August 6, 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 Stormwater Review Comments

Dear Mr. Courtemanch:

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

In addition, we have included information and buffer updates related to recent tree clearing within the project area (see Attachment D – Figure 1).

14.0 BASIC STANDARD (BINGHAM WIND PROJECT)

Comment 1:

Plan C9.2 – The applicant should revise the section numbering on the plan sheet so that it matches that in section 14.0 of the combined application. Some sub-sections on the plan sheet have identical numbering.

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 2:

Plan C-9.2, Section 14.2 – The proposed field adjustment allowance for changes in the horizontal alignment without MDEP approval is excessive. Alignment changes of up to 300 feet suggest the plan presented is "conceptual". Given the numerous, small watersheds and steep terrain through which this project runs, changes in alignment could require a substantial re-assessment of the stabilization plans, runoff treatment plans, and resource impacts via a major amendment application. Also, alignment changes of 300 feet would appear to extend well beyond the resource mapping done to date in many areas. For these reasons, I recommend that field adjustment of the horizontal alignment be limited to no more than 25 feet without department approval. As-built plans and, if required, updates to the project stabilization and runoff treatment plans would still be required.

Based on recent MDEP findings as indicated in both the Hancock Wind Project and Oakfield Wind Project land use permits, the Department has indicated, "The following minor adjustments may be made during construction without advance notice to the Department provided they do not impact protected resources and are reflected in the final as-built drawings: changes that result in a reduction in impact and/or footprint (such as a reduction in clearing or impervious area, and elimination of structures or a reduction in structure size); location of a structure within the identified clearing limits; the type of foundations used; additional drainage culverts, level spreaders or rock sandwiches; changes to culvert size or type provided that the culvert does not convey a regulated stream and that the hydraulic capacity of the substitute culvert is greater than or equal to that of the original; and changes of up to 10 feet in the base elevation of a turbine vertically as long as the change in elevation does not result in increased visual impacts or changes to the stormwater management plan.

Additionally, the following minor adjustments may be made upon prior approval by the third party inspector or Department staff, and do not require a revision or modification of the permit but must be reflected in the final as-built drawings: minor changes that do not increase overall project impacts or project footprint and which do not impact any protected resources as long as any new areas of impact have been surveyed for environmental resources and do not affect other landowners. These changes include adjustments to horizontal or vertical road geometry that do not result in changes to the stormwater management plan; a shift of up to 100 feet in a turbine clearing area; and adjustments to culvert locations based on field topography." (Site Location of Development Act and Natural Resources Protection Act Applications, Oakfield #L-24572-24-C-N, #L-24572-TF-D-N, #L-24572-IW-E-N, #L-24572-24-F-N, #L-24572-TF-G-N, p. 34; Hancock #L-25875-24-A-N, #L-25875-TF-B-N, pp. 22-23).

The Applicant will provide final As-Built Plans and, if required, updates to the project stabilization and runoff treatment plans.

Comment 3:

Plan Sheet C-9.2, Section 14.3.1 – The applicant should revise the "critical areas" definition to add the following as critical areas: areas draining to and within 75 feet of a wetland, river/stream/brook, pond shoreline, or vernal pool.

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 4:

Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the second bullet item under "Permanent Seeding and Mulching Plan" to read as follows: "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." The applicant should refer to section 5 of "Appendix A. Erosion and sedimentation control" in the Chapter 500, Stormwater Management Rules for the department's permanent stabilization requirements. I have restricted stabilization of critical areas to 48 hours to conform to the general intent to get these areas stabilized quickly in section 3 of "Appendix A. Erosion and sedimentation control" in the Chapter 500, Stormwater Management Rules.

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 5:

Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the third bullet item under "Permanent Seeding and Mulching Plan" to read as follows: "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 the Monitoring Schedule above. Should mulching prove to be ineffective, straw matting or excelsior matting will be used in its place." The applicant should refer to section A-1 of Maine Erosion and Sediment Control BMPs manual for guidance on the use of temporary mulching.

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 6:

Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the sixth bullet item under "Permanent Seeding and Mulching Plan" to revise the fifth bullet item to read as follows: "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 Table 14-1: Stabilization Schedule below." Same day fertilizing and seeding is a precaution against loam freeze-up during nighttime hours, which would make fertilizer and seed

incorporation into the loam difficult or impossible the next day. The applicant should refer to section A-1 of Maine Erosion and Sediment Control BMPs manual for guidance on the use of mulch in winter conditions.

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 7:

Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the sixth bullet item under "Permanent Seeding and Mulching Plan" to revise the sixth bullet item to read as follows: "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." The applicant should refer to section A-1 of Maine Erosion and Sediment Control BMPs manual for guidance on the use of temporary mulching.

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 8:

Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the second bullet item under "Temporary Seeding and Mulching Schedule" to read as follows: "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." The applicant should refer to section 3 of "Appendix A. Erosion and sedimentation control" in the Chapter 500, Stormwater Management Rules for the department's temporary stabilization requirements.

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 9:

Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the fifth bullet item under "Temporary Seeding and Mulching Schedule" to read as follows: "The 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."

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 10:

Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the eighth bullet item under "Temporary Seeding and Mulching Schedule" (page 14-11) to read as follows: "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." The applicant should refer to section 3 of "Appendix A. Erosion and sedimentation control" in the Chapter 500, Stormwater Management Rules for the department's temporary stabilization requirement for areas adjacent resources.

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 11:

Plan sheet C-9.2 section 14.1 Erosion control execution (should be section 14.5) – The applicant should include the following provision: "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 ditches in critical areas."

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 12:

Plan sheet C-9.2 section 14.1 Erosion control execution (should be section 14.5) – The applicant should include the following provision: "Culvert Inlet and Outlet Stabilization Plan – Any culvert installed on the project shall have the appropriate inlet and outlet protection installed within 7 days for culverts in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for culverts in critical areas."

This has been addressed. Refer to Attachment C and attached revised plan set.

Comment 13:

Plan sheet C-9.2 – The applicant should revise this plan sheet or another sheet to include seed mix specifications for the project. I suggest a specific mix be provided for each of the following areas: upland areas with loam cover, upland areas with erosion control mix cover, and areas of slopes and ditches below the water table or line of seepage. Establishment of vegetation on erosion control mix made from on-site stump grinding will be difficult due to wood decomposition using up the available nitrogen. The seed mix for those areas covered with erosion control mix should have a high proportion of nitrogen-fixing plants (trefoil, clover, vetch, etc.).

This has been addressed. Refer to attached revised plan set.

Comment 14:

Plan sheet C-9.0 – The applicant should revise note in the "Dirtbag Detail" to read as follows: "The owner's engineer shall designate the location of Dirtbag placement for construction dewatering. In all cases, the Dirtbag will be located in a vegetated, upland area having a slope less than 15% and be at least 75 feet from the edge of any wetland, the edge of any river/stream/brook; and any pond shoreline. No Dirtbag shall be located such that its discharge will flow into a significant vernal pool (whether currently flooded or dry)."

This has been addressed. Refer to attached revised plan set.

Comment 15:

Plan sheet C-7.0 – The applicant should revise the "Grassed Line Ditch Detail" to eliminate erosion control mix as a topsoil substitute in note 5.B. Erosion control mix does not allow for the quick vegetation establishment needed for a protective ditch lining and is not stable against channelized flows by itself.

This has been addressed. Refer to attached revised plan set.

Comment 16:

Plan sheet C-6.0 – The applicant should revise the "Permissible Back Slope Materials" detail to correct the references to the other details. For example, rip rap for slopes with grades from 2H:1V to 1-1/2H:1V should refer to detail "H" not detail "G".

This has been addressed. Refer to attached revised plan set.

Comment 17:

Plan sheet C-5.0 – The applicant should revise the "Pad Details" detail to change the pad stabilization note to read as follows: "Pad areas outside the pad access drive, the crane pad, and the turbine access drive will be covered with four inches of erosion control mix to allow re-establishment of vegetation naturally or will be covered with loam, seeded, and mulched to establish vegetation directly."

This has been addressed. Refer to attached revised plan set.

Comment 18:

Plan sheet C-5.0 – The applicant should revise the "Reinforced Turf and Reinforced Erosion Control Mix Details – For Earth Fill Conditions" detail to indicate that the reinforced erosion control mix alternate will still require seeding. The P300 turf reinforcement matting requires vegetation growing through it to stabilize a slope surface. A seed mix containing a large percentage of seed for nitrogen-fixing plants (clovers, trefoils, vetches, etc.) should be used with the erosion control mix.

This has been addressed. Refer to attached revised plan set.

14.0 BASIC STANDARD (115KV GENERATOR LEAD PROJECT)

Comment 19:

Plan sheet DET-01 – The applicant should amend general erosion control note # 8 to add the following statement: "Permanent Seeding shall be completed within 7 days following final topsoil/loam grading for non-critical areas. Permanent seeding shall be completed within 48 hours or prior to any storm event, whichever occurs first, following topsoil/loam grading for critical areas. A critical area is any area within 75 feet of a wetland, river/stream/brook, pond shoreline, or vernal pool. Seeded areas shall be mulched the same work day. Mulch shall consist of straw, hay, or hydro-mulch. 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."

Erosion Control Note #8 has been revised to include the requested language.

Comment 20:

Plan sheet DET-01 – The applicant should revise erosion control note #10 to read as follows: "Temporary mulching shall be done immediately for any non-critical area not to be worked for a 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. A critical area is any area within 75 feet of a wetland, river/stream/brook, pond shoreline, or vernal pool. In no case, shall any disturbed soil be left unstabilized for more than 21 days after initial disturbance. Temporary mulch shall consist of straw or hay applied at 2 tons/acre. Straw or hay 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."

Erosion Control Note #10 has been revised per the requested language.

Comment 21:

Plan sheet DET-01 – The applicant should revise winter construction note #8 to read as follows: "The mulch application rate shall be doubled during winter construction to 4 tons/acre. Mulch shall be applied at the end of each day's work to disturbed soil areas if snow is predicted or imminent or if the area has been finish graded. 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. All mulch applied to slopes steeper than 5% during the winter construction period will be anchored with biodegradable netting."

Winter Construction Note #8 has been revised per the requested language.

Comment 22:

Plan sheet DET-01– The applicant should amend the "Roadside Swale Detail" to add the following note: "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 ditches in critical areas. A critical area is any area within 75 feet of a wetland, river/stream/brook, shoreline, or vernal pool."

The requested note has been added to the Roadside Swale Detail on Sheet DET-01 as Note #6.

Comment 23:

Plan sheet DET-01– The applicant should amend the "Stone Check Dam Detail" to add the following note: "Any section of rough-graded ditch will have temporary stone check dams installed in the ditch within 24 hours to prevent ditch scouring."

The requested note has been added to the Stone Check Dam Detail on Sheet DET-01 as Note #7.

Comment 24:

Plan sheet DET-03 – The applicant should amend the "Typical Roadway Cross Culvert Detail" to add the following note: "Any culvert installed on the project shall have the appropriate inlet and outlet protection installed within 7 days for culverts in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for culverts in critical areas. A critical area is any area within 75 feet of a wetland, river/stream/brook, shoreline, or vernal pool."

The requested note has been added to the Typical Roadway Cross Culvert Detail on Sheet DET-03 as Note #4.

12.0 STORMWATER MANAGEMENT - GENERAL STANDARD (BINGHAM WIND PROJECT)

Gulf Stream Watershed

Comment 25:

The applicant should revise the treatment analysis for project development in the Gulf Stream watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the Chapter 500, Stormwater Management Rules, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

This has been addressed. Additionally, the General Standard project watersheds (i.e., Gulf Stream, Fall Brook, Kingsbury Stream, Rift Brook, Baker Flowage, and Thorn Brook) have been analyzed collectively. The resulting treatment percentage is 75.16%. Refer to Attachment A for the revised calculations.

Comment 26:

The applicant must correct the treatment analysis for project development in the Gulf Stream watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Gulf Stream watershed: DT-S77, DT-S78, DT-S79, DT-S80, DT-S81, and DT-S96A. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

Ditch turnouts have been adjusted accordingly. Refer to Attachment A and attached revised plan set.

Comment 27:

There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for a level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Gulf Stream watershed:

- *LS-S75 could be reduced to 39' (C-silt loam, 150' buffer, wooded, 0.39 acre impervious),*
- *LS-S92 could be reduced to 25' (C-sandy loam, 150' buffer, wooded, 0.33 acre impervious),*
- *LS-S72 could be reduced to 56' (C-silt loam, 150' buffer, wooded, 0.56 acre impervious), and*
- *LS-S73 could be reduced to 36' (C-silt loam, 150' buffer, wooded, 0.36 acre impervious).*

Stone Berm Level Spreader lengths have been reduced to the recommended length. Refer to Attachment A and attached revised plan set.

Comment 28:

The applicant must correct the treatment analysis for project development in the Gulf Stream watershed to limit ditch lengths draining to ditch turn-out buffers with A, B, and C-sandy loam soils to 250 feet when two lanes of roadway are draining to the turn-out. This affects the following ditch turn-out buffers in the Gulf Stream watershed: DT-S84, DT-S90, and DT-S95.

Additional turn-outs will be needed to limit the ditch length to each turn-out to 250 feet or, in some cases, replacing the turnout buffers with roadside buffers.

Ditch turnouts have been adjusted accordingly. Refer to Attachment A and attached revised plan set.

Comment 29:

It is unclear how the runoff from Access Road #1 is to get to ditch turn-out DT-S95. It would seem that replacing DT-S95 with a roadside buffer to treat runoff from station 79+00 to 82+00 and relocating the 18-inch culvert south to the wetland swale would be a better drainage solution than a ditch turn-out in this location.

A culvert (C-S65A) has been added to the plan at station 83+55. The proposed profile of the road would create a ditch condition on the north side and would require either a ditch turnout or level spreader. We have included an additional ditch turnout (DT-S95A) at Station 82+00. Should conditions change during construction, this can be modified as a Roadside Buffer and documented on the As-Built Plans.

Comment 30:

The applicant should correct the treatment analysis for the Gulf Stream watershed to start the road section draining to stone berm level lip spreader buffer LS-S6 at 29+00 feet. Road runoff before this station will not drain to the level spreader on this steep road section.

The treatment calculations have been revised. Refer to Attachment A.

Comment 31:

The applicant should revise the treatment analysis for the Gulf Stream watershed to correct the area treated by stone berm level lip spreader buffer LS-S49 and LS-S51. It appears that drainage from T73's pad access drive, crane pad, and turbine access way will flow to LS-S51 rather than west to LS-S49. The applicant should resize LS-S51 for the additional 0.28 acre of impervious area draining from T73 to LS-S-51 and resize LS-S49 for the 0.28 acre of reduced impervious area draining to it.

The treatment calculations have been revised. Refer to Attachment A.

Comment 32:

The applicant should revise the treatment analysis for the Gulf Stream watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using

stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules). This comment applies to AD-S19 treating runoff from T10 and AD-S2 treating runoff from T11.

Refer to Drawing C-9.1 for typical details associated with turbine pad buffer areas.

Fall Brook Watershed

Comment 33:

The applicant should revise the treatment analysis for project development in the Fall Brook watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the Chapter 500, Stormwater Management Rules, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

Refer to response to Comment #25.

Comment 34:

There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Fall Brook watershed:

- *LS-S11 could be reduced to 21' (C-gravelly loam, 150' buffer, wooded, 0.28 acre impervious),*
- *LS-S18 could be reduced to 30' (C-silt loam, 150' buffer, wooded, 0.30 acre impervious), and*
- *LS-S25 could be reduced to 36' (C-silt loam, 150' buffer, wooded, 0.30 acre impervious, >8% slope).*

Refer to response to Comment #27.

Comment 35:

The applicant should correct the treatment analysis for the Fall Brook watershed to end the road section draining to roadside buffer AD-S7 at 52+00. Road runoff after this station will not drain through this roadside buffer but, instead, drain via the road ditch to DT-S13.

The treatment calculations have been revised. Refer to Attachment A.

Comment 36:

The applicant should correct the treatment analysis for the Fall Brook watershed to end the road section draining to roadside buffer AD-S9 at 63+00. Road runoff before this station on this steep road section will not drain to the level spreader but, instead, drain via the road ditch to LS-S17. LS-S17 should be also be resized for the additional 100 feet of road drainage.

The treatment calculations have been revised. Refer to Attachment A.

Comment 37:

The applicant should correct the treatment analysis for the Fall Brook watershed to eliminate roadside buffer AD-S11 for treating from station 67+50 to station 71+50 of crane road #1. This buffer does not run directly alongside this section of roadway.

The treatment calculations have been revised. Refer to Attachment A.

Comment 38:

The applicant should correct the treatment analysis for the Fall Brook watershed to end the roadway section draining to AD-S15 at 108+00. The buffer slope beyond this station exceeds 20%.

The treatment calculations have been revised. Refer to Attachment A.

Comment 39:

The applicant should correct the treatment analysis for the Fall Brook watershed to eliminate ditch turn-out buffer DT-S21 for treating road runoff from station 111+50 to 114+00. The slope of this ditch turn-out buffer exceeds 15%. The applicant should consider bringing the ditch ending at 109+50 through the woods to a buffer on a less steep area downslope.

The treatment calculations have been revised. Refer to Attachment A.

Comment 40:

The applicant should revise the treatment analysis for the Fall Brook watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control

mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules). This comment applies to AD-S16 treating runoff from T1, to AD-S11 treating runoff from T5, to AD-S10 treating runoff from T6, to AD-S8 treating runoff from T7, to AD-S18 treating runoff from T7alt, to AD-S6 treating runoff from T8, and to AD-S3 treating runoff from T9.

Refer to response to Comment #32.

Comment 41:

The buffer area designated for treating runoff from T1 exceeds the maximum slope allowed for any buffer type. Another, less steep area will be necessary for a buffer if buffer treatment of runoff from T1 is to be credited in the general standard analysis for the Fall Brook watershed.

Buffer has been removed from treatment calculations.

Kingsbury Stream Watershed

Comment 42:

The applicant should revise the treatment analysis for project development in the Kingsbury Stream watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the Chapter 500, Stormwater Management Rules, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

Refer to response to Comment #25.

Comment 43:

The applicant must correct the treatment analysis for project development in the Kingsbury Stream watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Kingsbury Stream watershed: DT-N91, DT-N98, and DT-104. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

The treatment calculations have been revised. Refer to Attachment A.

Comment 44:

The applicant must correct the treatment analysis for project development in the Kingsbury Stream watershed to limit ditch lengths draining to ditch turn-out buffers with A, B, and C-sandy loam soils to 250 feet when two lanes of roadway are draining to the turn-out. This affects the following ditch turn-out buffer in the Kingsbury Stream watershed: DT-N108. Additional turn-outs will be needed to limit the ditch length to each turn-out to 250 feet.

The treatment calculations have been revised. Refer to Attachment A.

Comment 45:

There is an instance where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreader could be reduced significantly in length within the Kingsbury Stream watershed: LS-N110 could be reduced to 25' (C-sandy loam, 150' buffer, wooded, 0.28 acre impervious, >8% slope).

Refer to response to Comment #27.

Comment 46:

The applicant should correct the treatment analysis for the Kingsbury Stream watershed to start the road section draining to roadside buffer AD-N42 at station 1546+50. Road runoff before this station will not drain through this roadside buffer but, instead, drain via the road ditch to DT-N106.

The treatment calculations have been revised. Refer to Attachment A.

Comment 47:

The applicant should correct the treatment analysis for the Kingsbury Stream watershed to start the road section draining to roadside buffer AD-N17A at station 905+50. Road runoff before this station will not drain through this roadside buffer but, instead, drain via the road ditch to DT-S13.

The treatment calculations have been revised. Refer to Attachment A.

Comment 48:

The applicant should correct the treatment analysis for the Kingsbury Stream watershed to start the road section draining to level spreader buffer LS-N92 at station 127+50. Road runoff before this station on this steep section of road will not drain to this level spreader.

The treatment calculations have been revised. Refer to Attachment A.

Comment 49:

The applicant should correct the treatment analysis for the Kingsbury Stream watershed to end the road section draining to roadside buffer AD-N36 at station 1240+00. Road runoff after this station on this steep section of road will not drain through this roadside buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 50:

The applicant should correct the treatment analysis for the Kingsbury Stream watershed to end the road section draining to roadside buffer AD-N38A at station 1266+00. Road runoff after this station on this steep section of road will not drain through this roadside buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 51:

The applicant should revise the treatment analysis for the Kingsbury Stream watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules). This comment applies to AD-N15A treating runoff from N36, AD-N20 treating runoff from T41, AD-N43 treating runoff from T42, AD-N40 treating runoff from T44, AD-N30 treating runoff from T47, AD-N37 treating runoff from T49, AD-N38 treating runoff from T50, and AD-N39 treating runoff from T51.

Refer to response for Comment #32.

Rift Brook Watershed

Comment 52:

The applicant should revise the treatment analysis for project development in the Rift Brook watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the Chapter 500, Stormwater Management Rules, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

Refer to response for Comment #25.

Comment 53:

The applicant must correct the treatment analysis for project development in the Rift Brook watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Rift Brook watershed: DT-S30, DT-S31, and DT-S32. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

The treatment calculations have been revised. Refer to Attachment A.

Comment 54:

There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Rift Brook watershed:

- *LS-S56 could be reduced to 36' (C-silt loam, 150' buffer, wooded, 0.36 acre impervious),*
- *LS-S29 could be reduced to 17' (C-silt loam, 150' buffer, wooded, 0.17 acre impervious),*
- *LS-S27 could be reduced to 28' (C-silt loam, 150' buffer, wooded, 0.28 acre impervious),*
- *LS-S39 could be reduced to 35' (C-silt loam, 150' buffer, wooded, 0.35 acre impervious),*
- *LS-S41 could be reduced to 16' (C-sandy loam, 150' buffer, wooded, 0.21 acre impervious), and*
- *LS-S44 could be reduced to 47' (C-sandy loam, 150' buffer, wooded, 0.62 acre impervious).*

Refer to response to Comment #27.

Comment 55:

The applicant should correct the treatment analysis for the Rift Brook watershed to end the road section draining to roadside buffer AD-S23 at station 361+00. Road runoff after this station on this steep section of road will not drain through this roadside buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 56:

The applicant should correct the treatment analysis for the Rift Brook watershed to end the road section draining to roadside buffer AD-S22 at station 378+00. The 400 feet of road after this station will concentrate at the junction of crane road #5 and turbine pad T13. Use a level spreader at this location to spread the road runoff into a buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 57:

The applicant should correct the treatment analysis for the Rift Brook watershed to eliminate runoff treatment from station 403+00 to station 404+00 of crane road #5 in roadside buffer AD-S20. AD-S20 is not directly adjacent this roadway section. As such, runoff from this section of road must travel a few hundred feet over the turbine pad and, so, can't be expected to be in sheet flow upon reaching the buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 58:

The applicant should correct the treatment analysis for the Rift Brook watershed to end the road section draining to roadside buffer AD-S26 at station 411+50. The 150 feet of road after this station will concentrate at the junction of crane road #6 and crane road #26. Use a level spreader at this location to spread the road runoff into a buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 59:

The applicant should revise the treatment analysis for the Rift Brook watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules). This comment applies to AD-S22 treating runoff from T13, AD-S35 treating runoff from T16, AD-S34 treating runoff from T17, AD-S29 treating runoff from T75, AD-S27 treating runoff from T76, and AD-S28 treating runoff from T77.

Refer to response to Comment #32.

Baker Flowage Watershed

Comment 60:

The applicant should revise the treatment analysis for project development in the Baker Flowage watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the Chapter 500, Stormwater Management Rules, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

Refer to response to Comment #25.

Comment 61:

The applicant must correct the treatment analysis for project development in the Baker Flowage watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Baker Flowage watershed: DT-N27, DT-N32, DT-N26, and DT-N27. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

The treatment calculations have been revised. Refer to Attachment A.

Comment 62:

The applicant must correct the treatment analysis for project development in the Baker Flowage watershed to limit ditch lengths draining to ditch turn-out buffers with A, B, and C-sandy loam soils to 250 feet when two lanes of roadway are draining to the turn-out. This affects the following ditch turn-out buffers in the Baker Flowage watershed: DT-N32. Additional turn-outs will be needed to limit the ditch length to each turn-out to 250 feet or, in some cases, replacing the turnout buffers with roadside buffers.

The treatment calculations have been revised. Refer to Attachment A. DT-N32 has been replaced with LS-N31A.

Comment 63:

There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Baker Flowage watershed:

- *LS-N28 could be reduced to 19' (C-silt loam, 150' buffer, wooded, 0.19 acre impervious),*
- *LS-N34 could be reduced to 54' (C-sandy loam, 150' buffer, wooded, 0.72 acre impervious),*
- *LS-N37 could be reduced to 37' (C-silt loam, 150' buffer, wooded, 0.37 acre impervious),*
- *LS-N40 could be reduced to 38' (C-sandy loam, 150' buffer, wooded, 0.50 acre impervious), and*
- *LS-N31 could be reduced to 22' (C-silt loam, 150' buffer, wooded, 0.22 acre impervious).*

Refer to response to Comment #27.

Comment 64:

The applicant should correct the treatment analysis for the Baker Flowage watershed to eliminate runoff treatment from station 804+00 to station 807+50 of crane road #11 in roadside buffer AD-N13. AD-N13 is not directly adjacent this roadway section. As such, runoff from this section of road must travel a few hundred feet over the turbine pad and, so, can't be expected to be in sheet flow upon reaching the buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 65:

The applicant should correct the treatment analysis for the Baker Flowage watershed to eliminate runoff treatment from station 815+50 to station 818+50 of crane road #11 in roadside buffer AD-N14. AD-N14 is not directly adjacent this roadway section. As such, runoff from this section of road must travel a few hundred feet over the turbine pad and, so, can't be expected to be in sheet flow upon reaching the buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 66:

The applicant should correct the treatment analysis for the Baker Flowage watershed to eliminate runoff treatment from station 831+00 to station 832+00 of crane road #11 in roadside buffer AD-N14A. Runoff from this section of road will concentrate at the junction of crane road

#11 and turbine pad T34. Use a level spreader at this location to spread the road runoff into a buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 67:

The applicant should correct the treatment analysis for the Baker Flowage watershed to start the road section draining to roadside buffer AD-N14B at 836+00. Road runoff before this station on this section of road will not drain through this roadside buffer.

The treatment calculations have been revised. Refer to Attachment A.

Comment 68:

The applicant should revise the treatment analysis for the Baker Flowage watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules). This comment applies to AD-N13 treating runoff from T32, AD-N14 treating runoff from T33, AD-N14A treating runoff from T34, AD-N15 treating runoff from T35, AD-N15A treating runoff from T36, AD-N16 treating runoff from T37, AD-N17 treating runoff from T38, and AD-N18 treating runoff from T39.

Refer to response to Comment #32.

Thorn Brook Watershed

Comment 69:

The applicant should revise the treatment analysis for project development in the Thorn Brook watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the Chapter 500, Stormwater Management Rules, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

Refer to response to Comment #25.

Comment 70:

The applicant must correct the treatment analysis for project development in the Thorn Brook watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Thorn Brook watershed: DT-N70. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

The treatment calculations have been revised. Refer to Attachment A.

Comment 71:

There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Thorn Brook watershed:

- *LS-N60 could be reduced to 22' (C-sandy loam, 150' buffer, wooded, 0.29 acre impervious),*
- *LS-N71 could be reduced to 37' (C-silt loam, 150' buffer, wooded, 0.31 acre impervious, > 8% slope)*
- *LS-N63 could be reduced to 30' (C-sandy loam, 150' buffer, wooded, 0.33 acre impervious, > 8% slope)*
- *LS-N66 could be reduced to 64' (C-silt loam, 150' buffer, wooded, 0.53 acre impervious, slope > 8%),*
- *LS-N89 could be reduced to 15' (C-sandy loam, 150' buffer, wooded, 0.20 acre impervious), and*
- *LS-N84 could be reduced to 30' (C-silt loam, 150' buffer, wooded, 0.25 acre impervious, slope > 8%).*

Refer to response to Comment #27.

Comment 72:

The applicant should correct the treatment analysis for the Thorn Brook watershed to eliminate runoff treatment from station 1415+00 to station 1418+50 of crane road #18 in roadside buffer

AD-N33. Runoff from this section of road will concentrate at the junction of crane road #18 and turbine pad T55. Use a level spreader at this location to spread the road runoff into a buffer.

The treatment calculations have been revised. Refer to Attachment A. LS-N89A has been added.

Comment 73:

The applicant should revise the treatment analysis for the Thorn Brook watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules). This comment applies to AD-N26 treating runoff from T45, AD-N29 treating runoff from T53, AD-N28 treating runoff from T54, AD-N33 treating runoff from T55, and AD-N31 treating runoff from T57.

Refer to response to Comment #32.

Operations & Maintenance Facility

Comment 74:

The applicant should revise plan sheet C-SW3.0 to include construction oversight specifications for the two vegetated underdrain filters to be built on the O&M Facility. The oversight language should be similar to that given for the wetpond (Note #3) on plan sheet C-SW3.1, indicating the points during construction at which engineering inspection and monitoring of each filter basin's construction will take place.

Plans have been revised to include oversight language.

Comment 75:

The applicant should revise plan sheet C-SW3.0 to relocate the overflow spillway for vegetated underdrain filter #2 to the south end of the pond. Design criteria in section 3b of Appendix E of the Chapter 500, Stormwater Management Rules require emergency spillways to be located over undisturbed soil, wherever possible.

The spillway has been relocated. Refer to attached revised plan set.

Comment 76:

The applicant should revise plan sheet C-SW3.0 to reduce the grade of the overflow spillway for vegetated underdrain filter #1 so that the grade is 20% or less. Design criteria in section 3b of Appendix E of the Chapter 500, Stormwater Management Rules require spillways with flexible linings to have an exit channel grade of 20% or less. The easiest means to accomplish this grade reduction is probably to relocate the spillway to the west end of the basin and make the fill slope in this location 5H:1V instead of 3H:1V.

The spillway has been relocated. Refer to attached revised plan set.

12.0 STORMWATER MANAGEMENT - PHOSPHORUS STANDARD (BINGHAM WIND PROJECT)

Withee Pond Watershed

Comment 77:

The applicant should revise the treatment calculations for Withee Pond to use a treatment factor of 0.2 for LS-S50. Standard sizing for 0.54 acre of impervious area draining to a 150-foot, wooded buffer on sandy loam soil (Dixfield-Marlow Association) requires a 41-foot level spreader to receive a treatment factor of 0.4. The proposed 82-foot level spreader allows use of the minimum treatment factor of 0.2 per Table 4.1 in Volume II: Phosphorus Control in Lake Watersheds.

The treatment calculations have been revised. Refer to Attachment A.

Smith Pond Watershed

Comment 78:

The applicant should revise the treatment of runoff from turbine pad T15 in the Smith Pond watershed. The current plan uses a roadside buffer to treat the pad's impervious area runoff. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from this turbine pad doesn't sheet flow into the buffer, as runoff from the pad's access drive, crane pad, and turbine access way will need to cross 150 feet or more of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the pad's impervious areas will need to be delivered to the buffer using a ditch and stone berm level lip spreader. It is also possible to use the pad surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules).

Refer to response to Comment #32.

Hilton Pond #1 Watershed

Comment 79:

The applicant should revise the project phosphorus budget calculation (worksheet 1) for Hilton Pond #1 to eliminate the project acreage reduction due to steep slopes. Only areas of sustained slopes greater than 25% that are greater than one acre in size need to be subtracted from the project acreage. This change will increase the project acreage to 22.48 acres for both the standard calculation and for the small watershed adjustment. The project's phosphorus budget (PPB) will be the smaller of that found from the standard calculation and from the small watershed adjustment.

The treatment calculations have been revised. Refer to Attachment A.

Comment 80:

The applicant should revise the treatment calculations for Hilton Pond #1 to use a treatment factor of 0.2 for LS-N87. Standard sizing for 0.52 acre of impervious area draining to a 150-foot, wooded buffer on sandy loam soil (Colonel-Brayton-Lyman Complex) and 9.3% slope requires a 47-foot level spreader to receive a treatment factor of 0.4. The proposed 95-foot level spreader allows use of the minimum treatment factor of 0.2 per Table 4.1 in Volume II: Phosphorus Control in Lake Watersheds.

The treatment calculations have been revised. Refer to Attachment A.

Comment 81:

The applicant should revise the treatment of runoff from turbine pad T48 and turbine pad T58 in the Hilton Pond #1 watershed. The current plan uses a roadside buffer to treat each pad's impervious area runoff. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from these turbine pads doesn't sheet flow into the buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 feet or more of pad surface to reach a buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from each pad's impervious areas will need to be delivered to the buffer using a ditch and stone berm level lip spreader. It is also possible to use the pad surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules).

Refer to response for Comment #32.

Comment 82:

The transition from CR18 to the existing road south of turbine pad T58 appears to conflict with draining runoff to LS-N87. The applicant should revise plan sheet C-N1.28 to show the expected transition grading and the necessary culvert placement to bring ditch runoff to LS-N87.

A portion of the existing road south of T58 will be revegetated and access will be relocated to enter from the T58 pad. This is shown in the attached revised plan set.

Kingsbury Pond Watershed

Comment 83:

The applicant should check the project phosphorus budget for Kingsbury Pond to make sure that the steep slope acreage being subtracted from the total acreage of the development parcel is due to steep slope areas that are over one acre in size. Steep slope areas that are less than one acre in size do not need to be subtracted from the total acreage of the development parcel to find the project acreage.

The treatment calculations have been revised. Refer to Attachment A.

Comment 84:

The applicant should revise the treatment of runoff from turbine pad T28 in the Kingsbury Pond watershed. The current plan uses a roadside buffer to treat the pad's impervious area runoff. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from this turbine pad doesn't sheet flow into the buffer, as runoff from the pad's access drive, crane pad, and turbine access way will need to cross 150 feet or more of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the pad's impervious areas will need to be delivered to the buffer using a ditch and stone berm level lip spreader. It is also possible to use the pad surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules).

Refer to response to Comment #32.

Comment 85:

The applicant should revise plan sheet C-N1.08 to relocate/reorient DT-N18 a bit further west so to avoid runoff flowing back against road embankment rather than through the buffer.

This has been addressed. Refer to attached revised plan set.

Comment 86:

The applicant should correct the treatment calculations for Kingsbury Pond to eliminate runoff treatment from station 751+50 to station 753+00 of crane road #11 in roadside buffer AD-N8. Runoff from this section of road will concentrate at the junction of crane road #11 and turbine pad T28. If treatment is needed for this road section to meet the phosphorus standards, then the

plan should use a level spreader to spread the road runoff into a buffer at the junction of the road and crane pad.

The treatment calculations have been revised. Refer to Attachment A.

Comment 87:

The applicant should revise the treatment calculations for Kingsbury Pond to use a treatment factor of 0.2 for LS-N22. Standard sizing for 0.36 acre of impervious area draining to a 150-foot, wooded buffer on Elliotsville (HSG B) and Monson (HSG C/D) soils requires a 27-foot level spreader to receive a treatment factor of 0.4. The proposed 54-foot level spreader allows use of the minimum treatment factor of 0.2 per Table 4.1 in Volume II: Phosphorus Control in Lake Watersheds. – [see the following comment]

The treatment calculations have been revised. Refer to Attachment A.

Comment 88:

The road runoff from station 1805+00 to 1807+25 of crane road #22 will drain to Kingsbury Pond via the road ditch and LS-N22. The impervious area from these 225 feet of roadway should be included in the Kingsbury Pond watershed.

The treatment calculations have been revised. Refer to Attachment A.

Comment 89:

The applicant should revise the treatment calculations for Kingsbury Pond to use a treatment factor of 0.2 for LS-N21. Standard sizing for 0.52 acre of impervious area draining to a 150-foot, wooded buffer on Elliotsville (HSG B) and Monson (HSG C/D) soils requires a 39-foot level spreader to receive a treatment factor of 0.4. The proposed 79-foot level spreader allows use of the minimum treatment factor of 0.2 per Table 4.1 in Volume II: Phosphorus Control in Lake Watersheds.

The treatment calculations have been revised. Refer to Attachment A.

Mayfield Pond Watershed

Comment 90:

The applicant should check the project phosphorus budget for Mayfield Pond to make sure that the steep slope acreage being subtracted from the total acreage of the development parcel is due to steep slope areas that are over one acre in size. Steep slope areas that are less than one acre in size do not need to be subtracted from the total acreage of the development parcel to find the project acreage.

The treatment calculations have been revised. Refer to Attachment A. Please note that the permanent (post-construction) width of the crane roads within this watershed have been reduced to 15 feet.

Comment 91:

The applicant should revise the treatment calculations for Mayfield Pond to use a treatment factor of 0.15 for DT-S58 (the minimum allowed per Table 4.1 in Volume II: Phosphorus Control in Lake Watersheds). The buffer length proposed below the turn-out is more than twice that needed for 223 feet of road draining to a wooded buffer on HSG "B" soils (Elliotsville).

The treatment calculations have been revised. Refer to Attachment A.

Comment 92:

The applicant should correct the treatment calculations for Mayfield Pond to eliminate runoff treatment from station 600+00 to station 652+50 of crane road #9 in roadside buffer AD-S32. AD-S32 is not directly adjacent the travel surface and shoulder of this section of road such that runoff can sheet into the buffer. Much of this section is over 150 feet from the buffer and, so, can't reasonably be expected to be in sheet flow upon reaching the buffer's edge.

The treatment calculations have been revised. Refer to Attachment A.

Comment 93:

The applicant should revise the treatment of runoff from turbine pads T18, T20, T21, T22, T23, T24, T25, T26, T27, T29, and T30 in the Mayfield Pond watershed. The current plan uses a roadside buffer to treat each pad's impervious area runoff. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from these turbine pads doesn't sheet flow into these buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 feet or more of pad surface to reach a buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from each pad's impervious areas will need to be delivered to the buffer using a ditch and stone berm level lip spreader. It is also possible to use the pad surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the Chapter 500, Stormwater Management Rules).

Refer to response to Comment #32.

Comment 94:

The applicant should correct the treatment calculations for Mayfield Pond to eliminate runoff treatment from station 678+50 to station 681+50 of crane road #10 in roadside buffer AD-N5. AD-N5 is not directly adjacent the travel surface and shoulder of this section of road such that runoff can sheet into the buffer. This section of road is over 300 feet from the buffer and, so, can't reasonably be expected to be in sheet flow upon reaching the buffer's edge.

