otherwise require a permit amendment as determined by MDEP.

14.3 CONSTRUCTION CALENDAR

The Contractor is required to give special attention to the sections pertaining to fall and winter construction, as well as to sensitive areas and requirements for temporary seeding, dormant seeding, and mulching.

14.3.1 Definitions

The following definitions are terms commonly used throughout this plan.

Acceptance – As used herein shall mean verification by the Owner and/or the Engineer that the specific erosion control measure or device to be accepted is adequately constructed, performs satisfactorily as intended, and is complete. Acceptance of a measure or device by the Owner or the Engineer shall be based upon visual observations and inspection and is not a warranty of compliance, compaction, structural integrity, workmanship, or other construction-related or qualitative factors that may require testing or other means of certification of compliance.

Buffer strips – Natural, undisturbed strips of natural vegetation or reseeded strips of close-growing vegetation adjacent to and downslope of developed areas.

- Buffer with stone bermed level lip spreaders: This buffer is used for larger, developed areas and uses a level spreader to create sheet flow onto the buffer.
- Roadside Buffer adjacent to the downhill side of a road: This buffer is used for flow from a roadway when it directly enters the buffer as sheet flow.
- Ditch turn-out buffer: This buffer is used to divert roadway runoff collected in a ditch into a buffer as sheet flow.

Clearing – Includes cutting and removing of vegetative cover. It does not include grubbing. Limited cutting, thinning, use of heavy equipment, and other clearing restrictions will apply to sensitive areas and wetland crossings (Section 10).

Critical Areas – Specific areas identified herein or subjected to significant erosion problems as observed in the field prior to, during, or following construction activities such as areas with steep slopes or channels in excess of eight percent, newly graded slopes, highly erodible soils that will be exposed for more than seven days, bare soils exposed during late fall and winter when no vegetation can grow, areas draining to and within 75 feet of a wetland, river/stream/brook, pond shoreline, or vernal pool.

Earthwork – Consists of the movement of soil by mechanical means including excavation, filling, grading, trenching, and shaping.

Engineer – As used herein shall mean a representative of the civil engineer of record or person designated by the Owner.

Erosion and Sedimentation Controls – Defined as the installation of silt fence, bales, erosion control berms, rip-rap, mulching, erosion control matting or netting, check dams, inlet protection, reinforced turf, erosion control mix, construction entrances, diversions, level spreaders, and any other temporary or permanent measures required herein.

Grubbing – The removal of grass, stumps, roots, and scrub required to begin earthwork. Grubbing is the initial clearing action that exposes soil to erosive forces (wind, rain).

Interim Period – A period of time that an un-vegetated area sits un-worked, awaiting the next phase of work.

Permanent or Final – As used herein shall refer to the use or placement of erosion or sedimentation controls, seeding, or other measures, which will remain through final project completion.

Seasons – The following dates define the seasons as referred to herein:

Seasons	**Dates** *(Seasonal dates may vary from year-to-year)*
Winter	November 1 to April 15
Mud-Season	March 16 to April 30
Spring	May 1 to June 14
Summer	June 15 to September 15
Fall	September 16 to October 31

Temporary – As used herein shall refer to the use or placement of erosion or sedimentation controls, seeding, or other measures intended to be either removed, replaced, reworked, reseeded, or followed with permanent measures.

14.3.2 Schedule of Activities

The following activities, erosion control measures, or other items are required for the construction of this project or require specific measures or scheduling of activities to be conducted or restricted during the various construction seasons as defined above.

Clearing – Ground conditions permitting, clearing may occur at any time of the year.

Critical Areas – Work proposed in the defined critical areas may be conducted all year ground conditions permitting. Some problem areas may become "critical areas" during the course of construction. Areas observed to be experiencing significant erosion problems shall be deemed critical areas and shall be stabilized with appropriate erosion control measures immediately prior to progressing with work in these areas as directed by the Engineer.

Erosion and Sedimentation Controls Installation – Erosion control installation shall occur all year long, except that such measures shall be installed prior to commencement of disturbance activities related to each erosion control measure. See design plans for locations and installation procedures.

Road Construction – This construction may occur in the spring, summer, and fall seasons. It will also be allowed in the winter season, however, the winter construction schedule must be followed (see Section 14.5.1 below). The following requirement for access road construction will be adhered to in order to prevent erosion from taking place during winter construction:

- While the entire road system may be cleared in one effort, the roads will be constructed in segments where each segment is grubbed, constructed, and protected prior to earthwork on the next segment as approved by the Engineer. This construction sequence is intended to prevent large areas from being exposed, without temporary stabilization, to erosion during major rain events. A segment is defined as an area cleared and grubbed. See below for the stabilization schedule. Multiple segments in different areas of the project may be constructed concurrently.

Temporary Timber Mat Bridge – Temporary timber mat bridges will be used throughout the year as necessary for clearing and construction activities. Installation and removal of temporary timber mat bridges will proceed according to the following sequence:

  - Install erosion controls at the down-gradient perimeter of work adjacent to the stream resource.
  - Strip topsoil beneath the temporary bridge supports and stockpile for replacement following construction.
  - Place sand leveling material and geotextile fabric to create a stable base for bridge supports.

- Place timber bridge supports and span.
- Place gravel as necessary to create a smooth transition onto bridge.
- Remove bridge following construction, re-grade area with stockpiled topsoil, and reseed/restore per the project restoration plan.
- Remove barrier erosion controls following final stabilization/restoration of the crossing.

14.4 EROSION CONTROL MEASURES

14.4.1 General

The construction of this project may require or incorporate the following measures or practices as needed or applicable. Such measures, where indicated on the design plans, shall be implemented as shown, or as deemed necessary by the Engineer. Additional measures not shown on design plans may be required as specified herein or requested by the Engineer, as needed, in order to protect natural resources or off-site properties and prevent erosion and sedimentation.

Bales – Shall be installed along the contours in the locations and as detailed on the design plans. Straw (or hay) bales may be required in addition to silt fencing or other measures in sensitive areas as shown on Drawings. Bales are to be embedded four inches into the existing soil and staked with ends tightly abutting adjacent bales. Where staking and embedding of bales is impractical due to excessive roots, ledge, or other construction hazards, bale barriers may be substituted with erosion control mix berms as long as they are not installed in locations with concentrated flow.

Construction Entrance – A crushed stone-stabilized construction entrance will be installed wherever construction traffic will enter the public road system. The size, type, and locations of these shall be as shown and detailed in the design plans. Entrances shall be constructed with a 6-inch minimum layer of 2-inch stone. Stone entrances shall be placed on geotextile fabric and shall include a minimum 10-foot by 10-foot taper (or as needed to support large construction/delivery vehicles) on both sides of the entrance to allow for turning vehicles.

Dust Control – Contractor shall take necessary steps to control blowing and airborne movement of dust from exposed soil surfaces. Maintaining natural or temporary vegetation and/or mulching shall be used where practical. Mechanical sweepers shall be used where necessary to prevent and remove dust buildup on paved surfaces. Regularly traveled soil surfaces shall be maintained to minimize dust by periodically moistening bare areas with adequate water to prevent dust (for water sources, see Section 16, Water Supply). Calcium Chloride solution spray should be used in areas experiencing significant dust problems and to reduce frequency of watering. Repetitive treatment shall be applied as necessary to accomplish adequate dust control (refer to Section B-5 in the “Maine Erosion and Sediment Control Best Management Practices” manual).

Erosion Control Mix Berms – May be installed in locations that do not have a concentrated flow. Erosion control mix berms are an approved alternative to silt fence provided they are not located in sensitive areas described above. Erosion control mix may be manufactured on or offsite and shall follow the guidelines outlined in Section B-1 in the "Maine Erosion and Sediment Control Best Management Practices." The composition specification outlined in Section B-1 should be used a guideline but the actual mix design will be performance based. The mix shall be subject to testing if required by the Engineer.

Level Lip Spreader – Level lip spreader lengths are given in the details in the design plans and will be 6-inches to 24-inches deep, stone-lined ponded areas discharging over a level berm through a well vegetated buffer area. These spreaders will function to disperse channelized flow into shallow sheet flow. Construction and length of level lip spreaders shall be as detailed on the design plans.

Matting – Shall consist of straw, coconut or excelsior sandwiched between photodegradable netting. Matting may be substituted with sod where desired. Netting over straw mulch may be substituted for matting only when approved by the Engineer. Matting shall be used: (1) where indicated on the design plans; (2) in the base of swales with moderate slopes and erosive capability. High velocity ditch lining or geotextile soft armor may be required in steep ditches (> 8%) or areas receiving significant concentrated flows; (3) on steep slopes where rilling may occur or where mulching has proven to be ineffective in the field; or (4) where straw mulch has been determined to be ineffective based on observations made in the field or as directed by the Engineer.

Outlet Protection – Riprap outlets (aprons or plunge pools) shall be placed in locations where indicated on the design plans, and in locations where flared end sections have proven to be inadequate to prevent scouring at the pipe outlet in the field, as directed by the Engineer. The riprap outlets shall be the same size as that specified on the design plans.

Permanent Mulching and Revegetation – Permanent mulch is long-term cover that provides a good buffer on and around disturbed areas. Permanent mulching with erosion control mix can be used as a permanent ground cover, as an overwinter stabilization mulch, or left to naturalize and revegetate to near natural conditions. It is not used to support grassy vegetation, but legumes or woody vegetation may be established if allowed to revert to natural conditions. Permanent mulch must not be used in areas of concentrated water flows, and any evidence of groundwater seepage on slopes may require the erosion control mix to be replaced with riprap. Erosion control mix can be manufactured on or off the project site. It shall consist primarily of organic material, separated at the point of generation and may include shredded bark, stump grindings, composted bark, or flume grit and fragmented wood generated from water-flume log handling systems. Wood chips, ground construction debris, reprocessed wood products, or bark chips will not be acceptable as the organic component of the mix. Erosion control mix composition shall be in accordance with Section A-1 of the "Maine Erosion and Sediment Control Best Management Practices" manual. Erosion control mix must be free of refuse, physical contaminants, and material toxic to plant growth.

Riprap – Shall be used in swales, steep slopes, and outlets as shown on the design plans to protect soils from excessive flow velocities. It shall be of the size and depths specified on the design plans; angular stone shall be used. Riprap may be required at locations where revegetation matting, high velocity ditch lining or soft armor is proven to be ineffective in the field as directed by the Engineer.

Sediment Barrier Berms – A sediment barrier is a berm installed across or at the toe of a slope and down gradient of disturbed earth. Its purpose is to intercept and retain small amounts of sediment from disturbed or unprotected areas of limited extent. For other sediment barrier use, see Section B-1 of the "Maine Erosion and Sediment Control Best Management Practices" manual. A sediment barrier is used where:

- Sedimentation can pollute or degrade a wetland or other water resource.
- Sedimentation will reduce the capacity of storm drainage systems or adversely flood adjacent areas.
- The contributing drainage area does not exceed 1/4 acre per 100 feet of barrier length; the maximum length of slope above the barrier is 100 feet; and the maximum gradient behind the barrier is 50 percent (2:1). If the slope length is greater, additional measures such as diversions may be necessary to reduce that length.
- Sediment barriers cannot be used in areas of concentrated flows. *Under no circumstances* should erosion control mix sediment barriers be constructed in streams or in swales.

Silt Fence – Shall be installed along the contours in the locations and as detailed on the design plans. Silt fence may be required in additional or other locations, not indicated on design plans, as warranted or determined by field conditions or as directed by the Engineer. Silt fence may also be required in addition to bales or other measures in sensitive areas as shown on the design plans. Where staking and embedding fabric is impractical due to excessive roots, ledge, or other construction hazards, silt fence may be substituted with erosion control mix berms or placement of six inches of suitable non-organic material along fabric flap on upslope side of fence, in lieu of burying fabric in trench.

Stone Check Dams – Shall be installed in existing and proposed swales or at culvert inlets as shown on the design plans. These check dams serve to reduce flow velocities in swales thus helping to reduce rilling. Check dams shall be constructed with a six-inch tapered spillway at the center as shown on design plans to prevent breaching and scour at the outer edges along the sides of the ditch.

Temporary Mulching – Shall consist of spreading of straw (or hay) mulch or erosion control mix over bare or disturbed areas. It shall be applied at the rates described in the *Temporary Seeding and Mulching Schedule* described below. Alternate mulch materials or methods such as hydro seeding may be used only when approved by the Engineer. Mulching shall be substituted with matting in locations where it has proven to be ineffective in the field. Mulching rates shall be doubled where requested by the Engineer based on observations in the field or in locations undergoing winter construction.

14.5 EROSION CONTROL EXECUTION

14.5.1 General Construction Phase

The following general practices will be used to prevent erosion during construction of the project. Refer to design plans for applications, and installation methods. If the Contractor is unclear regarding the use, location, installation, intended performance, or maintenance of any prescribed erosion control measures, the Contractor shall refer to the "Maine Erosion and Sediment Control Best Management Practices" Manual for detailed procedures or contact the Engineer for assistance.

NOTE: Locations of erosion control measures are shown on design plans as typical for general purposes only to indicate the intent. Final locations should be selected based on actual field conditions and as site conditions warrant.

Construction Traffic – Construction traffic will be directed over the stabilized construction entrances and proposed roads. The crushed stone construction entrances shall be maintained with the addition of more crushed stone as needed or as the voids become filled. The public roadway shall be swept as soon as possible should mud be tracked onto it.

Erosion Control Installation – Prior to the start of grubbing, silt fence, bales, erosion control mix berms, stabilized construction entrances, or other appropriate measures shall be installed adjacent to construction areas, at the toe of slopes and in areas as shown on design plans, or as otherwise required to protect against construction related erosion. Immediately following construction of culverts and swales, stone check dams, and ditch linings shall be installed, as shown on the design plans. Prior to start of construction there will be a mandatory pre-construction meeting to discuss the construction schedule and the erosion and sedimentation control plan. The meeting shall be attended by the owner (or owner's representative), the Engineer, the contractor, the third-party inspector, and MDEP staff.

Following Clearing – Only those areas under active construction shall be left in an untreated or unvegetated condition.

Grading – Grading will be held to a maximum 2:1 slope where practical. Greater slopes may be used in ledge cut or stable material as shown in the design drawings. Finish-graded areas shall be stabilized with permanent seeding and mulching or other accepted means immediately after final grading is complete. If final grading will not be completed immediately, refer to the *Temporary Seeding and Mulching Schedule* detailed below. It is understood that immediately means within five days of the completion of work. For time periods longer than five days, refer to *Permanent Seeding and Mulching Plan* below.

Monitoring Schedule – The Contractor shall be responsible for installing, monitoring, maintaining, repairing, replacing and/or removing the temporary erosion and sedimentation controls as specified herein or as directed by the Engineer, or shall appoint a qualified subcontractor to do so, as follows:

- The Contractor or approved designated Inspector shall perform weekly inspections of the site until the site is stabilized. Inspections may be performed on a bi-weekly schedule when work has abated for more than one week.
- Maintenance measures will be performed as needed during the entire construction cycle. After each rainfall, and *prior to* predicted significant rainfall events (> 1"), a visual erosion controls inspection will be made by the Contractor or approved designated Inspector to insure their continuing function as designed.
- Stone check dams, bale barriers, drop inlet barriers, erosion control mix berms, silt fence, and mulch shall be inspected and repaired once a week or immediately following any significant rainfall. Sediment trapped behind these barriers shall be removed when it reaches a depth of 6 inches (or 1/2 the height of the dam for check dams) and redistributed to areas undergoing final grading.
- Near completion of the construction and after the site is reseeded and stabilized, the Contractor shall inspect, clean, maintain, repair, restabilize, or revegetate all drainage structures, storm drains, culverts, level spreaders and ditches prior to acceptance by the Owner.

Permanent Seeding and Mulching Plan – The following general practices will be used to re-establish final vegetation.

- Loam will be spread over disturbed areas and graded to a uniform depth and a natural appearance. Loam shall be as specified or approved by the Engineer.
- Final seeding shall be completed within 7 days following final topsoil and loam grading for non-critical areas. Final seeding shall be completed within 48 hours or prior to any storm event, whichever occurs first, following topsoil and loam grading for critical areas. All final fertilizing and seeding shall adhere to these specifications ~~unless otherwise approved by the Engineer.~~.
- Seeded areas shall be mulched the same work day. Mulch shall consist of straw/hay, hydro-mulch, or any suitable substitute deemed acceptable by the engineer. Straw, hay, or other mulch applied without a tackifier/binder will be anchored with biodegradable netting in the following areas: the base and side slopes of grassed ditches, slopes steeper than 15%, and exposed ridges. Mulched areas shall be monitored according to the *Monitoring Schedule* above. Should mulching prove to be ineffective, straw matting or excelsior matting will be used in its place.
- Straw mulch shall be applied at the rate of 2 tons per acre (90 pounds or 2 bales/1,000 square feet) unless otherwise specified.
- Hydro-mulch shall consist of a mixture of tackifier, wood fiber or paper fiber and water sprayed over a seeded area. Hydro-mulch shall not be used during the fall, winter, or mud season unless approved by the Engineer.
- Dormant seeding shall not occur unless approved by the Engineer. Should seeding be necessary between November 1 and April 15, the following procedure shall be followed.
    - Only unfrozen loam shall be used.
    - Loaming, seeding, and mulching will not be done over snow cover. If snow exists, it must be removed prior to placement of seed.
    - No permanent seeding will be done during fall, winter, or mud season unless specifically approved by the Engineer. If attempted, the normal seed application rate shall be doubled. Reseeding in spring by Contractor will be required in all areas with insufficient growth.