The treatment calculations have been revised. Refer to Attachment A.

Comment 95:

The applicant should correct the treatment calculations for Mayfield Pond to end road drainage from crane road #10 to AD-N5 at 706+00. Road drainage after this station on this steep section of road will drain via the road ditch and culvert to LS-N7.

The treatment calculations have been revised. Refer to Attachment A.

Comment 96:

The applicant should correct the treatment calculations for Mayfield Pond to start the road drainage from crane road #10 to LS-N7 at 706+00. The length of the level spreader for LS-N7 should also be resized to account for the additional runoff from the roadway impervious area.

The treatment calculations have been revised. Refer to Attachment A.

Comment 97:

The applicant should correct the treatment calculations for Mayfield Pond to start the road drainage from crane road #22 to AD-N9 at 1807+25. The road runoff from station 1805+00 to 1807+25 of crane road #22 will drain to Kingsbury Pond via the road ditch and LS-N22. The impervious area from these 225 feet of roadway should not be included in the Mayfield Pond watershed.

The treatment calculations have been revised. Refer to Attachment A.

12.0 STORMWATER MANAGEMENT – GENERAL STANDARD (115KV GENERATOR LEAD PROJECT)

Piscataquis River (AR-120)

Comment 98:

The applicant should correct the treatment analysis to end the road section draining to ditch turn-out buffer BMP #2 at station 3+50 feet. Road runoff after this station will flow past the turn-out to BMP#3.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-01 were required to accommodate this revision to the treatment calculations.

Comment 99:

The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #3 at station 3+50 and to end the roadway drainage to BMP #3 at 5+75. Road runoff after station 5+75 will flow past the turn-out to BMP #4.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-01 were required to accommodate this revision to the treatment calculations.

Comment 100:

The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #4 at station 5+75 and to end the roadway drainage to BMP #4 at 9+25. Road runoff after station 9+25 will flow past the turn-out.

As shown on Sheet AR-01 and noted in the treatment table in Appendix 12-1 and on Sheet SW-01, BMP #4 is a forested roadside buffer. Road runoff from Stations 6+00 to 9+50 will flow directly from the road surface in sheet flow and through the buffer. The road design and existing topography supports this buffer designation. No revisions have been completed to calculations associated with BMP #4.

Gales Brook (AR-212)

Comment 101:

The applicant should correct the treatment analysis to end the road section draining to ditch turn-out buffer BMP #2 at station 7+25. Road runoff after this station will flow past the turn-out to BMP #3.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-02 were required to accommodate this revision to the treatment calculations.

Comment 102:

The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #3 at station 7+25 and to end the roadway drainage to BMP #3 at 10+25. Road runoff after station 10+25 will flow past the turn-out to BMP #4.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-02 were required to accommodate this revision to the treatment calculations.

Comment 103:

The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #4 at station 10+25 and to end the roadway drainage to BMP #4 at 13+25. Road runoff after station 13+25 will flow past the turn-out to BMP #5.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-02 were required to accommodate this revision to the treatment calculations.

Comment 104:

The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #5 at station 13+25 and to end the roadway drainage to BMP #5 at 16+25. Road runoff after station 16+25 will flow past the turn-out.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-02 were required to accommodate this revision to the treatment calculations.

Gales Brook (AR-230)

Comment 105:

The applicant should correct the treatment analysis to end the road section draining to ditch turn-out buffer BMP #1 at station 2+25. Road runoff after this station will flow past the turn-out.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-03 were required to accommodate this revision to the treatment calculations.

Comment 106:

The applicant should correct the treatment analysis to end the road section draining to ditch turn-out buffer BMP #2 at station 6+25. Road runoff after this station will flow past the turn-out.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-03 were required to accommodate this revision to the treatment calculations.

Comment 107:

The applicant should correct the treatment analysis to start the road section draining to roadside buffer BMP #3 at station 6+75 (instead of 7+00).

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. Sheet AR-03 has been revised to illustrate the new limits of roadside buffer BMP #3.

Comment 108:

The applicant should correct the treatment analysis to end the road section draining to roadside buffer BMP #4 at station 29+50. Road runoff beyond this station will not get full treatment through the buffer.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. Sheet AR-04 has been revised to illustrate the new limits of roadside buffer BMP #4.

Carlton Stream (AR-300)

Comment 109:

The applicant should correct the treatment analysis to start the road section draining to ditch turn-out buffer BMP #2 at station 6+25 and end the road drainage to BMP #2 at 8+25. Road drainage before station 6+25 will flow past the turn-out.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-05 were required to accommodate this revision to the treatment calculations.

Comment 110:

The applicant should correct the treatment analysis to start the road section draining to ditch turn-out buffer BMP #3 at station 8+25 and end the road drainage to BMP #2 at 11+25. Road runoff before station 8+25 will flow to BMP #2.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-05 were required to accommodate this revision to the treatment calculations.

Comment 111:

The applicant should correct the treatment analysis to start the road section draining to ditch turn-out buffer BMP #4 at station 11+25. Road runoff before station 11+25 will flow to BMP #3.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. No plan changes to Sheet AR-05 were required to accommodate this revision to the treatment calculations.

Kingsbury Stream (AR-390)

Comment 112:

The applicant should correct the treatment analysis to start the road section draining to roadside buffer BMP #1 at 1+50. Road runoff before this station will not get full treatment through the buffer.

The Stormwater Quality Treatment Calculations located in Appendix 12-1 and shown on Sheet SW-01 have been revised as requested. Sheet AR-07 has been revised to illustrate the new limits of roadside buffer BMP #1.

The revisions to the Stormwater Quality Treatment Calculations as a result of addressing comments #98-112 have resulted in revised treatment percentage of 76.17% (previously 78.05%) which remains in compliance with the 75% treatment standard for a linear roadway project.

12.0 STORMWATER MANAGEMENT – FLOODING STANDARD (BINGHAM WIND PROJECT)

Comment 113:

The applicant should revise the pre-development and post-development runoff analyses for the operations and maintenance facility site to use the curve number for the "good" condition in modeling the woodlands. Generally, the use of the fair condition requires management conditions (e.g. heavy livestock grazing or burning) that significantly reduces the understory vegetation, significantly reduces the litter layer, and compacts the surface soils.

The pre- and post-development runoff calculations have been revised and included with Attachment B. The following table illustrates the updated runoff calculations:

O & M FACILITY						
Location	Pre-Development			Post-Development		
	2-Yr	10-Yr	25-Yr	2-Yr	10-Yr	25-Yr
POI #1	0	0	0	0	0	0.09
POI #2	0	0.1	0.02	0	0	0.02

*** The increase in peak flow at POI #1 in the 25-year storm is consistent with initial analysis. This is a negligible increase during an isolated event.**

Comment 114:

The applicant should revise the pre-development and post-development runoff analyses for the substation and DRD facility site to use the curve numbers for the "good" condition in modeling the woodlands and brush lands. Generally, the use of the fair condition requires management conditions (e.g. heavy livestock grazing) that significantly reduces the understory vegetation, significantly reduces the litter layer, and compacts the surface soils.

The pre- and post-development runoff calculations have been revised and included with Attachment B. The following table illustrates the updated runoff calculations:

SUBSTATION / DRD PAD						
Location	**Pre-Development**			**Post-Development**		
	2-Yr	**10-Yr**	**25-Yr**	**2-Yr**	**10-Yr**	**25-Yr**
POI #1	**1.64**	**6.37**	**9.06**	**0.90**	**4.55**	**6.77**
POI #2	**2.07**	**6.56**	**9.02**	**1.77**	**6.04**	**8.44**

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

Sincerely,

FIRST WIND



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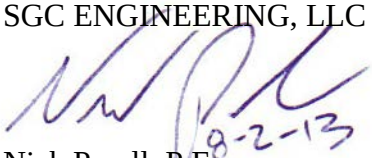
SGC ENGINEERING, LLC



Nick Porell, P.E.
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501 County Road
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Fax 207.347-8101

Attachments: Attachment A – Revised Treatment Calculations
Attachment B – Revised Pre- and Post Development Calculations for Substation and OM Building
Attachment C – Basic Standards Narrative (Section 14)
Attachment D – Figure 1 – Diseased Pine Clearing Area
Attachment E – Generator Lead Treatment Calculation Plan and Profile
Revised Plan Set

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

ATTACHMENT A

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
Chesuncoo	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	AD-S11	1.6%	55.0	0.19	0.19		0.00
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		-		-	-	-	0.28	0.00		0.28
T2		-		-	-	-	0.28	0.00		0.28
T1		-		-	-	55.0	0.28	0.00		0.28
						Totals	**9.03**	**7.42**		**1.61**

Impervious Area Treatment Calculations (Linear project)

Total Proposed Impervious Area=	9.03	ac
Total Treated Proposed Impervious Area=	7.42	ac
Total Untreated Proposed Impervious Area=	1.61	ac
Proposed Impervious Area Treatment Percentage=	82.16	%

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	-	374+00	DT-S31	6.6%	120.00	0.14	0.14		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	-	411+50	AD-S26	4.9%	55.00	0.14	0.14		0.00
CR6	411+50	-	413+50	-	-	-	0.11	0.00		0.11
CR6	413+50	-	415+00	AD-S26	4.9%	55.00	0.08	0.08		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	DT-N27	3.5%	120.00	0.14	0.14		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+50	DT-N70A	5.0%	120.00	0.08	0.08		0.00
CR16	1201+50	-	1202+50	DT-N70	6.7%	120.00	0.06	0.06		0.00
CR16	1202+50	-	1207+50	AD-N30	13.0%	55.00	0.28	0.28		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**	**6.74**		**1.38**

Impervious Area Treatment Calculations (Linear project)

Total Proposed Impervious Area=	8.12	ac
Total Treated Proposed Impervious Area=	6.74	ac
Total Untreated Proposed Impervious Area=	1.38	ac
Proposed Impervious Area Treatment Percentage=	82.99	%

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)	0.96	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**

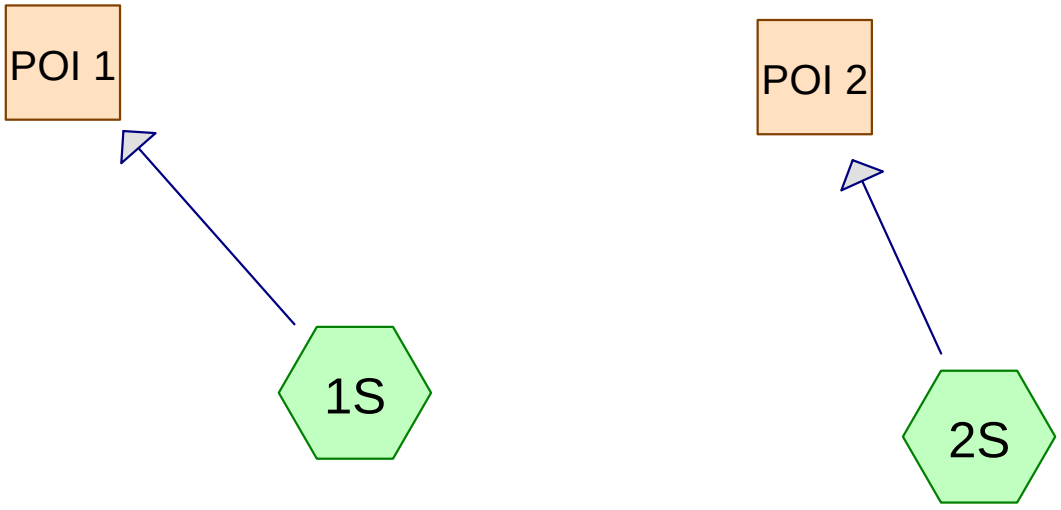
Mitigation credit when a pre-existing source is treated by a new BMP

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**

ATTACHMENT B

Revised Pre- and Post Development Calculations



Subcat Reach Pond Link

Drainage Diagram for 3048 OM BLDG PRE
Prepared by DELUCA-HOFFMAN ASSOCIATES INC, Printed 7/23/2013
HydroCAD® 8.50 s/n 000734 © 2007 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.022	30	Woods, Good, HSG A (1S,2S)
0.183	76	Gravel roads, HSG A (2S)
0.085	98	Paved parking & roofs (1S,2S)
3.289		**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
3.204	HSG A	1S, 2S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.085	Other	1S, 2S
3.289		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=103,324 sf 2.59% Impervious Runoff Depth=0.00"
Flow Length=367' Tc=21.5 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment2S: Runoff Area=39,949 sf 2.56% Impervious Runoff Depth=0.00"
Flow Length=197' Tc=11.2 min CN=41 Runoff=0.00 cfs 0.000 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
97.42% Pervious = 3.204 ac 2.58% Impervious = 0.085 ac

Summary for Subcatchment 1S:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

Area (sf)	CN	Description
2,678	98	Paved parking & roofs
100,646	30	Woods, Good, HSG A
103,324	32	Weighted Average
100,646		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	150	0.1070	0.15		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	217	0.0280	0.84		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
21.5	367	Total			

Summary for Subcatchment 2S:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

Area (sf)	CN	Description
1,024	98	Paved parking & roofs
7,950	76	Gravel roads, HSG A
30,975	30	Woods, Good, HSG A
39,949	41	Weighted Average
38,925		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	85	0.1290	0.14		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.50"
0.2	21	0.0200	2.28		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
0.9	91	0.1090	1.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
11.2	197	Total			

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=103,324 sf 2.59% Impervious Runoff Depth=0.00"
Flow Length=367' Tc=21.5 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment2S: Runoff Area=39,949 sf 2.56% Impervious Runoff Depth>0.04"
Flow Length=197' Tc=11.2 min CN=41 Runoff=0.01 cfs 0.003 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.003 af Average Runoff Depth = 0.01"
97.42% Pervious = 3.204 ac 2.58% Impervious = 0.085 ac

Summary for Subcatchment 1S:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

Area (sf)	CN	Description
2,678	98	Paved parking & roofs
100,646	30	Woods, Good, HSG A
103,324	32	Weighted Average
100,646		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	150	0.1070	0.15		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	217	0.0280	0.84		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
21.5	367	Total			

Summary for Subcatchment 2S:

Runoff = 0.01 cfs @ 15.37 hrs, Volume= 0.003 af, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

Area (sf)	CN	Description
1,024	98	Paved parking & roofs
7,950	76	Gravel roads, HSG A
30,975	30	Woods, Good, HSG A
39,949	41	Weighted Average
38,925		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	85	0.1290	0.14		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.50"
0.2	21	0.0200	2.28		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
0.9	91	0.1090	1.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
11.2	197	Total			

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=103,324 sf 2.59% Impervious Runoff Depth=0.00"
Flow Length=367' Tc=21.5 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment2S: Runoff Area=39,949 sf 2.56% Impervious Runoff Depth>0.11"
Flow Length=197' Tc=11.2 min CN=41 Runoff=0.02 cfs 0.009 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.009 af Average Runoff Depth = 0.03"
97.42% Pervious = 3.204 ac 2.58% Impervious = 0.085 ac

Summary for Subcatchment 1S:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

Area (sf)	CN	Description
2,678	98	Paved parking & roofs
100,646	30	Woods, Good, HSG A
103,324	32	Weighted Average
100,646		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	150	0.1070	0.15		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	217	0.0280	0.84		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
21.5	367	Total			

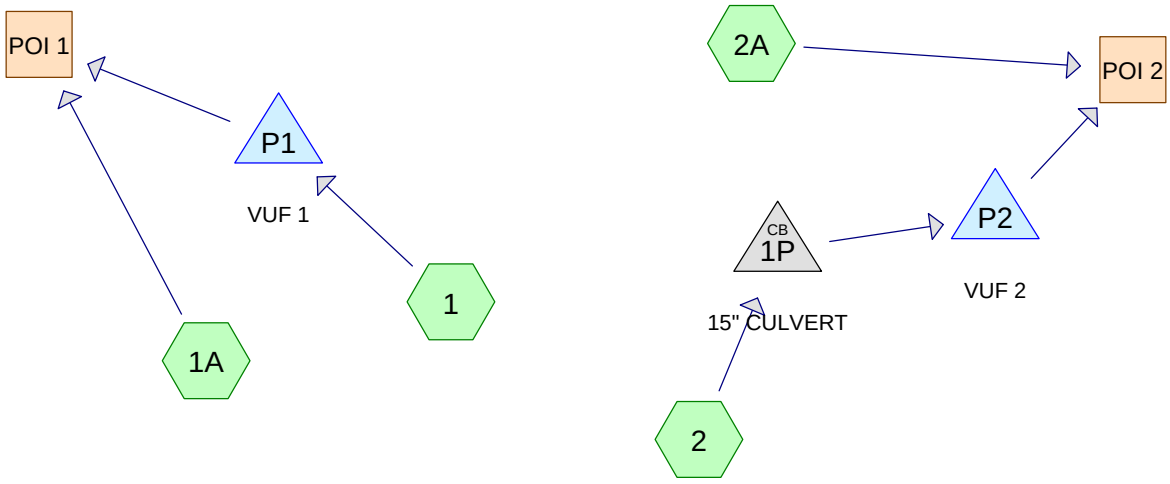
Summary for Subcatchment 2S:

Runoff = 0.02 cfs @ 13.77 hrs, Volume= 0.009 af, Depth> 0.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

Area (sf)	CN	Description
1,024	98	Paved parking & roofs
7,950	76	Gravel roads, HSG A
30,975	30	Woods, Good, HSG A
39,949	41	Weighted Average
38,925		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	85	0.1290	0.14		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.50"
0.2	21	0.0200	2.28		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
0.9	91	0.1090	1.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
11.2	197	Total			



Subcat Reach Pond Link

Drainage Diagram for 3048 OM BLDG POST

Prepared by DELUCA-HOFFMAN ASSOCIATES INC, Printed 7/23/2013

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.177	30	Woods, Good, HSG A (1A)
1.189	39	>75% Grass cover, Good, HSG A (1,1A,2,2A)
0.703	76	Gravel roads, HSG A (1,2)
0.220	98	Paved parking & roofs (1,1A,2A)
3.289		**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
3.069	HSG A	1, 1A, 2, 2A
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.220	Other	1, 1A, 2A
3.289		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Runoff Area=36,768 sf 15.99% Impervious Runoff Depth>0.34"
Flow Length=177' Slope=0.0200 '/' Tc=2.4 min CN=68 Runoff=0.30 cfs 0.024 af

Subcatchment1A: Runoff Area=66,557 sf 4.02% Impervious Runoff Depth=0.00"
Flow Length=387' Tc=20.7 min CN=34 Runoff=0.00 cfs 0.000 af

Subcatchment2: Runoff Area=29,801 sf 0.00% Impervious Runoff Depth>0.04"
Flow Length=107' Tc=4.0 min CN=53 Runoff=0.01 cfs 0.002 af

Subcatchment2A: Runoff Area=10,148 sf 10.09% Impervious Runoff Depth=0.00"
Flow Length=174' Tc=2.6 min CN=45 Runoff=0.00 cfs 0.000 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.026 af Average Runoff Depth = 0.10"
93.31% Pervious = 3.069 ac 6.69% Impervious = 0.220 ac

Summary for Subcatchment 1:

Runoff = 0.30 cfs @ 12.07 hrs, Volume= 0.024 af, Depth> 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

Area (sf)	CN	Description
5,880	98	Paved parking & roofs
19,652	76	Gravel roads, HSG A
11,236	39	>75% Grass cover, Good, HSG A
36,768	68	Weighted Average
30,888		Pervious Area
5,880		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
0.5	27	0.0200	0.99		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
2.4	177	Total			

Summary for Subcatchment 1A:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

Area (sf)	CN	Description
12,600	39	>75% Grass cover, Good, HSG A
2,678	98	Paved parking & roofs
51,279	30	Woods, Good, HSG A
66,557	34	Weighted Average
63,879		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.1200	0.15		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	237	0.0170	0.91		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
20.7	387	Total			

Summary for Subcatchment 2:

Runoff = 0.01 cfs @ 14.80 hrs, Volume= 0.002 af, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

Area (sf)	CN	Description
10,962	76	Gravel roads, HSG A
18,839	39	>75% Grass cover, Good, HSG A
29,801	53	Weighted Average
29,801		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	74	0.1600	0.33		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.50"
0.2	33	0.2000	3.13		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
4.0	107	Total			

Summary for Subcatchment 2A:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

Area (sf)	CN	Description
1,024	98	Paved parking & roofs
9,124	39	>75% Grass cover, Good, HSG A
10,148	45	Weighted Average
9,124		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	29	0.0200	0.95		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
2.1	145	0.0550	1.17		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
2.6	174	Total			

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Runoff Area=36,768 sf 15.99% Impervious Runoff Depth>0.98"
Flow Length=177' Slope=0.0200 '/' Tc=2.4 min CN=68 Runoff=1.09 cfs 0.069 af

Subcatchment1A: Runoff Area=66,557 sf 4.02% Impervious Runoff Depth=0.00"
Flow Length=387' Tc=20.7 min CN=34 Runoff=0.00 cfs 0.000 af

Subcatchment2: Runoff Area=29,801 sf 0.00% Impervious Runoff Depth>0.32"
Flow Length=107' Tc=4.0 min CN=53 Runoff=0.13 cfs 0.018 af

Subcatchment2A: Runoff Area=10,148 sf 10.09% Impervious Runoff Depth>0.11"
Flow Length=174' Tc=2.6 min CN=45 Runoff=0.00 cfs 0.002 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.089 af Average Runoff Depth = 0.33"
93.31% Pervious = 3.069 ac 6.69% Impervious = 0.220 ac

Summary for Subcatchment 1:

Runoff = 1.09 cfs @ 12.05 hrs, Volume= 0.069 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

Area (sf)	CN	Description
5,880	98	Paved parking & roofs
19,652	76	Gravel roads, HSG A
11,236	39	>75% Grass cover, Good, HSG A
36,768	68	Weighted Average
30,888		Pervious Area
5,880		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
0.5	27	0.0200	0.99		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
2.4	177	Total			

Summary for Subcatchment 1A:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

Area (sf)	CN	Description
12,600	39	>75% Grass cover, Good, HSG A
2,678	98	Paved parking & roofs
51,279	30	Woods, Good, HSG A
66,557	34	Weighted Average
63,879		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.1200	0.15		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	237	0.0170	0.91		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
20.7	387	Total			

Summary for Subcatchment 2:

Runoff = 0.13 cfs @ 12.13 hrs, Volume= 0.018 af, Depth> 0.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

Area (sf)	CN	Description
10,962	76	Gravel roads, HSG A
18,839	39	>75% Grass cover, Good, HSG A
29,801	53	Weighted Average
29,801		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	74	0.1600	0.33		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.50"
0.2	33	0.2000	3.13		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
4.0	107	Total			

Summary for Subcatchment 2A:

Runoff = 0.00 cfs @ 12.45 hrs, Volume= 0.002 af, Depth> 0.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

Area (sf)	CN	Description
1,024	98	Paved parking & roofs
9,124	39	>75% Grass cover, Good, HSG A
10,148	45	Weighted Average
9,124		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	29	0.0200	0.95		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
2.1	145	0.0550	1.17		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
2.6	174	Total			

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Runoff Area=36,768 sf 15.99% Impervious Runoff Depth>1.34"
Flow Length=177' Slope=0.0200 '/' Tc=2.4 min CN=68 Runoff=1.53 cfs 0.094 af

Subcatchment1A: Runoff Area=66,557 sf 4.02% Impervious Runoff Depth>0.00"
Flow Length=387' Tc=20.7 min CN=34 Runoff=0.00 cfs 0.001 af

Subcatchment2: Runoff Area=29,801 sf 0.00% Impervious Runoff Depth>0.52"
Flow Length=107' Tc=4.0 min CN=53 Runoff=0.31 cfs 0.030 af

Subcatchment2A: Runoff Area=10,148 sf 10.09% Impervious Runoff Depth>0.22"
Flow Length=174' Tc=2.6 min CN=45 Runoff=0.02 cfs 0.004 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.129 af Average Runoff Depth = 0.47"
93.31% Pervious = 3.069 ac 6.69% Impervious = 0.220 ac

Summary for Subcatchment 1:

Runoff = 1.53 cfs @ 12.05 hrs, Volume= 0.094 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

Area (sf)	CN	Description
5,880	98	Paved parking & roofs
19,652	76	Gravel roads, HSG A
11,236	39	>75% Grass cover, Good, HSG A
36,768	68	Weighted Average
30,888		Pervious Area
5,880		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
0.5	27	0.0200	0.99		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
2.4	177	Total			

Summary for Subcatchment 1A:

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.001 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

Area (sf)	CN	Description
12,600	39	>75% Grass cover, Good, HSG A
2,678	98	Paved parking & roofs
51,279	30	Woods, Good, HSG A
66,557	34	Weighted Average
63,879		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.1200	0.15		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	237	0.0170	0.91		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
20.7	387	Total			

Summary for Subcatchment 2:

Runoff = 0.31 cfs @ 12.10 hrs, Volume= 0.030 af, Depth> 0.52"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

Area (sf)	CN	Description
10,962	76	Gravel roads, HSG A
18,839	39	>75% Grass cover, Good, HSG A
29,801	53	Weighted Average
29,801		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	74	0.1600	0.33		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.50"
0.2	33	0.2000	3.13		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
4.0	107	Total			

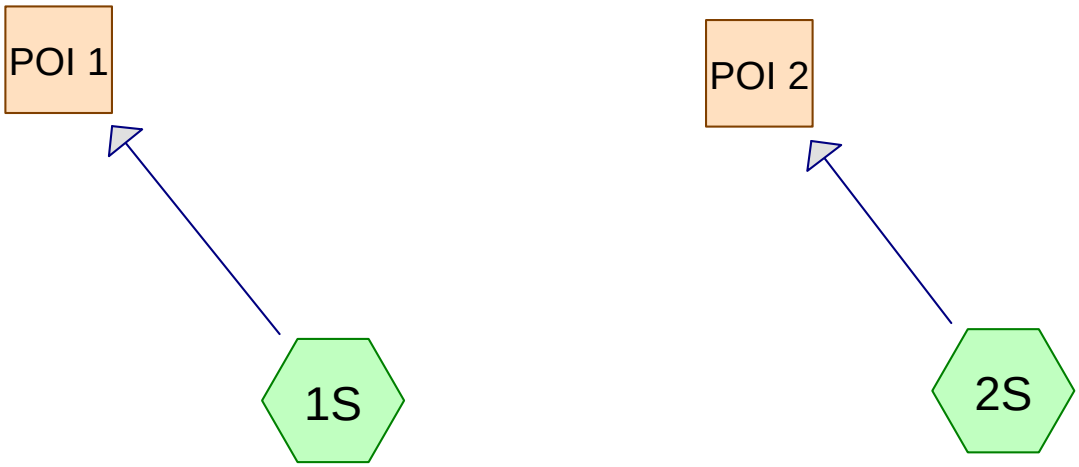
Summary for Subcatchment 2A:

Runoff = 0.02 cfs @ 12.33 hrs, Volume= 0.004 af, Depth> 0.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

Area (sf)	CN	Description
1,024	98	Paved parking & roofs
9,124	39	>75% Grass cover, Good, HSG A
10,148	45	Weighted Average
9,124		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	29	0.0200	0.95		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
2.1	145	0.0550	1.17		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
2.6	174	Total			



Subcat Reach Pond Link

Drainage Diagram for 3048 SUBSTATION PRE

Prepared by DELUCA-HOFFMAN ASSOCIATES INC, Printed 7/23/2013

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.190	48	Brush, Good, HSG B (1S)
5.570	65	Brush, Good, HSG C (1S,2S)
10.407	70	Woods, Good, HSG C (1S,2S)
0.305	89	Gravel roads, HSG C (1S,2S)
16.472		**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
0.000	HSG A	
0.190	HSG B	1S
16.281	HSG C	1S, 2S
0.000	HSG D	
0.000	Other	
16.472		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=373,731 sf 0.00% Impervious Runoff Depth>0.31"
Flow Length=1,485' Tc=18.8 min CN=67 Runoff=1.64 cfs 0.221 af

Subcatchment2S: Runoff Area=343,770 sf 0.00% Impervious Runoff Depth>0.40"
Flow Length=900' Tc=23.2 min CN=70 Runoff=2.07 cfs 0.263 af

Total Runoff Area = 16.472 ac Runoff Volume = 0.484 af Average Runoff Depth = 0.35"
100.00% Pervious = 16.472 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S:

Runoff = 1.64 cfs @ 12.37 hrs, Volume= 0.221 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

Area (sf)	CN	Description
12,692	89	Gravel roads, HSG C
141,393	70	Woods, Good, HSG C
211,366	65	Brush, Good, HSG C
8,280	48	Brush, Good, HSG B
373,731	67	Weighted Average
373,731		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	60	0.0200	1.10		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
5.0	395	0.0700	1.32		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
3.5	440	0.0900	2.10		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
9.4	590	0.0440	1.05		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
18.8	1,485	Total			

Summary for Subcatchment 2S:

Runoff = 2.07 cfs @ 12.41 hrs, Volume= 0.263 af, Depth> 0.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

Area (sf)	CN	Description
311,919	70	Woods, Good, HSG C
31,268	65	Brush, Good, HSG C
583	89	Gravel roads, HSG C
343,770	70	Weighted Average
343,770		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	140	0.0430	0.15		**Sheet Flow, A-B**
					Grass: Dense n= 0.240 P2= 2.50"
4.8	435	0.0910	1.51		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
1.5	220	0.1270	2.49		**Shallow Concentrated Flow, C-D**
					Short Grass Pasture Kv= 7.0 fps
1.3	105	0.0760	1.38		**Shallow Concentrated Flow, D-E**
					Woodland Kv= 5.0 fps
23.2	900	Total			

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=373,731 sf 0.00% Impervious Runoff Depth>0.92"
Flow Length=1,485' Tc=18.8 min CN=67 Runoff=6.37 cfs 0.658 af

Subcatchment2S: Runoff Area=343,770 sf 0.00% Impervious Runoff Depth>1.08"
Flow Length=900' Tc=23.2 min CN=70 Runoff=6.56 cfs 0.712 af

Total Runoff Area = 16.472 ac Runoff Volume = 1.370 af Average Runoff Depth = 1.00"
100.00% Pervious = 16.472 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S:

Runoff = 6.37 cfs @ 12.29 hrs, Volume= 0.658 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

Area (sf)	CN	Description
12,692	89	Gravel roads, HSG C
141,393	70	Woods, Good, HSG C
211,366	65	Brush, Good, HSG C
8,280	48	Brush, Good, HSG B
373,731	67	Weighted Average
373,731		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	60	0.0200	1.10		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
5.0	395	0.0700	1.32		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
3.5	440	0.0900	2.10		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
9.4	590	0.0440	1.05		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
18.8	1,485	Total			

Summary for Subcatchment 2S:

Runoff = 6.56 cfs @ 12.35 hrs, Volume= 0.712 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

Area (sf)	CN	Description
311,919	70	Woods, Good, HSG C
31,268	65	Brush, Good, HSG C
583	89	Gravel roads, HSG C
343,770	70	Weighted Average
343,770		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	140	0.0430	0.15		**Sheet Flow, A-B**
					Grass: Dense n= 0.240 P2= 2.50"
4.8	435	0.0910	1.51		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
1.5	220	0.1270	2.49		**Shallow Concentrated Flow, C-D**
					Short Grass Pasture Kv= 7.0 fps
1.3	105	0.0760	1.38		**Shallow Concentrated Flow, D-E**
					Woodland Kv= 5.0 fps
23.2	900	Total			

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=373,731 sf 0.00% Impervious Runoff Depth>1.27"
Flow Length=1,485' Tc=18.8 min CN=67 Runoff=9.06 cfs 0.906 af

Subcatchment2S: Runoff Area=343,770 sf 0.00% Impervious Runoff Depth>1.46"
Flow Length=900' Tc=23.2 min CN=70 Runoff=9.02 cfs 0.959 af

Total Runoff Area = 16.472 ac Runoff Volume = 1.865 af Average Runoff Depth = 1.36"
100.00% Pervious = 16.472 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S:

Runoff = 9.06 cfs @ 12.28 hrs, Volume= 0.906 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

Area (sf)	CN	Description
12,692	89	Gravel roads, HSG C
141,393	70	Woods, Good, HSG C
211,366	65	Brush, Good, HSG C
8,280	48	Brush, Good, HSG B
373,731	67	Weighted Average
373,731		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	60	0.0200	1.10		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
5.0	395	0.0700	1.32		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
3.5	440	0.0900	2.10		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
9.4	590	0.0440	1.05		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
18.8	1,485	Total			

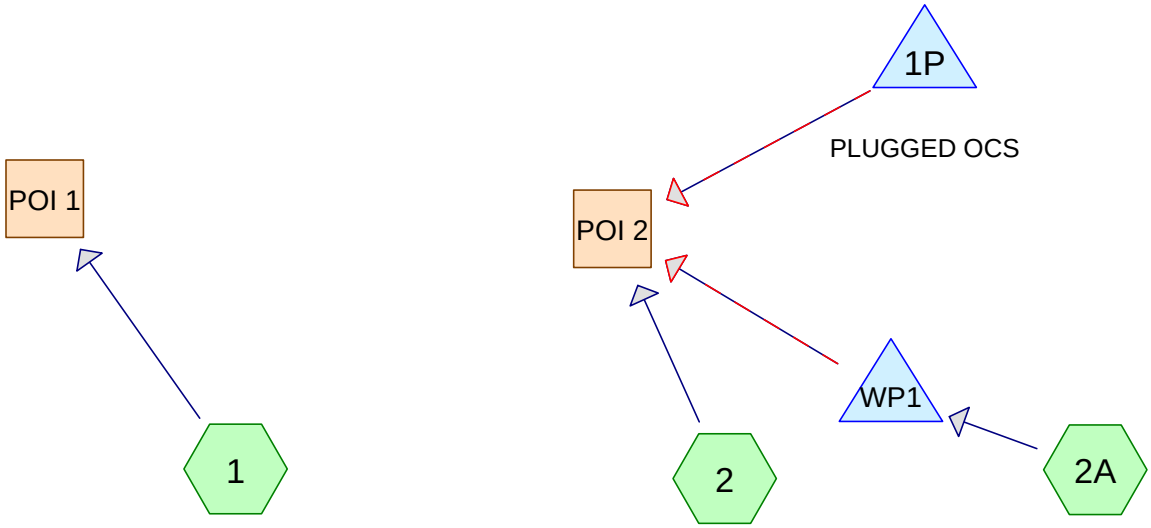
Summary for Subcatchment 2S:

Runoff = 9.02 cfs @ 12.34 hrs, Volume= 0.959 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

Area (sf)	CN	Description
311,919	70	Woods, Good, HSG C
31,268	65	Brush, Good, HSG C
583	89	Gravel roads, HSG C
343,770	70	Weighted Average
343,770		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	140	0.0430	0.15		**Sheet Flow, A-B**
					Grass: Dense n= 0.240 P2= 2.50"
4.8	435	0.0910	1.51		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
1.5	220	0.1270	2.49		**Shallow Concentrated Flow, C-D**
					Short Grass Pasture Kv= 7.0 fps
1.3	105	0.0760	1.38		**Shallow Concentrated Flow, D-E**
					Woodland Kv= 5.0 fps
23.2	900	Total			



Subcat Reach Pond Link

Drainage Diagram for 3048 SUBSTATION POST

Prepared by DELUCA-HOFFMAN ASSOCIATES INC, Printed 7/23/2013

HydroCAD® 8.50 s/n 000734 © 2007 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.463	55	Substation Pad, HSG C (2)
2.607	55	Substation Section HSG C (1)
6.245	65	Brush, Good, HSG C (1,2,2A)
5.248	70	Woods, Good, HSG C (1,2)
0.281	89	Gravel roads, HSG C (1,2)
1.109	98	Paved parking & roofs (2A)
0.079	98	Water Surface (2A)
16.031		**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
14.843	HSG C	1, 2, 2A
0.000	HSG D	
1.188	Other	2A
16.031		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: Runoff Area=312,219 sf 0.00% Impervious Runoff Depth>0.23"
Flow Length=1,225' Tc=15.5 min CN=64 Runoff=0.90 cfs 0.138 af

Subcatchment 2: Runoff Area=311,703 sf 0.00% Impervious Runoff Depth>0.31"
Flow Length=890' Tc=16.9 min CN=67 Runoff=1.41 cfs 0.185 af

Subcatchment 2A: Runoff Area=74,388 sf 69.56% Impervious Runoff Depth>1.29"
Flow Length=342' Tc=1.4 min CN=88 Runoff=3.02 cfs 0.184 af

Total Runoff Area = 16.031 ac Runoff Volume = 0.506 af Average Runoff Depth = 0.38"
92.59% Pervious = 14.843 ac 7.41% Impervious = 1.188 ac

Summary for Subcatchment 1:

Runoff = 0.90 cfs @ 12.40 hrs, Volume= 0.138 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

	Area (sf)	CN	Description
	9,545	89	Gravel roads, HSG C
	88,766	70	Woods, Good, HSG C
	100,349	65	Brush, Good, HSG C
*	113,559	55	Substation Section HSG C
	312,219	64	Weighted Average
	312,219		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
4.6	440	0.0100	1.61		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
0.3	85	0.5000	4.95		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.7	550	0.0440	1.05		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
15.5	1,225	Total			

Summary for Subcatchment 2:

Runoff = 1.41 cfs @ 12.34 hrs, Volume= 0.185 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

	Area (sf)	CN	Description
	139,851	70	Woods, Good, HSG C
	149,027	65	Brush, Good, HSG C
*	20,147	55	Substation Pad, HSG C
	2,678	89	Gravel roads, HSG C
	311,703	67	Weighted Average
	311,703		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	85	0.0580	0.15		**Sheet Flow, A-B**
					Grass: Dense n= 0.240 P2= 2.50"
1.5	125	0.0400	1.40		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
1.9	190	0.1110	1.67		**Shallow Concentrated Flow, C-D**
					Woodland Kv= 5.0 fps
2.8	380	0.1070	2.29		**Shallow Concentrated Flow, D-E**
					Short Grass Pasture Kv= 7.0 fps
1.4	110	0.0720	1.34		**Shallow Concentrated Flow, E-F**
					Woodland Kv= 5.0 fps
16.9	890	Total			

Summary for Subcatchment 2A:

Runoff = 3.02 cfs @ 12.03 hrs, Volume= 0.184 af, Depth> 1.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.50"

Area (sf)	CN	Description
48,322	98	Paved parking & roofs
3,421	98	Water Surface
22,645	65	Brush, Good, HSG C
74,388	88	Weighted Average
22,645		Pervious Area
51,743		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0200	1.06		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 2.50"
0.0	12	0.3300	4.02		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
0.6	280	0.0500	7.65	91.82	**Channel Flow, C-D**
					Area= 12.0 sf Perim= 20.9' r= 0.57' n= 0.030
1.4	342	Total			

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: Runoff Area=312,219 sf 0.00% Impervious Runoff Depth>0.77"
Flow Length=1,225' Tc=15.5 min CN=64 Runoff=4.55 cfs 0.460 af

Subcatchment 2: Runoff Area=311,703 sf 0.00% Impervious Runoff Depth>0.92"
Flow Length=890' Tc=16.9 min CN=67 Runoff=5.55 cfs 0.549 af

Subcatchment 2A: Runoff Area=74,388 sf 69.56% Impervious Runoff Depth>2.39"
Flow Length=342' Tc=1.4 min CN=88 Runoff=5.52 cfs 0.341 af

Total Runoff Area = 16.031 ac Runoff Volume = 1.350 af Average Runoff Depth = 1.01"
92.59% Pervious = 14.843 ac 7.41% Impervious = 1.188 ac

Summary for Subcatchment 1:

Runoff = 4.55 cfs @ 12.25 hrs, Volume= 0.460 af, Depth> 0.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

	Area (sf)	CN	Description
	9,545	89	Gravel roads, HSG C
	88,766	70	Woods, Good, HSG C
	100,349	65	Brush, Good, HSG C
*	113,559	55	Substation Section HSG C
	312,219	64	Weighted Average
	312,219		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
4.6	440	0.0100	1.61		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
0.3	85	0.5000	4.95		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.7	550	0.0440	1.05		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
15.5	1,225	Total			

Summary for Subcatchment 2:

Runoff = 5.55 cfs @ 12.26 hrs, Volume= 0.549 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

	Area (sf)	CN	Description
	139,851	70	Woods, Good, HSG C
	149,027	65	Brush, Good, HSG C
*	20,147	55	Substation Pad, HSG C
	2,678	89	Gravel roads, HSG C
	311,703	67	Weighted Average
	311,703		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	85	0.0580	0.15		**Sheet Flow, A-B**
					Grass: Dense n= 0.240 P2= 2.50"
1.5	125	0.0400	1.40		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
1.9	190	0.1110	1.67		**Shallow Concentrated Flow, C-D**
					Woodland Kv= 5.0 fps
2.8	380	0.1070	2.29		**Shallow Concentrated Flow, D-E**
					Short Grass Pasture Kv= 7.0 fps
1.4	110	0.0720	1.34		**Shallow Concentrated Flow, E-F**
					Woodland Kv= 5.0 fps
16.9	890	Total			

Summary for Subcatchment 2A:

Runoff = 5.52 cfs @ 12.02 hrs, Volume= 0.341 af, Depth> 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=3.80"

Area (sf)	CN	Description
48,322	98	Paved parking & roofs
3,421	98	Water Surface
22,645	65	Brush, Good, HSG C
74,388	88	Weighted Average
22,645		Pervious Area
51,743		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0200	1.06		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 2.50"
0.0	12	0.3300	4.02		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
0.6	280	0.0500	7.65	91.82	**Channel Flow, C-D**
					Area= 12.0 sf Perim= 20.9' r= 0.57' n= 0.030
1.4	342	Total			

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: Runoff Area=312,219 sf 0.00% Impervious Runoff Depth>1.09"
Flow Length=1,225' Tc=15.5 min CN=64 Runoff=6.77 cfs 0.649 af

Subcatchment 2: Runoff Area=311,703 sf 0.00% Impervious Runoff Depth>1.27"
Flow Length=890' Tc=16.9 min CN=67 Runoff=7.90 cfs 0.756 af

Subcatchment 2A: Runoff Area=74,388 sf 69.56% Impervious Runoff Depth>2.93"
Flow Length=342' Tc=1.4 min CN=88 Runoff=6.69 cfs 0.416 af

Total Runoff Area = 16.031 ac Runoff Volume = 1.821 af Average Runoff Depth = 1.36"
92.59% Pervious = 14.843 ac 7.41% Impervious = 1.188 ac

Summary for Subcatchment 1:

Runoff = 6.77 cfs @ 12.24 hrs, Volume= 0.649 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

	Area (sf)	CN	Description
	9,545	89	Gravel roads, HSG C
	88,766	70	Woods, Good, HSG C
	100,349	65	Brush, Good, HSG C
*	113,559	55	Substation Section HSG C
	312,219	64	Weighted Average
	312,219		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
4.6	440	0.0100	1.61		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
0.3	85	0.5000	4.95		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.7	550	0.0440	1.05		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
15.5	1,225	Total			

Summary for Subcatchment 2:

Runoff = 7.90 cfs @ 12.26 hrs, Volume= 0.756 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

	Area (sf)	CN	Description
	139,851	70	Woods, Good, HSG C
	149,027	65	Brush, Good, HSG C
*	20,147	55	Substation Pad, HSG C
	2,678	89	Gravel roads, HSG C
	311,703	67	Weighted Average
	311,703		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	85	0.0580	0.15		**Sheet Flow, A-B**
					Grass: Dense n= 0.240 P2= 2.50"
1.5	125	0.0400	1.40		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
1.9	190	0.1110	1.67		**Shallow Concentrated Flow, C-D**
					Woodland Kv= 5.0 fps
2.8	380	0.1070	2.29		**Shallow Concentrated Flow, D-E**
					Short Grass Pasture Kv= 7.0 fps
1.4	110	0.0720	1.34		**Shallow Concentrated Flow, E-F**
					Woodland Kv= 5.0 fps
16.9	890	Total			

Summary for Subcatchment 2A:

Runoff = 6.69 cfs @ 12.02 hrs, Volume= 0.416 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=4.40"

Area (sf)	CN	Description
48,322	98	Paved parking & roofs
3,421	98	Water Surface
22,645	65	Brush, Good, HSG C
74,388	88	Weighted Average
22,645		Pervious Area
51,743		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0200	1.06		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 2.50"
0.0	12	0.3300	4.02		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
0.6	280	0.0500	7.65	91.82	**Channel Flow, C-D**
					Area= 12.0 sf Perim= 20.9' r= 0.57' n= 0.030
1.4	342	Total			

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Runoff Area=312,219 sf 0.00% Impervious Runoff Depth>1.62"
Flow Length=1,225' Tc=15.5 min CN=64 Runoff=10.49 cfs 0.966 af

Subcatchment2: Runoff Area=311,703 sf 0.00% Impervious Runoff Depth>1.84"
Flow Length=890' Tc=16.9 min CN=67 Runoff=11.76 cfs 1.098 af

Subcatchment2A: Runoff Area=74,388 sf 69.56% Impervious Runoff Depth>3.74"
Flow Length=342' Tc=1.4 min CN=88 Runoff=8.44 cfs 0.532 af

Total Runoff Area = 16.031 ac Runoff Volume = 2.596 af Average Runoff Depth = 1.94"
92.59% Pervious = 14.843 ac 7.41% Impervious = 1.188 ac

Summary for Subcatchment 1:

Runoff = 10.49 cfs @ 12.23 hrs, Volume= 0.966 af, Depth> 1.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=5.30"

	Area (sf)	CN	Description
	9,545	89	Gravel roads, HSG C
	88,766	70	Woods, Good, HSG C
	100,349	65	Brush, Good, HSG C
*	113,559	55	Substation Section HSG C
	312,219	64	Weighted Average
	312,219		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 2.50"
4.6	440	0.0100	1.61		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
0.3	85	0.5000	4.95		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.7	550	0.0440	1.05		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
15.5	1,225	Total			

Summary for Subcatchment 2:

Runoff = 11.76 cfs @ 12.25 hrs, Volume= 1.098 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=5.30"

	Area (sf)	CN	Description
	139,851	70	Woods, Good, HSG C
	149,027	65	Brush, Good, HSG C
*	20,147	55	Substation Pad, HSG C
	2,678	89	Gravel roads, HSG C
	311,703	67	Weighted Average
	311,703		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	85	0.0580	0.15		**Sheet Flow, A-B**
					Grass: Dense n= 0.240 P2= 2.50"
1.5	125	0.0400	1.40		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
1.9	190	0.1110	1.67		**Shallow Concentrated Flow, C-D**
					Woodland Kv= 5.0 fps
2.8	380	0.1070	2.29		**Shallow Concentrated Flow, D-E**
					Short Grass Pasture Kv= 7.0 fps
1.4	110	0.0720	1.34		**Shallow Concentrated Flow, E-F**
					Woodland Kv= 5.0 fps
16.9	890	Total			

Summary for Subcatchment 2A:

Runoff = 8.44 cfs @ 12.02 hrs, Volume= 0.532 af, Depth> 3.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=5.30"

Area (sf)	CN	Description
48,322	98	Paved parking & roofs
3,421	98	Water Surface
22,645	65	Brush, Good, HSG C
74,388	88	Weighted Average
22,645		Pervious Area
51,743		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0200	1.06		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 2.50"
0.0	12	0.3300	4.02		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
0.6	280	0.0500	7.65	91.82	**Channel Flow, C-D**
					Area= 12.0 sf Perim= 20.9' r= 0.57' n= 0.030
1.4	342	Total			

ATTACHMENT C

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.

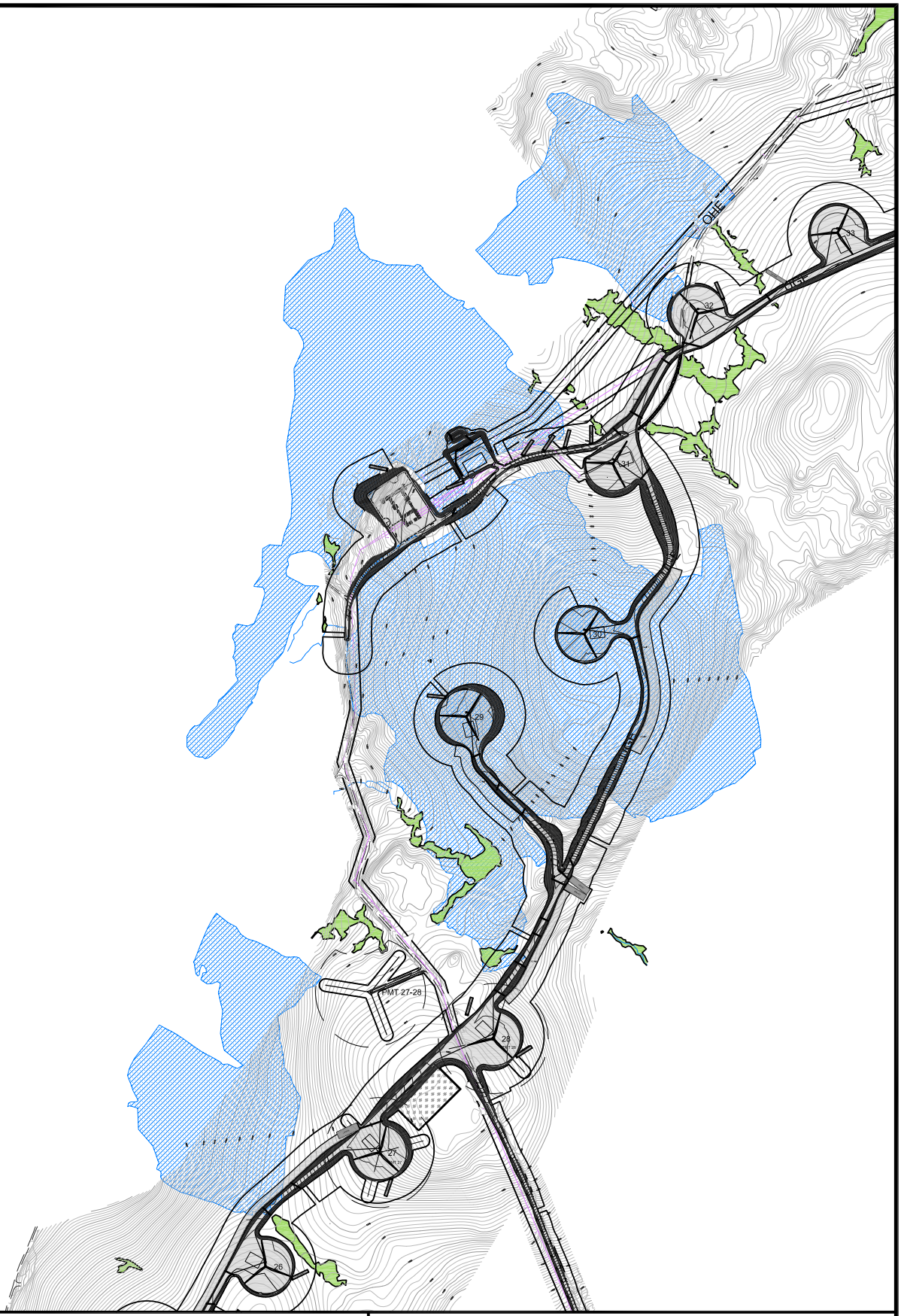
Once the trapped sediments have been removed from the temporary sedimentation devices, the disturbed areas will be loamed (if necessary), fertilized, seeded and mulched, or otherwise stabilized, in accordance with the rates previously stated.

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 D

Figure 1 – Diseased Pine Clearing Area



BINGHAM WIND PROJECT

DISEASED PINE CLEARING AREA

DeLuca-Hoffman Associates, Inc.
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DRAWN:	DED	DATE:	07.25.13
DESIGNED:	SJB	SCALE:	N.T.S.
CHECKED:	SJB	JOB NO.	3048
FILE NAME:	3048-PROF ROAD NORTH		

FIGURE
1

ATTACHMENT E

Generator Lead Treatment Calculation Plan and Profile

Project: Bingham Gen Lead Access Roads
Prepared for: Blue Sky West II, LLC
Prepared by: SGC Engineering
Project No.: 782001

Stormwater Treatment Calculations
River Watersheds
Ch. 500 4.B Stormwater Management General Standards - (Linear Project)
Stormwater treatment of new impervious area required = 75.00%

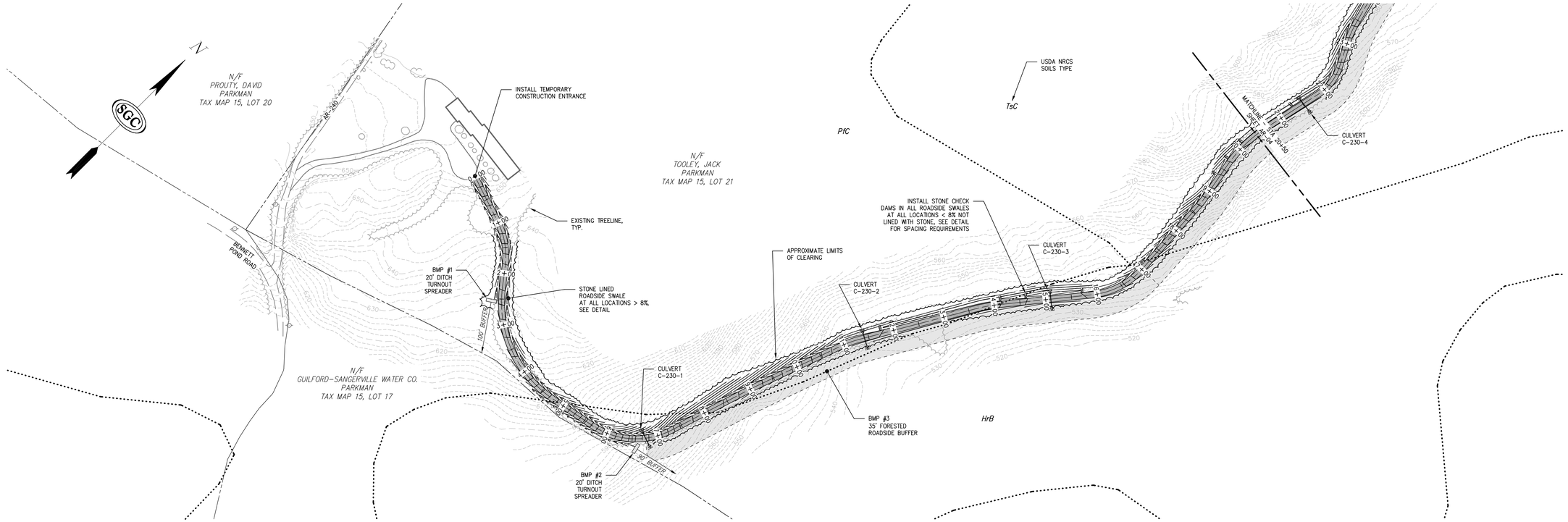
BMP ID Descriptions
BM = Meadow buffer adjacent to road
BF = Forested buffer adjacent to road
DM = Meadow ditch turnout buffer
DF = Forested ditch turnout buffer

Road ID	Roadway Segment Treated (Stations)	Buffer Location (Looking Upstation) R=right side road L=left side road	Road Length (ft) Total/Treated	Road Width (ft)	BMP TYPE	BMP ID	Level Spreader Length (ft)	USDA Soil	Soil HSG	Buffer Slope (%)	Buffer Length (ft)	Impervious Area (sq-ft)	Impervious Area Treated (sq-ft)	Treatment Percentage
Piscataquis River Watersheds														
Piscataquis River (direct)														
AR-120-B&C			**1,000**	**12**								**12,000**		
	1+00 to 2+00	R	100		BF	1	-	PhB	C	3	35		1,200	10.00%
	2+00 to 3+50	R	150		DF	2	20	HrB	C	14	90		1,800	15.00%
	3+50 to 5+75	R	225		DF	3	20	HrB	C	8	75		2,700	22.50%
	6+00 to 9+50	R	350		BF	4	-	HrB	C	8	35		4,200	35.00%
											Sub-Watershed Total	**12,000**	**9,900**	**82.50%**
Gales Brook > Piscataquis River														
AR-212			**1,900**	**12**								**22,800**		
	0+50 to 3+50	R	300		BF/BM	1	-	HrB	C	5	50		3,600	15.79%
	4+50 to 7+25	R	275		DF	2	20	HrB	C	7	100		3,300	14.47%
	7+25 to 10+25	R	300		DF	3	20	HrB	C	7	100		3,600	15.79%
	10+25 to 13+25	R	300		DF	4	20	HrB	C	8	100		3,600	15.79%
	13+25 to 16+25	R	300		DF	5	20	HrB	C	8	100		3,600	15.79%
AR-230			**3,465**	**12**								**41,580**		
	0+00 to 2+25	R	225		DF	1	20	PfC	C	8	100		2,700	6.49%
	4+50 to 6+25	R	175		DF	2	20	HrB	C	20	90		2,100	5.05%
	6+75 to 17+00	R	1,025		BF	3	-	HrB	C	15-20	35		12,300	29.58%
	17+00 to 29+50	R	1,250		BF	4	-	TsC	D	9-20	35		15,000	36.08%
											Sub-Watershed Total	**64,380**	**49,800**	**77.35%**

BMP Type:
BM=Meadow Buffer Adjacent to Road
BF=Forested Buffer Adjacent to Road
DM=Meadow Ditch Turnout Buffer
DF=Forested Ditch Turnout Buffer

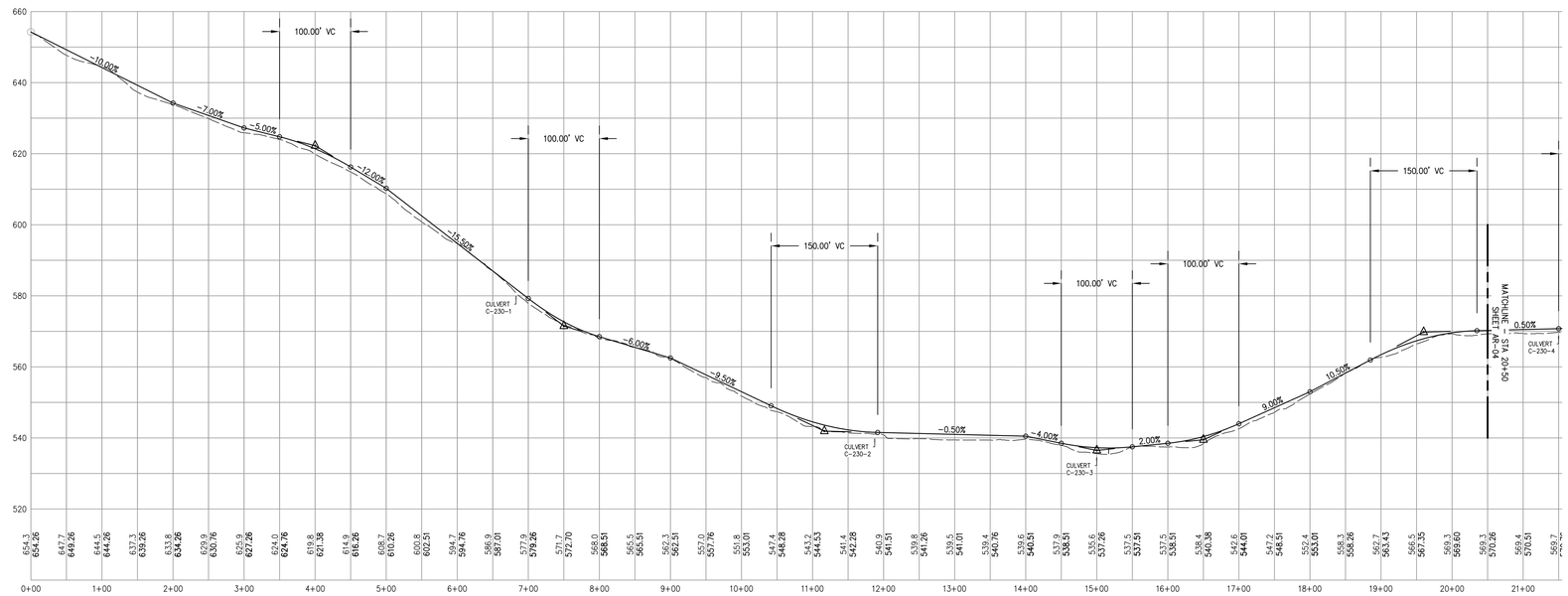
Road ID	Roadway Segment Treated (Stations)	Buffer Location (Looking Upstation) R=right side road L=left side road	Road Length (ft) Total/Treated	Road Width (ft)	BMP TYPE	BMP ID	Level Spreader Length (ft)	USDA Soil	Soil HSG	Buffer Slope (%)	Buffer Length (ft)	Impervious Area (sq-ft)	Impervious Area Treated (sq-ft)	Treatment Percentage
Carlton Stream > Kingsbury Stream > Piscataquis River														
AR-300			**1,300**	**12**								**15,600**		
	0+25 to 2+50	L	225		BM	1	-	HrB/PwC	C	3-15	50		2,700	17.31%
	6+25 to 8+25	L	200		DM	2	20	HrB	C	6	120		2,400	15.38%
	8+25 to 11+25	L	300		DF	3	20	PwC	C	6	100		3,600	23.08%
	11+25 to 13+00	L	175		DM	4	20	PwC	C	3	120		2,100	13.46%
											Sub-Watershed Total	**15,600**	**10,800**	**69.23%**
Kingsbury Stream > Piscataquis River														
AR-355			**850**	**12**								**10,200**		
	0+25 to 2+75	L	250		BF/BM	1	-	CpB	D	5	50		3,000	29.41%
	6+40 to 8+50	L	210		BF/BM	2	-	CpB	D	5	50		2,520	24.71%
AR-390			**1,575**	**12**								**18,900**		
	1+50 to 15+00	R	1,350		BF/BM	1	-	DbC	B	10-15	50		16,200	85.71%
AR-460-B			**525**	**12**								**6,300**		
	1+25 to 3+25	R	200		DF	1	20	DyC	D	8	100		2,400	38.10%
	3+25 to 5+25	R	200		DF	1	20	DyC	D	8	100		2,400	38.10%
											Sub-Watershed Total	**35,400**	**26,520**	**74.92%**
											PROJECT TOTAL	***127,380***	***97,020***	***76.17%***

BMP Type:
BM=Meadow Buffer Adjacent to Road
BF=Forested Buffer Adjacent to Road
DM=Meadow Ditch Turnout Buffer
DF=Forested Ditch Turnout Buffer



ROAD AR-230 STA. 0+00 TO 20+50

PLAN SCALE: 1"=100'



ROAD AR-230 STA. 0+00 TO 20+50

PROFILE SCALE: HOR. 1"=100'
VERT. 1"=20'

ROADWAY SUPERELEVATION TABLE		
BEGIN STATION	END STATION	DIRECTION
0+00	34+65 (END)	RIGHT

MAINE DEP PERMIT SUBMISSION

VERTICAL ROADWAY GEOMETRY FOR REFERENCE PURPOSES ONLY AND TO CONFIRM DRAINAGE PATTERNS. FINAL FINISHED GRADE ELEVATION AND VERTICAL CURVE GEOMETRY TO BE DETERMINED AS FIELD CONDITIONS DICTATE. ADJUST FINISHED GRADE ELEVATION AS NECESSARY TO PROVIDE 2' MIN COVER ON ALL CULVERTS.

100 50 0 100

GRAPHIC SCALE: FEET

NO.	REVISIONS:	APPD:	DATE:
0	ISSUED FOR REVIEW	TMH	03/28/13
1	MAINE DEP SUBMITTAL	TMH	03/29/13
2	RESPONSE TO ME DEP COMMENTS	NRP	07/03/13

STATE OF MAINE
NICHOLAS R. PORELL
No. 11829
LICENSED PROFESSIONAL ENGINEER
8-6-13

SGC ENGINEERING, LLC
• Civil Design & Survey Engineering
• Environmental & Regulatory Permitting
• Electrical Power Systems Engineering
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20 Cushing Street, Suite 200
South Portland, Maine 04106
Tel: 207-835-0231
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SGC Project: 7821001
Date: 03-20-2013
Scale: 1"=100'
Drawn: NRP
Design: NRP
Appd: TMH

Title: ACCESS ROAD PLAN AND PROFILE
ACCESS ROAD AR-230 (STA 0+00 TO 20+50)

Project: 115kV GENERATOR LEAD
MAYFIELD TWP TO PARKMAN, MAINE

Applicant: BLUE SKY WEST II, LLC
c/o First Wind Energy, LLC
129 Middle Street, 3rd Floor, Portland, ME 04101

firstwind
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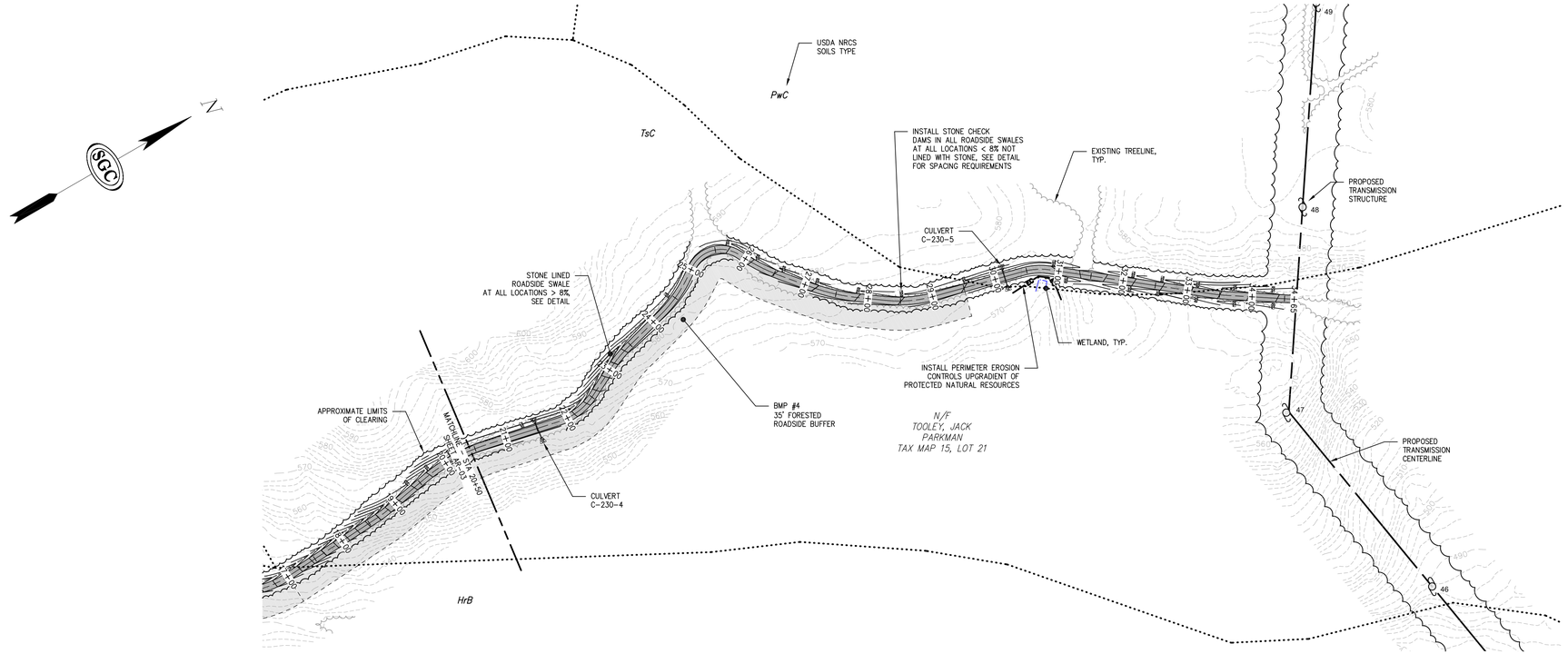
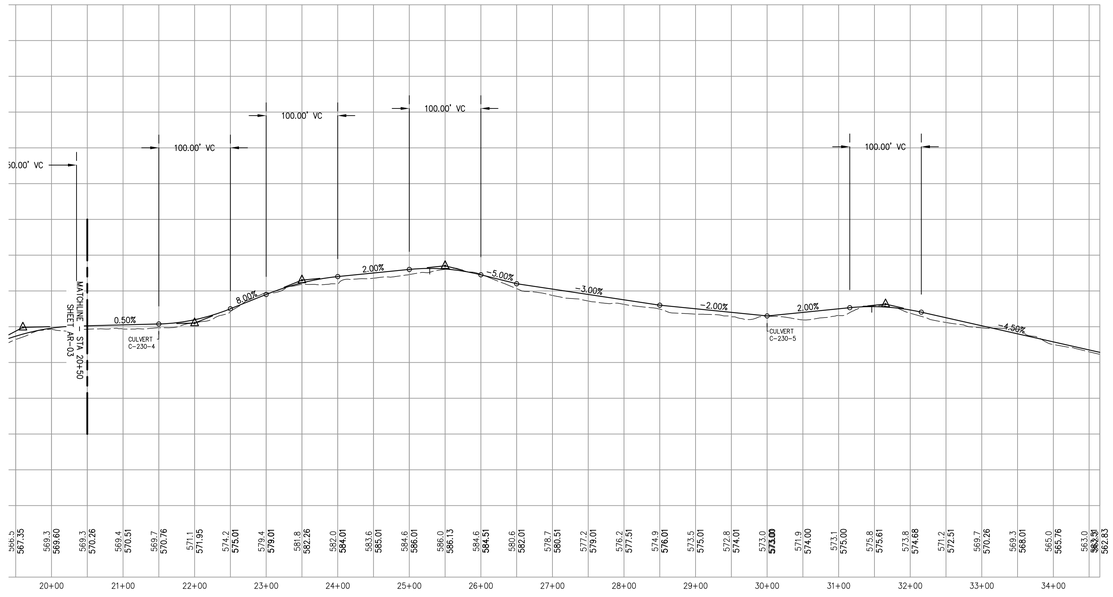
DWG. AR-03

SHEET 05 of 14



ROAD AR-230 STA. 20+50 TO 34+65 (END)

PLAN SCALE: 1"=100'



ROAD AR-230 STA. 20+50 TO 34+65 (END)

PROFILE SCALE: HOR. 1"=100'
VERT. 1"=20'

ROADWAY SUPERELEVATION TABLE		
BEGIN STATION	END STATION	DIRECTION
0+00	34+65 (END)	RIGHT

100 50 0 100
GRAPHIC SCALE: FEET

MAINE DEP PERMIT SUBMISSION

VERTICAL ROADWAY GEOMETRY FOR REFERENCE PURPOSES ONLY AND TO CONFIRM DRAINAGE PATTERNS. FINAL FINISHED GRADE ELEVATION AND VERTICAL CURVE GEOMETRY TO BE DETERMINED AS FIELD CONDITIONS DICTATE. ADJUST FINISHED GRADE ELEVATION AS NECESSARY TO PROVIDE 2' MIN COVER ON ALL CULVERTS.

NO.	REVISIONS:	APPD:	DATE:
0	ISSUED FOR REVIEW	TMH	03/26/13
1	MAINE DEP SUBMITTAL	TMH	03/29/13
2	RESPONSE TO ME DEP COMMENTS	NRP	07/03/13

STATE OF MAINE NICHOLAS R. PORELL No. 11829 PROFESSIONAL ENGINEER LICENSED

SGC ENGINEERING, LLC
• Civil Design & Survey Engineering
• Environmental & Regulatory Permitting
• Electrical Power Systems Engineering
SERVING OUR CLIENTS IN THE U.S.A. & CANADA
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South Burlington, Vermont 05403, Tel: 802.540.0161, Fax: 802.540.0191

SGC Project: 7821001 | Date: 03-20-2013 | Scale: 1"=100' | Drawn: NRP | Design: NRP | Appd: TMH

Title: ACCESS ROAD PLAN AND PROFILE
ACCESS ROAD AR-230 (STA 20+50 TO 34+65)

Project: 115kV GENERATOR LEAD
MAYFIELD TWP TO PARKMAN, MAINE

Applicant: BLUE SKY WEST II, LLC
c/o First Wind Energy, LLC
129 Middle Street, 3rd Floor, Portland, ME 04101

firstwind
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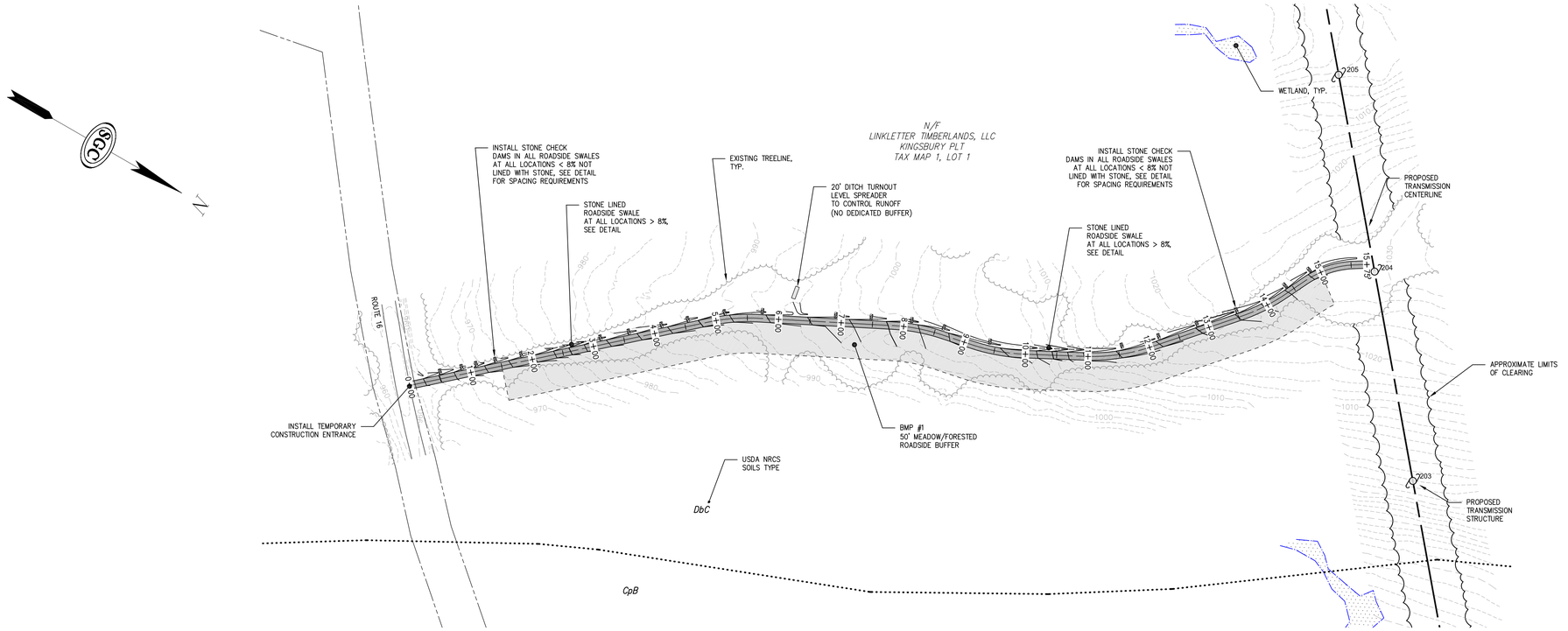
DWG. AR-04

SHEET 06 of 14



ROAD AR-390 STA. 0+00 TO 15+75 (END)

PLAN SCALE: 1"=100'

ROAD AR-390 STA. 0+00 TO 15+75 (END)

PROFILE SCALE: HOR. 1"=100'
VERT. 1"=20'

ROADWAY SUPERELEVATION TABLE		
BEGIN STATION	END STATION	DIRECTION
0+00	15+75 (END)	RIGHT

MAINE DEP PERMIT SUBMISSION

VERTICAL ROADWAY GEOMETRY FOR REFERENCE PURPOSES ONLY AND TO CONFIRM DRAINAGE PATTERNS. FINAL FINISHED GRADE ELEVATION AND VERTICAL CURVE GEOMETRY TO BE DETERMINED AS FIELD CONDITIONS DICTATE. ADJUST FINISHED GRADE ELEVATION AS NECESSARY TO PROVIDE 2' MIN COVER ON ALL CULVERTS.