  - Where temporary seeding is required, the rates specified in the *Temporary Seeding and Mulching Schedule* below shall be adhered to.
  - Fertilizing, seeding, and mulching shall be done the same work day that loam is spread on any area. Mulch shall consist of hay or straw applied at twice the normal rate, as specified in the *Table 14-1: Stabilization Schedule* below.
  - All mulch applied to slopes steeper than 5% during the winter construction period will be anchored with biodegradable netting. At the Engineer's direction, straw matting or excelsior matting may be substituted for the straw mulch and biodegradable netting.
  - Following final seeding, the site will be inspected every 30 days until 80 percent cover has been established. Reseeding and mulching shall be carried out in areas where inadequate catch is observed until adequate growth is established in seeded areas, as agreed upon by the Engineer. The Contractor may be required to reseed during the following spring subsequent to winter or fall construction and seeding in order to provide 90 percent vegetative cover as required for Acceptance by the Owner.
- Erosion control mix utilized for permanent stabilization and to promote natural revegetation may be used in lieu of loaming and seeding.

Temporary Seeding and Mulching Schedule – During construction, all disturbed areas shall adhere to the schedules specified in Tabled 14-1 and 14-2 below. Refer to *Permanent Seeding and Mulching Plan* above for permanent seeding and mulching requirements.

- The Contractor shall be responsible for monitoring daily weather reports when working in identified sensitive areas and for monitoring weekly reports in all other areas. The Contractor shall adjust the work schedule in anticipation of rains and shall stabilize the site as indicated or required.

- All completed areas that have been loamed and/or finish graded shall be permanently reseeded in accordance with the *Permanent Seeding and Mulching Plan* above.

- Temporary mulching or seeding shall be done immediately for any non-critical area not to be worked for an interim period of more than 7 days. Temporary mulching and seeding of critical areas shall occur within 48 hours of initial disturbance or prior to any storm event, whichever occurs first. Stabilization and seeding requirements shall be determined in accordance with *Table 14-1: Stabilization Schedule* and *Table 14-2: Temporary Seeding Schedule* and shall be implemented at the beginning of the expected interim period. In no case, shall any disturbed soil be left unstabilized for more than 30 days.

- Interim periods for sensitive and critical areas are indicated in the Tables 14-1 and 14-2. However, exposed or bare soil in these areas shall be mulched at the completion of work, each day, if significant rainfall is predicted or eminent.

- Mulch application rate shall be doubled during winter construction. Mulch shall be applied at the end of each day's work to disturbed soil areas if the area has been fine

graded or if snow is predicted or imminent. In no case, shall any area of disturbed soil be left without mulch or other surface cover for more than 7 days during the winter construction period.

- Permanent seeding shall not be attempted during the fall or winter seasons unless otherwise approved by the Engineer. Should seeding be approved by the Engineer during fall or winter seasons, the Contractor shall follow procedures for dormant seeding. See *Permanent Seeding and Mulching Plan* above for dormant seeding requirements. However, vegetation must be inspected and reseeded by Contractor as necessary in the following spring to ensure good vegetative cover. Acceptance of dormant seeding shall not occur until after May 1, in the following spring.

- Temporary seeding and mulch shall be inspected and maintained or repaired weekly. At a minimum, 75 percent of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (e.g., mulch, filter barriers, check dams, bales). Mulch shall be reapplied as necessary to completely cover soil.

- Areas within 75 feet of a protected natural resource shall be stabilized with temporary mulching or temporary seeding with mulching and have a sediment barrier installed between the area and resource within 48 hours or prior to any storm event, whichever occurs first.

Ditch Stabilization Plan – Any section of rough-graded ditch will have stone check dams installed in the ditch within 24 hours to prevent ditch scouring. Any section of finish-graded ditch will be stabilized with permanent lining of grass and or riprap within 7 days for ditches in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for culverts in critical areas.

Inlet and Outlet Stabilization Plan – Any drainage structure installed on the project shall have the appropriate inlet and outlet protection installed within 7 days in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, in critical areas.

Table 14-1: Stabilization Schedule

STABILIZATION SCHEDULE		
Maximum Expected Interim Period* - (Days)	**Temporary Mulching (Hay)**	**Temporary Seeding**
0-7 (0-2)	None	None
7-30 (2-14)	2-bales/1,000 sq.ft	None
30-60 (14-30)	2-bales/1,000 sq.ft.	(per Table 14-2: Temporary Seeding Schedule)
More than 7 days during winter season	4-bales/1,000 sq.ft.	Dormant seeding only
* Values in parentheses indicates interim period for sensitive and critical areas. ** Mulch application rates shall be doubled for winter construction.		

Table 14-2: Temporary Seeding Schedule

TEMPORARY SEEDING SCHEDULE			
Seed	**Seeding Rate (lbs/1,000 sq. ft.)**	**Seeding Depth (Inches)**	**Recommended Seeding Dates**
Annual Rye Grass	0.9	1/4	4/1 to 7/1
Sudan Grass	0.9	1/2	7/1 to 8/15
Perennial Rye Grass	1.8	1/4	8/15 to 9/15
Winter Rye Grass	2.6	1	9/15 to 10/15
Dormant Seeding 50% Winter Rye 50% Annual Rye	3.5 (2.6) (0.9)	1	10/15 to 3/31

Table 14-3: Permanent Seeding Schedule

	Seed	**Percent By Weight**
Upland Areas with Loam Cover	Tall Fescue Creeping Red Fescue Perennial Ryegrass Annual Ryegrass	35% 30% 20% 15%
Upland Areas with Erosion Control Mix Cover	Crown Vetch Perennial Lupine Crimson Clover Annual Rye	50% 25% 15% 10%
Slopes and Ditches Below Water Table or Line of Seepage	Creeping Red Fescue Red Top Tall Fescue	47% 6% 47%

Topsoil – Topsoil will be stockpiled on-site when necessary in areas that have minimum potential for erosion, such as flat slopes or on-site borrow pits, and will be kept as far as possible from existing drainage areas. Stockpiles expected to remain longer than 15 days shall be encircled with bales, erosion control mix berms, or silt fence at the down gradient sides of the stockpile and mulched with a second application of hay mulch and anchored with biodegradable netting if deemed necessary by the Engineer (Maine Construction General Permit, Appendix A (6) a-d).

Winter Construction – For any work proposed during the winter season, the Contractor shall adhere to the following practices.

- Limit the exposed area to those areas in which work is to occur during the following 15 days and that can be mulched in one day prior to any snow event.
- Where required and approved by the Engineer, installation of silt fence may be modified from detail on design plans to substitute six inches of suitable non-organic material over the bottom of the silt fence in lieu of trenching and backfilling fabric or erosion control mix berm/barrier.
- Mulching and seeding rates shall adhere to the *Temporary Seeding and Mulching Schedule* above. *Note that all mulching rates shall be doubled as shown in the above table and shall follow the sensitive area schedule during winter construction.*
- Permanent seeding shall not be attempted by the Contractor during winter season unless otherwise approved by the Engineer.

14.5.2 Erosion Control Removal

Removal of temporary erosion control measures shall be the responsibility of the Contractor. Erosion controls shall remain in place and will be maintained by the Contractor until all related construction is complete and the area has been stabilized. Erosion control mix will be used to revegetate roads/pads and should be left in place.

An area is considered stable if a 90 percent cover of vegetation has been established or riprap or other permanent measures are in place and functioning properly.

Bales and silt fence shall be removed within 30 days of final stabilization. The bales and silt fence shall be disposed of legally and properly off-site. Sediment trapped behind these controls shall be distributed to an area undergoing final grading and graded in an aesthetic manner to conform to the topography, and fertilized, seeded and mulched, or otherwise stabilized, in accordance with the rates previously stated.

The sediment trapped behind/around/in stone check dams, perforated risers, and sedimentation basins, shall be removed and transported off-site, or to an upslope area undergoing final grading. The sediment trapped by these devices shall not be regraded locally since they exist in drainage ways.

The rip-rap and stone from the check dams and risers may be either removed or regraded in an aesthetic manner that does not inhibit flow or create the potential for erosion.

Once the trapped sediments have been removed from the temporary sedimentation devices, the disturbed areas will be loamed (if necessary), fertilized, seeded and mulched, or otherwise stabilized, in accordance with the rates previously stated.

14.6 CONCLUSION

If constructed in conformance with the project design plans and these basic standards, the project is not expected to result in any significant erosion or sedimentation either on or off the site.

ATTACHMENT B

Revised Treatment Calculations

Bingham Wind Project
Mayfield Township and Moscow, Maine
Gulf Stream Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

Road ID	Start Station		End Station	BMP ID	Buffer Slope (%)	Buffer Length (ft)	New Impervious Area (ac)	Impervious Area Treated (ac)	Required Berm Length (ft)	Impervious Area Untreated (ac)
AR1	10+00	-	11+50	-	-	-	0.08	0.00		0.08
AR1	11+50	-	16+00	AD-S36	2.4%	80.00	0.25	0.25		0.00
AR1	16+00	-	23+00	LS-S75	3.5%	150.00	0.39	0.39	39.00	0.00
AR1	23+00		24+50	-	-	-	0.08	0.00		0.08
AR1	24+50	-	26+50	DT-S76	3.9%	120.00	0.11	0.11		0.00
AR1	26+50	-	30+00	-	-	-	0.19	0.00		0.19
AR1	30+00	-	31+90	DT-S77	4.8%	120.00	0.10	0.10		0.00
AR1	31+90	-	33+80	DT-S78	7.8%	120.00	0.10	0.10		0.00
AR1	33+80	-	35+70	DT-S79	4.3%	120.00	0.10	0.10		0.00
AR1	35+70	-	37+60	DT-S80	9.1%	120.00	0.10	0.10		0.00
AR1	37+60	-	39+00	DT-S81	14.2%	120.00	0.08	0.08		0.00
AR1	39+00	-	40+90	DT-S81A	10.8%	120.00	0.10	0.10		0.00
AR1	40+90	-	42+50	DT-S81B	3.3%	120.00	0.09	0.09		0.00
AR1	42+50	-	45+00	DT-S82	4.8%	120.00	0.14	0.14		0.00
AR1	45+00	-	47+50	DT-S83	5.5%	120.00	0.14	0.14		0.00
AR1	47+50	-	48+50	DT-S84	4.8%	120.00	0.06	0.06		0.00
AR1	48+50	-	51+00	DT-S84A	5.0%	120.00	0.14	0.14		0.00
AR1	51+00	-	55+00	-	-	-	0.22	0.00		0.22
AR1	55+00	-	57+50	DTS-85	1.7%	120.00	0.14	0.14		0.00
AR1	57+50	-	59+50	DTS-86	1.9%	120.00	0.11	0.11		0.00
AR1	59+50	-	62+00	DTS-87	4.8%	120.00	0.14	0.14		0.00
AR1	62+00	-	64+50	DTS-88	4.6%	120.00	0.14	0.14		0.00
AR1	64+50	-	66+50	DTS-89	2.5%	120.00	0.11	0.11		0.00
AR1	66+50	-	68+00	DTS-90	2.0%	120.00	0.08	0.08		0.00
AR1	68+00		70+50	DTS-90A	2.0%	120.00	0.14	0.14		0.00
AR1	70+50	-	73+00	DTS-91	2.8%	120.00	0.14	0.14		0.00
AR1	73+00	-	79+00	LS-S92	5.3%	150.00	0.33	0.33	25.00	0.00
AR1	79+00	-	80+50	DTS-95	5.0%	120.00	0.08	0.08		0.00
AR1	80+50	-	82+00	DTS-95A	6.9%	120.00	0.08	0.08		0.00
AR1	82+00	-	84+00	-	-	-	0.11	0.00		0.11
AR1	84+00	-	87+00	AD-S37	6.0%	55.00	0.17	0.17		0.00
AR1	87+00	-	90+50	-	-	-	0.19	0.00		0.19
AR1	90+50	-	91+75	DT-S96A	7.8%	120.00	0.07	0.07		0.00
AR1	91+75	-	93+00	DT-S96B	6.6%	120.00	0.07	0.07		0.00
AR1	93+00	-	97+00	AD-S38	11.0%	55.00	0.22	0.22		0.00
AR1	97+00	-	99+00	-	-	-	0.11	0.00		0.11
AR1	99+00	-	107+00	AD-S38A	6.8%	80.00	0.44	0.44		0.00
AR1	107+00	-	112+00	LS-S72	6.7%	150.00	0.28	0.28	56.00	0.00
AR1	112+00	-	113+50	LS-S73	4.0%	150.00	0.08	0.08	37.00	0.00
CR3	200+00	-	217+00	AD-S2	4.3%	55.00	0.94	0.94		0.00
T11		-		PAD	8% MAX	150.00	0.28	0.28		0.00
CR2	100+00	-	105+00	LS-S73	4.0%	150.00	0.28	0.28	37.00	0.00
T10		-		PAD	8% MAX	150.00	0.28	0.28		0.00
CR1	10+00	-	15+16	LS-S72	6.7%	150.00	0.28	0.28	56.00	0.00
CR1	15+16	-	22+00	-	-	-	0.38	0.00		0.38
CR1	22+00	-	25+50	AD-S4	2.4%	80.00	0.19	0.19		0.00
CR1	25+50	-	28+00	AD-S5	3.1%	80.00	0.14	0.14		0.00
CR1	28+00		29+00	-	-	-	0.06	0.00		0.06
CR1	29+00	-	35+75	LS-S6	4.0%	150.00	0.37	0.37	56.00	0.00
MET1	10+00	-	12+97	AD-S4	2.4%	80.00	0.08	0.08		0.00
MET5	500+00	-	508+55	LS-S49	2.7%	150.00	0.24	0.24	36.00	0.00
T73		-		LS-S51	2.0%	150.00	0.28	0.28		0.00
CR6	435+00	-	447+00	LS-S51	2.0%	150.00	0.66	0.66	142.00	0.00
AR2	200+00	-	246+89	-	-	-	2.58	0.00		2.58
						Totals	**12.74**	**8.73**		**4.01**

Impervious Area Treatment Calculations (Linear project)

Total Proposed Impervious Area=	12.74	ac
Total Treated Proposed Impervious Area=	8.73	ac
Total Untreated Proposed Impervious Area=	4.01	ac
Proposed Impervious Area Treatment Percentage=	68.54	%

Bingham Wind Project
Bingham, Maine
Fall Brook Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

SOIL GROUPS	
Abram	D
Lyman	C/D
Monson	C/D
Plaisted	C
Telos	C
Monarda	D
Dixmont	C
Dixfield	C
Colonel	C
Chesuncook	C
Elliotsville	B
Thorndike	C/D

Road ID	Start Station		End Station	BMP ID	Buffer Slope (%)	Buffer Length (ft)	New Impervious Area (ac)	Impervious Area Treated (ac)	Required Berm Length (ft)	Impervious Area Untreated (ac)
CR1	38+40	-	40+00	DT-S9	6.0%	120.0	0.09	0.09		0.00
CR1	40+00	-	45+00	LS-S11	6.7%	150.0	0.28	0.28	21.00	0.00
CR1	45+00	-	52+00	AD-S7	9.0%	55.0	0.39	0.39		0.00
CR1	52+00	-	54+50	DT-S13	3.3%	120.0	0.14	0.14		0.00
CR1	54+50	-	63+00	AD-S9	8.3%	80.0	0.47	0.47		0.00
CR1	63+00	-	68+00	LS-S17	9.3%	150.00	0.28	0.28	50.00	0.00
CR1	68+00	-	71+50	-	-	-	0.19	0.00		0.19
CR1	71+50	-	77+00	LS-S18	8.0%	150.0	0.30	0.30	31.00	0.00
CR1	77+00	-	78+50	AD-S12	13.7%	55.0	0.08	0.08		0.00
CR1	78+50		79+50	-	-	-	0.06	0.00		0.06
CR1	79+50	-	81+00	DT-S19	13.8%	120.0	0.08	0.08		0.00
CR1	81+00	-	95+50	AD-S13	14.5%	120.0	0.80	0.80		0.00
CR1	95+50	-	98+50	-	-	-	0.17	0.00		0.17
CR1	98+50	-	108+00	AD-S15	20.0%	55.0	0.52	0.52		0.00
CR1	108+00	-	114+00	-	-	-	0.33	0.00		0.33
CR5	327+00	-	333+00	AD-S24	4.5%	80.0	0.33	0.33		0.00
CR5	333+00		335+50	-	-	-	0.14	0.00		0.14
CR5	335+50		338+50	AD-S24A	4.9%	80.0	0.17	0.17		0.00
CR5	338+50		340+00	-	-	-	0.08	0.00		0.08
CR5	340+00		359+00	AD-S24B		80 / 55	1.05	1.05		0.00
CR4	250+00	-	255+50	LS-S25	10.0%	150.0	0.30	0.30	55.00	0.00
T9		-		PAD	8%MAX	150.0	0.28	0.28		0.00
T8		-		PAD	8%MAX	150.0	0.28	0.28		0.00
T7 ALT		-		PAD	8%MAX	150.0	0.28	0.28		0.00
T7		-		PAD	8%MAX	150.0	0.28	0.28		0.00
T6		-		PAD	8%MAX	150.0	0.28	0.28		0.00
T5		-		PAD	8%MAX	150.0	0.28	0.28		0.00
T4		-		PAD	8%MAX	150.0	0.28	0.28		0.00
T3		-		PAD	8%MAX	150.0	0.28	0.28		0.00
T2		-		-	-	-	0.28	0.00		0.28
T1		-		-	-	55.0	0.28	0.00		0.28
						Totals	**9.03**	**7.51**		**1.52**