100 50 0 100
GRAPHIC SCALE: FEET

NO.	REVISIONS:	APPD:	DATE:
0	ISSUED FOR REVIEW	TMH	03/28/13
1	MAINE DEP SUBMITTAL	TMH	03/29/13
2	RESPONSE TO ME DEP COMMENTS	NRP	07/03/13

STATE OF MAINE NICHOLAS R. PORELL No. 11829 REGISTERED PROFESSIONAL ENGINEER

SGC ENGINEERING, LLC
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• Environmental & Regulatory Permitting
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Bath Office: 2 Wing Farm Parkway, Suite 201, Bath, Maine 04530, Tel: 207-442-7884, Fax: 207-442-8840

Drawn: NRP | Design: NRP | Appd: TMH
Scale: 1"=100'
Date: 03-20-2013
SGC Project: 782001

Title: ACCESS ROAD PLAN AND PROFILE
ACCESS ROAD AR-390

Project: 115kV GENERATOR LEAD
MAYFIELD TWP TO PARKMAN, MAINE

Applicant: BLUE SKY WEST II, LLC
c/o First Wind Energy, LLC
129 Middle Street, 3rd Floor, Portland, ME 04101

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DWG. AR-07

SHEET 09 of 14

GENERAL EROSION CONTROL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL (ESC) MEASURES SHALL BE INSTALLED & MAINTAINED IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES BY THE CUMBERLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT AND THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION DATED MARCH, 2003 (AS REVISED).
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUCTING STORM WATER MANAGEMENT PRACTICES IN ACCORDANCE WITH LOCAL REGULATIONS AND GOVERNING AUTHORITIES AND SHALL BE RESPONSIBLE FOR ANY FINES RESULTING FROM EROSION CONTROL VIOLATIONS.
3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND SHALL BE MAINTAINED UNTIL FINAL STABILIZATION IS ACHIEVED.
4. THE CONTRACTOR SHALL PROVIDE PROPER EROSION AND SEDIMENT CONTROL MEASURES IN ALL AREAS OF WORK. PRIOR TO BEGINNING EXCAVATION WORK, SILT FENCE SHALL BE INSTALLED. EROSION CONTROL MEASURES SHOWN ON THE DRAWINGS ARE A MINIMUM, CONTRACTOR SHALL TAKE ALL OTHER NECESSARY MEASURES TO CONTROL EROSION. EROSION CONTROL MEASURES SHALL ALSO BE INSTALLED AT THE DOWNGRADIENT PERIMETER OF THE TOPSOIL STOCKPILES. ALL DISTURBED EARTH SURFACES SHALL BE STABILIZED IN THE SHORTEST PRACTICAL TIME AND TEMPORARY EROSION CONTROL DEVICES SHALL BE EMPLOYED UNTIL SUCH TIME AS ADEQUATE SOIL STABILIZATION HAS BEEN ACHIEVED. TEMPORARY STORAGE OF EXCAVATED MATERIAL SHALL BE STABILIZED IN A MANNER THAT WILL MINIMIZE EROSION.
5. THE CONTRATOR SHALL INSPECT ESC MEASURES ONCE EVERY SEVEN DAYS AND WITHIN 24 HOURS OF SIGNIFICANT RUNOFF EVENTS, INCLUDING THOSE THAT RESULT IN DISCHARGE OF STORMWATER FROM THE SITE. DAILY INSPECTIONS OF ESC MEASURES SHALL BE CONDUCTED DURING THE WINTER CONSTRUCTION PERIOD (NOVEMBER 1 –APRIL 15). REPAIRS SHALL BE MADE AS DIRECTED BY THE ENGINEER OR MAINE DEP AS NECESSARY. ACCUMULATED SEDIMENT TRAPPED BY ESC DEVICES SHALL BE REMOVED AS NECESSARY.
6. TEMPORARY CONSTRUCTION ENTRANCES ARE TO BE PROVIDED AT ALL CONNECTIONS WITH PUBLIC/PRIVATE ROADWAYS.
7. TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES SHALL BE REMOVED AND THOSE ADJACENT AREAS RESTORED UPON COMPLETION OF THE WORK OR WHEN SO ORDERED BY THE ENGINEER OR MAINE DEP. EXPOSED SOIL RESULTING FROM REMOVAL OF TEMPORARY ESC MEASURES SHALL BE RAKED, SEEDED, AND MULCHED OR MATTED AS NEEDED.
8. PERMANENT SEED MIX SHALL BE USED AS EARLY AS PRACTICABLE BETWEEN MAY 15TH AND SEPTEMBER 1ST. PERMANENT SEEDING SHALL BE COMPLETED WITHIN 7 DAYS FOLLOWING FINAL TOPSOIL/LOAM GRADING FOR NON–CRITICAL AREAS. PERMANENT SEEDING SHALL BE COMPLETED WITHIN 48 HOURS OR PRIOR TO ANY STORM EVENT, WHICHEVER OCCURS FIRST, FOLLOWING TOPSOIL/LOAM GRADING FOR CRITICAL AREAS. A CRITICAL AREA IS ANY AREA WITHIN 75 FEET OF A WETLAND, RIVER/STREAM/BROOK, POND SHORELINE, OR VERNAL POOL. SEEDED AREAS SHALL BE MULCHED THE SAME WORK DAY. MULCH SHALL CONSIST OF STRAW, HAY, OR HYDRO–MULCH. 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.
9. TEMPORARY SEED MIX SHALL BE USED BETWEEN SEPTEMBER 1ST AND MAY 15TH AND SHALL MEET THE FOLLOWING CRITERIA:

SEED	% WEIGHT	% GERMINATION
WINTER RYE	80 MINIMUM	85 MIN
RED FESCUE (CREEPING)	4 MIN	80 MIN
PERENNIAL RYE GRASS	3 MIN	90 MIN
RED CLOVER	3 MIN	90 MIN
OTHER CROP GRASS	0.5 MAX	
NOXIOUS WEED SEED	0.5 MAX	
INERT MATTER	1.0 MAX	

10. TEMPORARY MULCHING SHALL BE DONE IMMEDIATELY FOR ANY NON–CRITICAL AREA NOT TO BE WORKED FOR A 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. A CRITICAL AREA IS ANY AREA WITHIN 75 FEET OF A WETLAND, RIVER/STREAM/BROOK, POND SHORELINE, OR VERNAL POOL. IN NO CASE, SHALL ANY DISTURBED SOIL BE LEFT UNSTABILIZED FOR MORE THAN 21 DAYS AFTER INITIAL DISTURBANCE. TEMPORARY MULCH SHALL CONSIST OF STRAW OR HAY APPLIED AT 2 TONS/ACRE. STRAW OR HAY 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.
11. PERMANENT SEED MIX SHALL BE USED AS EARLY AS PRACTICABLE BETWEEN MAY 15TH AND SEPTEMBER 1ST AND MEET THE FOLLOWING CRITERIA:

RED FESCUE	50%
SHEEP FESCUE	25%
RED TOP	5%
WHITE CLOVER	10%
ANNUAL RYE	10%

12. WETLAND SEED MIX SHALL MEET THE FOLLOWING CRITERIA:

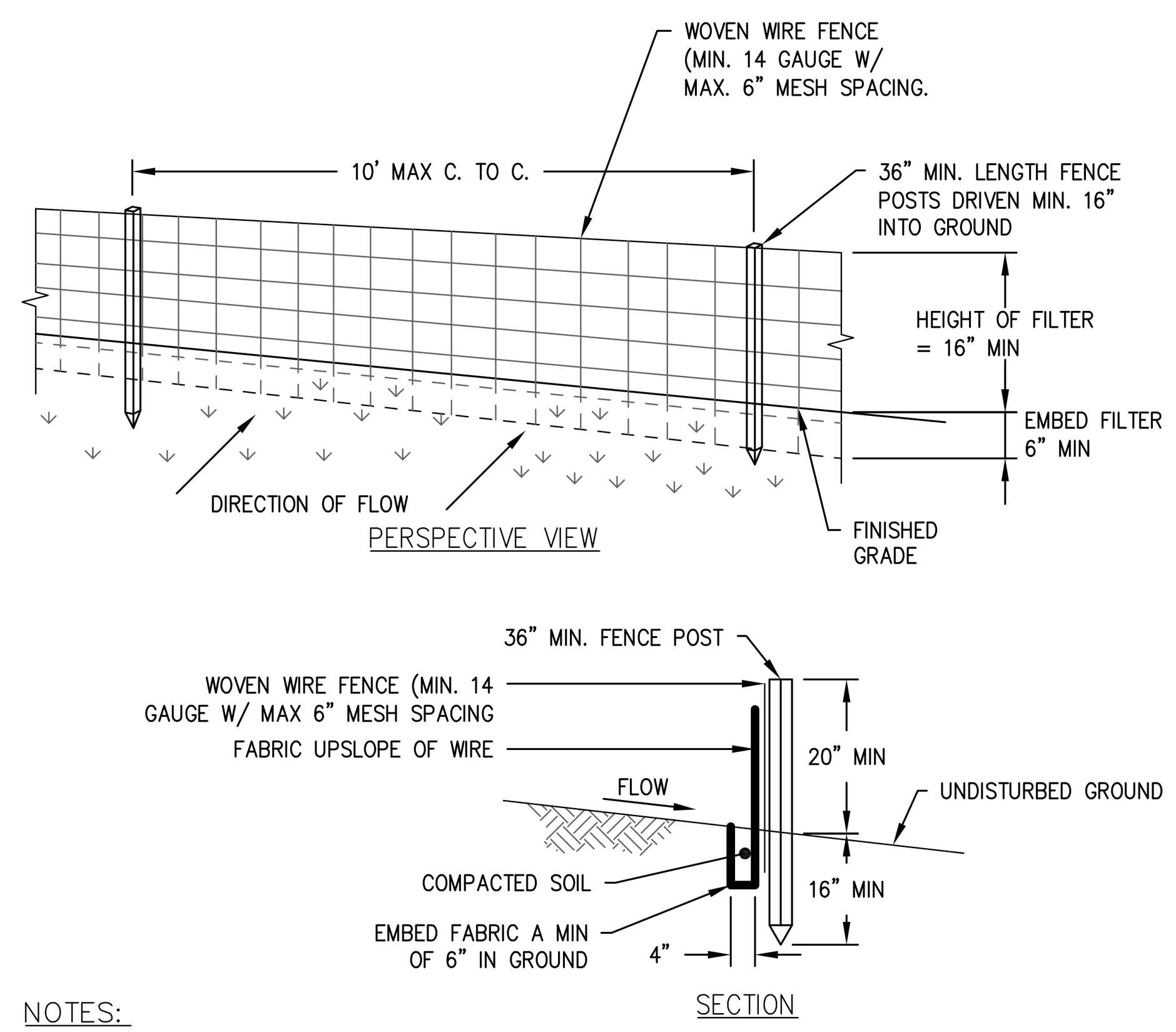
NODDING BUR MARIGOLD	3%
FOX SEDGE	13%
CREEPING BENTGRASS	14%
RIVERBANK WILD RYE	8%
VIRGINIA WILD RYE	14%
SOFT RUSH	2%
SENSITIVE FEM	1.5%
BLUE VERVAIN	1%
BLACKWELL SWITCH GRASS	25%
GREY DOGWOOD	0.5%
CREEPING RED FESCUE	18%

13. THE METHOD OF STRIPPING VEGETATION SHALL BE SUCH AS TO MINIMIZE EROSION. FILLS SHALL BE PLACED AND COMPACTED IN SUCH A MANNER THAT SOIL SLIDING AND EROSION IS MINIMIZED. GRADING SHALL BE DONE IN SUCH A MANNER AS NOT TO DIVERT WATER ON TO ADJOINING PROPERTY.
14. EROSION CONTROL BLANKET OR EQUIVALENT SHALL BE USED TO STABILIZE ALL DITCHES AND SIDESLOPES STEEPER THAN 3H:1V.
15. SEDIMENT LOGS AND OR EROSION CONTROL MIX BERMS MAY BE SUBSTITUTED FOR SILT FENCE BY THE CONTRACTOR AS CONDITIONS DICTATE.
16. PLACE EXCAVATED MATERIAL ON THE UP GRADIENT SIDE OF THE EXCAVATION TO THE EXTENT POSSIBLE, EXCESS SOILS ARE TO BE TRANSPORTED TO AN OFF–SITE UPLAND LOCATION FOR STOCKPILING. WETLAND SOILS SHALL BE STOCKPILED SEPARATELY FROM UPLAND SOILS.

WINTER CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETING ALL WINTER EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH SECTION A–3 OF "MAINE EROSION AND SEDIMENTATION CONTROL BMP'S".
2. WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED SUCH THAT FOR ANY GIVEN SEGMENT OF THE PROJECT AREA, NO MORE AREA THAN CAN BE STABILIZED IN A ONE–WEEK PERIOD IS TO BE EXPOSED AT ANY GIVEN TIME. MULTIPLE SEGMENTS AT DIFFERENT LOCATIONS WITHIN THE PROJECT AREA CAN BE EXPOSED CONCURRENTLY.
3. DISTURBED AREAS ARE TO BE LIMITED TO AREAS WHERE WORK IS TO BE COMPLETED WITHIN 15 DAYS AND CAN BE MULCHED IN ONE DAY PRIOR TO A SNOW EVENT.
4. AREAS OF DISTURBED SOIL SHALL BE STABILIZED AT THE END OF EACH WORK DAY, WITH THE FOLLOWING EXCEPTIONS: (1) IF NO RUNOFF EVENT IS FORECAST FOR WITHIN 24 HOURS AND WORK WILL RESUME IN THE SAME DISTURBED AREA WITHIN 24 HOURS AND/OR (2) DISTURBED AREAS THAT COLLECT AND RETAIN RUNOFF, SUCH AS OPEN UTILITY TRENCHES OR FOUNDATIONS, WHICH REQUIRE STABILIZATION AT THE END OF EACH WORK WEEK.
5. SNOW PILING SHALL OCCUR WITHIN THE DESIGNATED LIMITS OF DISTURBANCE.
6. DRAINAGE STRUCTURES SHALL BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
7. SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE SHALL BE INSTALLED PRIOR TO FROZEN GROUND CONDITIONS. SILT FENCE MAY BE INSTALLED WITH STONE BACKING DURING FROZEN GROUND CONDITIONS.
8. THE MULCH APPLICATION RATE SHALL BE DOUBLED DURING WINTER CONSTRUCTION TO 4 TONS/ACRE. MULCH SHALL BE APPLIED AT THE END OF EACH DAY'S WORK TO DISTURBED SOIL AREAS IF SNOW IS PREDICTED OR IMMINENT OR IF THE AREA HAS BEEN FINISH GRADED. 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. ALL MULCH APPLIED TO SLOPES STEEPER THAN 5% DURING THE WINTER CONSTRUCTION PERIOD WILL BE ANCHORED WITH BIODEGRADABLE NETTING.
9. PRIOR TO STABILIZATION, SNOW AND/OR ICE SHALL BE REMOVED TO LESS THAN 1 INCH THICKNESS.
10. TEMPORARY CONSTRUCTION ENTRANCES SHALL BE INSTALLED AND MAINTAINED AT LOCATIONS WHERE CONSTRUCTION VEHICLE TRAFFIC WILL BE ENTERING AND LEAVING THE CONSTRUCTION SITE.. ENTRANCES SHALL BE AT LEAST 14 FEET WIDE TO ACCOMMODATE VEHICULAR TRAFFIC.
11. ALL SLOPES LESS THAN 3H:1V SHALL BE MULCHED AT 4 TONS/ACRE AND TRACKED IN.
12. THE SITE STABILIZATION SCHEDULE BEFORE WINTER SHALL BE AS FOLLOWS:

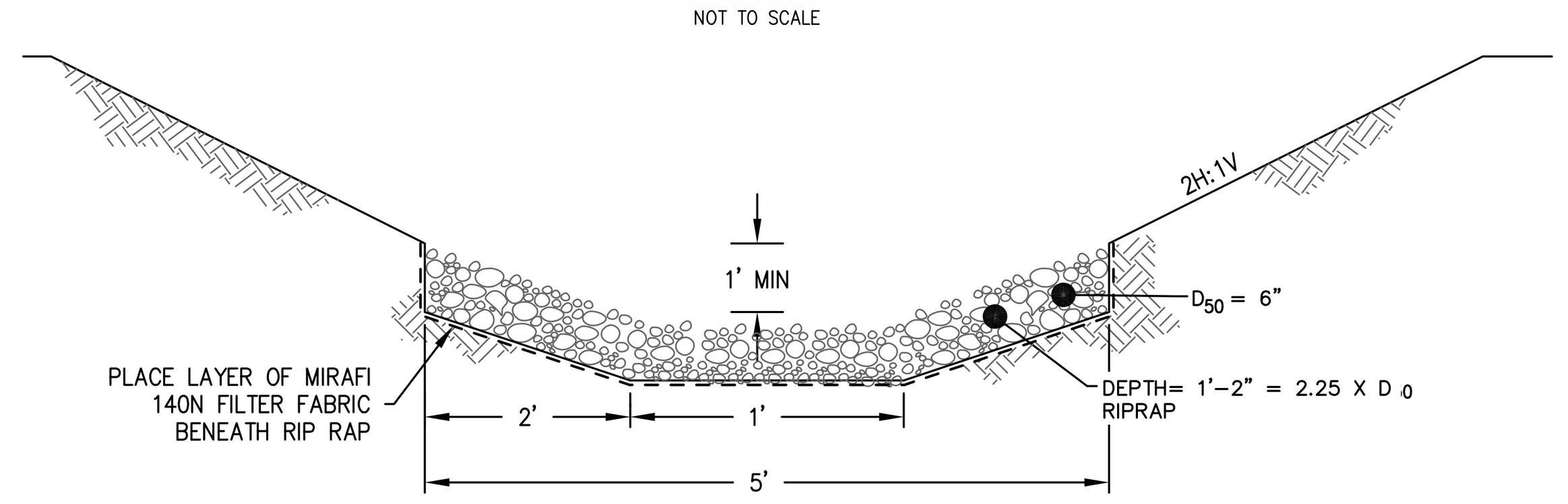
SEPTEMBER 15	ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED. ALL SLOPES MUST BE STABILIZED, SEEDED AND MULCHED. ALL GRASS LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR AN EROSION CONTROL BLANKET.
OCTOBER 1	ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANNUAL GRASS MUST BE SEEDED AT A SEEDING RATE OF 3 POUNDS PER 1000 SQ–FT AND MULCHED.
NOVEMBER 15	ALL STONE–LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED. SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THAT DATE.
DECEMBER 1	ALL DISTURBED AREAS WHERE THE GROWTH OF VEGETATION FAILS TO BE AT LEAST THREE INCHES TALL OR AT LEAST 75% OF THE DISTURBED SOIL IS COVERED BY VEGETATION, MUST BE PROTECTED FOR OVER–WINTER.



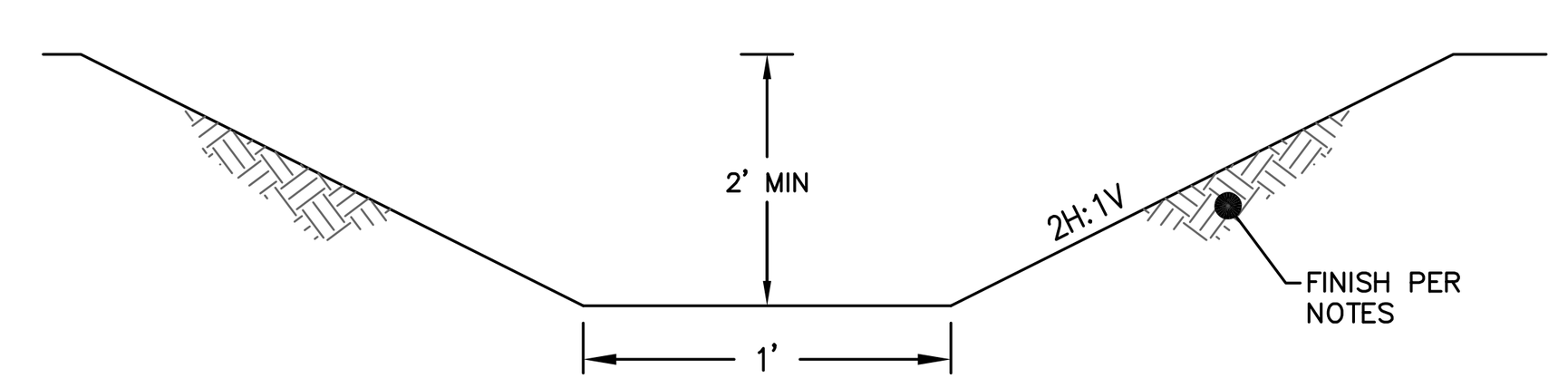
NOTES:

1. REINFORCED FENCE CAN BE USED IN PLACE OF TWO LAYERS OF CONVENTIONAL SILT FENCE WHEN WORKING IN ENVIRONMENTALLY SENSITIVE AREAS SUCH AS WITHIN 250' OF A LAKE, POND, RIVER, STREAM, OR BROOK, WITHIN 100 FEET A WETLAND OR STREAM CROSSING OR OTHER SENSITIVE AREAS.
2. WIRE REINFORCING NOT NECESSARY FOR NON–SENSITIVE INSTALLATIONS. FOR CONVENTIONAL SILT FENCE, INSTALL PER DETAIL MINUS WOVEN WIRE FENCE.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
4. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
5. DO NOT PLACE SILT FENCE IN STREAMS OR CONCENTRATED FLOW CONDITIONS.
6. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES.
7. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
8. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
9. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
10. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN SEDIMENT REACHES HALF OF FABRIC HEIGHT.
11. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN UPLAND AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF–SITE AND CAN BE PERMANENTLY STABILIZED.

SILT FENCE DETAIL
NOT TO SCALE



STONE LINED SWALE DETAIL
NOT TO SCALE

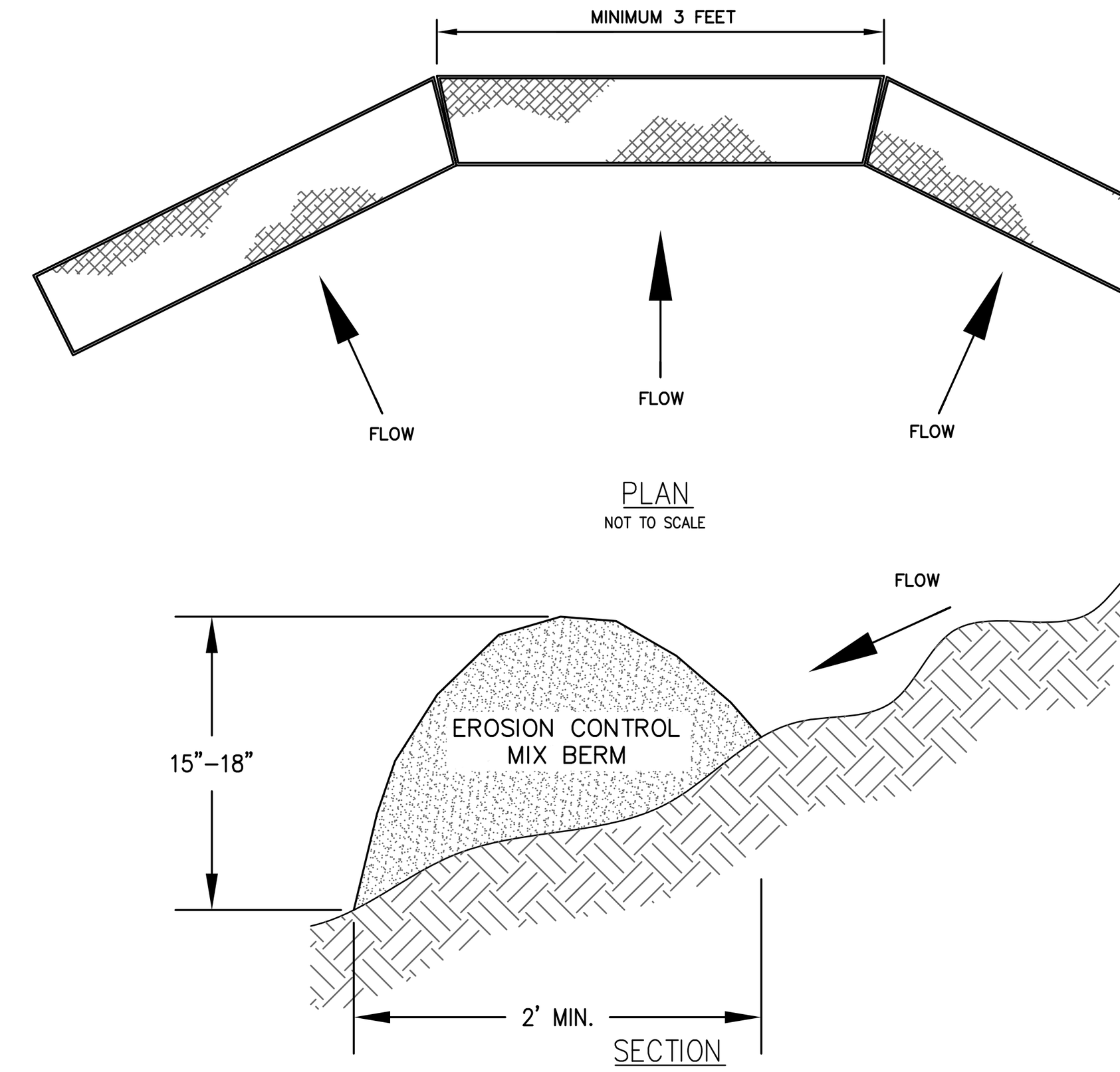


NOTES:

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 UTILIZED. 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. 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 DITCHES IN CRITICAL AREAS. A CRITICAL AREA IS ANY AREA WITHIN 75 FEET OF A WETLAND, RIVER/STREAM/BROOK, SHORELINE, OR VERNAL POOL.
7. GRASSED WATERWAY SHALL BE FINISHED AND STABILIZED AS FOLLOWS:
   - A. A MINIMUM OF 4" SCREENED LOAM SHALL BE PROVIDED AS TOPSOIL.
   - B. DURING THE WINTER MONTHS, THE PERIMETER SWALE IS TO BE LINED WITH EITHER MULCH OR EROSION CONTROL BLANKET AS GROUND CONDITIONS DICTATE.
   - C. THE GRASSED WATERWAY IS TO BE MULCHED AND SEEDED TO ENCOURAGE A GOOD CATCH OF GRASS AT THE COMPLETION OF CONSTRUCTION WHEN WINTER CONDITIONS HAVE SUBSIDED. SEED MIX SHALL MATCH ONE OF THE FOLLOWING:

BIRDSFOOT TREFOIL OR LADINO CLOVER	27%
TALL FESCUE OR SMOOTH BROMEGRASS	67%
REDTOP	6%
OR	
KENTUCKY BLUEGRASS	45%
CREEPING RED FESCUE	36%
PERENNIAL RYEGRASS	19%

ROADSIDE SWALE DETAIL
NOT TO SCALE

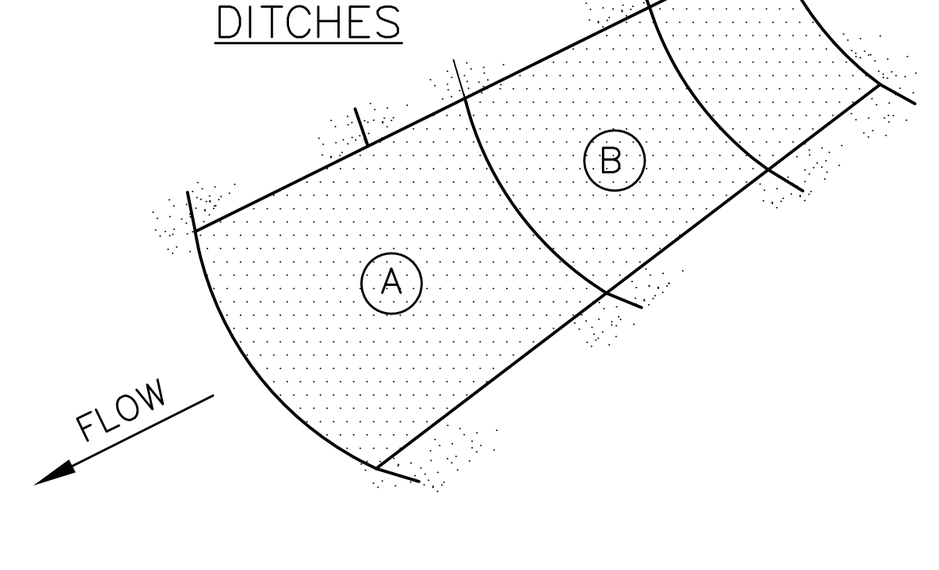


NOTES:

1. EROSION CONTROL MIX SHALL CONTAIN A WELL–GRADED MIXTURE OF STUMP GRINDINGS OR SIMILAR COARSE, FIBROUS ORGANIC MATERIAL WITH A RANGE OF SIZES AND MAY CONTAIN ROCKS LESS THAN 4–INCHES IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS.
   - 1.1. THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 80 AND 100 PERCENT, DRY WEIGHT BASIS.
   - 1.2. PARTICLE SIZE BY WEIGHT SHALL BE 100 PERCENT PASSING A 6–INCH SCREEN AND 70 PERCENT TO 85 PERCENT, PASSING A 3/4–INCH SCREEN.
   - 1.3. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
   - 1.4. LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
2. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL CONTOUR. TALL GRASSES MAY NEED TO BE CUT TO AVOID VOID SPACES THAT WOULD ALLOW FINES TO WASH UNDER THE BARRIER
3. FROZEN GROUND, OUTCROPS OF BEDROCK AND VERY ROOTED FORESTED AREAS ARE LOCATIONS WHERE BERMS OF EROSION CONTROL MIX ARE MOST PRACTICAL AND EFFECTIVE.
4. THE EROSION CONTROL MIX CAN BE CONTAINED WITHIN A SYNTHETIC TUBULAR NETTING OR 'SOCK'.

EROSION CONTROL MIX BERM DETAIL
NOT TO SCALE

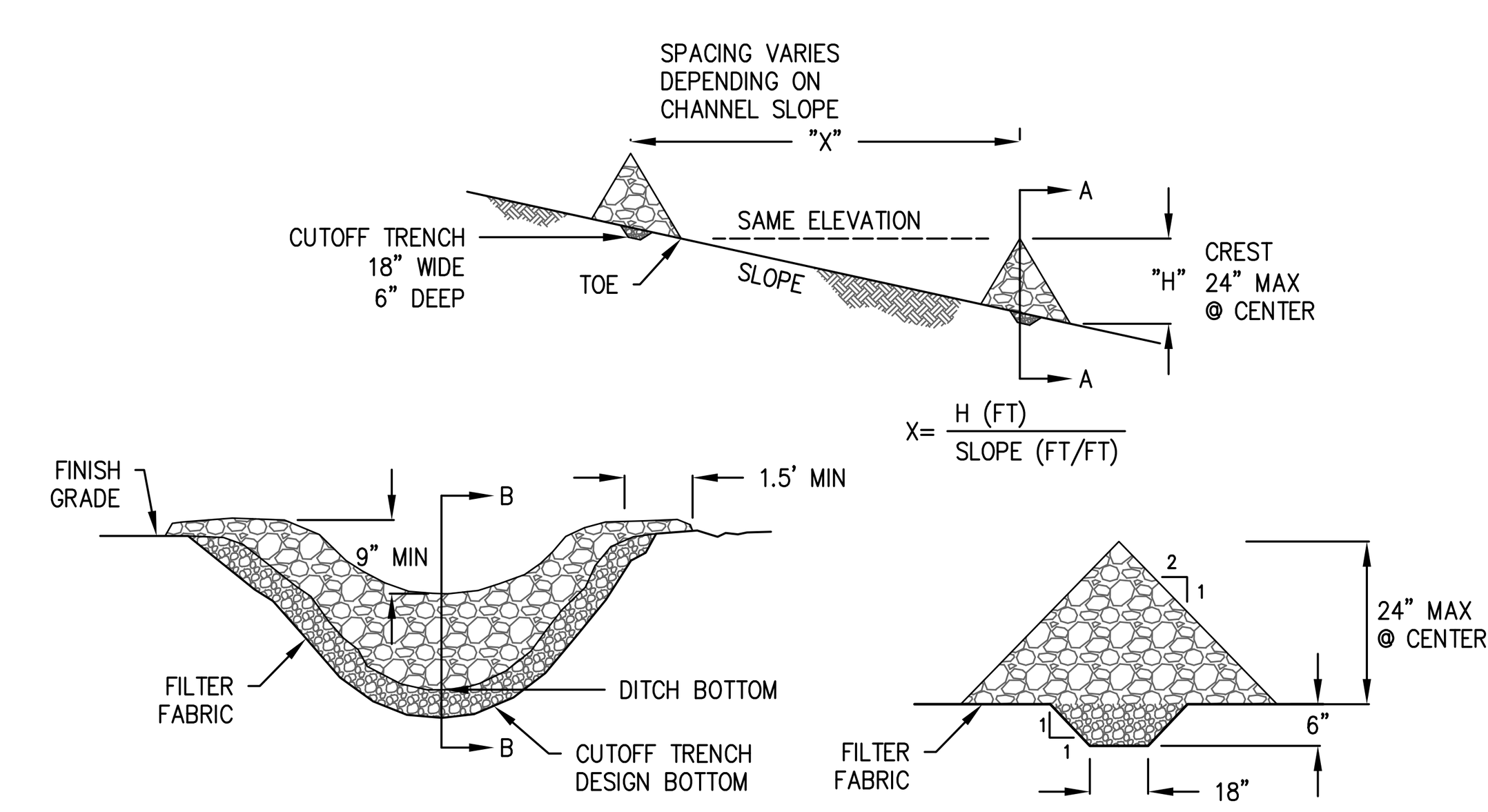
DITCHES



NOTES:

1. BURY THE TOP END OF THE MESH MATERIAL IN A 12" TRENCH. BACKFILL AND TAMP TRENCH, SECURE END WITH STAPLES AT 6" SPACING, 4" DOWN FROM EXPOSED END.
2. FLOW DIRECTION JOINTS TO HAVE UPPER END OF LOWER STRIP BURIED WITH UPPER LAYERS OVERLAPPED 4" AND STAPLED. OVERLAP B OVER A.
3. LATERAL JOINTS TO HAVE 4" OVERLAP OF STRIPS. STAPLE 18" ON CENTER.
4. STAPLE OUTSIDE LATERAL EDGE 2' ON CENTER.
5. WIRE STAPLES TO BE MIN. OF # 11 WIRE 6" LONG AND 1–1/2" WIDE.
6. USE NORTH AMERICAN GREEN DS 150 OR APPROVED EQUAL.

EROSION CONTROL BLANKET DETAIL (DITCH)
NOT TO SCALE



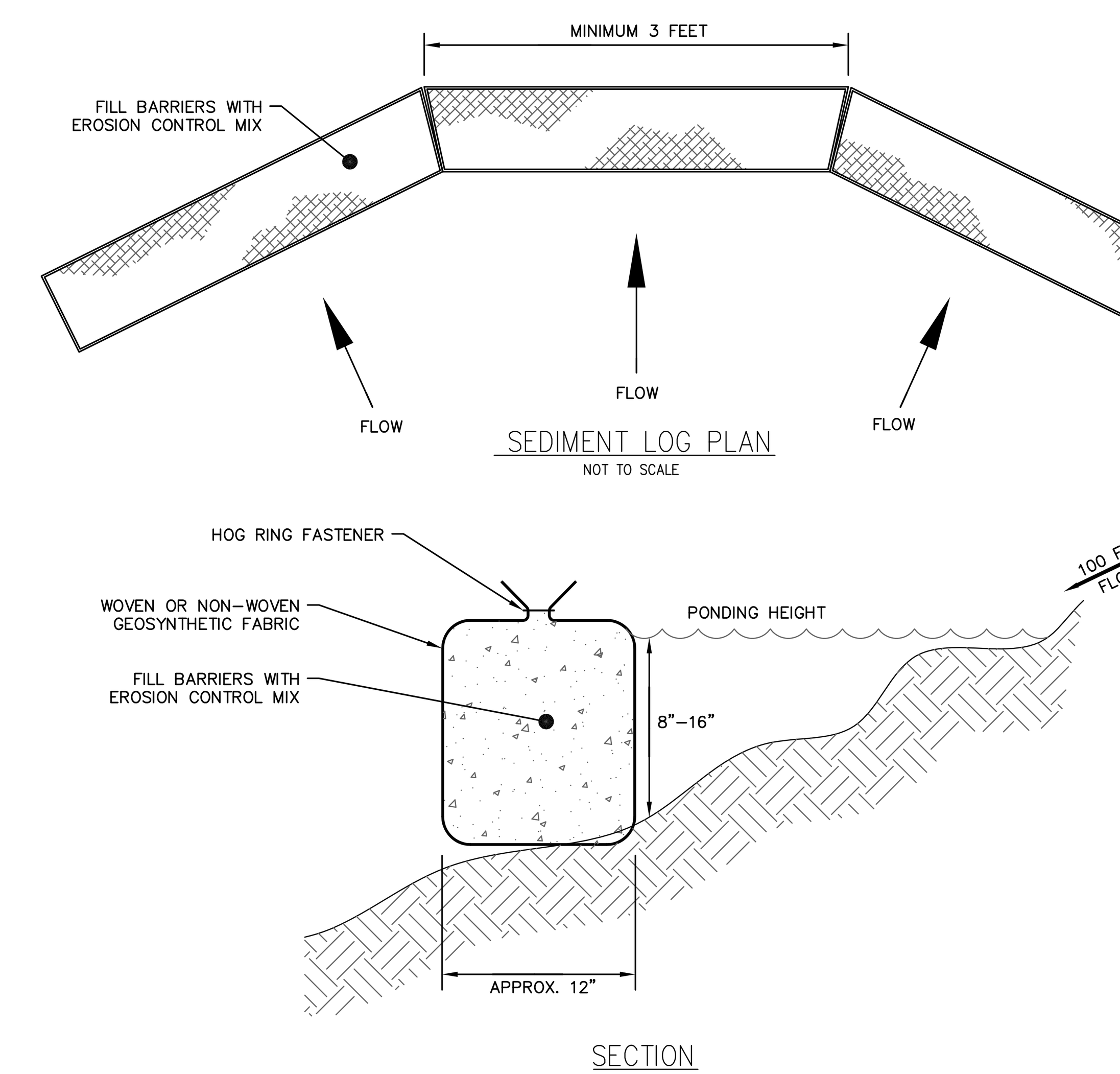
NOTES:

1. STONE SHALL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. STONE CHECK DAMS SHALL BE CONSTRUCTED OF 2 TO 3 INCH STONE.
3. SET SPACING OF CHECK DAMS SO THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE DOWNSTREAM DAM.
4. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
5. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
6. MONITOR INSTALLATION TO ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.
7. ANY SECTION OF ROUGH–GRADED DITCH WILL HAVE TEMPORARY STONE CHECK DAMS INSTALLED IN THE DITCH WITHIN 24 HOURS TO PREVENT DITCH SCOURING.

STONE CHECK DAM DETAIL
NOT TO SCALE

STONE CHECK DAM SPACING TABLE

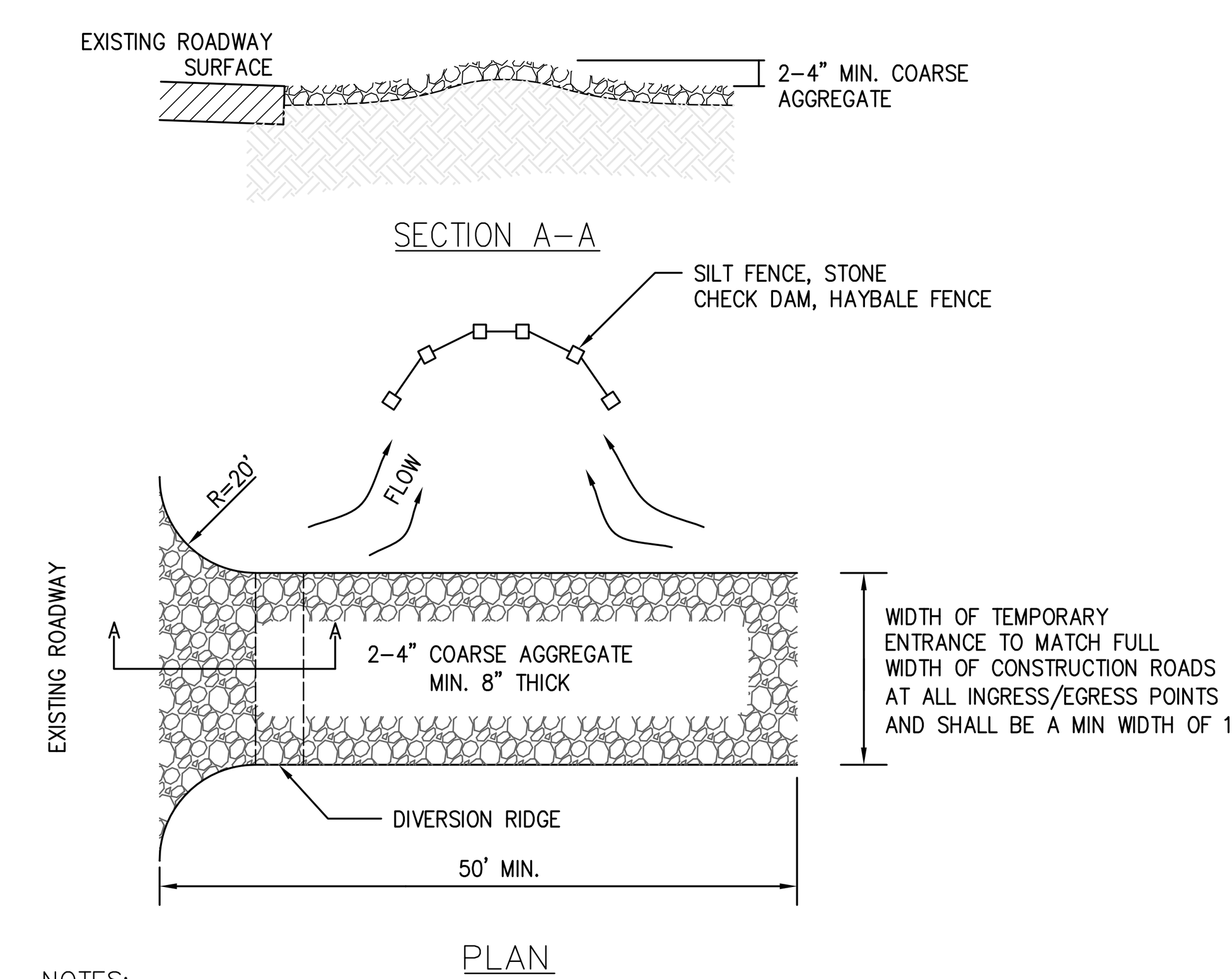
ROAD/DITCH GRADE, %	CHECK DAM SPACING, FT			
	6" HIGH	12" HIGH	18" HIGH	24" HIGH
1	50.0	100.0	150.0	200.0
2	25.0	50.0	75.0	100.0
3	16.7	33.3	50.0	66.7
4	12.5	25.0	37.5	50.0
5	10.0	20.0	30.0	40.0
6	8.3	16.7	25.0	33.3
7	7.1	14.3	21.4	28.6
≥8	USE STONE LINED SWALE, SEE DETAIL			



NOTES:

1. EROSION CONTROL MIX SHALL CONTAIN A WELL–GRADED MIXTURE OF PARTICLE SIZE AND MAY CONTAIN ROCKS LESS THAN 4–INCHES IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS.
   - 1.1. THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 80 AND 100 PERCENT, DRY WEIGHT BASIS.
   - 1.2. PARTICLE SIZE BY WEIGHT SHALL BE 100 PERCENT PASSING A 6–INCH SCREEN AND A MINIMUM OF 70 PERCENT, MAXIMUM OF 85 PERCENT, PASSING A 3/4–INCH SCREEN.
   - 1.3. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
   - 1.4. LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
   - 1.5. SUITABLE SALTS CONTENT SHALL BE LESS THAN 4.0 MINIMUM.
2. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL CONTOUR. TALL GRASSES MAY NEED TO BE CUT TO AVOID SPACES THAT WOULD ALLOW FINES TO WASH UNDER THE BARRIER
3. FROZEN GROUND, OUTCROPS OF BEDROCK AND VERY ROOTED FORESTED AREAS ARE LOCATIONS WHERE BERMS OF EROSION CONTROL MIX ARE MOST PRACTICAL AND EFFECTIVE.

SEDIMENT LOG DETAIL
NOT TO SCALE



NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAYS. THIS MAY REQUIRE TOP DRESSING. REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. ALL SEDIMENT SPILLED, DROPPED, OR WASHED ONTO PUBLIC RIGHT–OF–WAY MUST BE REMOVED IMMEDIATELY.
5. PLACE STONE ON GEOTEXTILE FABRIC EQUAL TO MIRAFI 600X.

TEMPORARY CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE

REVISIONS:

NO.	REVISIONS	APPD:	DATE:
0	ISSUED FOR REVIEW	TMH	03/20/13
1	MAINE DEP SUBMITTAL	TMH	03/29/13
2	RESPONSE TO ME DEP COMMENTS	NRP	07/03/13

STATE OF MAINE – NICHOLAS R. PORELL – No. 11829 – LICENSED – PROFESSIONAL ENGINEER – 7-3-13

SGC ENGINEERING, LLC
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• Environmental & Regulatory Permitting
• Electrical Power Systems Engineering
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SGC Project:	Date:	Scale:	Drawn:	Design:	Appd:
782001	03-20-2013		NRP	NRP	TMH

Title: ACCESS ROAD DETAILS
EROSION AND SEDIMENTATION CONTROL DETAILS

Project: 115kV GENERATOR LEAD
MAYFIELD TWP TO PARKMAN, MAINE

Applicant: BLUE SKY WEST II, LLC
c/o First Wind Energy, LLC
129 Middle Street, 3rd Floor, Portland, ME 04101

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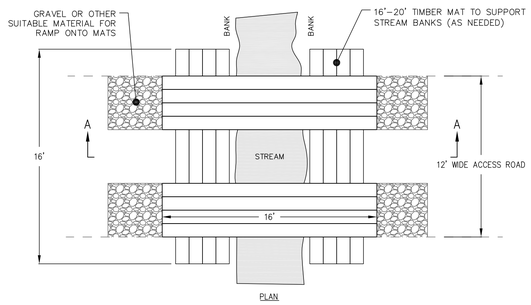
DWG. DET-01 SHEET 11 of 14

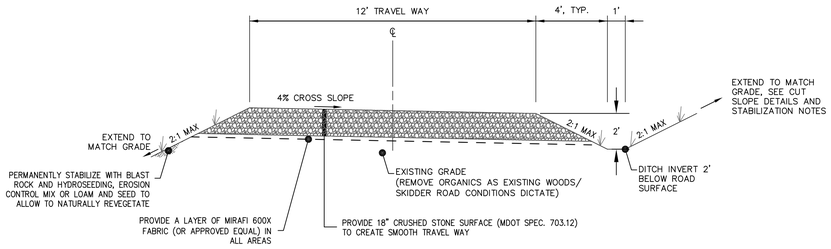


NOTES

1. DEPLOY EROSION CONTROLS AS NEEDED TO MINIMIZE EROSION.
2. PERFORM ROUTINE INSPECTION TO INCLUDE REMOVAL OF LOOSE SOIL TRACKED ONTO BRIDGE BY EQUIPMENT AND INSPECTION OF STREAM BANKS FOR STABILITY.
3. MATS SHALL BE POSITIONED TO RETAIN THE NATURAL STREAM CHARACTERISTICS.
4. MATS LAID PERPENDICULAR TO THE STREAM CAN BE SUBSTITUED WITH PRE-FABRICATED BRIDGE STRUCTURES AS SPAN LENGTHS DICTATE OR AT THE PREFERENCE OF THE CONTRACTOR.

TYPICAL "SWAMP MAT" TEMPORARY BRIDGE

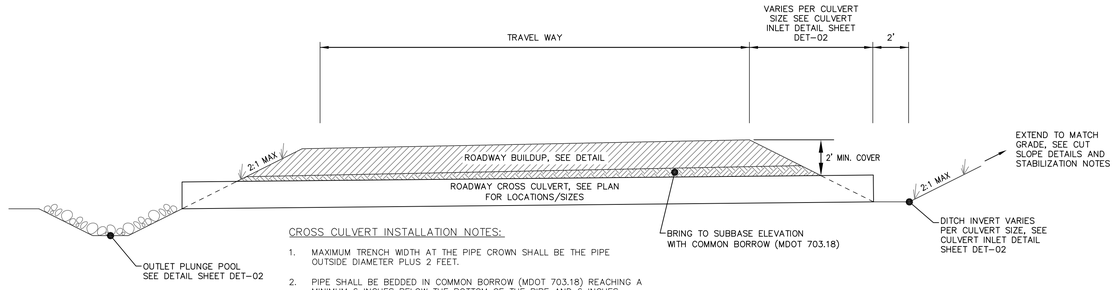
NOT TO SCALE



NOTE 12' TRANSMISSION LINE ACCESS ROAD IS SUPERELEVATED AT ALL LOCATIONS. SEE ACCESS ROAD PLANS FOR SUPERELEVATION DIRECTION TABLES.

12' TRANSMISSION LINE ACCESS ROAD CROSS-SECTION DETAIL

NOT TO SCALE

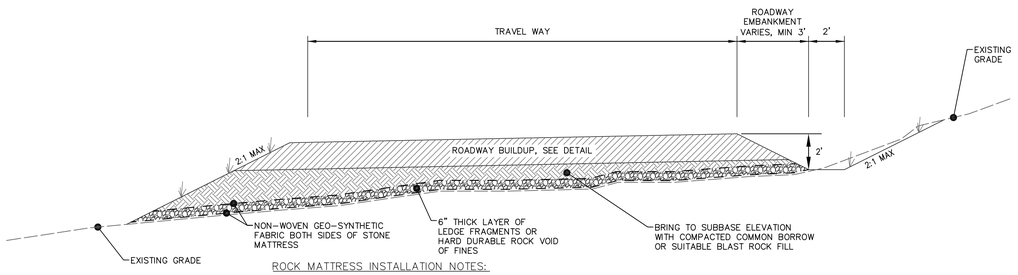


CROSS CULVERT INSTALLATION NOTES:

1. MAXIMUM TRENCH WIDTH AT THE PIPE CROWN SHALL BE THE PIPE OUTSIDE DIAMETER PLUS 2 FEET.
2. PIPE SHALL BE BEDDED IN COMMON BORROW (MDOT 703.18) REACHING A MINIMUM 6 INCHES BELOW THE BOTTOM OF THE PIPE AND 6 INCHES ABOVE THE TOP OF THE PIPE.
3. ALL ROAD CULVERTS TO BE HDPE, DOUBLE WALL, SMOOTH INTERIOR BORE, OUTSIDE CORRUGATED, ADS N-12 ST IB OR EQUAL, SIZE VARIES PER PLAN.
4. ANY CULVERT INSTALLED ON THE PROJECT SHALL HAVE THE APPROPRIATE INLET AND OUTLET PROTECTION INSTALLED WITHIN 7 DAYS FOR CULVERTS IN NON-CRITICAL AREAS AND WITHIN 48 HOURS OR PRIOR TO ANY STORM EVENT, WHICHEVER OCCURS FIRST, FOR CULVERTS IN CRITICAL AREAS. A CRITICAL AREA IS ANY AREA WITHIN 75 FEET OF A WETLAND, RIVER/STREAM/BROOK, SHORELINE, OR VERNAL POOL.

TYPICAL ROADWAY CROSS CULVERT DETAIL

NOT TO SCALE



ROCK MATTRESS INSTALLATION NOTES:

1. ROCK MATTRESS TO BE USED AS APPROPRIATE IN AREAS WHERE SIGNIFICANT UNANTICIPATED GROUNDWATER SEEPS ARE ENCOUNTERED DURING CONSTRUCTION.

TYPICAL ROCK MATTRESS DRAINAGE DETAIL

NOT TO SCALE

ROADWAY CROSS SECTION NOTES:

1. VERTICAL ROADWAY GEOMETRY FOR REFERENCE PURPOSES ONLY AND TO CONFIRM DRAINAGE PATTERNS. FINAL FINISHED GRADE ELEVATION AND VERTICAL CURVE GEOMETRY TO BE DETERMINED AS FIELD CONDITIONS DICTATE.
2. ROADWAY GRAVEL TO EXTEND TO EDGE OF THE DITCH/FILL SLOPE.
3. ALL ROADWAY MATERIALS TO BE PLACED IN 2 FOOT MAXIMUM LIFTS COMPACTED TO 95%
4. IN AREAS OF EXISTING VEGETATION/ORGAINIC MATERIAL, ROAD AREA SHALL BE GRUBBED TO A DEPTH SUFFICIENT TO REMOVE ALL ORGANICS (2 FEET MAXIMUM). BRING TO SUBGRADE WITH COMMON BORROW OR SUITABLE BLAST ROCK FILL.
5. GEOTEXTILE FABRIC TO BE PLACED BENEATH ROAD SUBBASE IN ALL AREAS.
6. LIMIT ROADWAY CLEARING TO THE EXTENT PRACTICABLE. TYPICALLY, CLEARING SHOULD BE LIMITED TO 10' FROM THE BOTTOM OF FILL SLOPES AND 5' FROM THE TOP OF CUT SLOPES.
7. IN AREAS WHERE EXISTING ROADS ARE BEING IMPROVED, RE-CONSTRUCTED, OR WIDENED, THE ADEQUACY OF EXISTING ROADWAY BASE AND SURFACE MATERIALS TO BE REUSED SHALL BE AS DETERMINED OR AGREED TO BY ENGINEER OR OTHER AUTHORIZED OWNER'S REPRESENTATIVE. IF EXISTING MATERIAL IS FOUND TO BE INADEQUATE OR OF INSUFFICIENT DEPTH, EXISTING ROADWAY MATERIALS ARE TO BE REMOVED, REPLACED, AND IMPROVED TO MEET THE SPECIFICATION OF THE ROADWAY DETAILS AS SHOWN ON THIS SHEET.
8. ROADSIDE SWALES ARE TO BE FINISHED PER THE DETAILS ON SHEET DET-01. AS INDICATED, SWALES ARE TO BE GRASS LINED FOR ROAD SLOPES OF 6% OR LESS. SWALES WITH SLOPES GREATER THAN 6% ARE TO BE FINISHED PER THE STONE LINED SWALE DETAIL.

NO.	REVISIONS:	APPD:	DATE:
0	ISSUED FOR REVIEW	TMH	03/28/13
1	MAINE DEP SUBMITTAL	TMH	03/29/13
2	RESPONSE TO ME DEP COMMENTS	NRP	07/03/13

STATE OF MAINE NICHOLAS R. PORELL No. 11829 REGISTERED PROFESSIONAL ENGINEER

SGC ENGINEERING, LLC
• Civil Design & Survey Engineering
• Environmental & Regulatory Permitting
• Electrical Power Systems Engineering
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Bowling Green, Kentucky 42103 (270) 495-4311 Fax: 270-347-4451
20 Gurnet Road, Suite 200 Brunswick, Maine 04011 (207) 406-6255 Fax: 207-347-4451
Boulder, Colorado 80301 (303) 415-0625 Fax: 855-660-7716

Drawn: NRP | Design: NRP | Appd: TMH
Scale:
Date: 03-20-2013
SGC Project: 782001

Title: ACCESS ROAD DETAILS
ROADWAY DETAILS

Project: 115kV GENERATOR LEAD
MAYFIELD TWP TO PARKMAN, MAINE

Applicant: BLUE SKY WEST II, LLC
c/o First Wind Energy, LLC
129 Middle Street, 3rd Floor, Portland, ME 04101

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DWG. DET-03

SHEET 13 of 14

Stormwater Treatment Calculations
River Watersheds
Ch. 500 4.B Stormwater Management General Standards - (Linear Project)
Stormwater treatment of new impervious area required = 75.00%

BMP ID Descriptions
BM = Meadow buffer adjacent to road
BF = Forested buffer adjacent to road
DM = Meadow ditch turnout buffer
DF = Forested ditch turnout buffer

Road ID	Roadway Segment Treated (Stations)	Buffer Location (Looking Upstation) R=right side road L=left side road	Road Length (ft) Total/Treated	Road Width (ft)	BMP TYPE	BMP ID	Level Spreader Length (ft)	USDA Soil	Soil HSG	Buffer Slope (%)	Buffer Length (ft)	Impervious Area (sq-ft)	Impervious Area Treated (sq-ft)	Treatment Percentage
Piscataquis River Watersheds														
Piscataquis River (direct)														
AR-120-B&C			**1,000**	**12**								**12,000**		
	1+00 to 2+00	R	100		BF	1	-	PhB	C	3	35		1,200	10.00%
	2+00 to 3+50	R	150		DF	2	20	HrB	C	14	90		1,800	15.00%
	3+50 to 5+75	R	225		DF	3	20	HrB	C	8	75		2,700	22.50%
	6+00 to 9+50	R	350		BF	4	-	HrB	C	8	35		4,200	35.00%
											Sub-Watershed Total	**12,000**	**9,900**	**82.50%**
Gales Brook > Piscataquis River														
AR-212			**1,900**	**12**								**22,800**		
	0+50 to 3+50	R	300		BF/BM	1	-	HrB	C	5	50		3,600	15.79%
	4+50 to 7+25	R	275		DF	2	20	HrB	C	7	100		3,300	14.47%
	7+25 to 10+25	R	300		DF	3	20	HrB	C	7	100		3,600	15.79%
	10+25 to 13+25	R	300		DF	4	20	HrB	C	8	100		3,600	15.79%
	13+25 to 16+25	R	300		DF	5	20	HrB	C	8	100		3,600	15.79%
AR-230			**3,465**	**12**								**41,580**		
	0+00 to 2+25	R	225		DF	1	20	PfC	C	8	100		2,700	6.49%
	4+50 to 6+25	R	175		DF	2	20	HrB	C	20	90		2,100	5.05%
	6+75 to 17+00	R	1,025		BF	3	-	HrB	C	15-20	35		12,300	29.58%
	17+00 to 29+50	R	1,250		BF	4	-	TsC	D	9-20	35		15,000	36.08%
											Sub-Watershed Total	**64,380**	**49,800**	**77.35%**
Carlton Stream > Kingsbury Stream > Piscataquis River														
AR-300			**1,300**	**12**								**15,600**		
	0+25 to 2+50	L	225		BM	1	-	HrB/PwC	C	3-15	50		2,700	17.31%
	6+25 to 8+25	L	200		DM	2	20	HrB	C	6	120		2,400	15.38%
	8+25 to 11+25	L	300		DF	3	20	PwC	C	6	100		3,600	23.08%
	11+25 to 13+00	L	175		DM	4	20	PwC	C	3	120		2,100	13.46%
											Sub-Watershed Total	**15,600**	**10,800**	**69.23%**
Kingsbury Stream > Piscataquis River														
AR-355			**850**	**12**								**10,200**		
	0+25 to 2+75	L	250		BF/BM	1	-	CpB	D	5	50		3,000	29.41%
	6+40 to 8+50	L	210		BF/BM	2	-	CpB	D	5	50		2,520	24.71%
AR-390			**1,575**	**12**								**18,900**		
	1+50 to 15+00	R	1,350		BF/BM	1	-	DbC	B	10-15	50		16,200	85.71%
AR-460-B			**525**	**12**								**6,300**		
	1+25 to 3+25	R	200		DF	1	20	DyC	D	8	100		2,400	38.10%
	3+25 to 5+25	R	200		DF	1	20	DyC	D	8	100		2,400	38.10%
											Sub-Watershed Total	**35,400**	**26,520**	**74.92%**
											PROJECT TOTAL	***127,380***	***97,020***	***76.17%***

CULVERT SIZING TABLE

Mannings Equation $Q\ (cfs) = \frac{kAR^{2/3}S^{1/2}}{n}$ — k= **1.486** (US Units) R= **A/P**; n= **0.013** HDPE Pipe S= **slope (ft/ft)**
A= **Pipe Area (full), ft²**
P= **Wetted Perimeter (full), ft**

Rational Method $Q\ (cfs) = C*I*A$ — C= **0.3** (Moderately Sloped Timberland, C/D Soils)
I= **6** (Rainfall Intensity, Inches/hr, Newport, ME)
A= **Area, acres**

Road ID	Culvert ID	Tributary Area sq-ft	Tributary Area acres	Calculated Runoff, Rational Method (cfs)	Length (ft)	Diameter (in) (15" Min)	# of Culverts **	Min Slope (ft/ft)	Mannings Culvert Capacity (cfs)
AR-120									
AR-212									
AR-230									
	C-230-1	130,000	2.984	5.37	25	15	1	0.02	9.14
	C-230-2	200,000	4.591	8.26	25	15	1	0.03	11.19
	C-230-3	735,000	16.873	30.37	25	24	1	0.04	45.24
	C-230-4	220,000	5.051	9.09	25	15	1	0.03	11.19
	C-230-5	205,000	4.706	8.47	25	15	1	0.03	11.19
AR-300									
AR-355									
	C-355-1	86,000	1.974	3.55	30	15	1	0.01	6.46
	C-355-2	80,000	1.837	3.31	25	15	1	0.01	6.46
AR-390									
AR-460-B									

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0	ISSUED FOR REVIEW	TMH	03/28/13
1	MAINE DEP SUBMITTAL	TMH	03/29/13
2	RESPONSE TO ME DEP COMMENTS	NRP	07/03/13

STATE OF MAINE — NICHOLAS R. PORELL — No. 11829 — LICENSED PROFESSIONAL ENGINEER — 8-7-13

SGC, ENGINEERING, LLC
• Civil Design & Survey Engineering
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Drawn: NRP | Design: NRP | Appd: TMH
Scale:
Date: 03-20-2013
SGC Project: 7822001

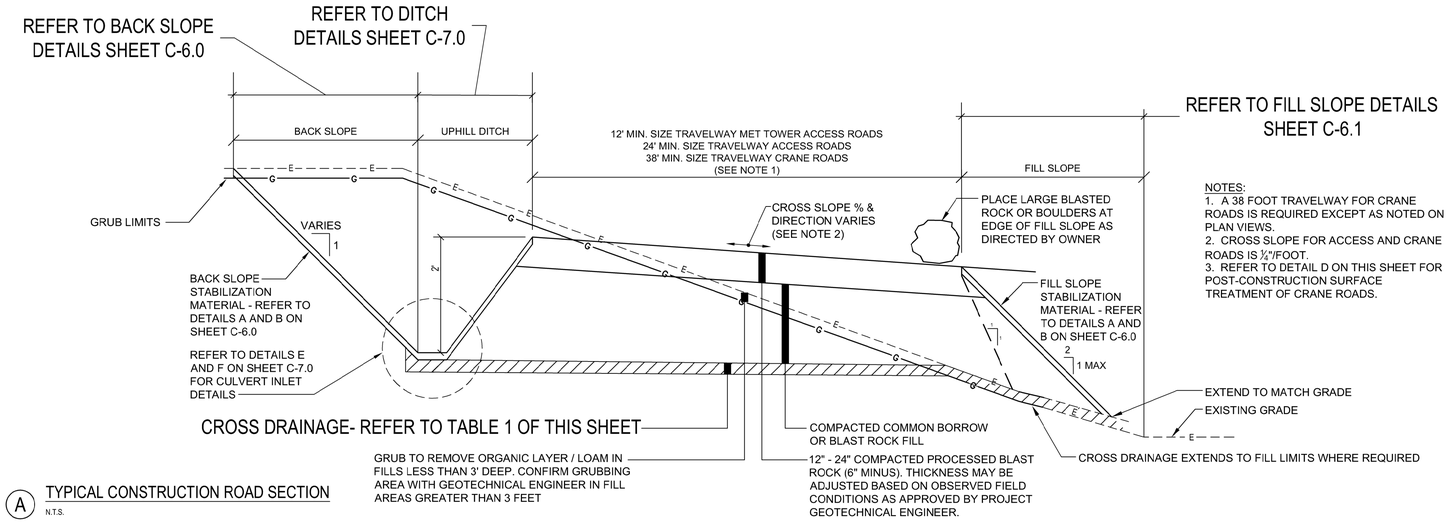
Title: STORMWATER CALCULATIONS
Project: 115kV GENERATOR LEAD, MAYFIELD TWP TO PARKMAN, MAINE
Applicant: BLUE SKY WEST II, LLC, c/o First Wind Energy, LLC, 129 Middle Street, 3rd Floor, Portland, ME 04101

firstwind. CLEAN ENERGY. MADE HERE.

The information contained herein is strictly confidential and is the sole property of the project owner.

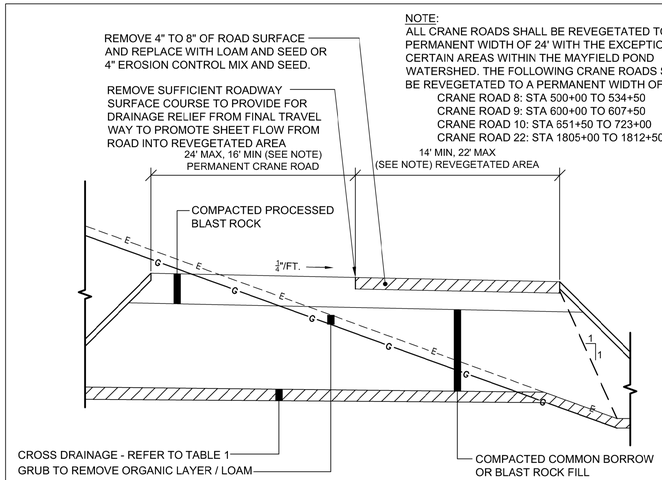
DWG. SW-01 | SHEET 14 of 14

REVISED PLAN SET



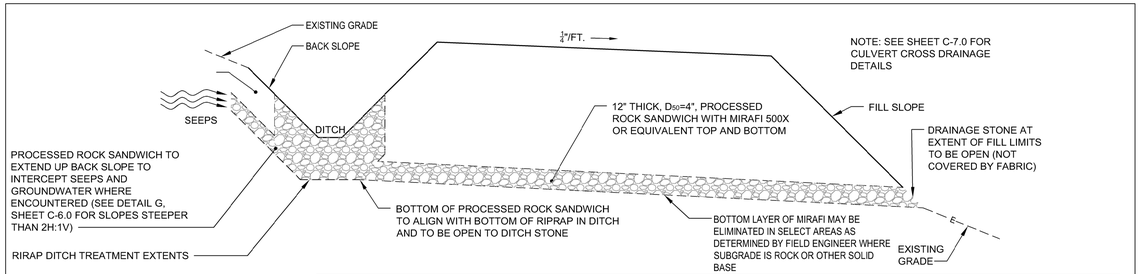
NOTES:
1. A 38 FOOT TRAVELWAY FOR CRANE ROADS IS REQUIRED EXCEPT AS NOTED ON PLAN VIEWS.
2. CROSS SLOPE FOR ACCESS AND CRANE ROADS IS ¼"/FOOT.
3. REFER TO DETAIL D ON THIS SHEET FOR POST-CONSTRUCTION SURFACE TREATMENT OF CRANE ROADS.

A TYPICAL CONSTRUCTION ROAD SECTION
N.T.S.



NOTE:
ALL CRANE ROADS SHALL BE REVEGETATED TO A PERMANENT WIDTH OF 24' WITH THE EXCEPTION OF CERTAIN AREAS WITHIN THE MAYFIELD POND WATERSHED. THE FOLLOWING CRANE ROADS SHALL BE REVEGETATED TO A PERMANENT WIDTH OF 16':
CRANE ROAD 8: STA 500+00 TO 534+50
CRANE ROAD 9: STA 600+00 TO 607+50
CRANE ROAD 10: STA 651+50 TO 723+00
CRANE ROAD 22: STA 1805+00 TO 1812+50

D POST CONSTRUCTION REVEGATION DETAIL (CRANE ROADS ONLY)
N.T.S.



NOTE: THE PRIMARY OBJECTIVE OF THIS CROSS DRAINAGE DETAIL IS TO KEEP EXISTING HYDROLOGY INTACT TO THE EXTENT POSSIBLE

TABLE 1
CROSS DRAINAGE OPTIONS

CONDITION	TYPICAL SOIL TYPE	DRAINAGE LAYER	6" CROSS PIPING	CULVERTS
① DRY SUBSOIL, NO SEEPS OR WATER TABLE AND SMALL WATERSHED ABOVE ROAD	-	NOT REQUIRED	NOT REQUIRED	REQUIRED FOR CONDITIONS 1 AND 2
② SEEPS OR WATER TABLE ENCOUNTERED OR SIGNIFICANT WATERSHED SIZE ABOVE ROAD	-	12" THICK, D50=4", PROCESSED ROCK SANDWICH AS SHOWN ON PLANS*	AS SHOWN ON PLANS (AT MORE SIGNIFICANT SEEPS - SPACING TO BE DETERMINED BY FIELD ENGINEER)*	
③ ROAD CONSTRUCTED ON DRAINAGE DIVIDE, NO WATER TABLE (NO CROSS DRAINAGE REQUIRED)	-	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED

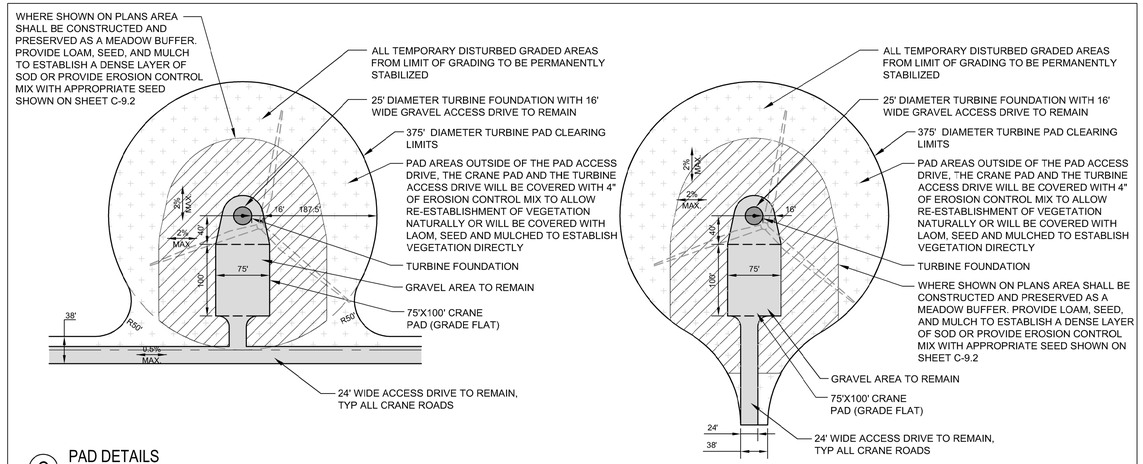
*ADDITIONAL AREAS REQUIRING THE ROCK SANDWICH OR CROSS PIPING MAY BE ENCOUNTERED ONCE CONSTRUCTION COMMENCES AND WILL BE DETERMINED BY THE FIELD ENGINEER AND CIVIL SUPERINTENDENT.

B CROSS DRAINAGE
N.T.S.

GENERAL ROADWAY CROSS SECTION NOTES (APPLICABLE TO ALL SECTIONS):

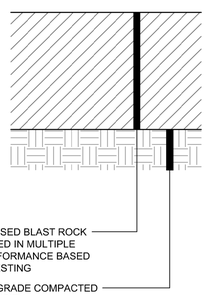
1. ALL PROPOSED ROADWAY GRADES, CUTS, FILLS AND SLOPES SUBJECT TO FINAL GEOTECHNICAL INVESTIGATION PRIOR TO CONSTRUCTION.
2. ROADWAY PROCESSED BLAST ROCK TO EXTEND TO EDGE OF THE DITCH/FILL SLOPE.
3. MAXIMUM LIFT THICKNESS AND COMPACTION SHALL BE PERFORMED BASED AND COORDINATED WITH THE PROJECT GEOTECHNICAL ENGINEER.
4. ROAD AREA SHALL BE GRUBBED A MINIMUM OF 6 INCHES BELOW EXISTING GRADE AND TO A DEPTH SUFFICIENT TO REMOVE ALL ORGANICS. BRING TO SUBGRADE WITH COMMON BORROW OR SUITABLE BLAST ROCK FILL. IN FILL AREAS GREATER THAN 3 FEET CONFIRM GRUBBING REQUIREMENTS WITH PROJECT GEOTECHNICAL ENGINEER.
5. GEOTEXTILE FABRIC TO BE PLACED BENEATH ROAD SUBBASE IN AREAS OF WEAK OR UNSTABLE SUBGRADE.
6. LIMIT ROADWAY CLEARING TO THE EXTENT PRACTICABLE. TYPICALLY, CLEARING SHOULD BE LIMITED TO 10 FEET FROM THE BOTTOM OF FILL SLOPES AND 5 FEET FROM THE TOP OF CUT SLOPES.
7. IN AREAS WHERE EXISTING ROADS ARE BEING IMPROVED, RE-CONSTRUCTED OR WIDENED, THE CONTRACTOR IS TO VERIFY THE ADEQUACY OF ROADWAY BASE AND SURFACE MATERIALS. IF EXISTING MATERIAL IS FOUND TO BE INADEQUATE OR OF INSUFFICIENT DEPTH, EXISTING ROADWAY MATERIALS ARE TO BE REMOVED, REPLACED, AND IMPROVED TO MEET THE SPECIFICATION OF THE ROADWAY DETAILS AS SHOWN ON THIS SHEET.
8. ROADSIDE SWALES ARE TO BE FINISHED PER THE DETAILS AS INDICATED. SWALES ARE TO BE GRASS LINED FOR ROAD SLOPES OF 6% OR LESS. SWALES WITH SLOPES GREATER THAN 6% ARE TO BE FINISHED PER THE STONE LINED SWALE DETAIL.
9. ROADWAY RE-VEGETATION IS TO OCCUR PER THE ROAD RE-VEGETATION DETAIL, THIS SHEET.

E GENERAL ROADWAY CROSS SECTION NOTES (APPLICABLE TO ALL SECTIONS)
N.T.S.

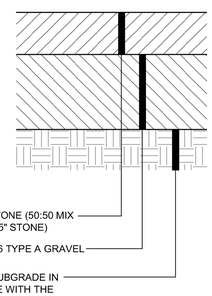


C PAD DETAILS
N.T.S.

NOTES:
1. ACTUAL LOCATIONS OF CRANE PADS SHALL BE DETERMINED IN THE FIELD
2. CRANE PADS SHALL BE GRADED WITH NO CROSS SLOPE



F TYPICAL GRAVEL CRANE PAD SECTION
N.T.S.



G SUBSTATION PAD SECTION
N.T.S.

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

ROADWAY AND PAD SECTION DETAILS

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

STATE OF MAINE STEVEN J. BLAKE II 17695 REGISTERED PROFESSIONAL ENGINEER
P.E. STEVEN J BLAKE II
LIC. # 17695

BINGHAM WIND PROJECT
BLUE SKY WEST, LLC

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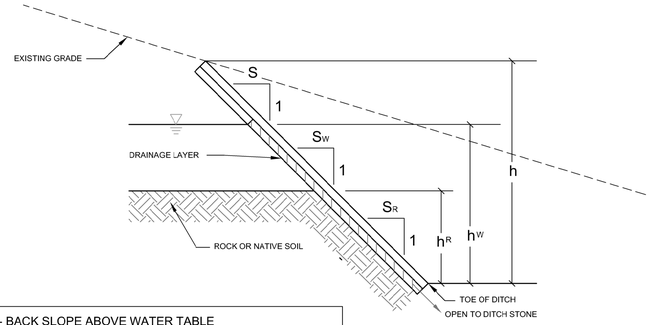
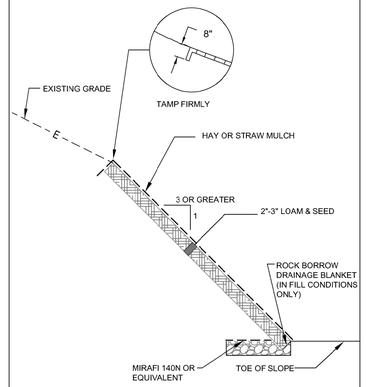
DH

SHEET
C-5.0

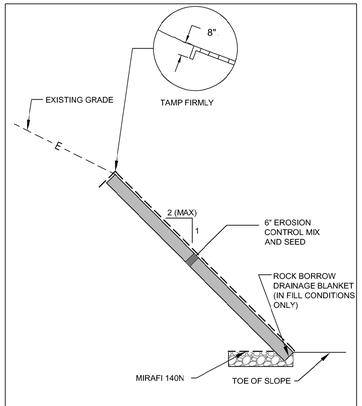


S - BACK SLOPE ABOVE WATER TABLE
S_W - BACK SLOPE BELOW WATER TABLE
S_R - BACK SLOPE IN ROCK
h_W - HEIGHT FROM TOE OF DITCH TO WATER TABLE
h_R - HEIGHT FROM TOE OF DITCH TO ROCK
h - SLOPE HEIGHT

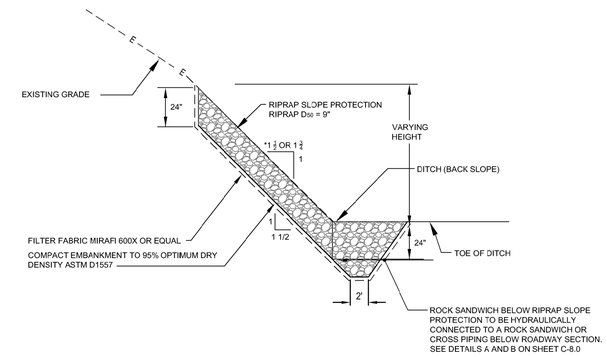
A GENERIC BACK SLOPE DETAIL
N.T.S.