Impervious Area Treatment Calculations (Linear project)

Total Proposed Impervious Area=	9.03	ac
Total Treated Proposed Impervious Area=	7.51	ac
Total Untreated Proposed Impervious Area=	1.52	ac
Proposed Impervious Area Treatment Percentage=	83.12	%

Bingham Wind Project
Kingsbury Plantation, Maine
Kingsbury Stream Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

Road ID	Start Station		End Station	BMP ID	Buffer Slope (%)	Buffer Length (ft)	New Impervious Area (ac)	Impervious Area Treated (ac)	Required Berm Length (ft)	Impervious Area Untreated (ac)
CR19	1500+00	-	1533+50	AD-N40	14.0%	55.00	1.85	1.85		0.00
CR19	1533+50		1534+50	DT-N104	10.0%	120.00	0.06	0.06		0.00
CR19	1534+50	-	1536+00	DT-N104A	8.7%	120.00	0.08	0.08		0.00
CR19	1536+00	-	1538+50	DT-N105	9.1%	120.00	0.14	0.14		0.00
CR19	1538+50	-	1541+00	AD-N41	9.8%	55.00	0.14	0.14		0.00
CR19	1541+00	-	1544+00	-	-	-	0.17	0.00		0.17
CR19	1544+00	-	1546+50	DT-N106	11.0%	120.00	0.14	0.14		0.00
CR19	1546+50	-	1555+50	AD-N42	9.5%	55.00	0.50	0.50		0.00
CR19	1555+50	-	1558+00	DT-N108	11.0%	120.00	0.14	0.14		0.00
CR19	1558+00	-	1563+00	LS-N110	8.7%	150.00	0.28	0.28	28.00	0.00
T42		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T43		-		-	-	-	0.28	0.00		0.28
T44		-		PAD	8% MAX	150.00	0.28	0.28		0.00
CR12	905+50	-	913+00	AD-N17A	11.0%	55.00	0.41	0.41		0.00
CR12	913+00	-	917+50	LS-N46	6.7%	150.00	0.25	0.25	38.00	0.00
CR12	917+50	-	929+40	LS-N48	7.3%	150.00	0.66	0.66	99.00	0.00
CR12	929+40	-	933+50	LS-N54	11.0%	120.00	0.23	0.23	41.00	0.00
CR12	933+50	-	942+00	LS-N57	10.0%	150.00	0.47	0.47	85.00	0.00
CR12	942+00	-	946+50	-	-	-	0.25	0.00		0.25
CR12	946+50	-	950+50	AD-N21	7.8%	80.00	0.22	0.22		0.00
CR12	950+50	-	952+50	-	-	-	0.11	0.00		0.11
CR12	952+50	-	953+50	AD-N23	9.2%	80.00	0.06	0.06		0.00
CR12	953+50	-	955+00	-	-	-	0.08	0.00		0.08
CR12	955+00	-	956+50	AD-N24	10.0%	80.00	0.08	0.08		0.00
CR12	956+50		959+18	-	-	-	0.15	0.00		0.15
T41		-		PAD	8% MAX	150.00	0.28	0.28		0.00
CR15	1100+00	-	1102+50	AD-N25	8.1%	55.00	0.14	0.14		0.00
CR25	1102+50	-	1103+50	-	-	-	0.06	0.00		0.06
CR15	1103+50	-	1105+00	AD-N25	8.1%	55.00	0.08	0.08		0.00
CR15	1105+00	-	1108+00	-	-	-	0.17	0.00		0.17
CR15	1108+00	-	1110+30	DT-N57	2.5%	120.00	0.13	0.13		0.00
T46		-		-	-	-	0.28	0.00		0.28
CR16	1213+10	-	1215+00	DT-N72	6.7%	120.00	0.10	0.10		0.00
CR16	1215+00	-	1219+50	AD-N29	13.0%	55.00	0.25	0.25		0.00
CR16	1219+50	-	1222+50	-	-	-	0.17	0.00		0.17
CR16	1222+50	-	1225+00	DT-N91	11.7%	120.00	0.14	0.14		0.00
CR16	1225+00	-	1227+50	DT-N91A	4.2%	120.00	0.14	0.14		0.00
CR16	1227+50	-	1233+00	LS-N92	6.0%	150.00	0.30	0.30	46.00	0.00
CR16	1233+00	-	1235+00	-	-	-	0.11	0.00		0.11
CR16	1235+00	-	1240+00	AD-N36	12.0%	55.00	0.28	0.28		0.00
CR16	1240+00	-	1249+00	LS-N95	5.3%	150.00	0.50	0.50	75.00	0.00
CR16	1249+00	-	1255+00	-	-	-	0.33	0.00		0.33
CR16	1255+00	-	1256+00	DT-N98	6.0%	120.00	0.06	0.06		0.00
CR16	1256+00	-	1257+50	DT-N98A	7.5%	120.00	0.08	0.08		0.00
CR16	1257+50	-	1259+00	-	-	-	0.08	0.00		0.08
CR16	1259+00	-	1266+00	AD-N38A	6.4%	55.00	0.39	0.00		0.39
CR16	1266+00	-	1269+50	-	-	-	0.19	0.00		0.19
T47		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T49		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T50		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T51		-		PAD	8% MAX	150.00	0.28	0.28		0.00
						Totals	**12.62**	**9.82**		**2.80**

Impervious Area Treatment Calculations (Linear project)

Total Proposed Impervious Area=	12.62	ac
Total Treated Proposed Impervious Area=	9.82	ac
Total Untreated Proposed Impervious Area=	2.80	ac
Proposed Impervious Area Treatment Percentage=	77.81	%

Bingham Wind Project
Mayfield Township, Maine
Rift Brook Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

Road ID	Start Station		End Station	BMP ID	Buffer Slope (%)	Buffer Length (ft)	New Impervious Area (ac)	Impervious Area Treated (ac)	Required Berm Length (ft)	Impervious Area Untreated (ac)
CR8	534+00	-	540+50	LS-S56	5.3%	150.00	0.36	0.36	36.00	0.00
CR8	540+50	-	543+50	AD-S33	2.9%	55.00	0.17	0.17		0.00
CR8	543+50	-	549+50	LS-S54	8.0%	150.00	0.33	0.33	50.00	0.00
CR8	549+50	-	556+00	AD-S35	21.0%	55.00	0.36	0.36		0.00
T16		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T17/CR 23		-		PAD/AD-S34	8%/9.8%	150 / 55	0.38	0.38		0.00
CR5	317+86	-	324+00	-	-	-	0.34	0.00		0.34
CR5	324+00	-	326+50	DT-S34	4.0%	120.00	0.14	0.14		0.00
CR5	359+00	-	361+00	-	-	-	0.11	0.00		0.11
CR5	361+00	-	371+50	AD-S23	7.6%	80.00	0.58	0.58		0.00
CR5	371+50	-	372+75	DT-S31	6.6%	120.00	0.07	0.07		0.00
	372+75		374+00	DT-S31A	6.6%	120.00	0.07	0.07		0.00
CR5	374+00	-	378+00	AD-S22	5.3%	55.00	0.22	0.22		0.00
CR5	378+00	-	382+50	-	-	-	0.25	0.00		0.25
CR5	382+50	-	385+50	LS-S29	6.0%	150.00	0.17	0.17	17.00	0.00
CR5	385+50	-	388+00	-	-	-	0.14	0.00		0.14
CR5	388+00	-	393+00	AD-S21	4.9%	80.00	0.28	0.28		0.00
CR5	393+00	-	398+00	LS-S27	3.3%	150.00	0.28	0.28	28.00	0.00
CR5	398+00	-	399+90	DT-S30	4.2%	120.00	0.10	0.10		0.00
CR5	399+90	-	401+80	DT-S30A	3.3%	120.00	0.10	0.10		0.00
CR5	401+80	-	403+00	DT-S32	5.8%	120.00	0.07	0.07		0.00
CR5	403+00	-	404+00	-	-	-	0.06	0.00		0.06
T12		-		-	-	-	0.28	0.00		0.28
T13		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T14		-		-	-	-	0.28	0.00		0.28
CR7	500+00	-	507+00	-	-	-	0.39	0.00		0.39
CR7	507+00	-	526+00	-	-	-	1.05	0.00		1.05
CR7	526+00	-	529+50	AD-S29	3.3%	55.00	0.19	0.19		0.00
CR7	529+50	-	531+10	-	-	-	0.09	0.00		0.09
CR26	2100+00	-	2102+50	AD-S26	4.9%	55.00	0.14	0.14		0.00
CR26	2102+50	-	2105+00	LS-S39	2.0%	150.00	0.14	0.14	35.00	0.00
T76		-		PAD	8% MAX	150.00	0.28	0.28		0.00
CR27	2200+00	-	2207+50	-	-	-	0.28	0.00		0.28
T77		-		PAD	8% MAX	150.00	0.28	0.28		0.00
CR6	400+00	-	401+50	-	-	-	0.08	0.00		0.08
CR6	401+50	-	405+24	LS-S41	4.0%	150.00	0.21	0.21	16.00	0.00
CR6	405+24	-	409+00	LS-S39	2.0%	150.00	0.21	0.21	35.00	0.00
CR6	409+00	-	410+50	-	-	-	0.08	0.00		0.08
CR6	410+50	-	412+50	AD-S26	4.9%	55.00	0.11	0.11		0.00
CR6	412+50	-	413+00	-	-	-	0.03	0.00		0.03
CR6	413+00	-	415+00	AD-S26	4.9%	55.00	0.11	0.11		0.00
CR6	415+00	-	419+00	-	-	-	0.22	0.00		0.22
CR6	419+00	-	430+26	LS-S44	4.0%	150.00	0.62	0.62	47.00	0.00
T75		-		PAD	8% MAX	150.00	0.28	0.28		0.00
						Totals	**10.44**	**6.78**		**3.66**

Impervious Area Treatment Calculations (Linear project)

Total Proposed Impervious Area=	10.44	ac
Total Treated Proposed Impervious Area=	6.78	ac
Total Untreated Proposed Impervious Area=	3.66	ac
Proposed Impervious Area Treatment Percentage=	64.92	%

Bingham Wind Project
Mayfield Township, Maine
Baker Flowage Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Road Side Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

Road ID	Start Station		End Station	BMP ID	Buffer Slope (%)	Buffer Length (ft)	New Impervious Area (ac)	Impervious Area Treated (ac)	Required Berm Length (ft)	Impervious Area Untreated (ac)
CR11	787+00	-	796+50	-	-	-	0.52	0.00		0.52
CR11	796+50	-	802+50	AD-N12	4.7%	55.00	0.33	0.33		0.00
CR11	802+50	-	804+00	-	-	-	0.08	0.00		0.08
CR11	804+00	-	807+50	-	-	-	0.19	0.00		0.19
CR11	807+50	-	810+00	LS-N27	3.5%	150.00	0.14	0.14	21.00	0.00
CR11	810+00	-	812+00	-	-	-	0.11	0.00		0.11
CR11	812+00	-	815+50	LS-N28	5.3%	150.00	0.19	0.19	20.00	0.00
CR11	815+50	-	818+50	-	-	-	0.17	0.00		0.17
CR11	818+50	-	824+00	LS-N31	5.0%	150.00	0.30	0.30	23.00	0.00
CR11	824+00	-	827+00	LS-N31A	9.1%	150.00	0.17	0.17	25.00	0.00
CR11	827+00	-	832+00	-	-	-	0.28	0.00		0.28
CR11	832+00	-	833+50	AD-N14A	3.1%	55.00	0.08	0.08		0.00
CR11	833+50	-	836+00	-	-	-	0.14	0.00		0.14
CR11	836+00	-	841+50	AD-N14B	8.0%	80.00	0.30	0.30		0.00
CR11	841+50	-	842+50	-	3.0%	-	0.06	0.00		0.06
CR11	842+50	-	855+50	LS-N34	6.0%	150.00	0.72	0.72	54.00	0.00
CR11	855+50	-	862+30	LS-N37	8.0%	150.00	0.37	0.37	38.00	0.00
T31		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T32		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T33		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T34		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T35		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T36		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T37		-		PAD	8% MAX	150.00	0.28	0.00		0.28
CR14	1100+00	-	1104+50	LS-N40	6.7%	150.00	0.25	0.25	42.00	0.00
CR12	900+00	-	905+50	LS-N40	6.7%	150.00	0.30	0.30	42.00	0.00
T38		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T39		-		PAD	8% MAX	150.00	0.28	0.28		0.00
AR4	400+00	-	402+50	AD-N12	4.7%	55.00	0.14	0.14		0.00
AR4	402+50	-	404+00	-	-	-	0.08	0.00		0.08
AR4	404+00	-	405+50	DT-N26	9.2%	120.00	0.08	0.08		0.00
AR4	405+50	-	407+00	DT-N27	14.1%	120.00	0.08	0.08		0.00
AR4	407+00	-	408+90	DT-N28	14.0%	120.00	0.10	0.10		0.00
AR4	408+90		410+50	DT-N28C	14.0%	120.00	0.09	0.09		0.00
AR4	410+50	-	415+50	-	-	-	0.28	0.00		0.28
SUBSTATION*		-					1.95	1.95		0.00
						Totals	**10.02**	**7.84**		**2.18**

*Portion of Substation will be treated by a gravel filter, see design memo appended to application.

Impervious Area Treatment Calculations (Linear project)

Total Proposed Impervious Area=	10.02	ac
Total Treated Proposed Impervious Area=	7.84	ac
Total Untreated Proposed Impervious Area=	2.18	ac
Proposed Impervious Area Treatment Percentage=	78.24	%

Bingham Wind Project
Kingsbury Plantation, Maine
Thorn Brook Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

Road ID	Start Station		End Station	BMP ID	Buffer Slope (%)	Buffer Length (ft)	New Impervious Area (ac)	Impervious Area Treated (ac)	Required Berm Length (ft)	Impervious Area Untreated (ac)
T55		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T56		-		PAD	8% MAX	150.00	0.28	0.28		0.00
CR15	1110+30	-	1115+50	LS-N60	6.7%	150.00	0.29	0.29	22.00	0.00
CR15	1115+50	-	1118+00	DT-N61	5.7%	120.00	0.14	0.14		0.00
CR15	1118+00	-	1122+77	-	-	-	0.26	0.00		0.26
CR16	1200+00	-	1201+00	-	-	-	0.06	0.00		0.06
CR16	1201+00	-	1207+50	AD-N30	13.0%	55.00	0.36	0.36		0.00
CR16	1207+50	-	1213+10	LS-N71	12.0%	150.00	0.31	0.31	31.00	0.00
METR4	40+00	-	44+42	DT-N68	9.1%	120.00	0.12	0.12		0.00
CR24	2000+00	-	2004+00	AD-N26	11.5%	55.00	0.22	0.22		0.00
T45		-		PAD	8% MAX	150.00	0.28	0.28		0.00
CR25	2010+00	-	2014+00	AD-N26	11.5%	55.00	0.22	0.22		0.00
CR25	2014+00	-	2014+50	-	-	-	0.03	0.00		0.03
CR25	2014+50	-	2018+00	AD-N26	11.5%	55.00	0.19	0.19		0.00
CR25	2018+00	-	2024+00	LS-N63	10.0%	150.00	0.33	0.33	34.00	0.00
CR25	2024+00	-	2031+00	LS-N66	10.7%	150.00	0.39	0.39	64.00	0.00
CR25	2031+00	-	2036+00	AD-N27	8.7%	55.00	0.28	0.28		0.00
CR25	2036+00	-	2037+00	-	-	-	0.06	0.00		0.06
CR25	2037+00	-	2045+50	AD-N28	20.0%	55.00	0.47	0.47		0.00
CR25	2045+50	-	2051+00	-	-	-	0.30	0.00		0.30
CR25	2051+00	-	2052+50	DT-N69	11.6%	120.00	0.08	0.08		0.00
CR13	1000+00	-	1001+50	AD-N31	13.3%	55.00	0.08	0.08		0.00
T57		-		PAD	8% MAX	150.00	0.28	0.28		0.00
CR18	1400+00	-	1402+50	LS-N66	10.7%	150.00	0.14	0.14	64.00	0.00
CR18	1402+50	-	1411+30	-	-	-	0.48	0.00		0.48
CR18	1411+30	-	1415+00	LS-N89	6.7%	150.00	0.20	0.20	16.00	0.00
CR18	1415+00	-	1418+50	LS-N89A	8.7%	150.00	0.19	0.19	15.00	0.00
CR18	1418+50	-	1420+50	AD-N33	7.8%	55.00	0.11	0.11		0.00
CR18	1420+50	-	1424+00	-	-	-	0.19	0.00		0.19
CR18	1424+00	-	1429+00	AD-N32	8.1%	55.00	0.28	0.28		0.00
CR18	1429+00	-	1430+00	-	-	-	0.06	0.00		0.06
CR18	1430+00	-	1431+50	AD-N32	8.1%	55.00	0.08	0.08		0.00
CR18	1431+50	-	1436+00	LS-N84	14.7%	150.00	0.25	0.25	38.00	0.00
T40		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T53		-		PAD	8% MAX	150.00	0.28	0.28		0.00
T54		-		PAD	8% MAX	150.00	0.28	0.28		0.00
						Totals	**8.12**	**6.68**		**1.44**

Impervious Area Treatment Calculations (Linear project)

Total Proposed Impervious Area=	8.12	ac
Total Treated Proposed Impervious Area=	6.68	ac
Total Untreated Proposed Impervious Area=	1.44	ac
Proposed Impervious Area Treatment Percentage=	82.31	%

Total Proposed Impervious Area=	62.98	ac
Total Treated Proposed Impervious Area=	47.36	ac
Proposed Impervious Area Treatment Percentage=	75.21	%

Bingham Wind Project
Mayfield Township, Maine
Withee Pond Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

SOIL GROUPS	
Abram	D
Lyman	C/D
Monson	C/D
Plaisted	C
Telos	C
Monarda	D
Dixmont	C
Dixfield	C
Colonel	C
Chesuncook	C
Elliotsville	B
Thorndike	C/D

Road ID	Start Station		End Station	BMP ID	HSG	Buffer Slope	Buffer Length (ft)	New Impervious Area (ac)	Required Berm Length (ft)	Export Coefficient	Pre-Treat Export (lbs P/yr)	BMP Treatment Factor	Post-Treat Export (lbs P/yr)	Road Width After Revegetation (ft)
CR6/T74	430+26	-	435+00	LS-S50	C	4.0%	150.00	0.54	82.00	1.75	0.95	0.20	0.19	24
							Totals	**0.54**			**0.95**		**0.19**	

Project Phosphorus Calculations

Project Phosphorus Budget (PPB)	0.38	lbs/yr
Project Phosphorus Export (PPE)	0.19	lbs/yr
Mitigation credit	0.00	lbs/yr
Project Phosphorus Export (PPE)	0.19	lbs/yr

Bingham Wind Project
Brighton Plantation, Maine
Smith (Weeks) Pond Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

SOIL GROUPS	
Abram	D
Lyman	C/D
Monson	C/D
Plaisted	C
Telos	C
Monarda	D
Dixmont	C
Dixfield	C
Colonel	C
Chesuncook	C
Elliotsville	B
Thorndike	C/D

Road ID	Start Station		End Station	BMP ID	HSG	Buffer Slope	Buffer Length (ft)	New Impervious Area (ac)	Required Berm Length (ft)	Export Coefficient	Pre-Treat Export (lbs P/yr)	BMP Treatment Factor	Post-Treat Export (lbs P/yr)	Road Width After Revegetation (ft)
T15		-		PAD	C	8% MAX	150.00	0.23		1.75	0.40	0.30	0.12	24
							Totals	**0.23**			**0.40**		**0.12**	

Project Phosphorus Calculations

Project Phosphorus Budget (PPB)	0.21	lbs/yr
Project Phosphorus Export (PPE)	0.12	lbs/yr
Mitigation credit	0.00	lbs/yr
Project Phosphorus Export (PPE)	0.12	lbs/yr

Bingham Wind Project
Kingsbury Plantation, Maine
Hilton Pond #1 Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

SOIL GROUPS	
Abram	D
Lyman	C/D
Monson	C/D
Plaisted	C
Telos	C
Monarda	D
Dixmont	C
Dixfield	C
Colonel	C
Chesuncook	C
Elliotsville	B
Thorndike	C/D

CRANE RD 18 FOLLOWS AN EXISTING ROAD THAT IS APPROXIMATELY 18 FT WIDE FROM STA. 1440+00 TO 1447+00
CALCULATIONS ASSUME THAT A 6' WIDTH OF NEW ROADWAY WILL BE CONSTRUCTED.

Road ID	Start Station		End Station	BMP ID	HSG	Buffer Slope	Buffer Length (ft)	New Impervious Area (ac)	Required Berm Length (ft)	Export Coefficient	Pre-Treat Export (lbs P/yr)	BMP Treatment Factor	Post-Treat Export (lbs P/yr)	Road Width After Revegetation (ft)
CR18	1436+00	-	1437+50	-	-	-	-	0.08		1.75	0.14	1.00	0.14	
CR18	1437+50	-	1447+00	LS-N87	C	9.3%	150.00	0.13	95.00	1.75	0.23	0.20	0.05	
T58		-		-	-	-	-	0.28		1.75	0.49	1.00	0.49	
T48		-		PAD	C	8% MAX	150.00	0.18		1.75	0.32	0.30	0.09	
							Totals	**0.67**			**1.18**		**0.77**	

Project Phosphorus Calculations

Project Phosphorus Budget (PPB)	0.94	lbs/yr	Hilton Pond #1
Project Phosphorus Export (PPE)	0.77	lbs/yr	
Mitigation credit	0.00	lbs/yr	
Project Phosphorus Export (PPE)	0.77	lbs/yr	

Bingham Wind Project
Mayfield Township, Maine
Kingsbury Pond Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Bufer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

SOIL GROUPS	
Abram	D
Lyman	C/D
Monson	C/D
Plaisted	C
Telos	C
Monarda	D
Dixmont	C
Dixfield	C
Colonel	C
Chesuncook	C
Elliotsville	B
Thorndike	C/D

NEW HAYDEN POND RD (AR3) IS APPROXIMATELY 18 TO 20 FT WIDE
CALCULATIONS ASSUME THAT A 5' WIDTH OF NEW ROADWAY WILL BE CONSTRUCTED.

Road ID	Start Station		End Station	BMP ID	HSG	Buffer Slope	Buffer Length (ft)	New Impervious Area (ac)	Required Berm Length (ft)	Export Coefficient	Pre-Treat Export (lbs P/yr)	BMP Treatment Factor	Post-Treat Export (lbs P/yr)	Road Width After Revegetation (ft)
T28		-		PAD	C	8% MAX	150.00	0.29		1.75	0.51	0.30	0.15	
CR11	750+00	-	751+50	DT-N18	C	1.1%	120.00	0.08		1.75	0.14	0.30	0.04	
CR11	751+50	-	753+00	-	-	-	-	0.08		1.75	0.14	1.00	0.14	
CR11	753+00	-	762+50	AD-N8	C	12.0%	55.00	0.52		1.75	0.92	0.30	0.27	
CR11	762+50	-	764+00	LS-N22	C	7.0%	150.00	0.08	73.00	1.75	0.14	0.20	0.03	
CR11	764+00	-	773+50	LS-N21	C	8.0%	150.00	0.52	79.00	1.75	0.92	0.20	0.18	
CR11	773+50	-	787+00	AD-N11	C	11.7%	80.00	0.74		1.75	1.30	0.30	0.39	
AR3	300+00		394+47	-	-	-	-	1.08		1.75	1.90	1.00	1.90	
CR22	1800+00	-	1807+25	LS-N22	C	7.0%	55.00	0.40	73.00	1.75	0.70	0.20	0.14	
							Totals	**3.81**			**6.67**		**3.26**	

Project Phosphorus Calculations

Project Phosphorus Budget (PPB)	3.40	lbs/yr
Project Phosphorus Export (PPE)	3.26	lbs/yr
Mitigation credit	0.00	lbs/yr
Project Phosphorus Export (PPE)	3.26	lbs/yr

Bingham Wind Project
Mayfield Township, Maine
Mayfield Pond Watershed Treatment Calculations

Impervious Area Road ID Descriptions:	
CR1	CRANE ROAD
AR1	ACCESS ROAD
13	TURBINE PAD SITE
METR	M.E.T. Road
Misc.	Miscellaneous Imp. Area

BMP ID DESCRIPTIONS	
AD	Roadside Buffer
DT	Ditch Turnout Buffer
LS	Level Spreader Buffer
PAD	Turbine Pad Meadow Buffer

SOIL GROUPS	
Abram	D
Lyman	C/D
Monson	C/D
Plaisted	C
Telos	C
Monarda	D
Dixmont	C
Dixfield	C
Colonel	C
Chesuncook	C
Elliotsville	B
Thorndike	C/D

Road ID	Start Station		End Station	BMP ID	HSG	Buffer Slope	Buffer Length (ft)	New Impervious Area (ac)	Required Berm Length (ft)	Export Coefficient	Pre-Treat Export (lbs P/yr)	BMP Treatment Factor	Post-Treat Export (lbs P/yr)	Road Width After Revegetation (ft)
CR8	500+00	-	504+50	-	-	-	-	0.15		1.75	0.27	1.00	0.27	15
CR8	504+50	-	511+50	AD-S30	C/D	10.0%	55.00	0.24		1.75	0.42	0.35	0.15	15
CR8	511+50	-	518+00	LS-S65	C	9.5%	150.00	0.22	41.00	1.75	0.39	0.30	0.12	15
CR8	518+00	-	520+50	DT-S63A	C	8.3%	120.00	0.09		1.75	0.15	0.30	0.05	15
CR8	520+50	-	534+50	AD-S32	C/D	5.0%	55.00	0.48		1.75	0.84	0.35	0.30	15
T18		-		PAD	C	8% MAX	150.00	0.28		1.75	0.49	0.30	0.15	
METR2	20+00	-	24+50	AD-S32	C	5.0%	55.00	0.15		1.75	0.27	0.30	0.08	12
METR2	24+50	-	26+73	DT-S58	C	6.7%	120.00	0.06		1.75	0.11	0.15	0.02	12
CR9	600+00	-	602+50	-	-	-	-	0.09		1.75	0.15	1.00	0.15	15
CR9	602+50	-	607+50	LS-S62	C	4.7%	150.00	0.17	26.00	1.75	0.30	0.30	0.09	15
T19		-		DT-S60	C/D	8.6%	120.00	0.14		1.75	0.25	0.35	0.09	
T19		-		DT-S59	C/D	7.7%	120.00	0.14		1.75	0.25	0.35	0.09	
T20		-		PAD	C	8% MAX	150.00	0.29		1.75	0.51	0.30	0.15	
CR10	651+50	-	659+50	LS-N16	C	8.0%	150.00	0.28	42.00	1.75	0.48	0.30	0.14	15
CR10	659+50	-	676+50	AD-N6	C	5.2%	55.00	0.59		1.75	1.02	0.30	0.31	15
CR10	676+50	-	678+50	DT-N13	C	8.1%	120.00	0.07		1.75	0.12	0.30	0.04	15
CR10	678+50	-	681+50	-	-	-	-	0.10		1.75	0.18	1.00	0.18	15
CR10	681+50	-	687+00	LS-N10	C	8.7%	150.00	0.19	29.00	1.75	0.33	0.30	0.10	15
CR10	687+00	-	692+00	AD-N4	C	7.0%	80.00	0.17		1.75	0.30	0.30	0.09	15
CR10	692+00	-	698+00	LS-N9	C	8.0%	150.00	0.21	31.00	1.75	0.36	0.30	0.11	15
CR10	698+00	-	706+00	AD-N3	C	20.0%	55.00	0.28		1.75	0.48	0.30	0.14	15
CR10	706+00	-	710+00	LS-N7	C	8.5%	150.00	0.14	21.00	1.75	0.24	0.30	0.07	15
CR10	710+00	-	723+00	LS-N2	C	9.0%	150.00	0.45	68.00	1.75	0.78	0.30	0.24	15
T21		-		PAD	C	8% MAX	150.00	0.28		1.75	0.49	0.30	0.15	
T22		-		PAD	C	8% MAX	150.00	0.46		1.75	0.81	0.30	0.24	
T23		-		PAD	C	8% MAX	150.00	0.28		1.75	0.49	0.30	0.15	
T24		-		PAD	C	8% MAX	150.00	0.28		1.75	0.49	0.30	0.15	
T25		-		PAD	C	8% MAX	150.00	0.28		1.75	0.49	0.30	0.15	
T26		-		PAD	C	8% MAX	150.00	0.28		1.75	0.49	0.30	0.15	
T27		-		PAD	C	8% MAX	150.00	0.28		1.75	0.49	0.30	0.15	
T29		-		PAD	C	8% MAX	150.00	0.28		1.75	0.49	0.30	0.15	
T30		-		PAD	C	8% MAX	150.00	0.37		1.75	0.65	0.30	0.19	
METR3	30+00		34+03	-	-	-	-	0.11		1.75	0.19	1.00	0.19	
SUBSTATION								2.00		1.25	2.50	0.25	0.63	
CR22	1807+25	-	1812+50	AD-N9	C	17.4%	55.00	0.18		1.75	0.32	0.30	0.09	15
							Totals	**10.06**			**16.60**		**5.48**	

Project Phosphorus Calculations

Project Phosphorus Budget (PPB)	5.17	lbs/yr
Project Phosphorus Export (PPE)	5.48	lbs/yr
Mitigation credit	0.36	lbs/yr
Project Phosphorus Export (PPE)	5.13	lbs/yr

Worksheet 1
PPB calculations

Project name: Bingham Wind

Lake name: Withee Pond

Town name: Mayfield Township

Standard Calculation

Watershed per acre phosphorus budget (Appendix C):	**PAPB**	0.058	lbs P/acre/year
Total acreage of development parcel:	**TA**	13.32	acres
NWI wetland acreage:	**WA**	0	acres
Steep slope acreage:	**SA**	0	acres
Existing developed area			acres
Project acreage: A = TA - (WA + SA)	**A**	13.32	acres
Project Phosphorus Budget: PPB = P x A	**PPB**	0.77256	**lbs P/year**

Small Watershed Adjustment

If Project Acreage (A) is greater than the threshold acreage for the small watershed threshold (SWT, from pertinent lake and town info in the table in Appendix C), calculate an alternative PPB using the analysis below and use this value if it is less than

Small Watershed Threshold (Appendix C):	**SWT**	5	acres
Project acreage:	**A**	13.32	acres
Allowable increase in town's share of annual phosphorus load to lake (Appendix C):	**FC**	1.21	lbs P/year
Area available for development (Appendix C):	**AAD**	104	acres
Ratio of A to AAD (R=A/AAD)	**R**	0.128076923	
If R < 0.5, Project Phosphorus Budget PPB = [(FC x R)/2] + [FC/4]	**PPB**	0.379986538	**lbs P/year**
If R> 0.5, Project Phosphorus Budget PPB = FC x R	**PPB**	0.154973077	**lbs P/year**

Worksheet 1
PPB calculations

Project name: Bingham Wind

Lake name: Smith (Weeks) Pond

Town name: Brighton Plantation

Standard Calculation

Watershed per acre phosphorus budget (Appendix C):	**PAPB**	0.048	lbs P/acre/year
Total acreage of development parcel:	**TA**	4.4	acres
NWI wetland acreage:	**WA**	0	acres
Steep slope acreage:	**SA**	0	acres
Existing developed area			acres
Project acreage: A = TA - (WA + SA)	**A**	4.4	acres
Project Phosphorus Budget: PPB = P x A	**PPB**	0.2112	**lbs P/year**

Small Watershed Adjustment

If Project Acreage (A) is greater than the threshold acreage for the small watershed threshold (SWT, from pertinent lake and town info in the table in Appendix C), calculate an alternative PPB using the analysis below and use this value if it is less than

Small Watershed Threshold (Appendix C):	**SWT**	137	acres
Project acreage:	**A**	4.4	acres
Allowable increase in town's share of annual phosphorus load to lake (Appendix C):	**FC**	26.21	lbs P/year
Area available for development (Appendix C):	**AAD**	2735	acres
Ratio of A to AAD (R=A/AAD)	**R**	0.001608775	
If R < 0.5, Project Phosphorus Budget PPB = [(FC x R)/2] + [FC/4]	**PPB**	6.573582998	**lbs P/year**
If R> 0.5, Project Phosphorus Budget PPB = FC x R	**PPB**	0.042165996	**lbs P/year**

Worksheet 1
PPB calculations

Project name: Bingham Wind

Lake name: Hilton Pond 1

Town name: Kingsbury Plantation

Standard Calculation

Watershed per acre phosphorus budget (Appendix C):	**PAPB**	0.042	lbs P/acre/year
Total acreage of development parcel:	**TA**	22.48	acres
NWI wetland acreage:	**WA**	0	acres
Steep slope acreage:	**SA**	0	acres
Existing developed area			acres
Project acreage: A = TA - (WA + SA)	**A**	22.48	acres
Project Phosphorus Budget: PPB = P x A	**PPB**	0.94416	**lbs P/year**

Small Watershed Adjustment

If Project Acreage (A) is greater than the threshold acreage for the small watershed threshold (SWT, from pertinent lake and town info in the table in Appendix C), calculate an alternative PPB using the analysis below and use this value if it is less than

Small Watershed Threshold (Appendix C):	**SWT**	21	acres
Project acreage:	**A**	22.48	acres
Allowable increase in town's share of annual phosphorus load to lake (Appendix C):	**FC**	3.46	lbs P/year
Area available for development (Appendix C):	**AAD**	414	acres
Ratio of A to AAD (R=A/AAD)	**R**	0.054299517	
If R < 0.5, Project Phosphorus Budget PPB = [(FC x R)/2] + [FC/4]	**PPB**	0.958938164	**lbs P/year**
If R> 0.5, Project Phosphorus Budget PPB = FC x R	**PPB**	0.187876329	**lbs P/year**

Worksheet 1
PPB calculations

Project name: Bingham Wind

Lake name: Kingsbury Pond

Town name: Mayfield Township

Standard Calculation

Watershed per acre phosphorus budget (Appendix C):	**PAPB**	0.047	lbs P/acre/year
Total acreage of development parcel:	**TA**	72.3	acres
NWI wetland acreage:	**WA**	0	acres
Steep slope acreage:	**SA**	0	acres
Existing developed area		4.12	acres
Project acreage: A = TA - (WA + SA)	**A**	72.3	acres
Project Phosphorus Budget: PPB = P x A	**PPB**	3.3981	**lbs P/year**