C LOAM, SEED AND MULCH SLOPE (FOR EARTH SOIL BACK SLOPE CONDITIONS ONLY)
N.T.S.

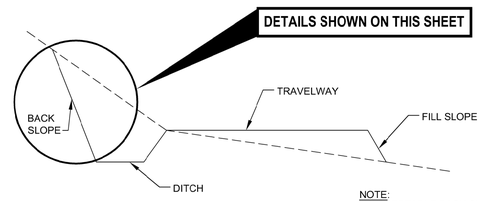


F EROSION CONTROL MIX SLOPE (FOR EARTH SOIL BACK SLOPE CONDITIONS ONLY)
N.T.S.



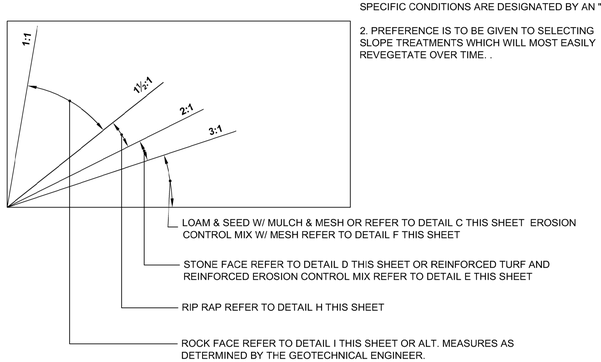
H RIPRAP SLOPE DETAIL (FOR EARTH SOIL BACK SLOPE CONDITIONS ONLY)
N.T.S.

CONDITION	Sr	Sw	S	LOAM SEED AND MULCH	EROSION CONTROL MIX	STONE FACE	RIPRAP	EXPOSED ROCK	ALT. MEASURES TO BE DETERMINED BY GEOTECHNICAL ENGINEER
ABOVE WATER TABLE	N/A	N/A	<1:1	--	--	--	--	--	X
ABOVE ROCK	N/A	N/A	1.1 to 1.75:1	--	--	--	X	--	--
	N/A	N/A	2:1	--	X	X	--	--	--
	N/A	N/A	3:1	--	X	X	--	--	--
	-	-	-	X	X	X	--	--	--
ABOVE WATER TABLE W/ ROCK	1:1	N/A	1:1	--	--	--	--	X	--
	1:1	N/A	1.5 to 1.75:1	--	--	--	--	X	--
	1:1	N/A	2:1	--	--	--	--	X	--
	1:1	N/A	3:1	--	--	--	--	X	--
	1:1	N/A	>3:1	--	--	--	--	X	--
BELOW WATER TABLE; ABOVE ROCK	N/A	Varies	1:1	--	--	--	--	--	X
(DRAINAGE LAYER OR PIPING REQUIRED)	N/A	Varies	1.5 to 1.75:1	--	--	--	X	--	--
	N/A	Varies	2:1	--	--	--	X	--	--
	N/A	Varies	3:1	--	--	--	X	--	--
	N/A	Varies	>3:1	--	--	--	X	--	--
BELOW WATER TABLE WITH ROCK	1:1	Varies	1:1	--	--	--	--	X	--
	1:1	Varies	1.5 to 1.75:1	--	--	--	--	X	--
	1:1	Varies	2:1	--	--	--	--	X	--
	1:1	Varies	3:1	--	--	--	--	X	--
	1:1	Varies	>3:1	--	--	--	--	X	--

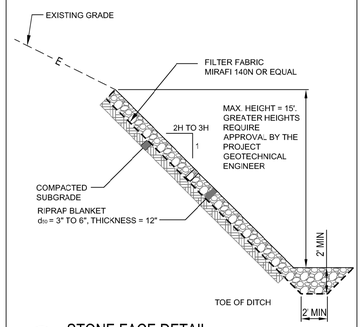


NOTE:
1. ACCEPTABLE BACK SLOPE MATERIALS FOR SPECIFIC CONDITIONS ARE DESIGNATED BY AN "X".

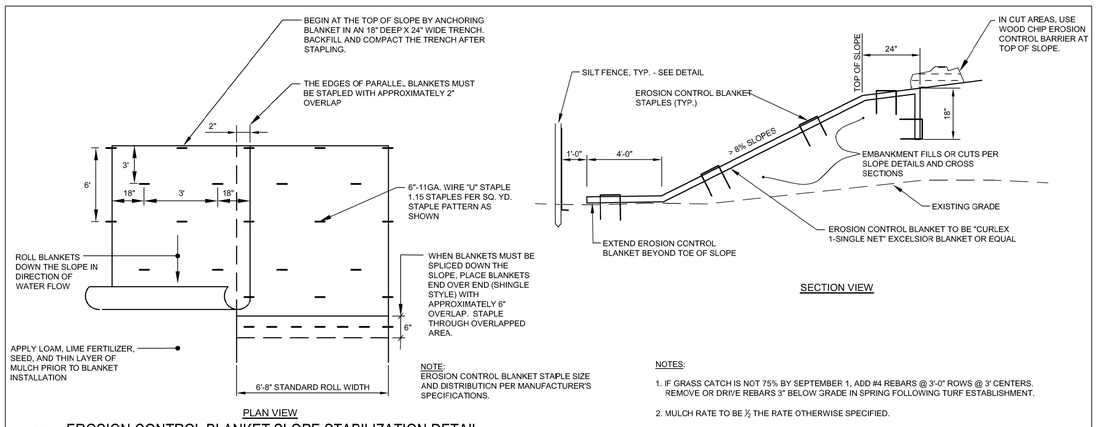
2. PREFERENCE IS TO BE GIVEN TO SELECTING SLOPE TREATMENTS WHICH WILL MOST EASILY REVEGETATE OVER TIME. .



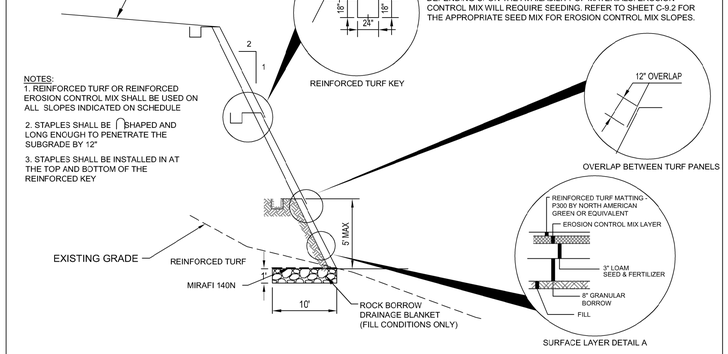
B PERMISSIBLE BACK SLOPE MATERIALS
N.T.S.



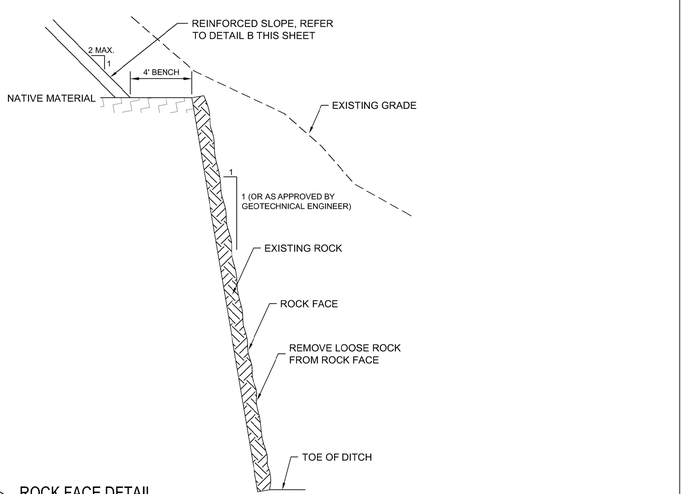
D STONE FACE DETAIL
N.T.S.



G EROSION CONTROL BLANKET SLOPE STABILIZATION DETAIL
N.T.S.



E REINFORCED TURF AND REINFORCED EROSION CONTROL MIX DETAILS - FOR EARTH FILL CONDITIONS
N.T.S.



I ROCK FACE DETAIL
N.T.S.

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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2	03.06.13	ACOE REVISIONS
1	12.19.12	PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

BACK SLOPE 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 — 16595 — REGISTERED PROFESSIONAL ENGINEER

P.E. STEVEN J. BLAKE II
LIC. # 16595

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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778 MAIN STREET, SUITE 8
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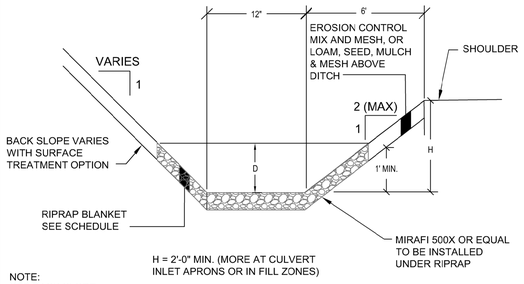
207.775.1121
www.delucahoffman.com

SHEET
C-6.0



H = 2'-0" MIN. (MORE AT CULVERT INLET APRONS OR IN FILL ZONES)

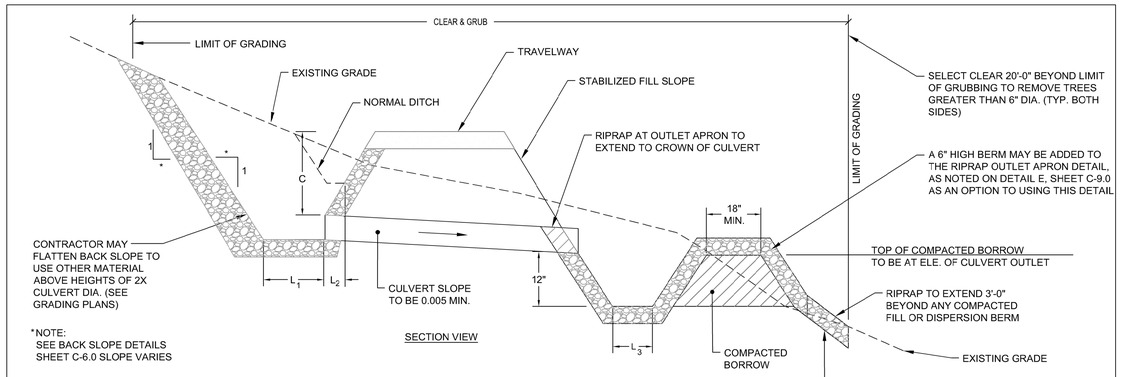
NOTE:
SEE BACK SLOPE DETAILS SHEET C-6.0

Ⓐ 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.

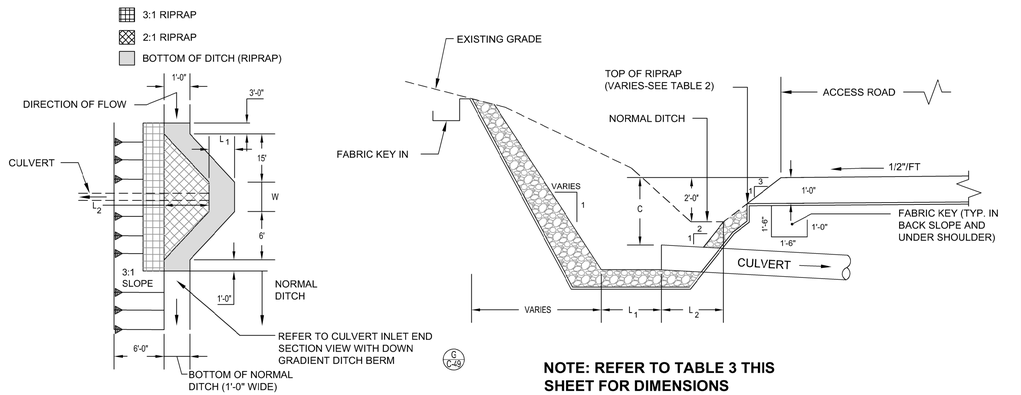


*NOTE:
SEE BACK SLOPE DETAILS
SHEET C-6.0 SLOPE VARIES

SECTION VIEW

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

Ⓑ VACANT
N.T.S.

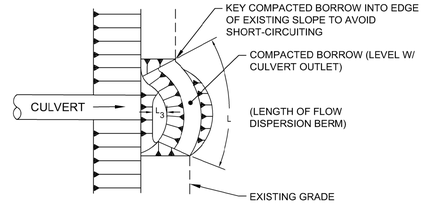


NOTE: REFER TO TABLE 3 THIS SHEET FOR DIMENSIONS

Ⓔ CULVERT INLET PLAN VIEW
N.T.S.

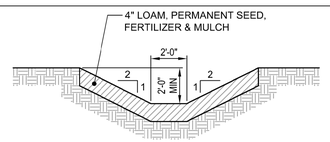
CULVERT INLET SECTION VIEW
N.T.S.

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 SC 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 NO" 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.

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

C. THE GRASSED WATERWAY IS TO BE MULCHED 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.

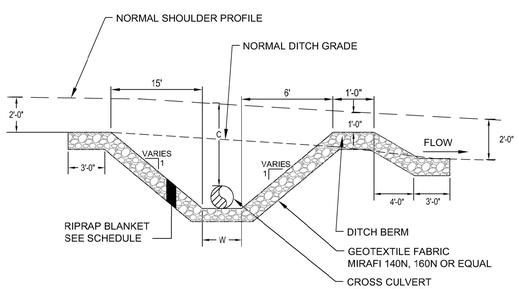
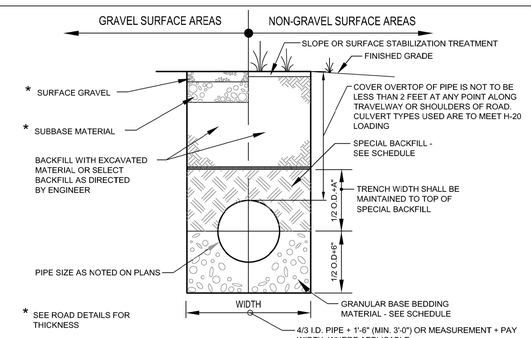


TABLE 3								
DIMENSIONAL SCHEDULE FOR CULVERT INLETS AND FLOW DISPERSION BERMS								
CULVERT DIAMETER	RIPRAP BLANKET		W	C	L_1	L_2	L_3	L
	D_{50}	THICKNESS						
12"	6"	14"	2'	36"	2'	4'	8'	8'
18"	6"	14"	4'	30"	4'	4'	*	*
24"	6"	14"	6'	24"	6'	4'	*	*
30"	12"	27"	8'	24"	8'	5'	*	*
36"	12"	27"	8'	24"	8'	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
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

DITCH AND CULVERT DETAILS

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

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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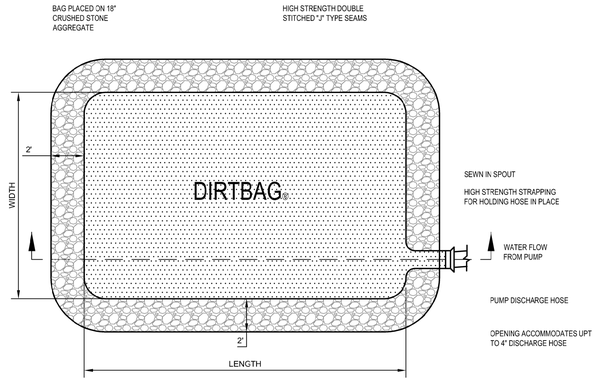
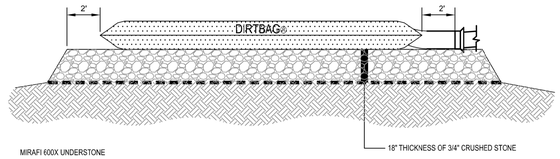


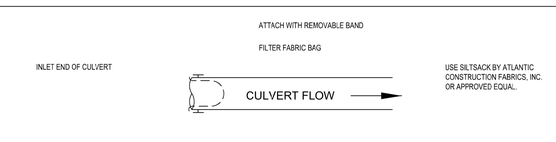
PLAN VIEW



SECTION VIEW

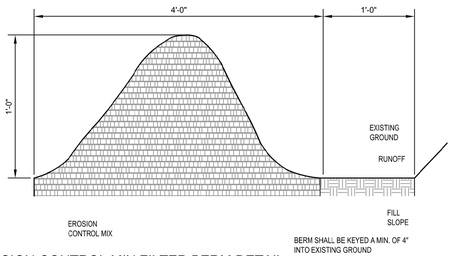
NOTE:
THE OWNER'S ENGINEER SHALL DESIGNATE THE LOCATION OF DIRTBAG PLACEMENT FOR CONSTRUCTION DEWATERING. IN ALL CASES, THE DIRTBAG WILL BE LOCATED IN A VEGETATED, UPLAND AREA HAVING A SLOPE LESS THAN 15% AND BE AT LEAST 75 FT FROM THE EDGE OF ANY WETLAND, THE EDGE OF ANY RIVER / STREAM / BROOK AND ANY POND SHORELINE. NO DIRTBAG SHALL BE LOCATED SUCH THAT ITS DISCHARGE WILL FLOW INTO A SIGNIFICANT VERNAL POOL (WHETHER CURRENTLY FLOODED OR DRY).

(A) DIRTBAG DETAIL
N.T.S.

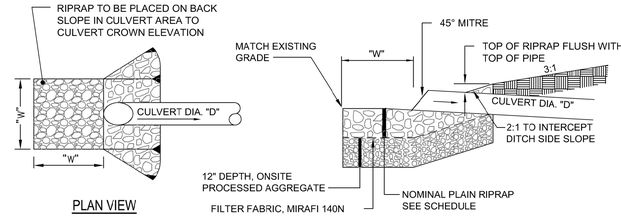


(B) SILT SACK DETAIL
N.T.S.

NOTES:
1. THE EROSION CONTROL MIX SHALL CONFORM TO THE FOLLOWING STANDARDS:
   - A. THE ORGANIC MATTER CONTENT IS BETWEEN 50 AND 100%, DRY WEIGHT BASIS.
   - B. PARTICLE SIZE BY WEIGHT IS 100% PASSING A 6" SCREEN AND A MINIMUM OF 70%, MAXIMUM OF 85%, PASSING A 0.75" SCREEN.
   - C. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
   - D. LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
   - E. SOLUBLE SALTS CONTENT IS LESS THAN 4.0 MMHOS/CM.
   - F. THE pH SHOULD FALL BETWEEN 5.0 AND 8.0.
   - G. ON SLOPES LESS THAN 5% OR AT THE BOTTOM OF STEEPER SLOPES (<2:1) UP TO 20 FEET LONG, THE BARRIER SHOULD BE A MINIMUM OF 12" HIGH, AS MEASURED ON THE UPHILL SIDE OF THE BARRIER, AND A MINIMUM OF TWO FEET WIDE. ON LONGER OR STEEPER SLOPES, THE BARRIER SHOULD BE WIDER TO ACCOMMODATE THE ADDITIONAL FLOW.
   - H. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL, CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BARRIER THROUGH THE GRASS BLADES OR PLANT STEMS.
   - I. GOCD LOCATIONS FOR STAND-ALONE USE WITHOUT REINFORCEMENT BY OTHER BMPS ARE:
     - AT TOE OF SHALLOW SLOPES;
     - ON FROZEN GROUND, OUTCROPS OF BEDROCK AND VERY ROOTED FORESTED AREAS; AND
     - AT THE EDGE OF GRAVEL PARKING AREAS AND AREAS UNDER CONSTRUCTION.
   - J. LOCATIONS WHERE OTHER BMPS SHOULD BE USED:
     - AT LOW POINTS OF CONCENTRATED RUNOFF;
     - BELOW CULVERT OUTLET APRONS;
     - WHERE A PREVIOUS STAND-ALONE EROSION CONTROL MIX APPLICATION HAS FAILED;
     - AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT ARE MORE THAN 50 FEET FROM TOP TO BOTTOM (I.E., A LARGE UP-GRADIENT CONTRIBUTING WATERSHED); AND
     - AROUND CATCHBASINS AND CLOSED STORM SYSTEMS.
2. BERMS SHALL REMAIN IN PLACE UNTIL UPSTREAM AREA IS COMPLETED OR 90% CATCH OF VEGETATION IS ATTAINED. BERMS SHALL BE REMOVED BY SPREADING SUCH THAT THE NATIVE EARTH CAN BE SEEN BELOW.



(C) EROSION CONTROL MIX FILTER BERM DETAIL
N.T.S.



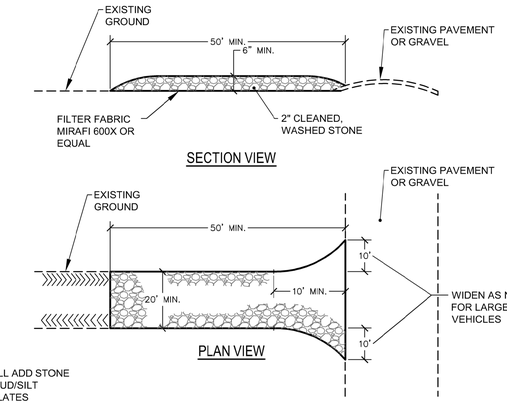
PLAN VIEW

SECTION VIEW

NOTE:
RIPRAP GRADATION AND PLACEMENT - THE RIPRAP GRADATION SHALL BE A WELL-GRADED MIX FROM ABOUT 1.5 TIMES THE d_{50} SIZE TO ABOUT 25 PERCENT OF THE d_{50} SIZE. THE RIPRAP STONES SHALL BE CAREFULLY PLACED WORKING FROM THE TOE OF THE SLOPE UPWARD. THE STONES SHOULD BE LOWERED TO THE SLOPE AND NOT BE ALLOWED TO DROP MORE THAN 12 INCHES ONTO THE GEOTEXTILE. THE FINISHED SURFACE SHALL BE A RELATIVELY SMOOTH UNIFORMLY SLOPED SURFACE.

SCHEDULE FOR STORM DRAIN			
CULVERT DIAMETER (D)	WIDTH (W)	STONE ds_{50}	RIPRAP THICKNESS
12"	2'	6"	14"
15" OR 18"	4'	6"	14"
24"	6'	6"	14"
30"	8'	12"	27"
36"	8'	12"	27"

(D) PIPE / CULVERT INLET APRON IN FILL AREAS
N.T.S.

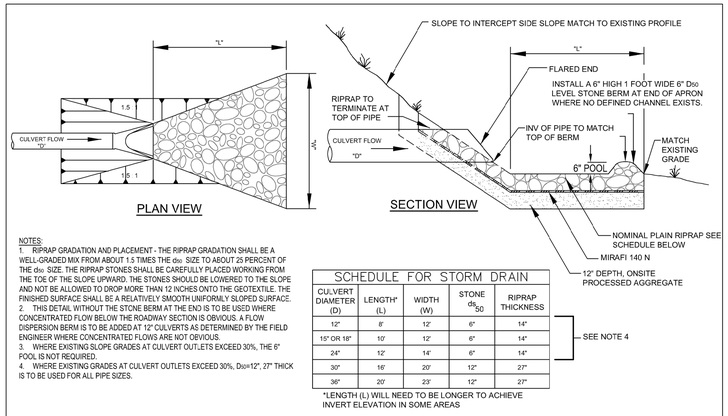


SECTION VIEW

PLAN VIEW

NOTE:
CONTRACTOR SHALL ADD STONE TO ENTRANCE AS MUD/SILT MATERIAL ACCUMULATES

(G) STABILIZED CONSTRUCTION ENTRANCE
N.T.S.



PLAN VIEW

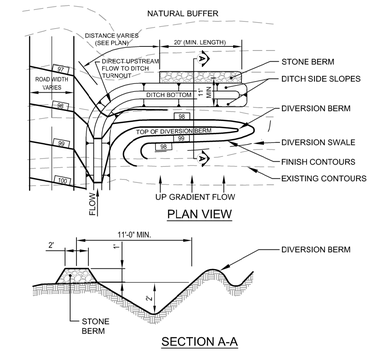
SECTION VIEW

NOTES:
1. RIPRAP GRADATION AND PLACEMENT - THE RIPRAP GRADATION SHALL BE A WELL-GRADED MIX FROM ABOUT 1.5 TIMES THE d_{50} SIZE TO ABOUT 25 PERCENT OF THE d_{50} SIZE. THE RIPRAP STONES SHALL BE CAREFULLY PLACED WORKING FROM THE TOE OF THE SLOPE UPWARD. THE STONES SHOULD BE LOWERED TO THE SLOPE AND NOT BE ALLOWED TO DROP MORE THAN 12 INCHES ONTO THE GEOTEXTILE. THE FINISHED SURFACE SHALL BE A RELATIVELY SMOOTH UNIFORMLY SLOPED SURFACE.
2. THIS DETAIL WITHOUT THE STONE BERM AT THE END IS TO BE USED WHERE CONCENTRATED FLOW BELOW THE ROADWAY SECTION IS OBVIOUS. A FLOW DISPERSION BERM IS TO BE ADDED AT 12' CULVERTS AS DETERMINED BY THE FIELD ENGINEER WHERE CONCENTRATED FLOWS ARE NOT OBVIOUS.
3. WHERE EXISTING SLOPE GRADES AT CULVERT OUTLETS EXCEED 30%, THE 6" POOL IS NOT REQUIRED.
4. WHERE EXISTING GRADES AT CULVERT OUTLETS EXCEED 30%, D_{50}=12", 27" THICK IS TO BE USED FOR ALL PIPE SIZES.

SCHEDULE FOR STORM DRAIN					
CULVERT DIAMETER (D)	LENGTH* (L)	WIDTH (W)	STONE ds_{50}	RIPRAP THICKNESS	
12"	8'	12'	6"	14"	SEE NOTE 4
15" OR 18"	10'	12'	6"	14"	
24"	12'	14'	6"	14"	
30"	16'	20'	12"	27"	
36"	20'	23'	12"	27"	

*LENGTH (L) WILL NEED TO BE LONGER TO ACHIEVE INVERT ELEVATION IN SOME AREAS

(E) PIPE / CULVERT OUTLET APRON
N.T.S.

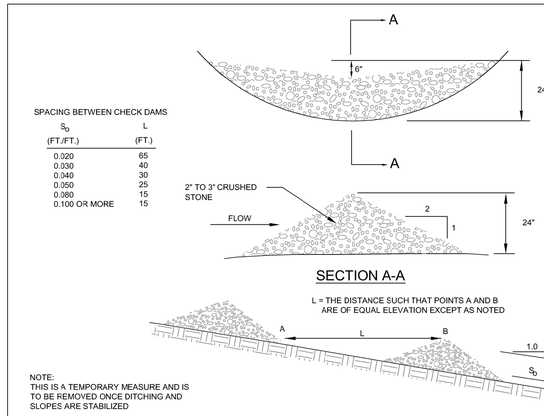


PLAN VIEW

SECTION A-A

NOTES:
1. ONLY RUNOFF FROM ADJACENT ROAD SURFACE AND SHOULDERS BE DIRECTED TO BUFFER.
2. BUFFER SLOPES NOT ALLOWED ON SLOPES IN EXCESS OF 15%.
3. NO MORE THAN 400 FEET OF ROAD AND DITCH MAY BE TREATED IN ANY ONE DITCH TURNOUT BUFFER, AND NO MORE THAN 250 FEET MAY BE TREATED IF MORE THAN ONE TRAVEL LANE IS DRAINING TO THE DITCH.
4. THE TURNOUT SHOULD EXTEND INTO THE SIDE DITCH OR CUT SLOPE TO INTERCEPT THE DITCH RUNOFF AND CARRY IT INTO THE BUFFER AREA.
5. THE STONE BERM MUST BE AT LEAST 20 FEET IN LENGTH AND CONSTRUCTED ALONG THE CONTOUR. IT MUST BE AT LEAST ONE FOOT HIGH AND TWO FEET ACROSS THE TOP WITH 2:1 SIDE SLOPES. THE STONE MUST CONSIST OF SOUND DURABLE ROCK THAT WILL NOT DISINTEGRATE BY EXPOSURE TO WATER OR WEATHER. FIELDSTONE, ROUGH QUARRIED STONE, BLASTED LEDGE OR TAILINGS MAY BE USED. THE ROCK MUST BE WELL GRADED WITH A MEDIAN SIZE OF APPROXIMATELY 3 INCHES AND A MAXIMUM SIZE OF 6 INCHES.

(F) TYPICAL DITCH TURNOUT BUFFER DETAIL
N.T.S.

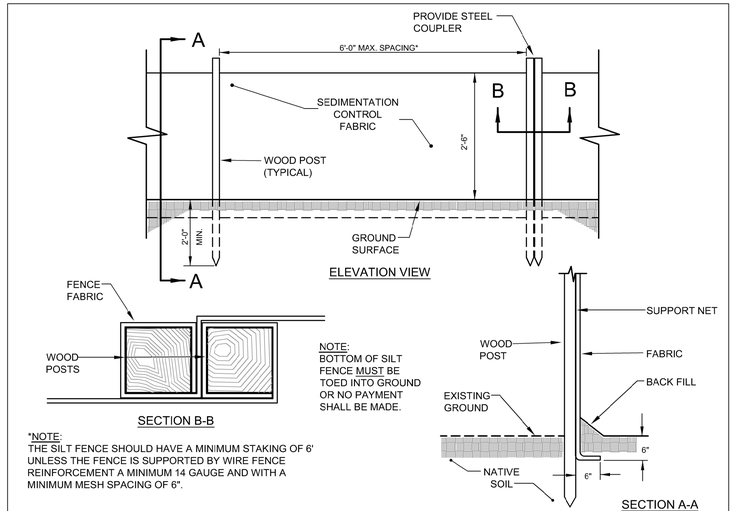


SECTION A-A

L = THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION EXCEPT AS NOTED

NOTE:
THIS IS A TEMPORARY MEASURE AND IS TO BE REMOVED ONCE DITCHING AND SLOPES ARE STABILIZED

(H) STONE CHECK DAM
N.T.S.



NOTE:
BOTTOM OF SILT FENCE MUST BE TOED INTO GROUND OR NO PAYMENT SHALL BE MADE.

*NOTE:
THE SILT FENCE SHOULD HAVE A MINIMUM STAKING OF 6' UNLESS THE FENCE IS SUPPORTED BY WIRE FENCE REINFORCEMENT A MINIMUM 14 GAUGE AND WITH A MINIMUM MESH SPACING OF 6".

(I) SILTATION FENCE DETAIL
N.T.S.

PRELIMINARY - NOT FOR CONSTRUCTION

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

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

EROSION CONTROL DETAILS

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

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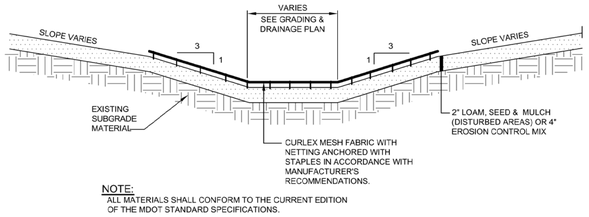
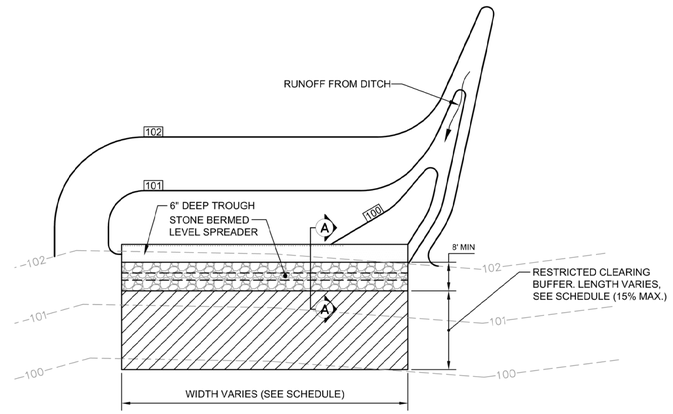
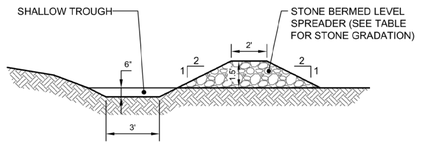


NOTE:
ALL MATERIALS SHALL CONFORM TO THE CURRENT EDITION OF THE MDOT STANDARD SPECIFICATIONS.

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



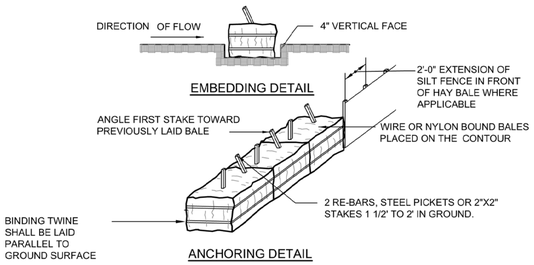


SECTION A-A

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.

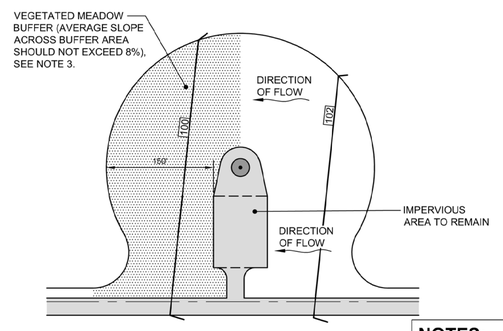
(C) STONE BERMED LEVEL SPREADER DETAIL
N.T.S.



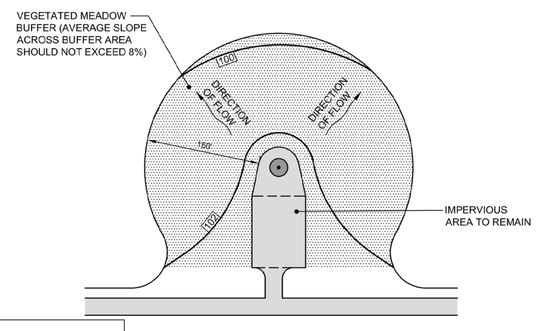
CONSTRUCTION SPECIFICATIONS

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.



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 36 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.