Small Watershed Adjustment

If Project Acreage (A) is greater than the threshold acreage for the small watershed threshold (SWT, from pertinent lake and town info in the table in Appendix C), calculate an alternative PPB using the analysis below and use this value if it is less than

Small Watershed Threshold (Appendix C):	**SWT**	116	acres
Project acreage:	**A**	72.3	acres
Allowable increase in town's share of annual phosphorus load to lake (Appendix C):	**FC**	21.65	lbs P/year
Area available for development (Appendix C):	**AAD**	2319	acres
Ratio of A to AAD (R=A/AAD)	**R**	0.031177232	
If R < 0.5, Project Phosphorus Budget PPB = [(FC x R)/2] + [FC/4]	**PPB**	5.749993532	**lbs P/year**
If R> 0.5, Project Phosphorus Budget PPB = FC x R	**PPB**	0.674987063	**lbs P/year**

Worksheet 1
PPB calculations

Project name: Bingham Wind

Lake name: Mayfield Pond

Town name: Mayfield Township

Standard Calculation

Watershed per acre phosphorus budget (Appendix C):	**PAPB**	0.032	lbs P/acre/year
Total acreage of development parcel:	**TA**	183.25	acres
NWI wetland acreage:	**WA**	0	acres
Steep slope acreage:	**SA**	0	acres
Existing developed area			acres
Project acreage: A = TA - (WA + SA)	**A**	183.25	acres
Project Phosphorus Budget: PPB = P x A	**PPB**	5.864	**lbs P/year**

Small Watershed Adjustment

If Project Acreage (A) is greater than the threshold acreage for the small watershed threshold (SWT, from pertinent lake and town info in the table in Appendix C), calculate an alternative PPB using the analysis below and use this value if it is less than

Small Watershed Threshold (Appendix C):	**SWT**	141	acres
Project acreage:	**A**	183.25	acres
Allowable increase in town's share of annual phosphorus load to lake (Appendix C):	**FC**	18.29	lbs P/year
Area available for development (Appendix C):	**AAD**	2826	acres
Ratio of A to AAD (R=A/AAD)	**R**	0.064844303	
If R < 0.5, Project Phosphorus Budget PPB = [(FC x R)/2] + [FC/4]	**PPB**	5.16550115	**lbs P/year**
If R> 0.5, Project Phosphorus Budget PPB = FC x R	**PPB**	1.1860023	**lbs P/year**

Appendix D: Worksheet 3 - Mitigation credit

Project name: Bingham Wind Project **Development type**: Wind Power Sheet # 1

Mitigation credit when a pre-existing source is being eliminated

Mitigation Source Area Land Use	Acres	Export Coefficient (lbs P/acre/year)	Modifier	Pre-treatment Historical P Export (lbs P/year)	Treatment Factor for Historical BMP(s) (1.0 if no BMPs)	Historical P Export (lbs P/year)			Mitigation Credit (lbs P/year)	Comments
Existing Land Mgmt Rd in Mayfield Pond Wshed	0.41	1.75	0.5	0.35875	1	0.35875			0.35875	
						0			0	
						0			0	
				Total source elimination mitiagion credit (SEC)					**0.35875**	**lbs P/year**

Mitigation credit when a pre-existing source is treated by a new BMP

Mitigation Source Area Land Use	Acres	Export Coefficient (lbs P/acre/year)	Modifier	Pre-treatment Historical P Export (lbs P/year)	Treatment Factor for Historical BMP(s) (1.0 if no BMPs)	Historical P Export (lbs P/year)		Treatment Factor for New BMP(s) Chapter 6	Mitigation Credit (lbs P/year)	Comments
			0.5	0	1	0	1 -		0	
			0.5	0	1	0	1 -		0	
			0.5	0	1	0	1 -		0	
				Total source treatment mitiagion credit (STC)					**0**	**lbs P/year**

TOTAL MITIGATION CREDIT (SEC + STC)	**0.35875**	**lbs P/year**

REVISED PLAN SHEETS

14.0 Basic Standards

14.1 Introduction

The following plan has been developed to provide a strategy for controlling erosion and sedimentation associated with the Bingham Wind Project (project) both during and after site construction (Maine Construction General Permit). The project is a proposed utility-scale wind energy facility located in Somerset and Piscataquis Counties, Maine, and includes 62 wind turbines (63 potential turbine locations are being permitted), existing and new access roads and crane paths, up to 5 temporary and up to 5 permanent meteorological towers, an Operations and Maintenance (O&M) building, 34.5-kilovolt electrical collector lines (the majority of which will be buried alongside project roads), a collector substation, and an approximately 17-mile electrical generator lead. This plan is based upon sound conservation practices, including as applicable, those outlined in the "Maine Erosion and Sediment Control Best Management Practices" manual published by the Bureau of Land and Water Quality, Maine Department of Environmental Protection (MDEP; March 2003), and past experience of the Applicants in constructing wind projects in Maine.

Details of erosion and sedimentation control during the construction of roadways and turbine pads can be found in the civil design plan included within Exhibit 1. Details of erosion and sedimentation control during the construction of the O&M building and substation facilities are located on sheets C-9.0 and C-9.1 of Exhibit 1. The electrical generator lead erosion and sedimentation control can be found in the electrical design plan of Exhibit 2.

14.1.1 Stormwater Management Measures

Additional measures may be required to protect new stormwater conveyance or management systems due to changes in actual site conditions. For more information on stormwater management, see Section 12. For additional information on buffers, the contractor shall reference the Maine Stormwater Best Management Practices Manual, Volume III: BMP Technical Design Manual Chapter 5, Vegetated Buffers (revised June 2010).

14.2 field adjustments

The Applicants expect that minor adjustments will be made during final design work and during construction based on conditions encountered in the field. As described below, the Applicants have identified changes that do not require a permit modification and that may be made (a) without advance notice to MDEP or, (b) that require prior approval by the third-party inspector or MDEP staff.

The following field and/or final design adjustments are authorized under the permit provided they do not result in new impacts to protected natural resources as defined under the Natural Resources Protection Act (38 MRSA Section 480-B(8)); do not increase overall project clearing; do not impact a new landowner; and meet the requirements of MDEP Chapter 500 Stormwater Management Standards. Any of these adjustments will be reflected in the final as-built drawings.

(a)Examples of adjustments that may be made during construction and/or final design without advance notice to MDEP:

- Reduction in clearing, impervious surface, or size of structure; elimination of a structure; or relocation of a structure;
- Location, dimension or addition of drainage culverts, level spreaders, rock sandwiches or other stormwater infrastructure, provided that the culvert does not convey a regulated stream and that the hydraulic capacity of the modified stormwater infrastructure meets design standards;
- Changes to pole or anchor locations for the electrical collector, provided that any adjustment meets the buffer requirements as defined in Section 10;
- Maintenance within the footprint of existing roads with exception of any in-stream work or wetland impacts to be used for temporary construction access;
- Changes of up to 10 feet in vertical roadway alignment and turbine pad elevation; and
- Changes of up to 300 feet in either direction in horizontal roadway alignment and associated clearing, and in turbine or met tower clearing area, and in electrical collector alignment laydown/staging areas.

(b) May be made upon prior approval by the third-party inspector or MDEP staff:

- Changes other than those identified in (a) and that do not otherwise require a permit amendment as determined by MDEP.

14.3 Construction Calendar

The Contractor is required to give special attention to the sections pertaining to fall and winter construction, as well as to sensitive areas and requirements for temporary seeding, dormant seeding, and mulching.

14.3.1 Definitions

The following definitions are terms commonly used throughout this plan.

Acceptance - As used herein shall mean verification by the Owner and/or the Engineer that the specific erosion control measure or device to be accepted is adequately constructed, performs satisfactorily as intended, and is complete. Acceptance of a measure or device by the Owner or the Engineer shall be based upon visual observations and inspection and is not a warranty of compliance, compaction, structural integrity, workmanship, or other construction-related or qualitative factors that may require testing or other means of certification of compliance.

Buffer strips - Natural, undisturbed strips of natural vegetation or reseeded strips of close-growing vegetation adjacent to and downslope of developed areas.

- Buffer with stone bermed level lip spreaders: This buffer is used for larger, developed areas and uses a level spreader to create sheet flow onto the buffer.
- Roadside Buffer adjacent to the downhill side of a road: This buffer is used for flow from a roadway when it directly enters the buffer as sheet flow.
- Ditch turn-out buffer: This buffer is used to divert roadway runoff collected in a ditch into a buffer as sheet flow.

Clearing - Includes cutting and removing of vegetative cover. It does not include grubbing. Limited cutting, thinning, use of heavy equipment, and other clearing restrictions will apply to sensitive areas and wetland crossings (Section 10).

Critical Areas - Specific areas identified herein or subjected to significant erosion problems as observed in the field prior to, during, or following construction activities such as areas with steep slopes or channels in excess of eight percent, newly graded slopes, highly erodible soils that will be exposed for more than seven days, bare soils exposed during late fall and winter when no vegetation can grow, areas draining to and within 75 feet of a wetland, river/stream/brook, pond shoreline, or vernal pool.

Earthwork - Consists of the movement of soil by mechanical means including excavation, filling, grading, trenching, and shaping.

Engineer - As used herein shall mean a representative of the civil engineer of record or person designated by the Owner.

Erosion and Sedimentation Controls - Defined as the installation of silt fence, bales, erosion control berms, rip-rap, mulching, erosion control matting or netting, check dams, inlet protection, reinforced turf, erosion control mix, construction entrances, diversions, level spreaders, and any other temporary or permanent measures required herein.

Grubbing - The removal of grass, stumps, roots, and scrub required to begin earthwork. Grubbing is the initial clearing action that exposes soil to erosive forces (wind, rain).

Interim Period - A period of time that an un-vegetated area sits un-worked, awaiting the next phase of work.

Permanent or Final - As used herein shall refer to the use or placement of erosion or sedimentation controls, seeding, or other measures, which will remain through final project completion.

Seasons - The following dates define the seasons as referred to herein:

Seasons	**Dates** *(Seasonal dates may vary from year-to-year)*
Winter	November 1 to April 15
Mud-Season	March 16 to April 30
Spring	May 1 to June 14
Summer	June 15 to September 15
Fall	September 16 to October 31

Temporary - As used herein shall refer to the use or placement of erosion or sedimentation controls, seeding, or other measures intended to be either removed, replaced, reworked, reseeded, or followed with permanent measures.

14.3.2 Schedule of Activities

The following activities, erosion control measures, or other items are required for the construction of this project or require specific measures or scheduling of activities to be conducted or restricted during the various construction seasons as defined above.

Clearing - Ground conditions permitting, clearing may occur at any time of the year.

Critical Areas - Work proposed in the defined critical areas may be conducted all year ground conditions permitting. Some problem areas may become "critical areas" during the course of construction. Areas observed to be experiencing significant erosion problems shall be deemed critical areas and shall be stabilized with appropriate erosion control measures immediately prior to progressing with work in these areas as directed by the Engineer.

Erosion and Sedimentation Controls Installation - Erosion control installation shall occur all year long, except that such measures shall be installed prior to commencement of disturbance activities related to each erosion control measure. See design plans for locations and installation procedures.

Road Construction - This construction may occur in the spring, summer, and fall seasons. It will also be allowed in the winter season, however, the winter construction schedule must be followed (see Section 14.5.1 below). The following requirement for access road construction will be adhered to in order to prevent erosion from taking place during winter construction:

- While the entire road system may be cleared in one effort, the roads will be constructed in segments where each segment is grubbed, constructed, and protected prior to earthwork on the next segment as approved by the Engineer. This construction sequence is intended to prevent large areas from being exposed, without temporary stabilization, to erosion during major rain events. A segment is defined as an area cleared and grubbed. See below for the stabilization schedule. Multiple segments in different areas of the project may be constructed concurrently.

Temporary Timber Mat Bridge - Temporary timber mat bridges will be used throughout the year as necessary for clearing and construction activities. Installation and removal of temporary timber mat bridges will proceed according to the following sequence:

- Install erosion controls at the down-gradient perimeter of work adjacent to the stream resource.
- Strip topsoil beneath the temporary bridge supports and stockpile for replacement following construction.
- Place sand leveling material and geotextile fabric to create a stable base for bridge supports.
- Place timber bridge supports and span.
- Place gravel as necessary to create a smooth transition onto bridge.
- Remove bridge following construction, re-grade area with stockpiled topsoil, and reseed/restore per the project restoration plan.
- Remove barrier erosion controls following final stabilization/restoration of the crossing.

14.4 Erosion control measures

14.4.1 General

The construction of this project may require or incorporate the following measures or practices as needed or applicable. Such measures, where indicated on the design plans, shall be implemented as shown, or as deemed necessary by the Engineer. Additional measures not shown on design plans may be required as specified herein or requested by the Engineer, as needed, in order to protect natural resources or off-site properties and prevent erosion and sedimentation.

Bales - Shall be installed along the contours in the locations and as detailed on the design plans. Straw (or hay) bales may be required in addition to silt fencing or other measures in sensitive areas as shown on Drawings. Bales are to be embedded four inches into the existing soil and staked with ends tightly abutting adjacent bales. Where staking and embedding of bales is impractical due to excessive roots, ledge, or other construction hazards, bale barriers may be substituted with erosion control mix berms as long as they are not installed in locations with concentrated flow.

Construction Entrance - A crushed stone-stabilized construction entrance will be installed wherever construction traffic will enter the public road system. The size, type, and locations of these shall be as shown and detailed in the design plans. Entrances shall be constructed with a 6-inch minimum layer of 2-inch stone. Stone entrances shall be placed on geotextile fabric and shall include a minimum 10-foot by 10-foot taper (or as needed to support large construction/delivery vehicles) on both sides of the entrance to allow for turning vehicles.

Dust Control - Contractor shall take necessary steps to control blowing and airborne movement of dust from exposed soil surfaces. Maintaining natural or temporary vegetation and/or mulching shall be used where practical. Mechanical sweepers shall be used where necessary to prevent and remove dust buildup on paved surfaces. Regularly traveled soil surfaces shall be maintained to minimize dust by periodically moistening bare areas with adequate water to prevent dust (for water sources, see Section 16, Water Supply). Calcium Chloride solution spray should be used in areas experiencing significant dust problems and to reduce frequency of watering. Repetitive treatment shall be applied as necessary to accomplish adequate dust control (refer to Section B-5 in the "Maine Erosion and Sediment Control Best Management Practices" manual).

Erosion Control Mix Berms - May be installed in locations that do not have a concentrated flow. Erosion control mix berms are an approved alternative to silt fence provided they are not located in sensitive areas described above. Erosion control mix may be manufactured on or offsite and shall follow the guidelines outlined in Section B-1 in the "Maine Erosion and Sediment Control Best Management Practices." The composition specification outlined in Section B-1 should be used a guideline but the actual mix design will be performance based. The mix shall be subject to testing if required by the Engineer.

Level Lip Spreader - Level lip spreader lengths are given in the details in the design plans and will be 6-inches to 24-inches deep, stone-lined ponded areas discharging over a level berm through a well vegetated buffer area. These spreaders will function to disperse channelized flow into shallow sheet flow. Construction and length of level lip spreaders shall be as detailed on the design plans.

Matting - Shall consist of straw, coconut or excelsior sandwiched between photodegradable netting. Matting may be substituted with sod where desired. Netting over straw mulch may be substituted for matting only when approved by the Engineer. Matting shall be used: (1) where indicated on the design plans; (2) in the base of swales with moderate slopes and erosive capability. High velocity ditch lining or geotextile soft armor may be required in steep ditches (> 8%) or areas receiving significant concentrated flows; (3) on steep slopes where rilling may occur or where mulching has proven to be ineffective in the field; or (4) where straw mulch has been determined to be ineffective based on observations made in the field or as directed by the Engineer.

Outlet Protection - Riprap outlets (aprons or plunge pools) shall be placed in locations where indicated on the design plans, and in locations where flared end sections have proven to be inadequate to prevent scouring at the pipe outlet in the field, as directed by the Engineer. The riprap outlets shall be the same size as that specified on the design plans.

Permanent Mulching and Revegetation - Permanent mulch is long-term cover that provides a good buffer on and around disturbed areas. Permanent mulching with erosion control mix can be used as a permanent ground cover, as an overwinter stabilization mulch, or left to naturalize and revegetate to near natural conditions. It is not used to support grassy vegetation, but legumes or woody vegetation may be established if allowed to revert to natural conditions. Permanent mulch must not be used in areas of concentrated water flows, and any evidence of groundwater seepage on slopes may require the erosion control mix to be replaced with riprap. Erosion control mix can be manufactured on or off the project site. It shall consist primarily of organic material, separated at the point of generation and may include shredded bark, stump grindings, composted bark, or flume grit and fragmented wood generated from water-flume log handling systems. Wood chips, ground construction debris, reprocessed wood products, or bark chips will not be acceptable as the organic component of the mix. Erosion control mix composition shall be in accordance with Section A-1 of the "Maine Erosion and Sediment Control Best Management Practices" manual. Erosion control mix must be free of refuse, physical contaminants, and material toxic to plant growth.

Riprap - Shall be used in swales, steep slopes, and outlets as shown on the design plans to protect soils from excessive flow velocities. It shall be of the size and depths specified on the design plans; angular stone shall be used. Riprap may be required at locations where revegetation matting, high velocity ditch lining or soft armor is proven to be ineffective in the field as directed by the Engineer.