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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 — STEVEN J. BLAKE — 11695 — REGISTERED PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

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SOUTH PORTLAND, ME 04106
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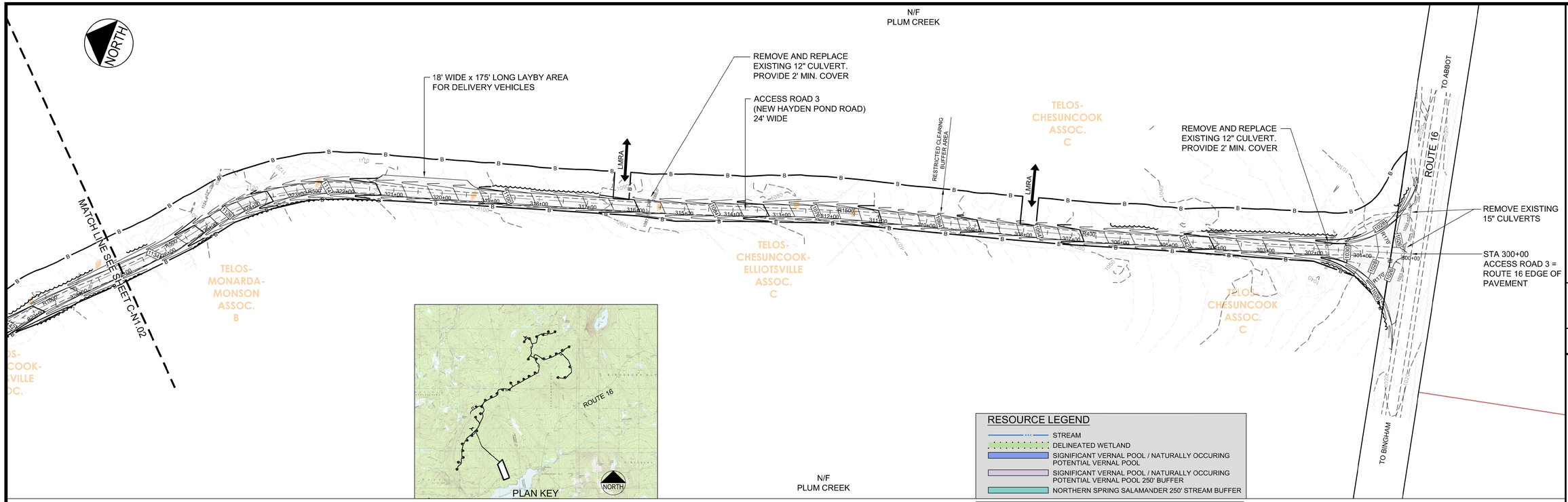


NORTH ACCESS ROAD 3 PLAN

SCALE: 1" = 100'

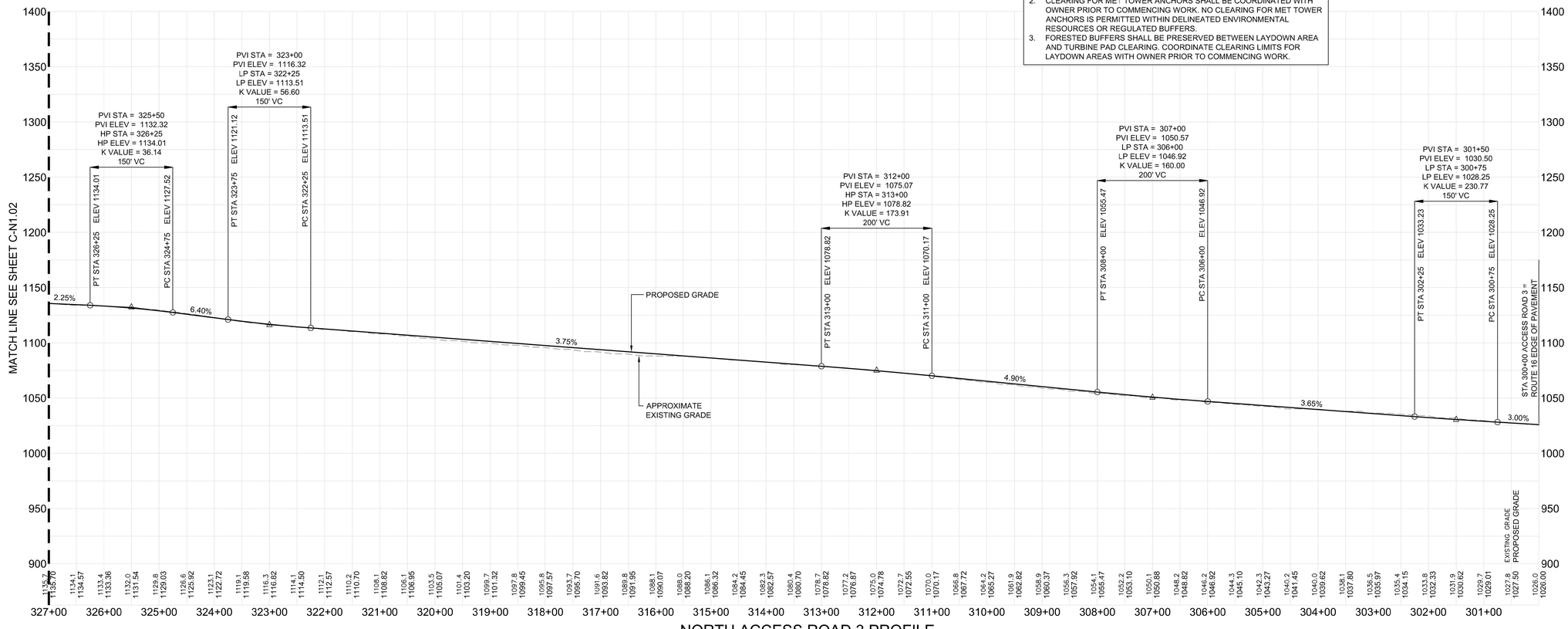
RESOURCE LEGEND

- 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.

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.



NORTH ACCESS ROAD 3 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

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ACCESS ROAD 3 PLAN AND PROFILE [STA 300+00 TO 327+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: VFG - NORTH AR 3

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

REED & REED

DeLuca-Hoffman Associates, Inc.
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N/F
PLUM CREEK

N/F
PLUM CREEK

MONARDA-
TELOS
ASSOC.
B

18' WIDE x 175' LONG LAYBY AREA
FOR DELIVERY VEHICLES

LMRA

REMOVE AND REPLACE
EXISTING 12" CULVERT.
PROVIDE 2' MIN. COVER

TELOS-
MONARDA-
MONSON
ASSOC.
B

ACCESS ROAD 3
(NEW HAYDEN POND ROAD)
24' WIDE

18' WIDE x 175' LONG LAYBY AREA
FOR DELIVERY VEHICLES

TELOS-
MONARDA-
MONSON
ASSOC.
B

LMRA

RESTRICTED CLEARING
BUFFER AREA

REMOVE AND REPLACE
EXISTING 12" CULVERT.
PROVIDE 2' MIN. COVER

TELOS-
CHESUNCOOK-
ELLIOTSVILLE
ASSOC.
C

REMOVE AND REPLACE
EXISTING 12" CULVERT.
PROVIDE 2' MIN. COVER

MATCH LINE SEE SHEET C-N1.03

MATCH LINE SEE SHEET C-N1.01

MONARDA-
TELOS
ASSOC.
B

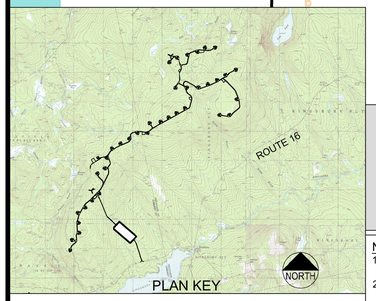
ROCK SANDWICH

REMOVE AND REPLACE
EXISTING 12" CULVERT.
PROVIDE 2' MIN. COVER

TELOS-
MONARDA-
MONSON
ASSOC.
B

TELOS-
CHESUNCOOK-
ELLIOTSVILLE
ASSOC.
C

TELOS-
MONARDA-
MONSON
ASSOC.
B



PLAN KEY

RESOURCE LEGEND

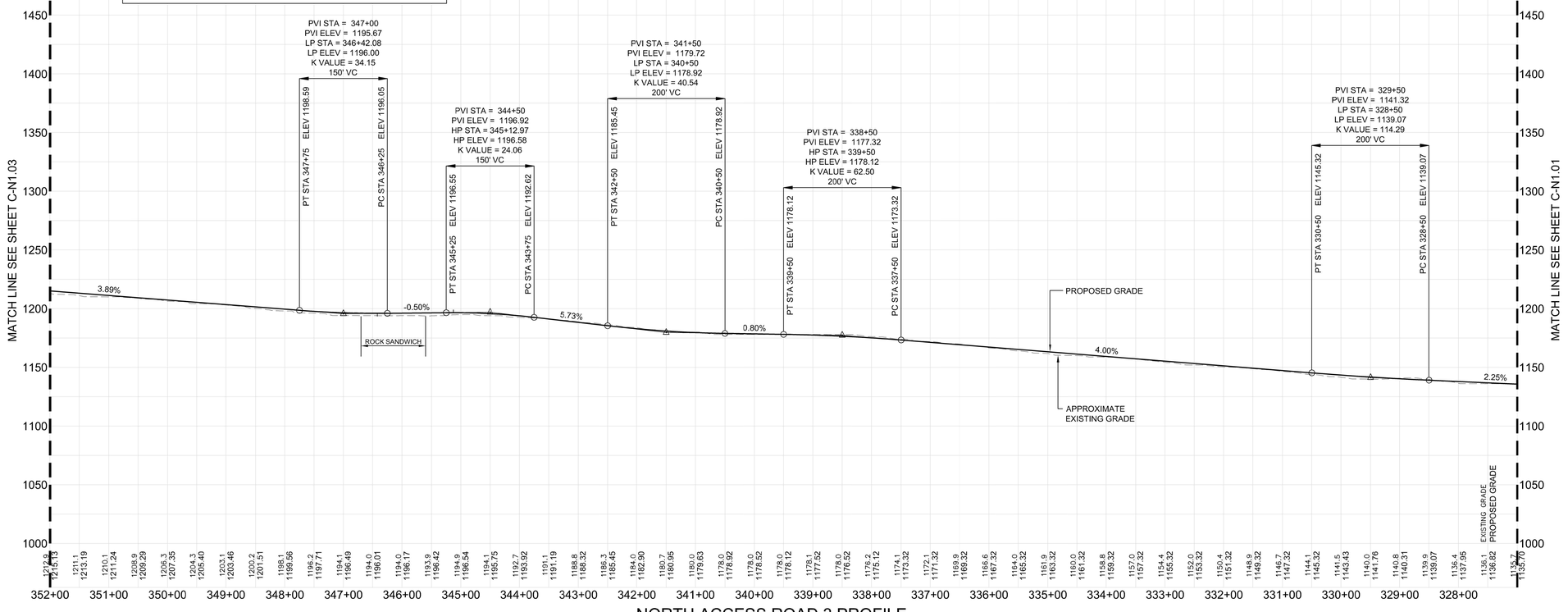
- STREAM
- DELINEATED WETLAND
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL 250' BUFFER
- NORTHERN SPRING SALAMANDER 250' STREAM BUFFER

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 ACCESS ROAD 3 PLAN

SCALE: 1" = 100'

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.



NORTH ACCESS ROAD 3 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

ACCESS ROAD 3 PLAN AND PROFILE [STA 327+00 TO 352+00]

DRAWN: DED
DESIGNED: SJB
CHECKED: SRB
FILE NAME: VFG - NORTH AR 3
SCALE: AS NOTED
DATE: SEPT 2012
JOB NO. 3048

STATE OF MAINE
STEVEN J. BLAKE
PLANNER
#11695
LICENSED
PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

RED RENEWABLE SERVICES

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

SHEET
C-N1.02

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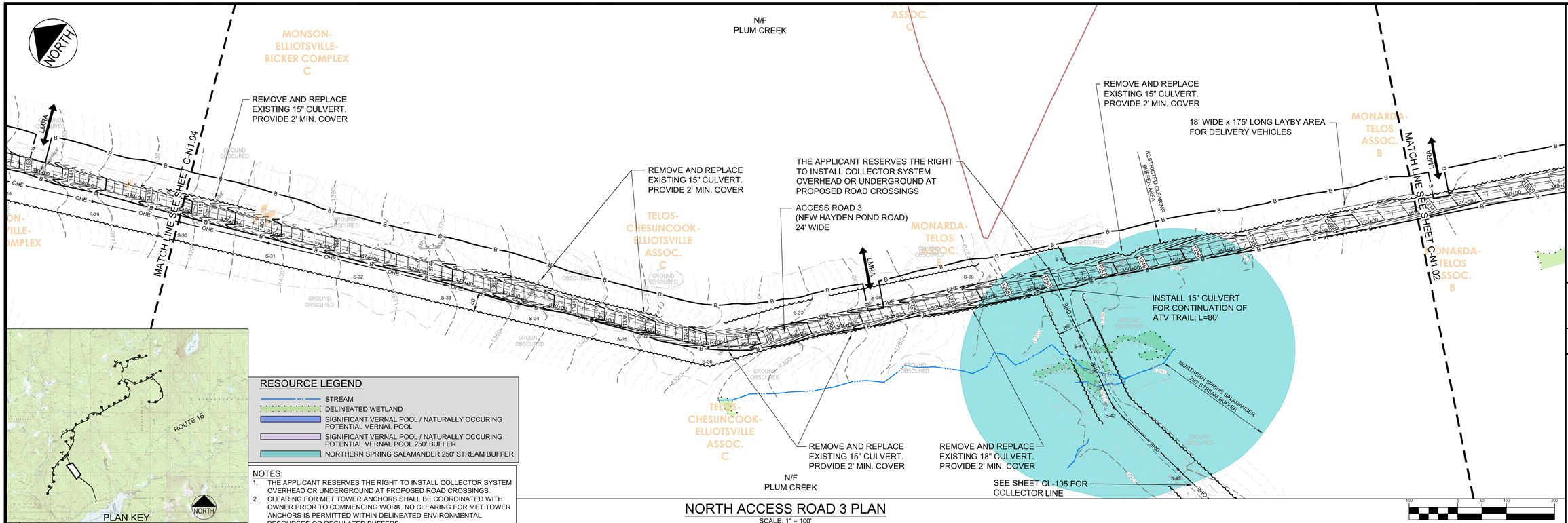
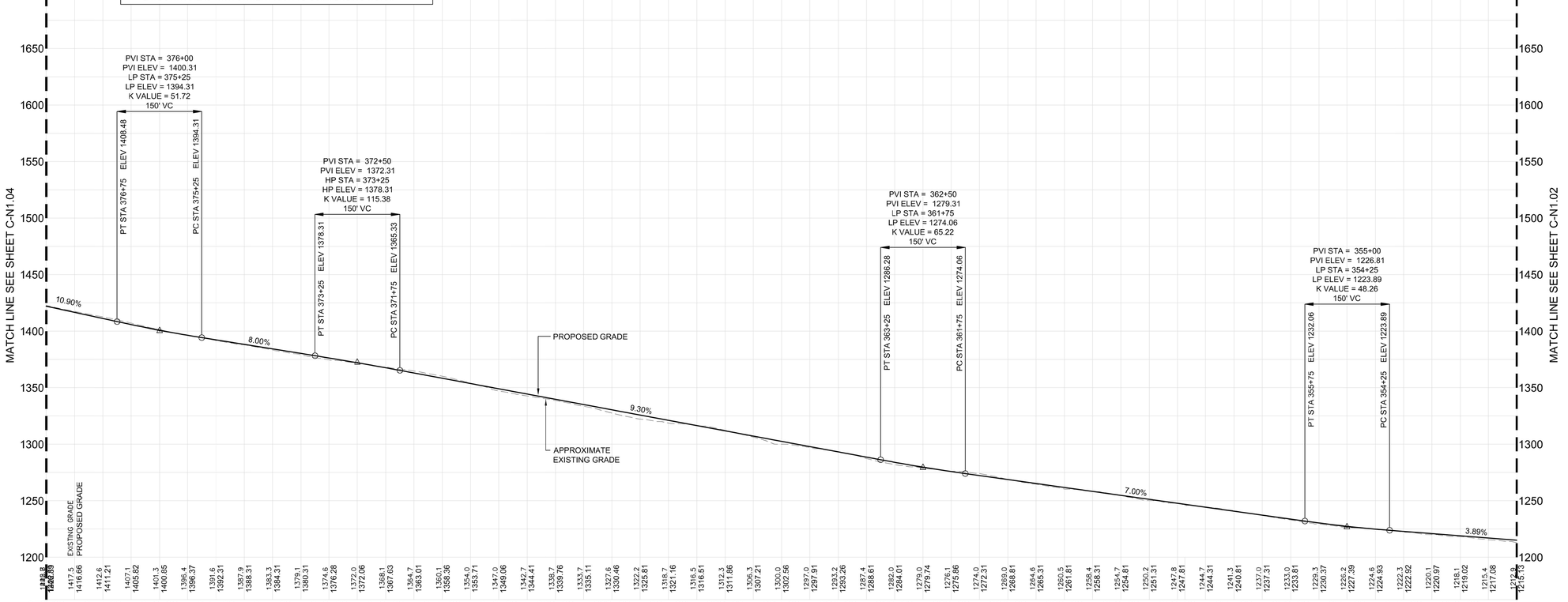


NORTH ACCESS ROAD 3 PLAN

SCALE: 1" = 100'



NORTH ACCESS ROAD 3 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

ACCESS ROAD 3 PLAN AND PROFILE [STA 352+00 TO 378+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: VFG - NORTH AR 3

STATE OF MAINE
STEVEN J. BLAKE II
3695
LICENSED PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11695

BINGHAM WIND PROJECT

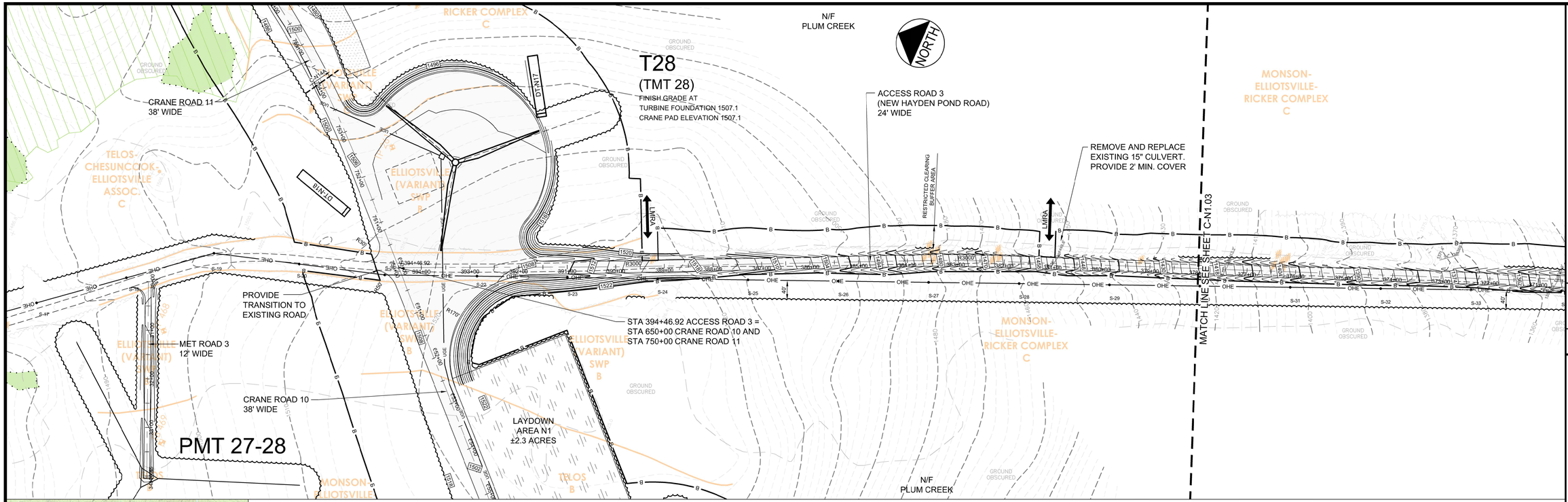
BLUE SKY WEST, LLC

REED & REED
WIND POWER SERVICES

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

SHEET

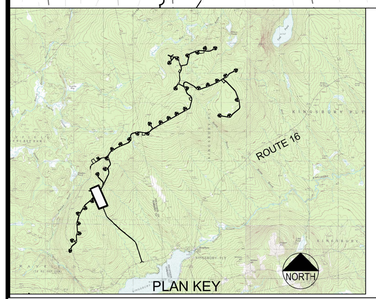
C-N1.03



NORTH ACCESS ROAD 3 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.

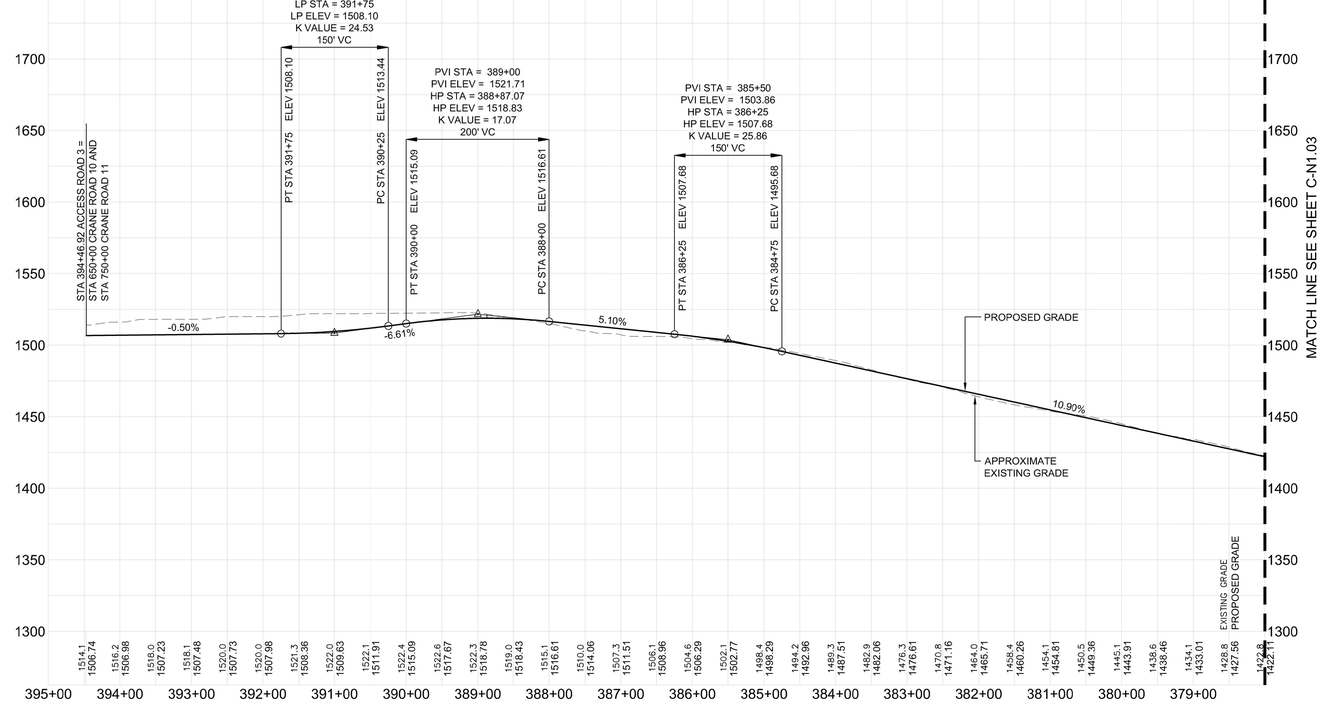


RESOURCE LEGEND

- 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 ACCESS ROAD 3 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

ACCESS ROAD 3 PLAN AND PROFILE [STA 378+00 TO 394+47]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE:	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH AR 3		

STATE OF MAINE
STEVEN J. BLAKE
11695
REGISTERED
PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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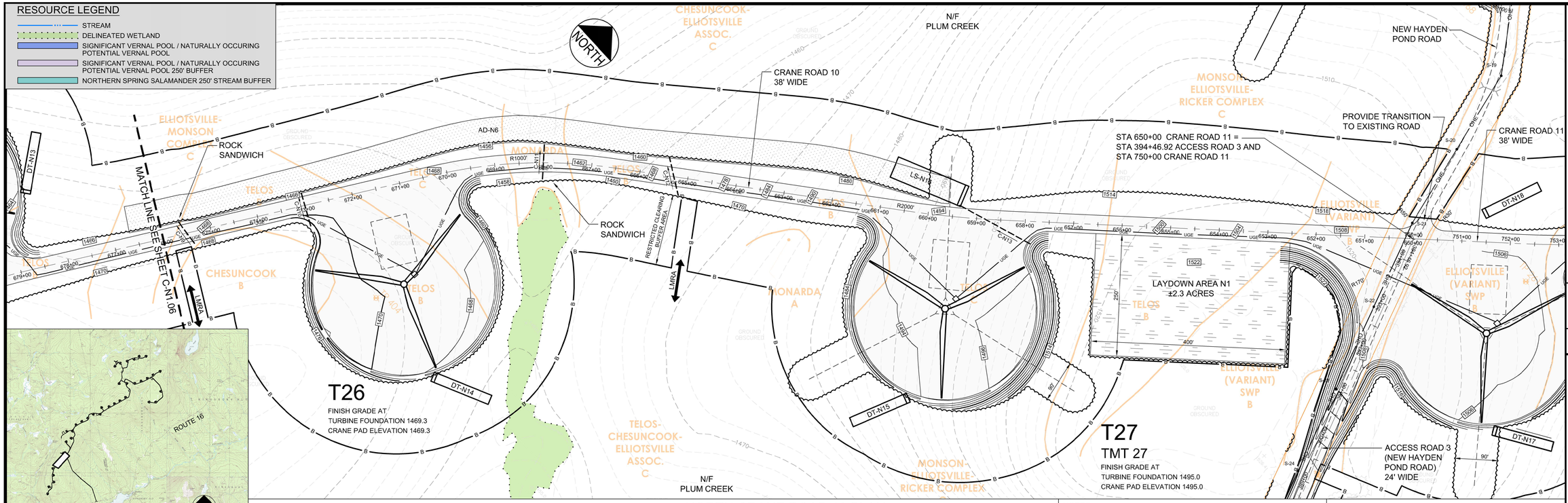
www.delucahoffman.com

SHEET

C-N1.04

R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\NORTH\VFG - NORTH AR_3.dwg davis_d 6/1/2013 9:57 AM

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



NORTH CRANE ROAD 10 PLAN
SCALE: 1" = 100'

NOTES:
1. THE APPLICANT RESERVES THE RIGHT TO INSTALL COLLECTOR SYSTEM OVERHEAD OR UNDERGROUND AT PROPOSED ROAD CROSSINGS.
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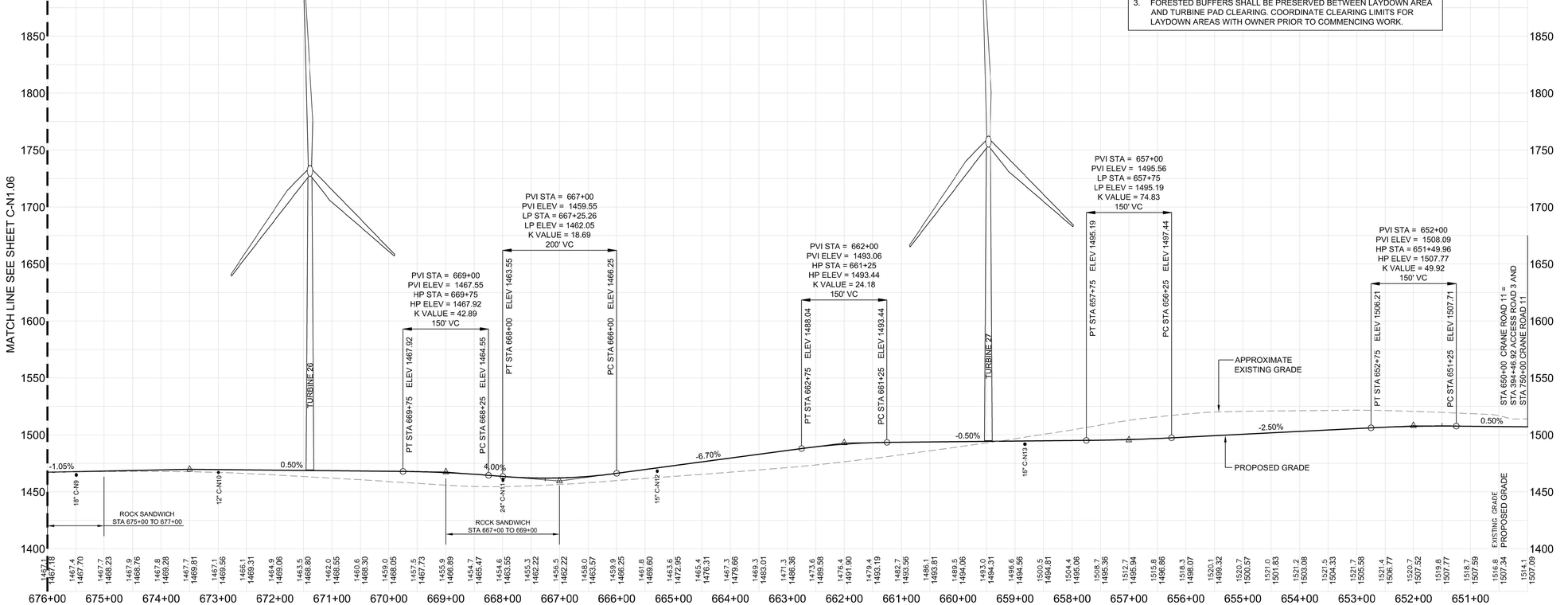
3. FORESTED BUFFERS SHALL BE PRESERVED BETWEEN LAYDOWN AREA AND TURBINE PAD CLEARING. COORDINATE CLEARING LIMITS FOR LAYDOWN AREAS WITH OWNER PRIOR TO COMMENCING WORK.

(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 10 PROFILE
SCALE: H 1" = 100'
V 1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

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

CRANE ROAD 10 PLAN AND PROFILE [STA 650+00 TO 676+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO.: 3048
FILE NAME: VFG - NORTH CR_10

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

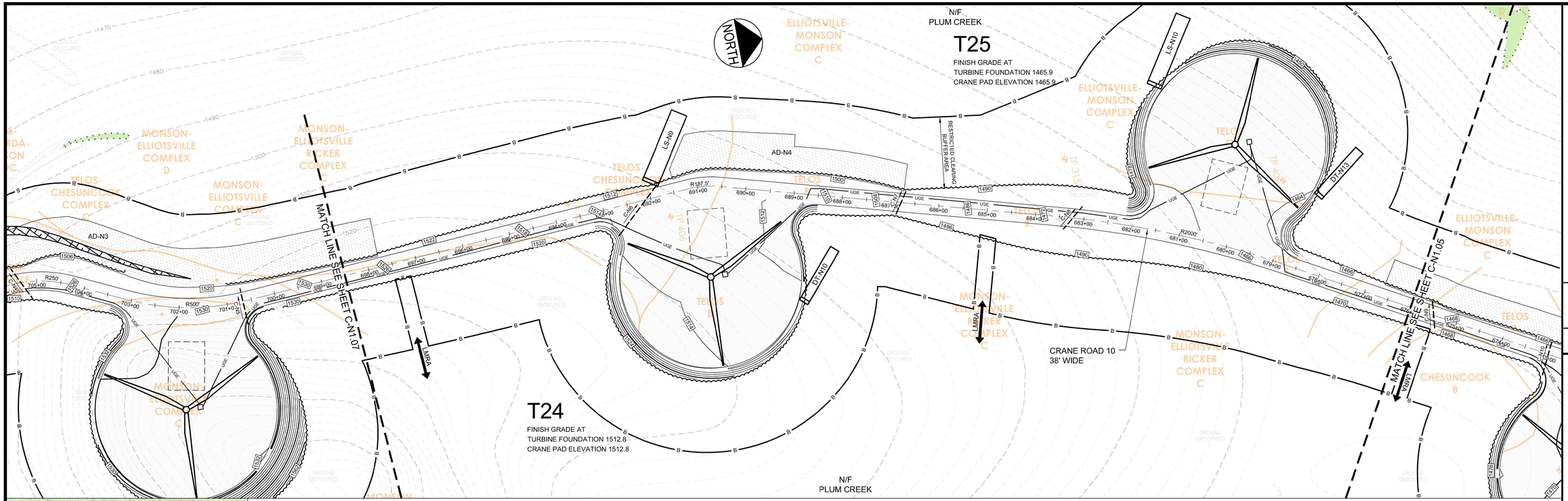
BINGHAM WIND PROJECT

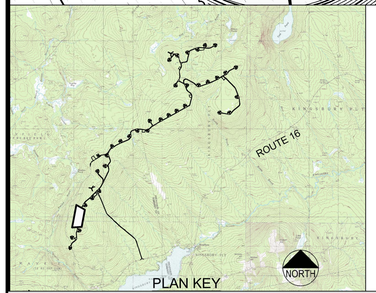
BLUE SKY WEST, LLC

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET SUITE 5
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

SHEET
C-N1.05

R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\NORTH\VFG - NORTH CR_10.dwg davis_d 8/1/2013 10:29 AM



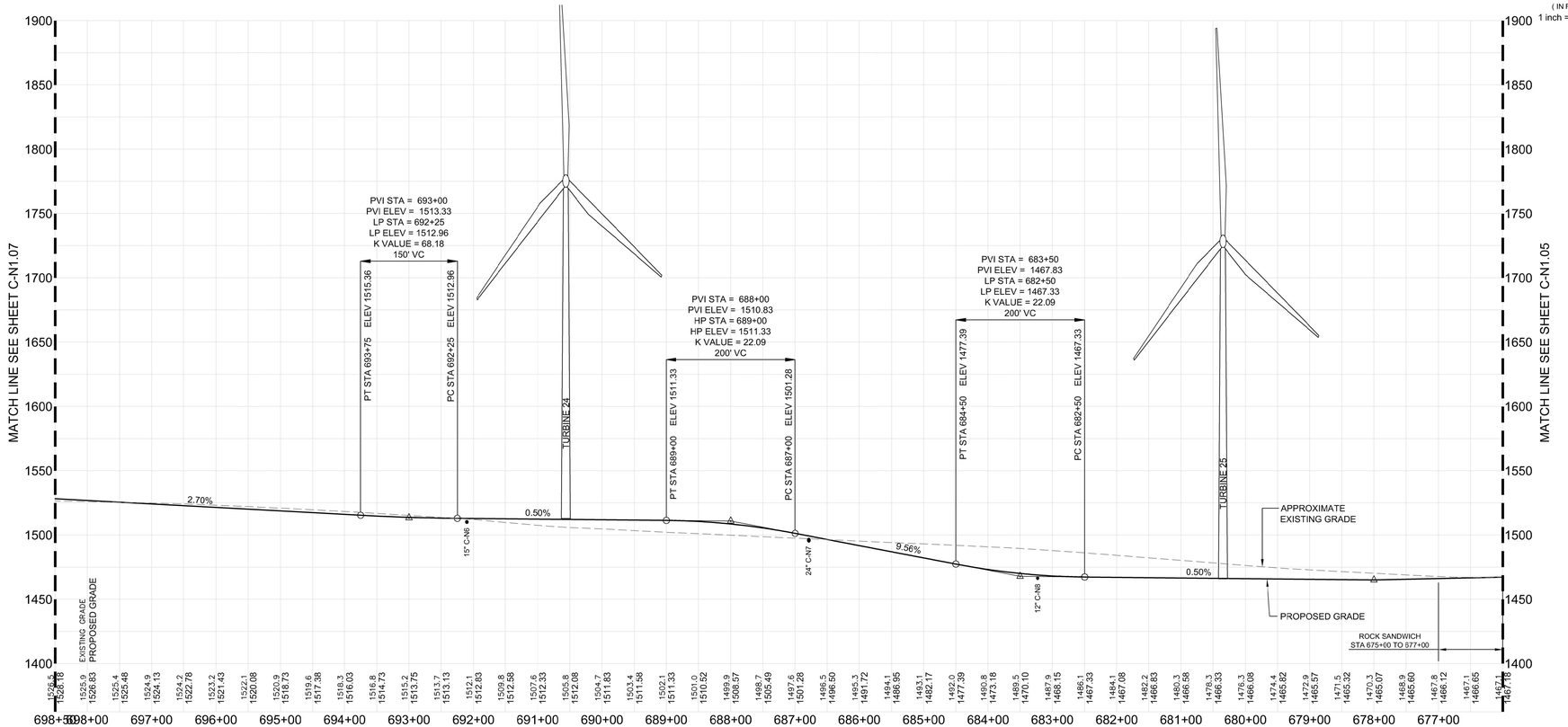


PLAN KEY

NORTH CRANE ROAD 10 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 10 PROFILE

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

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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PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 10 PLAN AND PROFILE
[STA 676+00 TO 698+50]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_10		

STATE OF MAINE
STEVEN J. BLAKE II
#11695
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

C-N1.06

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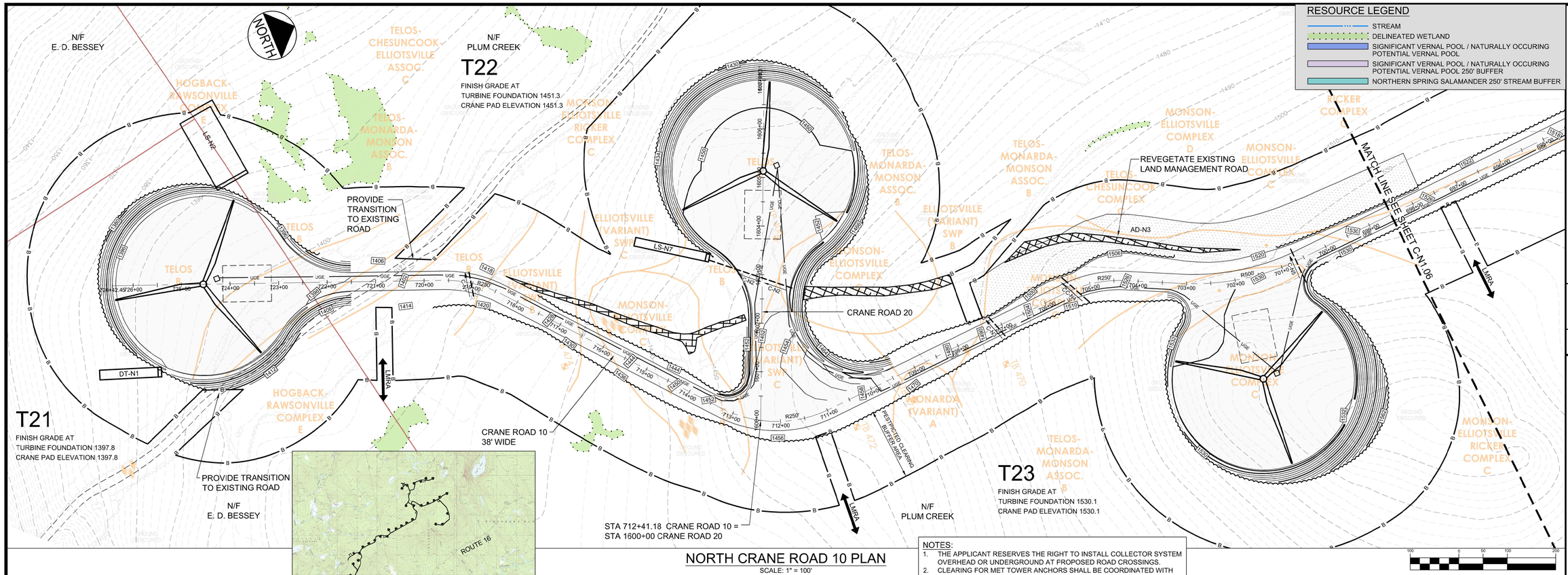

NORTH CRANE ROAD 10 PLAN

SCALE: 1" = 100'

NOTES:
1. THE APPLICANT RESERVES THE RIGHT TO INSTALL COLLECTOR SYSTEM OVERHEAD OR UNDERGROUND AT PROPOSED ROAD CROSSINGS.
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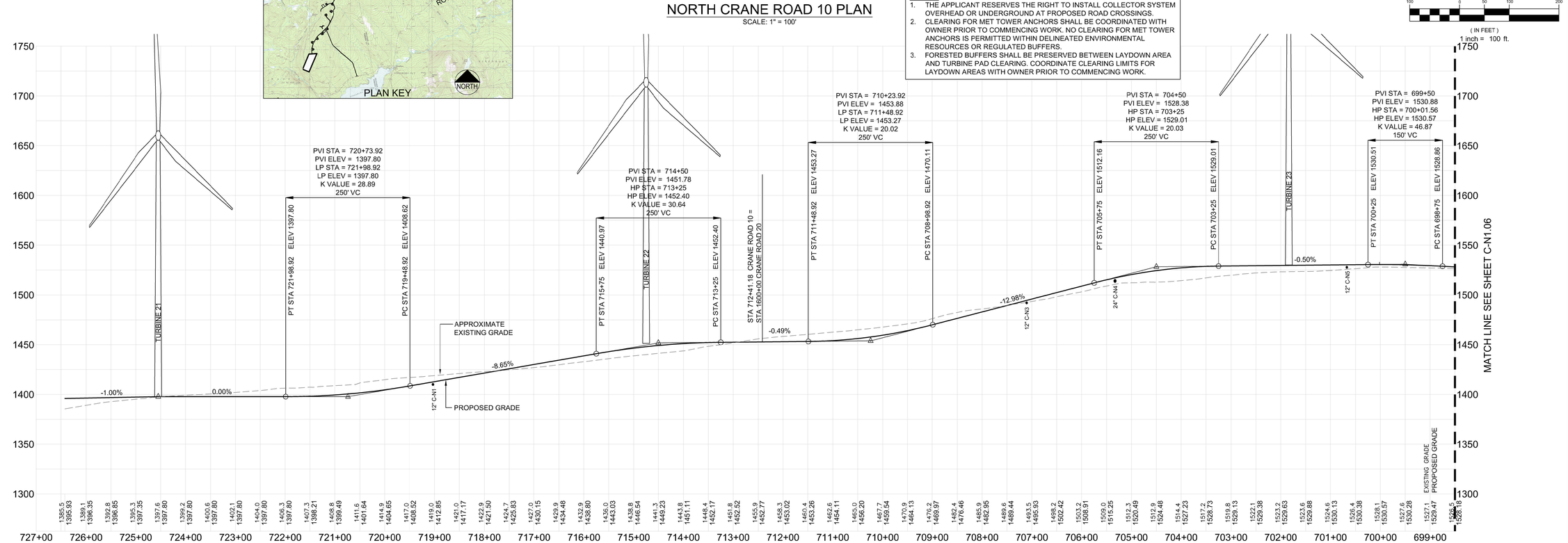

NORTH CRANE ROAD 10 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO.: 3048
FILE NAME: VFG - NORTH CR_10

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
C-N1.07

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STA 750+00 CRANE ROAD 11 =
STA 394+46.92 ACCESS ROAD 3
AND STA 650+00 CRANE ROAD 10

CRANE ROAD 10
38' WIDE

NEW HAYDEN
POND ROAD

N/F
PLUM CREEK

CRANE ROAD 22
38' WIDE

CRANE ROAD 11
38' WIDE

MATCH LINE SEE SHEET C-N1.09

DT-N18

DT-N17

LMRA

AD-N8

AD-N11

ROCK
SANDWICH

LS-N22

LS-N21

STA 762+00 CRANE ROAD 11 =
STA 1800+00 CRANE ROAD 22

RESTRICTED CLEARING
BUFFER AREA

ACCESS ROAD 3
(NEW HAYDEN
POND ROAD)
24' WIDE

ELLIOTSVILLE (VARIANT) SWP B

ELLIOTSVILLE (VARIANT) SWP C

ELLIOTSVILLE B

ELLIOTSVILLE-MONSON COMPLEX C

MONSON-ELLIOTSVILLE COMPLEX D

MONSON-ELLIOTSVILLE-RICKER COMPLEX

TELOS-CHESUNCOOK-ELLIOTSVILLE ASSOC. C

T28
(TMT 28)

FINISH GRADE AT
TURBINE FOUNDATION 1507.1
CRANE PAD ELEVATION 1507.1

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.
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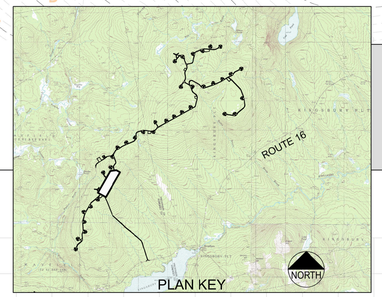
NORTH CRANE ROAD 11 PLAN
SCALE: 1" = 100'

N/F
PLUM CREEK

NORTH



PLAN KEY

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

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.