Sediment Barrier Berms - A sediment barrier is a berm installed across or at the toe of a slope and down gradient of disturbed earth. Its purpose is to intercept and retain small amounts of sediment from disturbed or unprotected areas of limited extent. For other sediment barrier use, see Section B-1 of the "Maine Erosion and Sediment Control Best Management Practices" manual. A sediment barrier is used where:

- Sedimentation can pollute or degrade a wetland or other water resource.
- Sedimentation will reduce the capacity of storm drainage systems or adversely flood adjacent areas.
- The contributing drainage area does not exceed 1/4 acre per 100 feet of barrier length; the maximum length of slope above the barrier is 100 feet; and the maximum gradient behind the barrier is 50 percent (2:1). If the slope length is greater, additional measures such as diversions may be necessary to reduce that length.
- Sediment barriers cannot be used in areas of concentrated flows. *Under no circumstances* should erosion control mix sediment barriers be constructed in streams or in swales.

Silt Fence - Shall be installed along the contours in the locations and as detailed on the design plans. Silt fence may be required in additional or other locations, not indicated on design plans, as warranted or determined by field conditions or as directed by the Engineer. Silt fence may also be required in addition to bales or other measures in sensitive areas as shown on the design plans. Where staking and embedding fabric is impractical due to excessive roots, ledge, or other construction hazards, silt fence may be substituted with erosion control mix berms or placement of six inches of suitable non-organic material along fabric flap on upslope side of fence, in lieu of burying fabric in trench.

Stone Check Dams - Shall be installed in existing and proposed swales or at culvert inlets as shown on the design plans. These check dams serve to reduce flow velocities in swales thus helping to reduce rilling. Check dams shall be constructed with a six-inch tapered spillway at the center as shown on design plans to prevent breaching and scour at the outer edges along the sides of the ditch.

Temporary Mulching - Shall consist of spreading of straw (or hay) mulch or erosion control mix over bare or disturbed areas. It shall be applied at the rates described in the *Temporary Seeding and Mulching Schedule* described below. Alternate mulch materials or methods such as hydro seeding may be used only when approved by the Engineer. Mulching shall be substituted with matting in locations where it has proven to be ineffective in the field. Mulching rates shall be doubled where requested by the Engineer based on observations in the field or in locations undergoing winter construction.

14.5 Erosion control execution

14.5.1 General Construction Phase

The following general practices will be used to prevent erosion during construction of the project. Refer to design plans for applications, and installation methods. If the Contractor is unclear regarding the use, location, installation, intended performance, or maintenance of any prescribed erosion control measures, the Contractor shall refer to the "Maine Erosion and Sediment Control Best Management Practices" Manual for detailed procedures or contact the Engineer for assistance.

NOTE: Locations of erosion control measures are shown on design plans as typical for general purposes only to indicate the intent. Final locations should be selected based on actual field conditions and as site conditions warrant.

Construction Traffic - Construction traffic will be directed over the stabilized construction entrances and proposed roads. The crushed stone construction entrances shall be maintained with the addition of more crushed stone as needed or as the voids become filled. The public roadway shall be swept as soon as possible should mud be tracked onto it.

Erosion Control Installation - Prior to the start of grubbing, silt fence, bales, erosion control mix berms, stabilized construction entrances, or other appropriate measures shall be installed adjacent to construction areas, at the toe of slopes and in areas as shown on design plans, or as otherwise required to protect against construction related erosion. Immediately following construction of culverts and swales, stone check dams, and ditch linings shall be installed, as shown on the design plans. Prior to start of construction there will be a mandatory pre-construction meeting to discuss the construction schedule and the erosion and sedimentation control plan. The meeting shall be attended by the owner (or owner's representative), the Engineer, the contractor, the third-party inspector, and MDEP staff.

Following Clearing - Only those areas under active construction shall be left in an untreated or unvegetated condition.

Grading - Grading will be held to a maximum 2:1 slope where practical. Greater slopes may be used in ledge cut or stable material as shown in the design drawings. Finish-graded areas shall be stabilized with permanent seeding and mulching or other accepted means immediately after final grading is complete. If final grading will not be completed immediately, refer to the *Temporary Seeding and Mulching Schedule* detailed below. It is understood that immediately means within five days of the completion of work. For time periods longer than five days, refer to *Permanent Seeding and Mulching Plan* below.

Monitoring Schedule - The Contractor shall be responsible for installing, monitoring, maintaining, repairing, replacing and/or removing the temporary erosion and sedimentation controls as specified herein or as directed by the Engineer, or shall appoint a qualified subcontractor to do so, as follows:

- The Contractor or approved designated Inspector shall perform weekly inspections of the site until the site is stabilized. Inspections may be performed on a bi-weekly schedule when work has abated for more than one week.
- Maintenance measures will be performed as needed during the entire construction cycle. After each rainfall, and *prior to* predicted significant rainfall events (> 1"), a visual erosion controls inspection will be made by the Contractor or approved designated Inspector to insure their continuing function as designed.
- Stone check dams, bale barriers, drop inlet barriers, erosion control mix berms, silt fence, and mulch shall be inspected and repaired once a week or immediately following any significant rainfall. Sediment trapped behind these barriers shall be removed when it reaches a depth of 6 inches (or 1/2 the height of the dam for check dams) and redistributed to areas undergoing final grading.
- Near completion of the construction and after the site is reseeded and stabilized, the Contractor shall inspect, clean, maintain, repair, restabilize, or revegetate all drainage structures, storm drains, culverts, level spreaders and ditches prior to acceptance by the Owner.

Permanent Seeding and Mulching Plan - The following general practices will be used to re-establish final vegetation.

- Loam will be spread over disturbed areas and graded to a uniform depth and a natural appearance. Loam shall be as specified or approved by the Engineer.
- Final seeding shall be completed within 7 days following final topsoil and loam grading for non-critical areas. Final seeding shall be completed within 48 hours or prior to any storm event, whichever occurs first, following topsoil and loam grading for critical areas. All final fertilizing and seeding shall adhere to these specifications.
- Seeded areas shall be mulched the same work day. Mulch shall consist of straw/hay, hydro-mulch, or any suitable subsititute deemed acceptable by the engineer. Straw, hay, or other mulch applied without a tackifier/binder will be anchored with biodegradable netting in the following areas: the base and side slopes of grassed ditches, slopes steeper than 15%, and exposed ridges. Mulched areas shall be monitored according to the *Monitoring Schedule* above. Should mulching prove to be ineffective, straw matting or excelsior matting will be used in its place.
- Straw mulch shall be applied at the rate of 2 tons per acre (90 pounds or 2 bales/1,000 square feet) unless otherwise specified.
- Hydro-mulch shall consist of a mixture of tackifier, wood fiber or paper fiber and water sprayed over a seeded area. Hydro-mulch shall not be used during the fall, winter, or mud season unless approved by the Engineer.
- Dormant seeding shall not occur unless approved by the Engineer. Should seeding be necessary between November 1 and April 15, the following procedure shall be followed.
  - Only unfrozen loam shall be used.
  - Loaming, seeding, and mulching will not be done over snow cover. If snow exists, it must be removed prior to placement of seed.
  - No permanent seeding will be done during fall, winter, or mud season unless specifically approved by the Engineer. If attempted, the normal seed application rate shall be doubled. Reseeding in spring by Contractor will be required in all areas with insufficient growth.
  - Where temporary seeding is required, the rates specified in the *Temporary Seeding and Mulching Schedule* below shall be adhered to.
  - Fertilizing, seeding, and mulching shall be done the same work day that loam is spread on any area. Mulch shall consist of hay or straw applied at twice the normal rate, as specified in the *Table 14-1: Stabilization Schedule* below.
  - All mulch applied to slopes steeper than 5% during the winter construction period will be anchored with biodegradable netting. At the Engineer's direction, straw matting or excelsior matting may be substituted for the straw mulch and biodegradable netting.
  - Following final seeding, the site will be inspected every 30 days until 80 percent cover has been established. Reseeding and mulching shall be carried out in areas where inadequate catch is observed until adequate growth is established in seeded areas, as agreed upon by the Engineer. The Contractor may be required to reseed during the following spring subsequent to winter or fall construction and seeding in order to provide 90 percent vegetative cover as required for Acceptance by the Owner.
- Erosion control mix utilized for permanent stabilization and to promote natural revegetation may be used in lieu of loaming and seeding.

Temporary Seeding and Mulching Schedule - During construction, all disturbed areas shall adhere to the schedules specified in Tabled 14-1 and 14-2 below. Refer to *Permanent Seeding and Mulching Plan* above for permanent seeding and mulching requirements.

- The Contractor shall be responsible for monitoring daily weather reports when working in identified sensitive areas and for monitoring weekly reports in all other areas. The Contractor shall adjust the work schedule in anticipation of rains and shall stabilize the site as indicated or required.
- All completed areas that have been loamed and/or finish graded shall be permanently reseeded in accordance with the *Permanent Seeding and Mulching Plan* above.
- Temporary mulching or seeding shall be done immediately for any non-critical area not to be worked for an interim period of more than 7 days. Temporary mulching and seeding of critical areas shall occur within 48 hours of initial disturbance or prior to any storm event, whichever occurs first. Stabilization and seeding requirements shall be determined in accordance with *Table 14-1: Stabilization Schedule* and *Table 14-2: Temporary Seeding Schedule* and shall be implemented at the beginning of the expected interim period. In no case, shall any disturbed soil be left unstabilized for more than 30 days.
- Interim periods for sensitive and critical areas are indicated in the Tables 14-1 and 14-2. However, exposed or bare soil in these areas shall be mulched at the completion of work, each day, if significant rainfall is predicted or eminent.
- Mulch application rate shall be doubled during winter construction. Mulch shall be applied at the end of each day's work to disturbed soil areas if the area has been fine graded or if snow is predicted or imminent. In no case, shall any area of disturbed soil be left without mulch or other surface cover for more than 7 days during the winter construction period.
- Permanent seeding shall not be attempted during the fall or winter seasons unless otherwise approved by the Engineer. Should seeding be approved by the Engineer during fall or winter seasons, the Contractor shall follow procedures for dormant seeding. See *Permanent Seeding and Mulching Plan* above for dormant seeding requirements. However, vegetation must be inspected and reseeded by Contractor as necessary in the following spring to ensure good vegetative cover. Acceptance of dormant seeding shall not occur until after May 1, in the following spring.
- Temporary seeding and mulch shall be inspected and maintained or repaired weekly. At a minimum, 75 percent of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (e.g., mulch, filter barriers, check dams, bales), Mulch shall be reapplied as necessary to completely cover soil.
- Areas within 75 feet of a protected natural resource shall be stabilized with temporary mulching or temporary seeding with mulching and have a sediment barrier installed between the area and resource within 48 hours or prior to any storm event, whichever occurs first.

Ditch Stabilization Plan - Any section of rough-graded ditch will have stone check dams installed in the ditch within 24 hours to prevent ditch scouring. Any section of finish-graded ditch will be stabilized with permanent lining of grass and or riprap within 7 days for ditches in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for culverts in critical areas.

Inlet and Outlet Stabilization Plan - Any drainage structure installed on the project shall have the appropriate inlet and outlet protection installed within 7 days in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, in critical areas.

Table 14-1: Stabilization Schedule

STABILIZATION SCHEDULE		
Maximum Expected Interim Period* - (Days)	**Temporary Mulching (Hay)**	**Temporary Seeding**
0-7 (0-2)	None	None
7-30 (2-14)	2-bales/1,000 sq.ft	None
30-60 (14-30)	2-bales/1,000 sq.ft.	(per Table 14-2: Temporary Seeding Schedule)
More than 7 days during winter season	4-bales/1,000 sq.ft.	Dormant seeding only

* Values in parentheses indicates interim period for sensitive and critical areas.
** Mulch application rates shall be doubled for winter construction.

Table 14-2: Temporary Seeding Schedule

TEMPORARY SEEDING SCHEDULE			
Seed	**Seeding Rate (lbs/1,000 sq. ft.)**	**Seeding Depth (Inches)**	**Recommended Seeding Dates**
Annual Rye Grass	0.9	1/4	4/1 to 7/1
Sudan Grass	0.9	1/2	7/1 to 8/15
Perennial Rye Grass	1.8	1/4	8/15 to 9/15
Winter Rye Grass	2.6	1	9/15 to 10/15
Dormant Seeding 50% Winter Rye 50% Annual Rye	3.5 (2.6) (0.9)	1	10/15 to 3/31

Table 14-3: Permanent Seeding Schedule

PERMANENT SEEDING SCHEDULE		
	SEED	**PERCENT BY WEIGHT**
Upland Areas with Loam Cover	Tall Fescue Creeping Red Fescue Perennial Ryegrass Annual Ryegrass	35% 30% 20% 15%
Upland Areas with Erosion Control Mix Cover	Crown Vetch Perennial Lupine Crimson Clover Annual Rye	50% 25% 15% 10%
Slopes and Ditches Below Water Table or Line of Seepage	Creeping Red Fescue Red Top Tall Fescue	47% 6% 47%

Topsoil - Topsoil will be stockpiled on-site when necessary in areas that have minimum potential for erosion, such as flat slopes or on-site borrow pits, and will be kept as far as possible from existing drainage areas. Stockpiles expected to remain longer than 15 days shall be encircled with bales, erosion control mix berms, or silt fence at the down gradient sides of the stockpile and mulched with a second application of hay mulch and anchored with biodegradable netting if deemed necessary by the Engineer (Maine Construction General Permit, Appendix A (6) a-d).

Winter Construction - For any work proposed during the winter season, the Contractor shall adhere to the following practices.

- Limit the exposed area to those areas in which work is to occur during the following 15 days and that can be mulched in one day prior to any snow event.
- Where required and approved by the Engineer, installation of silt fence may be modified from detail on design plans to substitute six inches of suitable non-organic material over the bottom of the silt fence in lieu of trenching and backfilling fabric or erosion control mix berm/barrier.
- Mulching and seeding rates shall adhere to the *Temporary Seeding and Mulching Schedule* above. *Note that all mulching rates shall be doubled as shown in the above table and shall follow the sensitive area schedule during winter construction.*
- Permanent seeding shall not be attempted by the Contractor during winter season unless otherwise approved by the Engineer.

14.5.2 Erosion Control Removal

Removal of temporary erosion control measures shall be the responsibility of the Contractor. Erosion controls shall remain in place and will be maintained by the Contractor until all related construction is complete and the area has been stabilized. Erosion control mix will be used to revegetate roads/pads and should be left in place.

An area is considered stable if a 90 percent cover of vegetation has been established or riprap or other permanent measures are in place and functioning properly.

Bales and silt fence shall be removed within 30 days of final stabilization. The bales and silt fence shall be disposed of legally and properly off-site. Sediment trapped behind these controls shall be distributed to an area undergoing final grading and graded in an aesthetic manner to conform to the topography, and fertilized, seeded and mulched, or otherwise stabilized, in accordance with the rates previously stated.

The sediment trapped behind/around/in stone check dams, perforated risers, and sedimentation basins, shall be removed and transported off-site, or to an upslope area undergoing final grading. The sediment trapped by these devices shall not be regraded locally since they exist in drainage ways.

The rip-rap and stone from the check dams and risers may be either removed or regraded in an aesthetic manner that does not inhibit flow or create the potential for erosion.

Once the trapped sediments have been removed from the temporary sedimentation devices, the disturbed areas will be loamed (if necessary), fertilized, seeded and mulched, or otherwise stabilized, in accordance with the rates previously stated.

14.6 Conclusion

If constructed in conformance with the project design plans and these basic standards, the project is not expected to result in any significant erosion or sedimentation either on or off the site.

NO.	DATE	DESCRIPTION
6	09.12.13	RESPONSE TO MEDEP COMMENTS
5	08.02.13	MEDEP STORMWATER AND BASIC STANDARDS COMMENT RESPONSE
4	04.17.13	ADDRESS STANTEC RESOURCE COMMENTS
3	04.09.13	PERMIT PLAN SUBMISSION
2	03.06.13	ACOE REVISIONS
1	12.19.12	PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

DRAWN: -
DESIGNED: SJB
CHECKED: SRB
FILE NAME: 3048-DET

SCALE: -
DATE SEPT 2012
JOB NO. 3048

EROSION CONTROL NOTES

STATE OF MAINE
STEVEN J. BLAKE
11695
REGISTERED
LICENSED
PROFESSIONAL ENGINEER

P.E. STEVEN J. BLAKE II
LIC. # 11695

REED & REED
BRIDGE STRUCTURE SUPERSTRUCTURE

BINGHAM WIND PROJECT

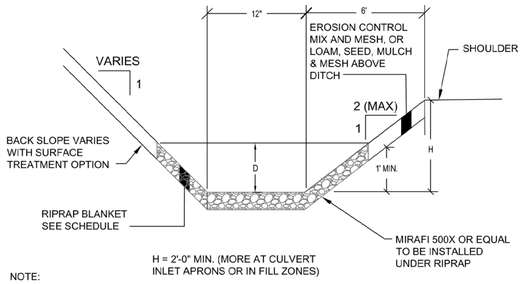
BLUE SKY WEST, LLC

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

DH

SHEET
C-9.2

PRELIMINARY - NOT FOR CONSTRUCTION



NOTE:
SEE BACK SLOPE DETAILS SHEET C-6.0

Ⓐ DITCH DETAIL (SOIL CONDITIONS ONLY)
N.T.S.

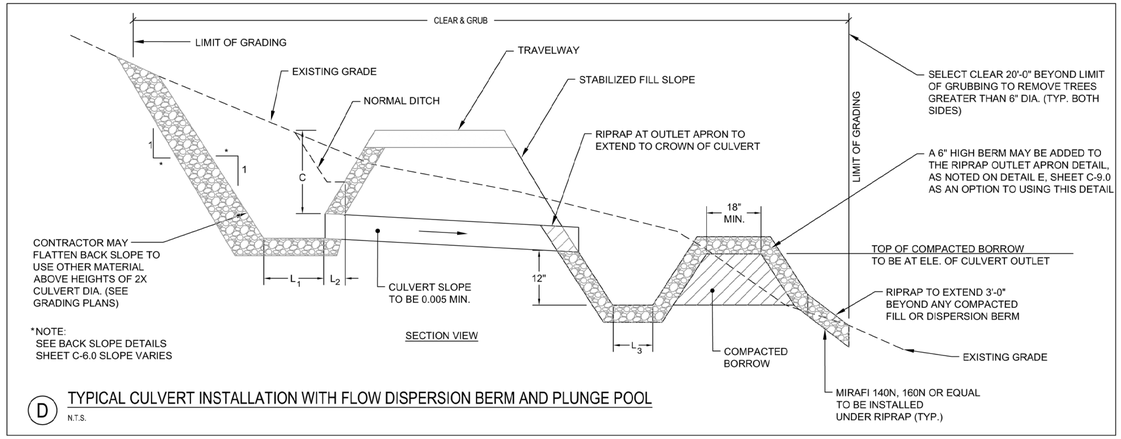
TABLE 2

ACCEPTABLE DITCH LINING RIPRAP MATERIAL SIZE, DEPTH & THICKNESS

		DITCH GRADIENT 0-5%		DITCH GRADIENT 5-10%		DITCH GRADIENT 10-15%	
CULVERT SIZE BELOW DITCH	D	RIPRAP SIZE	RIPRAP THICKNESS	RIPRAP SIZE	RIPRAP THICKNESS	RIPRAP SIZE	RIPRAP THICKNESS
12"	11"	3"	7"	3"	7"	6"	14"
18"	15"	3"	7"	6"	14"	6"	14"
24"	19"	6"	14"	6"	14"	9"	21"
30"	24"	6"	14"	9"	21"	9"	21"
36"	24"	6"	14"	9"	21"	12"	27"

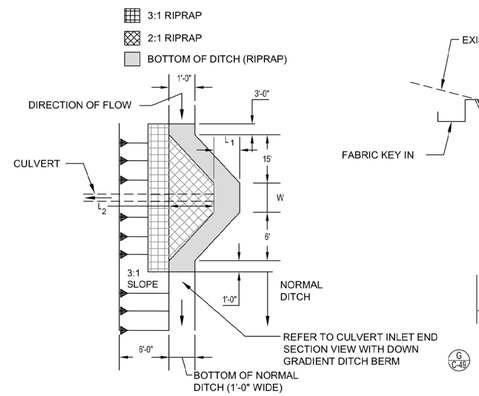
NOTE: WHERE 15" CULVERTS ARE USED THEY ARE TO MATCH RIPRAP REQUIREMENTS FOR THE 18" CULVERTS

DITCH TREATMENT OPTIONS
N.T.S.

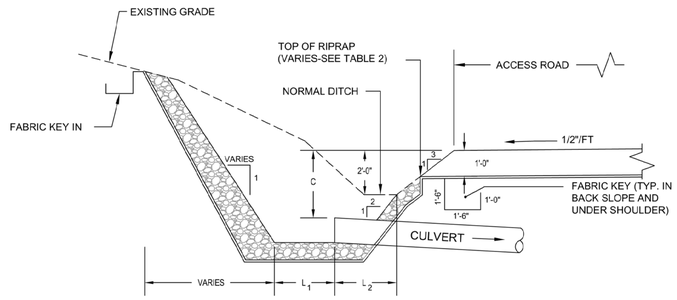


Ⓓ TYPICAL CULVERT INSTALLATION WITH FLOW DISPERSION BERM AND PLUNGE POOL
N.T.S.

Ⓑ VACANT
N.T.S.



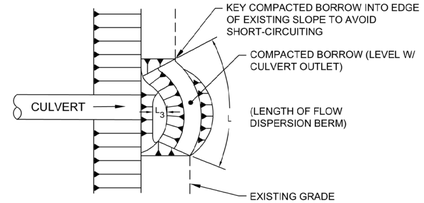
Ⓔ CULVERT INLET PLAN VIEW
N.T.S.



NOTE: REFER TO TABLE 3 THIS SHEET FOR DIMENSIONS

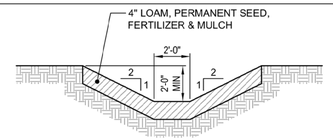
CULVERT INLET SECTION VIEW
N.T.S.

NOTE:
1. FLOW DISPERSION BERMS ARE TO BE USED WHERE CONCENTRATED FLOW BELOW THE ROAD SECTION IS NOT OBVIOUS. A 6" HIGH BERM MAY BE ADDED TO THE RIPRAP OUTLET APRON DETAIL, AS NOTED ON DETAIL E SHEET C-9.0 AS AN OPTION TO USING THIS DETAIL.
2. REFER TO TABLE 3 THIS SHEET FOR DIMENSIONS



NOTE: FLOW DISPERSION BERMS ARE TO BE SITED SUCH THAT FLOWS WILL ENTER IN AN IDENTIFIABLE CHANNEL (DRAINAGE SWALE, BROOK OR STREAM) WITHIN 100 FEET WHERE POSSIBLE.

Ⓖ PLUNGE POOL AND FLOW DISPERSION BERM PLAN VIEW
N.T.S.



NOTES:

1. GRASSED WATERWAYS / SWALES ARE TO BE USED ONLY FOR SLOPES 6% OR LESS. FOR SLOPES GREATER THAN 6%, STONE LINED SWALES ARE TO BE UTILITIZED. SEE DETAIL, THIS SHEET.
2. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE WATERWAY.
3. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
4. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE WATERWAY.
5. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF IN UPLAND AREAS SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
6. GRASSED WATERWAY SHALL BE FINISHED AND STABILIZED AS FOLLOWS:

A. A MINIMUM OF 2" SCREENED LOAM OR 4" EROSION CONTROL MIX SHALL BE PROVIDED AS TOPSOIL EROSION CONTROL MIX SHALL BE APPROVED BY THE ENGINEER.

B. DURING THE WINTER MONTHS, THE PERIMETER SWALE IS TO BE LINED WITH EROSION CONTROL BLANKET. EROSION CONTROL BLANKET SHALL BE APPROVED BY THE ENGINEER.

C. THE GRASSED WATERWAY IS TO BE ANCHOR-MULCHED (OR PROTECTED WITH EROSION CONTROL MATTING) AND SEEDED TO ENCOURAGE A GOOD CATCH OF GRASS AT THE COMPLETION OF CONSTRUCTION WHEN WINTER CONDITIONS HAVE SUBSIDED. SEED MIX SHALL BE: NEW ENGLAND LOGGING ROAD SEED MIX AS MANUFACTURED BY "NEW ENGLAND WETLAND PLANTS, INC." - AMHERST, MA. OR EQUIVALENT.

Ⓒ GRASS LINED DITCH DETAIL
N.T.S.

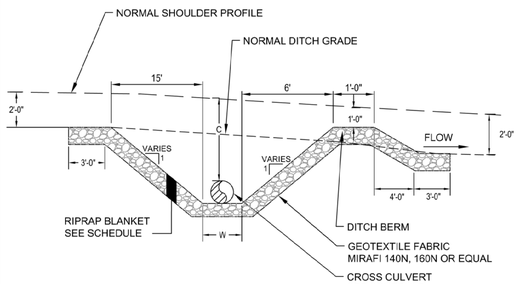


TABLE 3

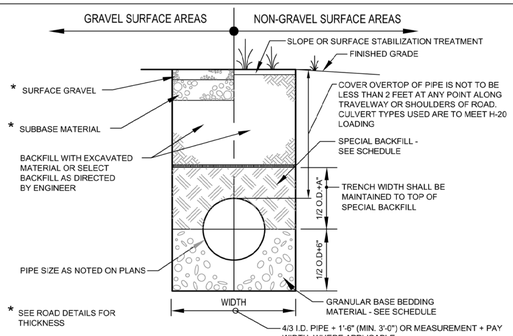
DIMENSIONAL SCHEDULE FOR CULVERT INLETS AND FLOW DISPERSION BERMS

CULVERT DIAMETER	RIPRAP BLANKET D_{50}	RIPRAP BLANKET THICKNESS	W	C	L_1	L_2	L_3	L
12"	6"	14"	2'	36"	2'	4'	8'	8'
18"	6"	14"	4'	30"	4'	4'	*	*
24"	6"	14"	6'	24"	6'	4'	*	*
30"	12"	27"	8'	24"	8'	5'	*	*
36"	12"	27"	8'	24"	8'	6'	*	*

NOTE: WHERE 15" CULVERTS ARE USED THEY ARE TO MATCH RIPRAP REQUIREMENTS FOR THE 18" CULVERTS

*FLOW DISPERSION BERMS ARE NOT TO BE USED FOR CULVERTS LARGER THAN 15 INCHES.

Ⓕ CULVERT INLET END SECTION VIEW WITH DOWN GRADIENT DITCH BERM
N.T.S.



SCHEDULE OF BASE BACKFILL

TYPE OF PIPE	BEDDING MATERIAL	SPECIAL BACKFILL	SPECIAL BACKFILL COVER "A" (IN)	SELECT BACKFILL
CONCRETE	GRANULAR AASHTO M145-49 A-3 OR BETTER	GRANULAR AASHTO M145-49 A-3 OR BETTER	12	GRANULAR AASHTO M145-49 A-3 OR BETTER
HDPE	3/4" CRUSHED STONE	GRANULAR AASHTO M145-49 A-3 OR BETTER	6	GRANULAR AASHTO M145-49 A-3 OR BETTER
CMP	3/4" CRUSHED STONE	GRANULAR AASHTO M145-49 A-3 OR BETTER	6	GRANULAR AASHTO M145-49 A-3 OR BETTER

SUBMITTALS FOR PIPE TYPE TO BE USED ARE REQUIRED NOTING THAT PIPE TYPE MEETS H-20 LOADING WITH 2 FEET OF GRAVEL COVER

Ⓗ TYPICAL CULVERT TRENCH SECTION
N.T.S.

PRELIMINARY - NOT FOR CONSTRUCTION

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NO.	DATE	DESCRIPTION
5	09.03.13	RESPONSE TO MEDEP COMMENTS
4	08.02.13	MEDEP STORMWATER AND BASIC STANDARDS COMMENT RESPONSE
3	04.09.13	PERMIT PLAN SUBMISSION
2	03.06.13	ACOE REVISIONS
1	12.10.12	PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

DITCH AND CULVERT DETAILS

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: 3048-DET

STATE OF MAINE STEVEN J. BLAKE 11695 REGISTERED PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11695

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

SHEET
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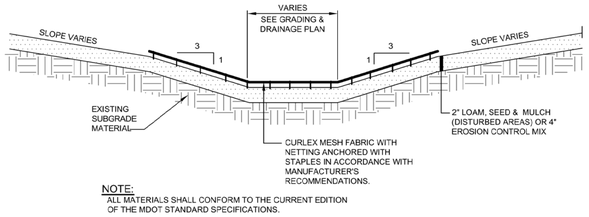
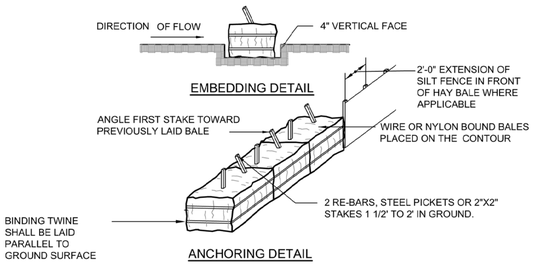


NOTE:
ALL MATERIALS SHALL CONFORM TO THE CURRENT EDITION OF THE MDOT STANDARD SPECIFICATIONS.

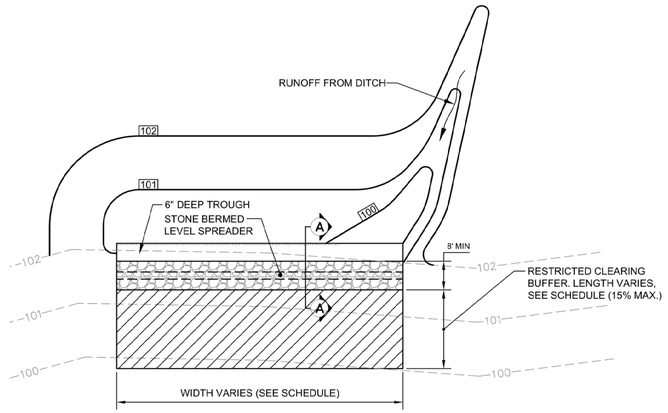
(A) VEGETATED SWALE DETAIL
N.T.S.

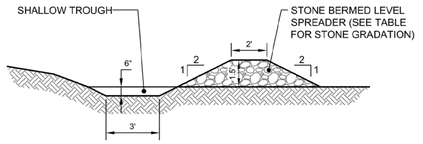


CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4".
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY STAKES OR RE-BARS DRIVEN THROUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.
4. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

(B) STRAW OR HAY BALE BARRIER
N.T.S.



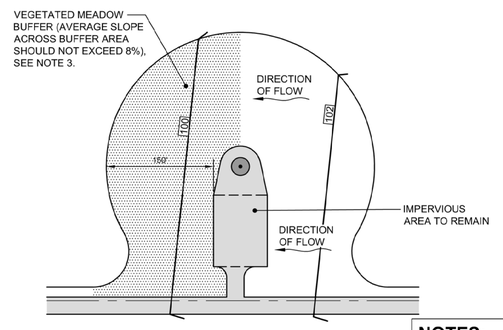


SECTION A-A

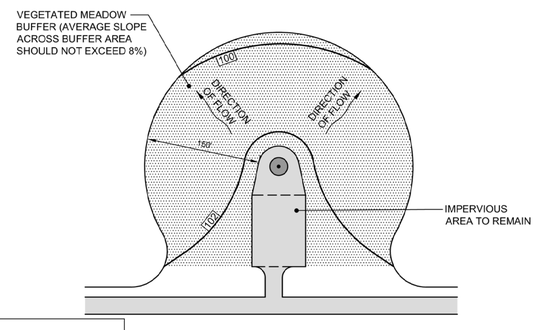
BERM STONE SIZE	
SIEVE DESIGNATION (US CUSTOMARY)	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVE
12 IN	100
6 IN	84-100
3 IN	68-83
1 IN	42-55
NO. 4	8-12

NOTE:
LEVEL SPREADER SHALL BE ORIENTATED PARALLEL TO THE EXISTING CONTOUR. SHOULD FIELD CONDITIONS CHANGE ROTATE LAYOUT OF BERM TO DIRECT SHEET FLOW ALONG EXISTING CONTOUR.

(C) STONE BERMED LEVEL SPREADER DETAIL
N.T.S.



SCENARIO #1



SCENARIO #2

NOTES:

1. VEGETATED BUFFERS SHALL BE EITHER LOAMED AND SEEDED OR COVERED WITH EROSION CONTROL MIX AND SEEDED WITH AN APPROPRIATE SEED MIX. REFER TO DRAWING C-9.2 FOR APPROPRIATE SEED MIXES.
2. THE FOLLOWING TURBINE PADS REQUIRE A VEGETATED BUFFER:
   - AT LEAST 37 OF THE FOLLOWING: T1 - T11, T7 ALT, T13, T16, T17, T31 - T47, T49 - T51, T53 - T57 AND T75 - T77.
   - T15 (SMITH POND)
   - AT LEAST ONE (1) OF THE FOLLOWING: T48, T58 (HILTON POND)
   - T28 (KINGSBURY POND)
   - T18 - T27, T29 - T30
3. SHOULD PAD CLEARING AREAS BE REDUCED DURING CONSTRUCTION, REMAINING FORESTED AREAS MAY BE COUNTED AS BUFFER AREA.

(D) TYPICAL TURBINE PAD BUFFER
N.T.S.

NO.	DATE	DESCRIPTION
5	09.03.13	RESPONSE TO MEDEP COMMENTS
4	08.02.13	MEDEP STORMWATER AND BASIC STANDARDS COMMENT RESPONSE
3	04.09.13	PERMIT PLAN SUBMISSION
2	03.06.13	ACOE REVISIONS
1	12.19.12	PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

EROSION CONTROL DETAILS

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: 3048-DET

STATE OF MAINE — REGISTERED PROFESSIONAL ENGINEER — STEVEN J. BLAKE II — 11695
P.E. STEVEN J. BLAKE II
LIC. # 11695

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

REED & REED
DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

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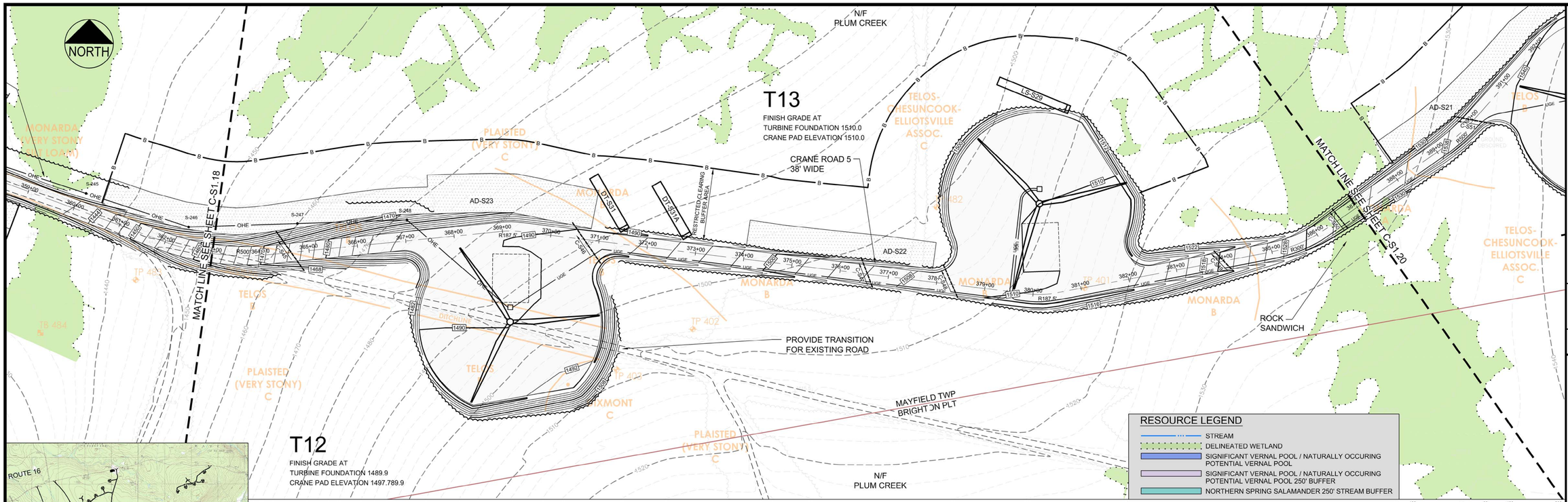
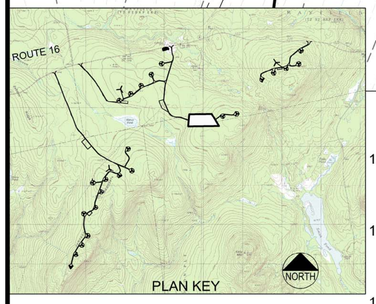


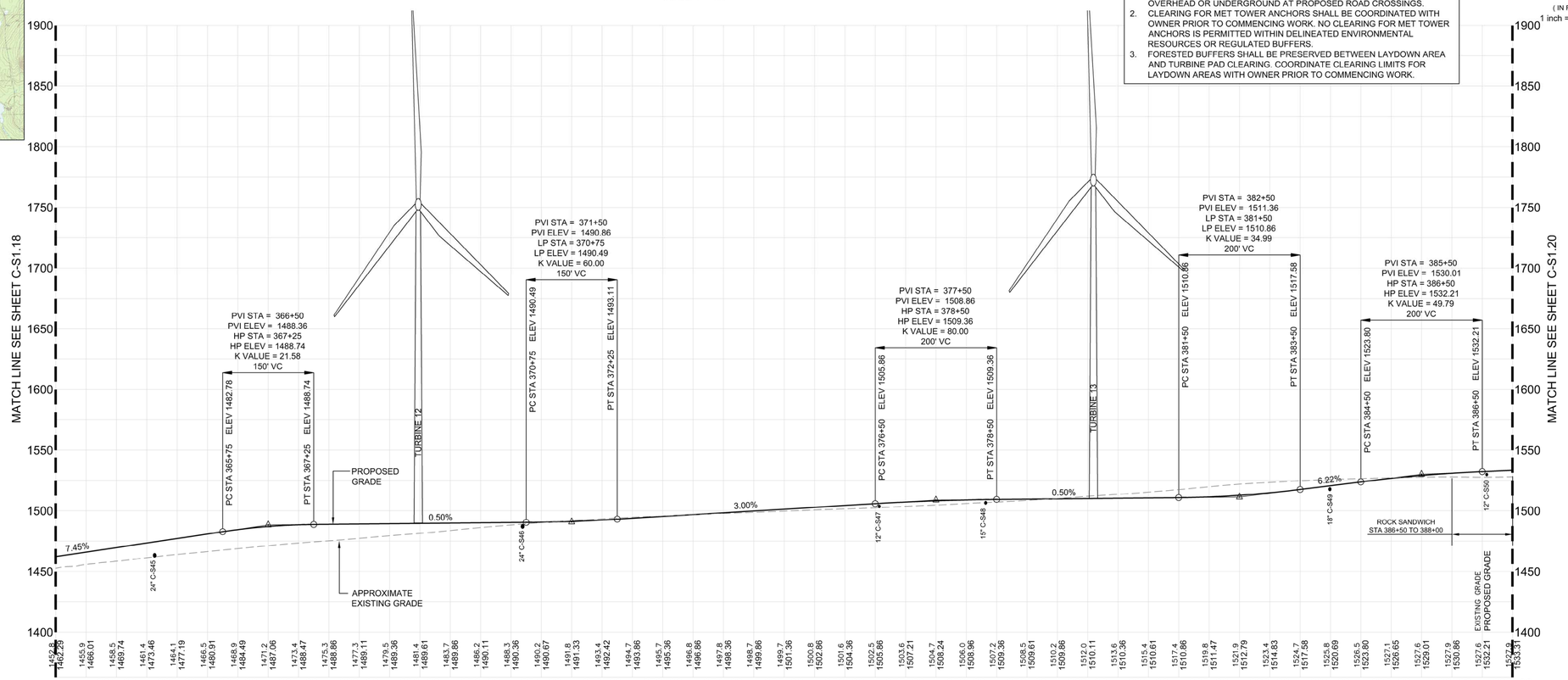
SOUTH CRANE ROAD 5 PLAN

SCALE: 1" = 100'

NOTES:
1. THE APPLICANT RESERVES THE RIGHT TO INSTALL COLLECTOR SYSTEM OVERHEAD OR UNDERGROUND AT PROPOSED ROAD CROSSINGS.
2. CLEARING FOR MET TOWER ANCHORS SHALL BE COORDINATED WITH OWNER PRIOR TO COMMENCING WORK. NO CLEARING FOR MET TOWER ANCHORS IS PERMITTED WITHIN DELINEATED ENVIRONMENTAL RESOURCES OR REGULATED BUFFERS.
3. FORESTED BUFFERS SHALL BE PRESERVED BETWEEN LAYDOWN AREA AND TURBINE PAD CLEARING. COORDINATE CLEARING LIMITS FOR LAYDOWN AREAS WITH OWNER PRIOR TO COMMENCING WORK.

(IN FEET)
1 inch = 100 ft.





SOUTH CRANE ROAD 5 PROFILE

SCALE: H 1" = 100'
V 1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
5	09.03.13	RESPONSE TO MEDEP COMMENTS
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3	04.09.13	PERMIT PLAN SUBMISSION
2	03.06.13	ACCE REVISIONS
1	12.19.12	PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

CRANE ROAD 5 PLAN AND PROFILE [STA 363+00 TO 387+00]

DRAWN: DSD | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO.: 3048
FILE NAME: SOUTH CR_5

STATE OF MAINE — STEVEN J. BLAKE — 11695 — REGISTERED PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11695

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET SUITE 8
SOUTH PORTLAND, ME 04106
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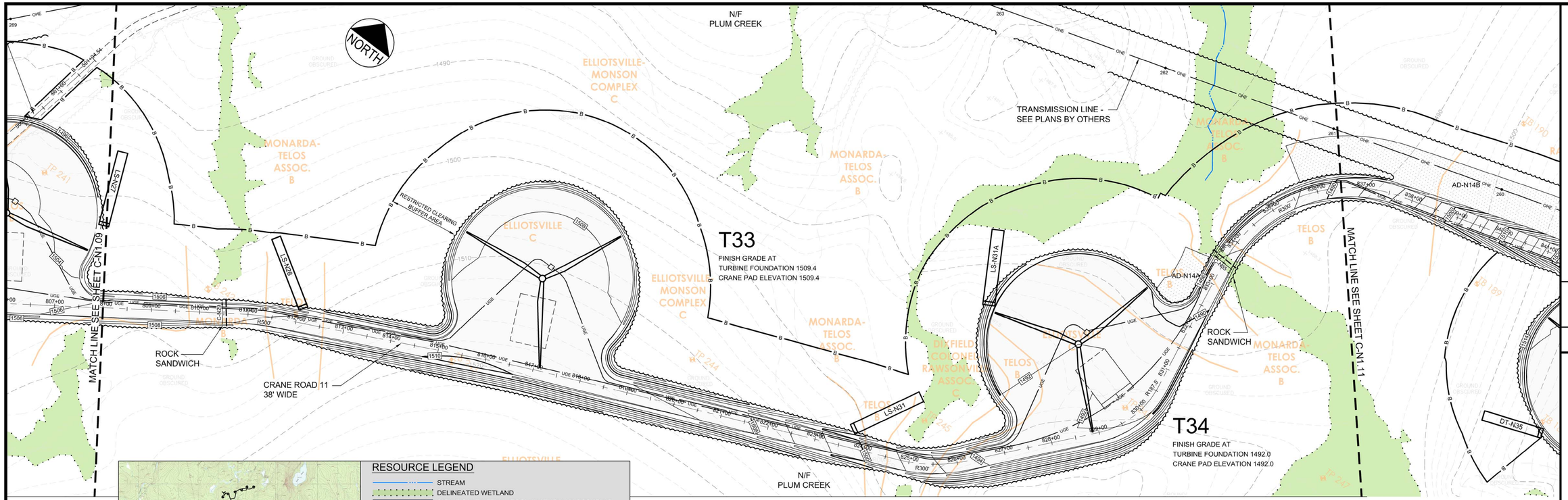
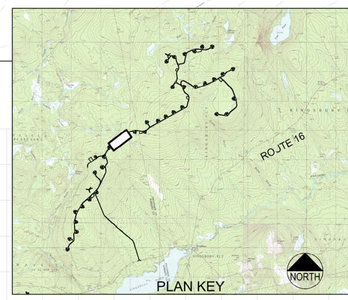


NORTH CRANE ROAD 11 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



RESOURCE LEGEND

- STREAM
- DELINEATED WETLAND
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL 250' BUFFER
- NORTHERN SPRING SALAMANDER 250' STREAM BUFFER

NOTES:

1. THE APPLICANT RESERVES THE RIGHT TO INSTALL COLLECTOR SYSTEM OVERHEAD OR UNDERGROUND AT PROPOSED ROAD CROSSINGS.
2. CLEARING FOR MET TOWER ANCHORS SHALL BE COORDINATED WITH OWNER PRIOR TO COMMENCING WORK. NO CLEARING FOR MET TOWER ANCHORS IS PERMITTED WITHIN DELINEATED ENVIRONMENTAL RESOURCES OR REGULATED BUFFERS.
3. FORESTED BUFFERS SHALL BE PRESERVED BETWEEN LAYDOWN AREA AND TURBINE PAD CLEARING. COORDINATE CLEARING LIMITS FOR LAYDOWN AREAS WITH OWNER PRIOR TO COMMENCING WORK.

NORTH CRANE ROAD 11 PROFILE

SCALE: H 1" = 100'
V 1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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1	12.19.12	PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

CRANE ROAD 11 PLAN AND PROFILE [STA 808+00 TO 836+50]

DRAWN:	DSD	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_11		

STATE OF MAINE
STEVEN J. BLAKE II
LICENSED
PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11695

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

SHEET
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RESOURCE LEGEND

- STREAM
- DELINEATED WETLAND
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL 250' BUFFER
- NORTHERN SPRING SALAMANDER 250' STREAM BUFFER

NOTES:
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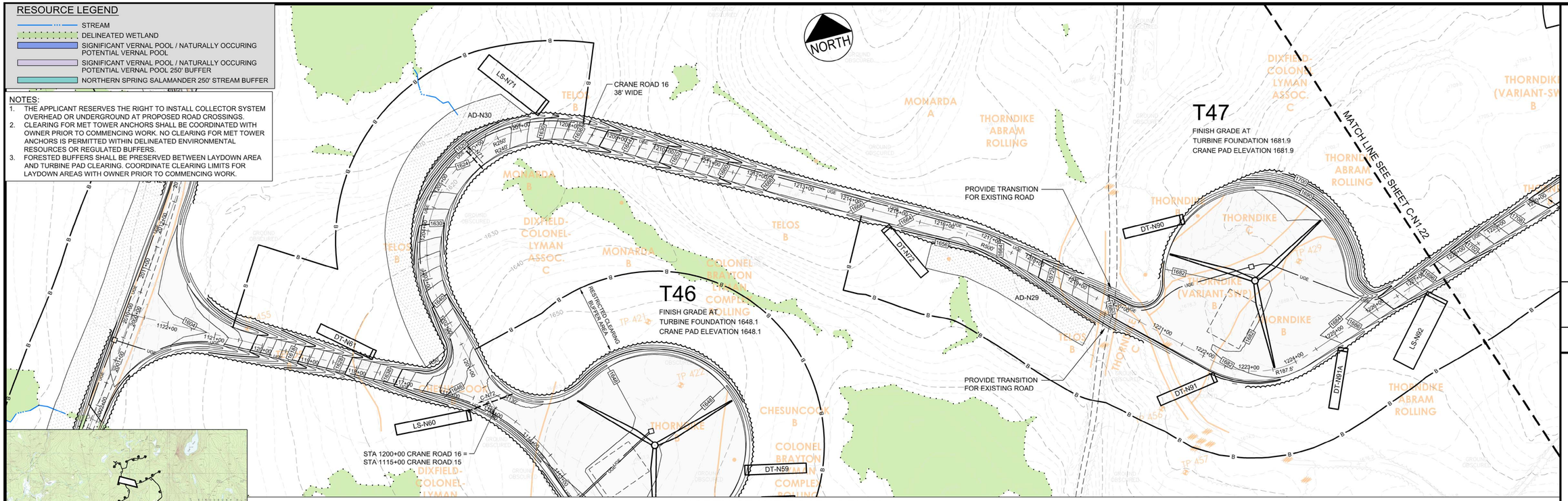
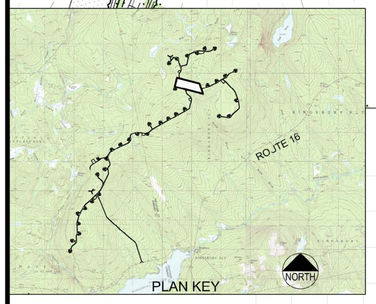
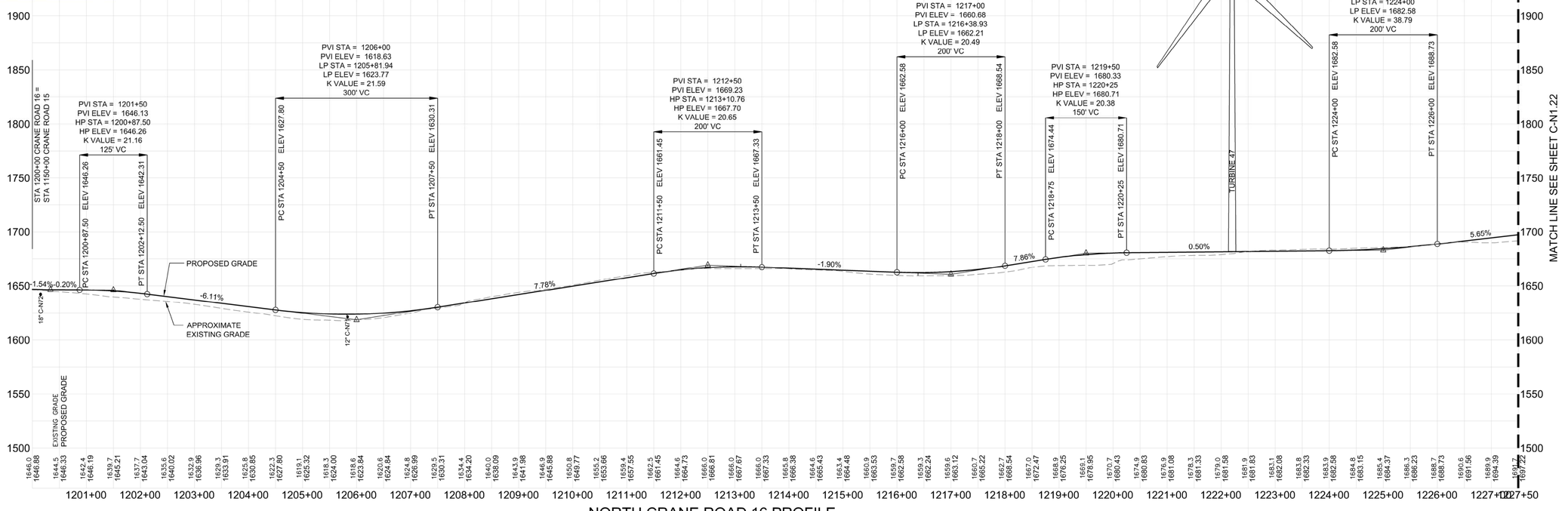


NORTH CRANE ROAD 16 PLAN

SCALE: 1" = 100'





NORTH CRANE ROAD 16 PROFILE

SCALE: H 1" = 100'
V 1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

(IN FEET)
1 inch = 100 ft.

NO.	DATE	DESCRIPTION
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1	12.19.12	PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

CRANE ROAD 16 PLAN AND PROFILE
[STA 1200+00 TO 1227+50]

DRAWN:	DSD	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_16		

STATE OF MAINE
STEVEN J. BLAKE II
PLS 1695
LICENSED PROFESSIONAL ENGINEER
P.E.: STEVEN J BLAKE II
LIC. # 11695

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SURVEY AVENUE SERVICES

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
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