PVI STA = 754+50
PVI ELEV = 1504.84
HP STA = 753+50
HP ELEV = 1505.34
K VALUE = 39.66
200' VC

PVI STA = 758+00
PVI ELEV = 1485.44
LP STA = 758+83.45
LP ELEV = 1485.90
K VALUE = 33.10
200' VC

PVI STA = 764+00
PVI ELEV = 1488.44
LP STA = 762+75
LP ELEV = 1487.82
K VALUE = 21.74
250' VC

PVI STA = 774+00
PVI ELEV = 1608.44
HP STA = 775+15
HP ELEV = 1607.84
K VALUE = 20.00
250' VC

STA 750+00 CRANE ROAD 11 =
STA 394+46.92 ACCESS ROAD 3 AND
STA 650+00 CRANE ROAD 10

TURBINE 28

PC STA 753+50 ELEV 1505.34
PT STA 755+50 ELEV 1499.30
PC STA 757+00 ELEV 1490.99
PT STA 759+00 ELEV 1485.94
STA 762+00 CRANE ROAD 11 =
STA 1800+00 CRANE ROAD 22
PC STA 762+75 ELEV 1487.82
PT STA 765+25 ELEV 1503.44
PC STA 772+75 ELEV 1593.44
PT STA 775+25 ELEV 1607.82

-0.50%
-5.54%
0.50%
12.00%
-0.50%

APPROXIMATE EXISTING GRADE
PROPOSED GRADE

12" C-N14A
15" C-N14
12" C-N15
12" C-N16
15" C-N17
15" C-N18
12" C-N22

ROCK SANDWICH
STA 758+00 TO 760+00

EXISTING GRADE
PROPOSED GRADE

751+00 752+00 753+00 754+00 755+00 756+00 757+00 758+00 759+00 760+00 761+00 762+00 763+00 764+00 765+00 766+00 767+00 768+00 769+00 770+00 771+00 772+00 773+00 774+00 775+00 776+00 777+00 778+00

NORTH CRANE ROAD 11 PROFILE
SCALE: H 1" = 100'
V 1" = 50'

MATCH LINE SEE SHEET C-N1.09

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 11 PLAN AND PROFILE
[STA 750+00 TO 778+00]

DRAWN: DED | 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 11695 LICENSED PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11695

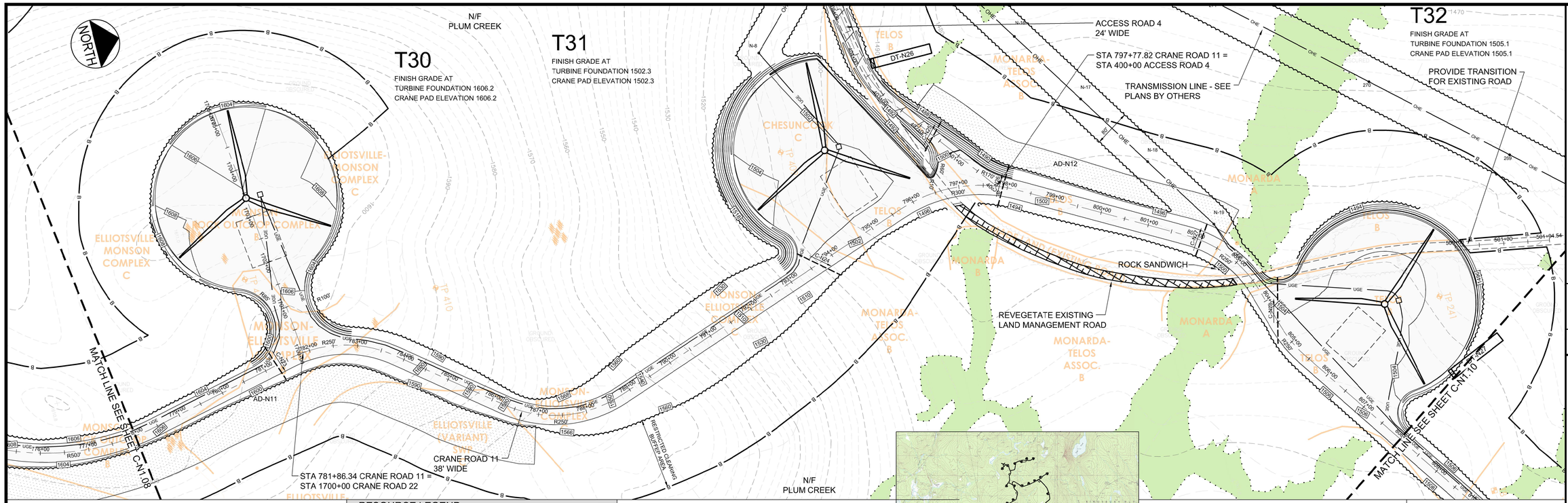
BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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

SHEET
C-N1.08

R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\NORTH\VFG - NORTH CR_11.dwg davis_d 8/1/2013 10:42 AM

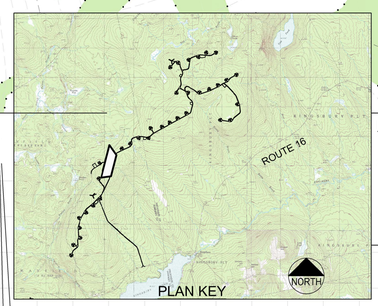


RESOURCE LEGEND

- 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

NORTH CRANE ROAD 11 PLAN

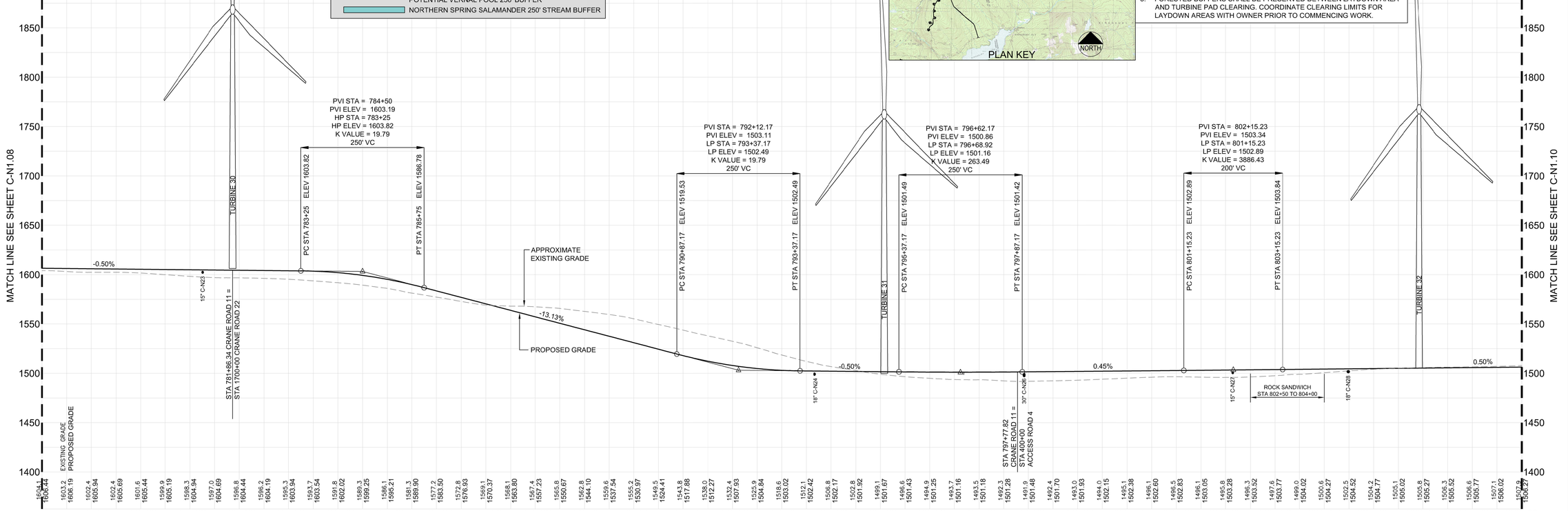
SCALE: 1" = 100'



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.

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 11 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 11 PLAN AND PROFILE [STA 778+00 TO 808+00]

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

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

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207.775.1121
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SHEET

C-N1.09

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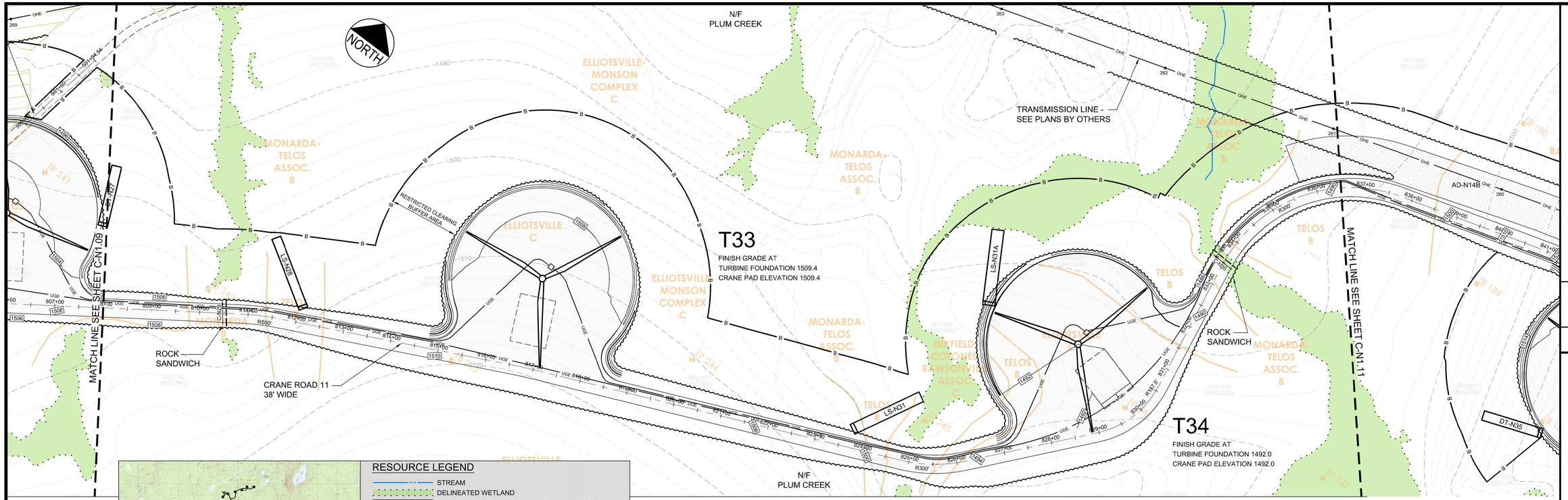

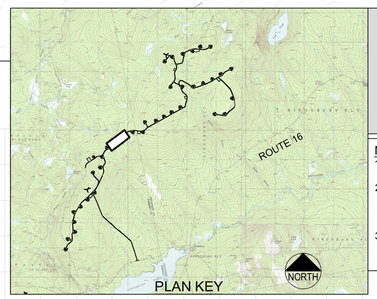

RESOURCE LEGEND

- 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:

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 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.

NORTH CRANE ROAD 11 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

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

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

DRAWN:	DED	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 — 11695 — REGISTERED PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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778 MAIN STREET, SUITE 8
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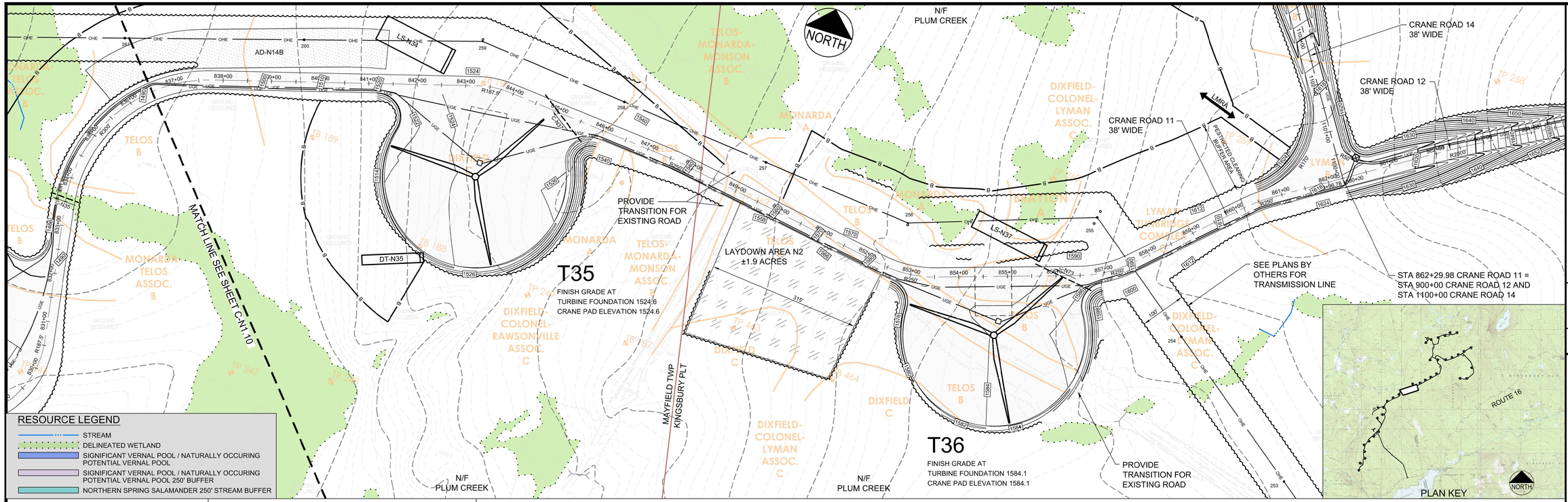
207.775.1121
www.delucahoffman.com

SHEET
C-N1.10



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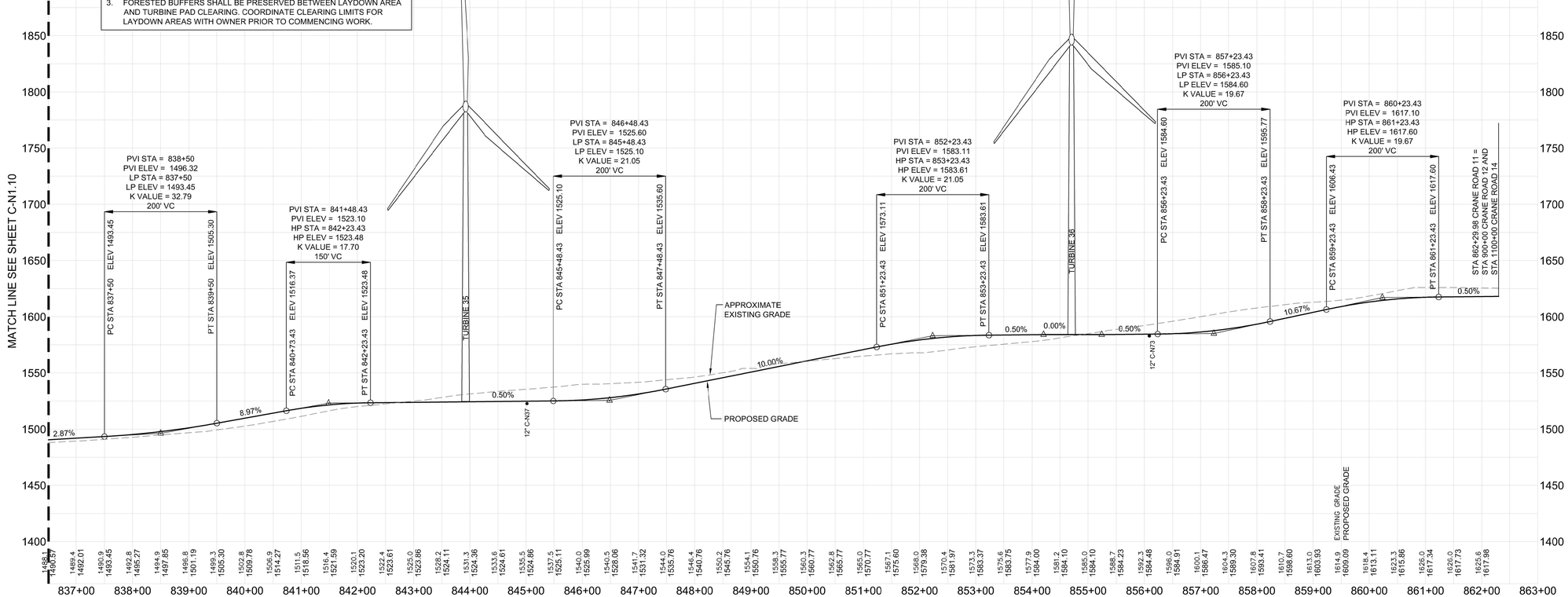
NORTH CRANE ROAD 11 PLAN

SCALE: 1" = 100'

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 11 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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3	04.09.13	PERMIT PLAN SUBMISSION
2	03.06.13	ACOE REVISIONS
1	12.19.12	PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

CRANE ROAD 11 PLAN AND PROFILE [STA 836+50 TO 862+30]

DRAWN:	DED	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 11695 REGISTERED PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11695

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

REED RSE

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 5
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

SHEET

C-N1.11

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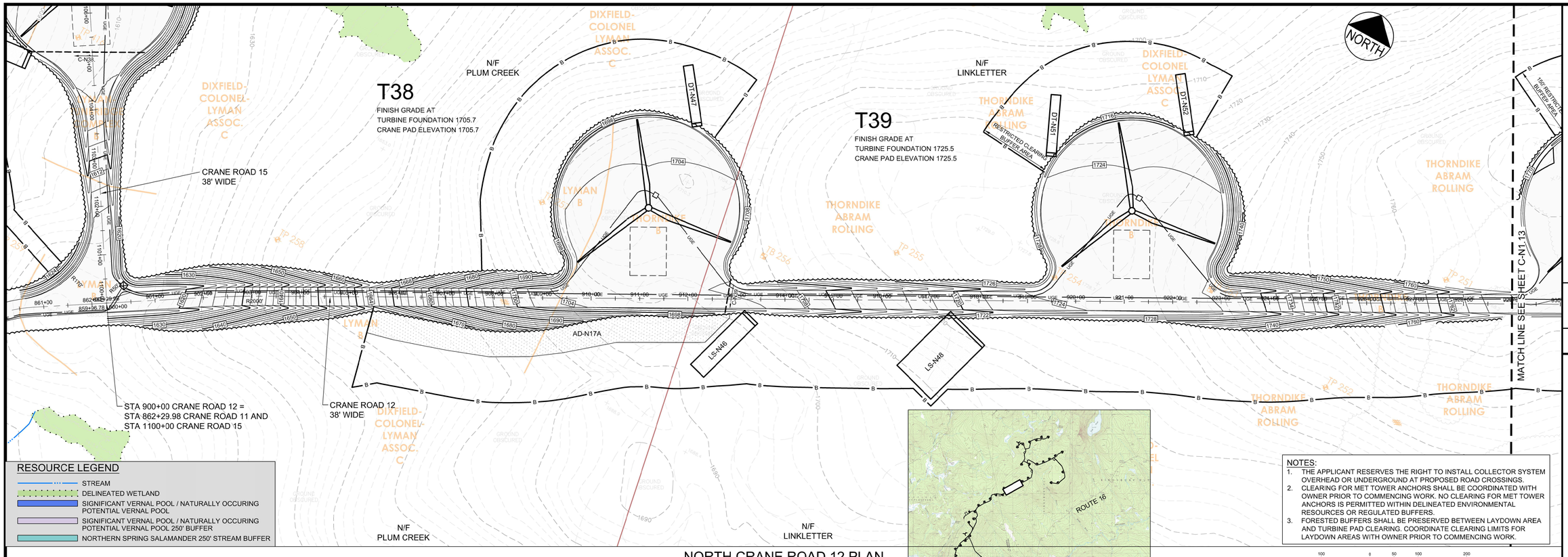

NORTH CRANE ROAD 12 PLAN

SCALE: 1" = 100'

NOTES:
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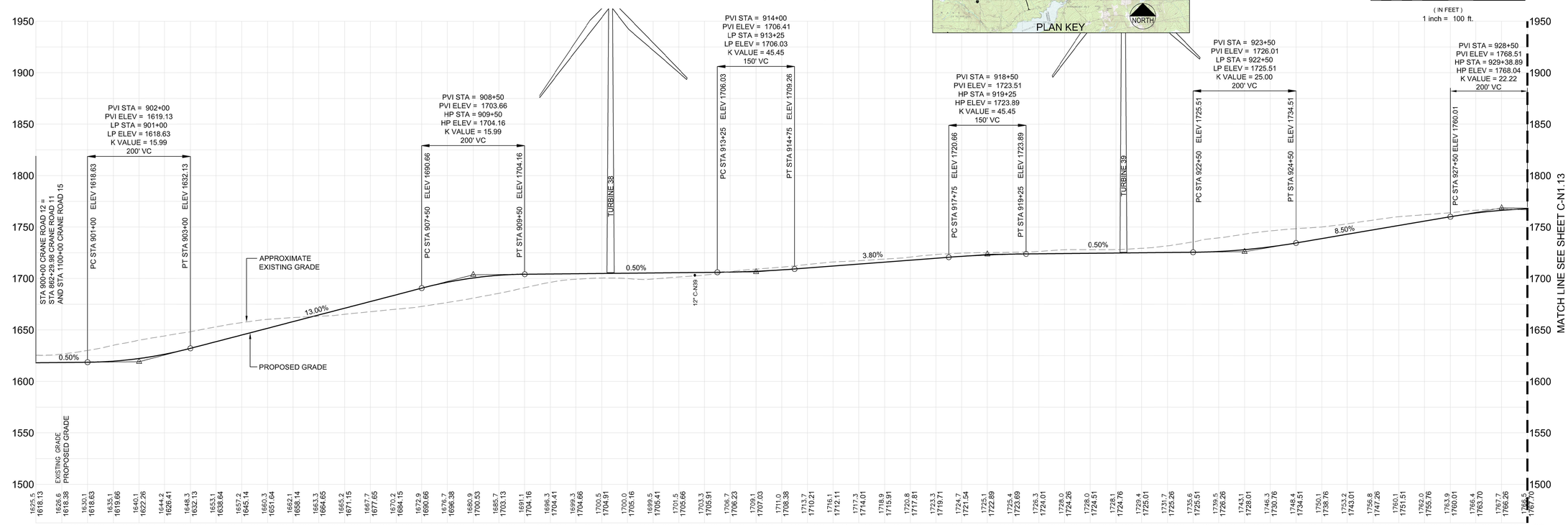
100 0 50 100 200
(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 12 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 12 PLAN AND PROFILE [STA 900+00 TO 929+00]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE:	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_12		

STATE OF MAINE JOSEPH STEVEN J. BLAKE 11695 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

C-N1.12

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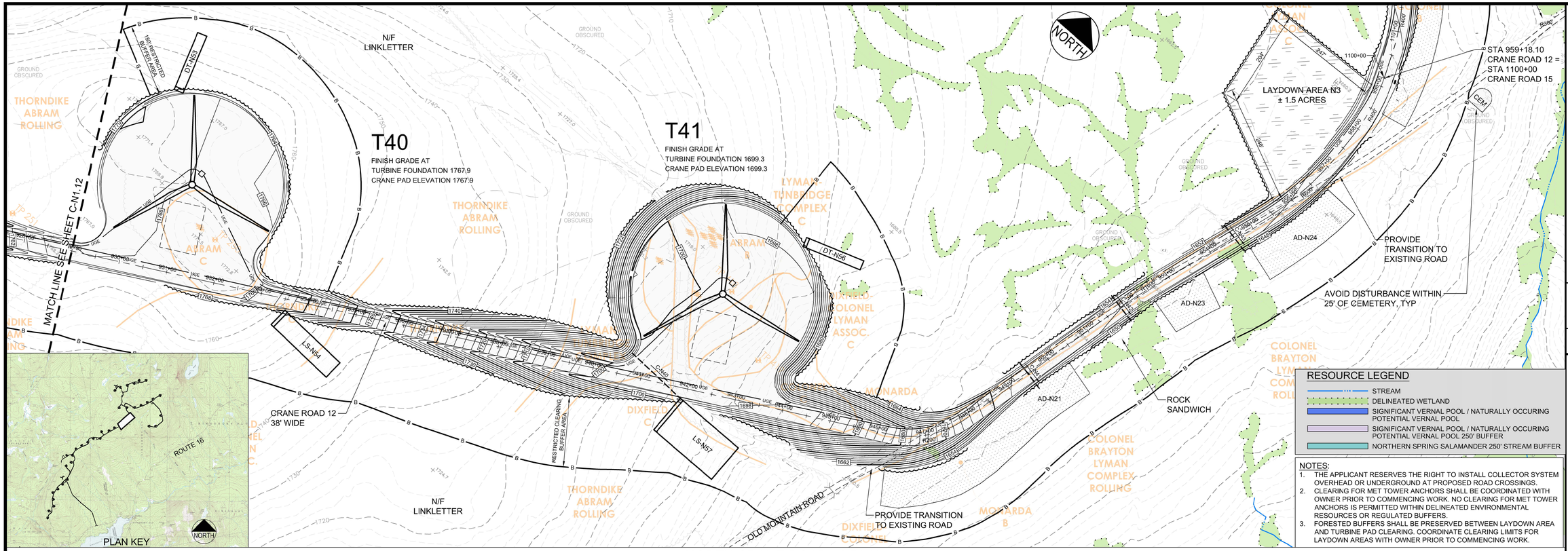
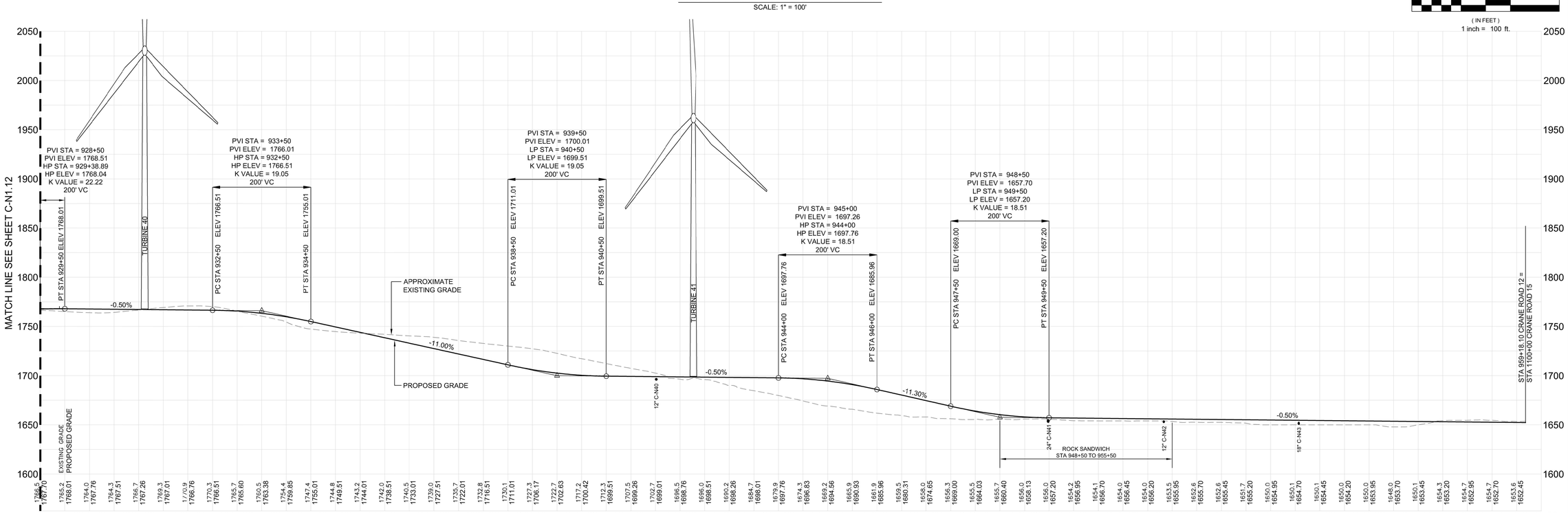


NORTH CRANE ROAD 12 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 12 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 12 PLAN AND PROFILE
[STA 929+00 TO 959+18]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_12		

STATE OF MAINE
STEVEN J. BLAKE
3695
REGISTERED
PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11695

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www.reedreed.com

BINGHAM WIND PROJECT

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SOUTH PORTLAND, ME 04106
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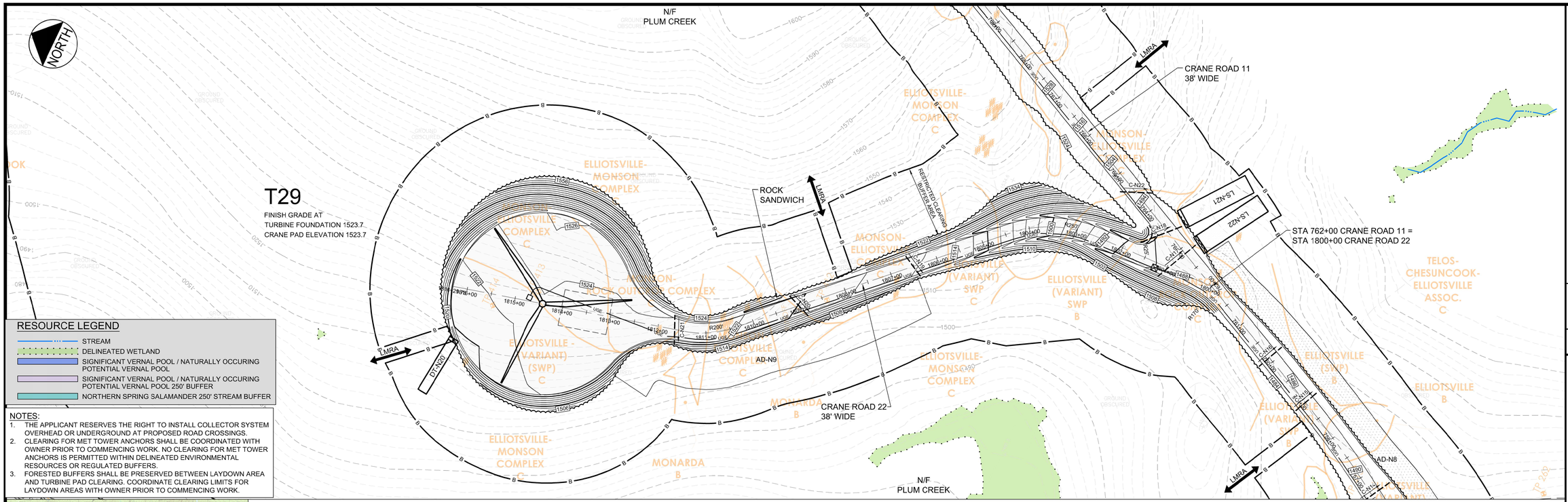

RESOURCE LEGEND

- 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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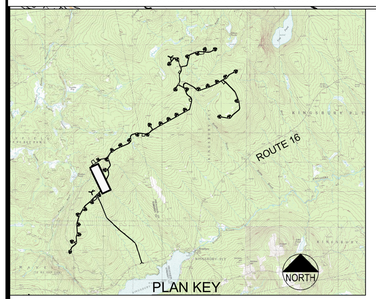
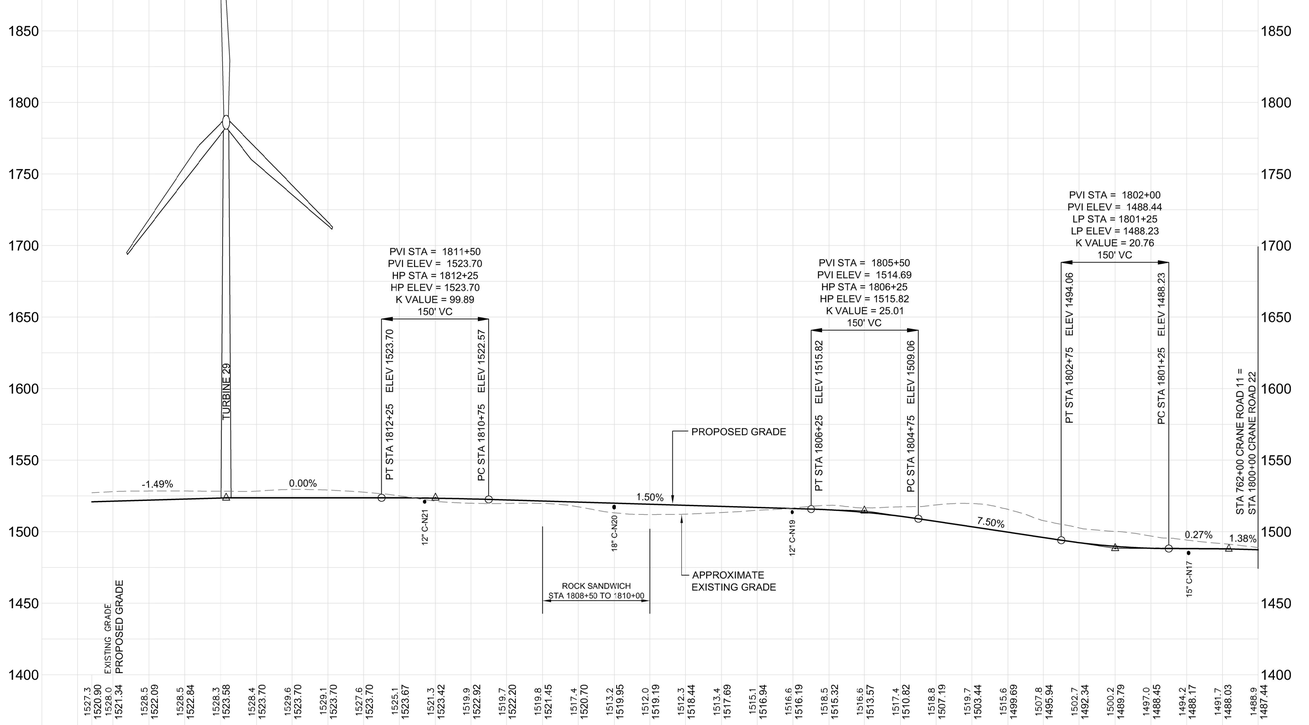


NORTH CRANE ROAD 22 PLAN

SCALE: 1" = 100'



NORTH CRANE ROAD 22 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

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

CRANE ROAD 22 PLAN AND PROFILE [STA 1800+00 TO 1816+30]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_22		

STATE OF MAINE STEVEN J. BLAKE 11695 LICENSED PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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

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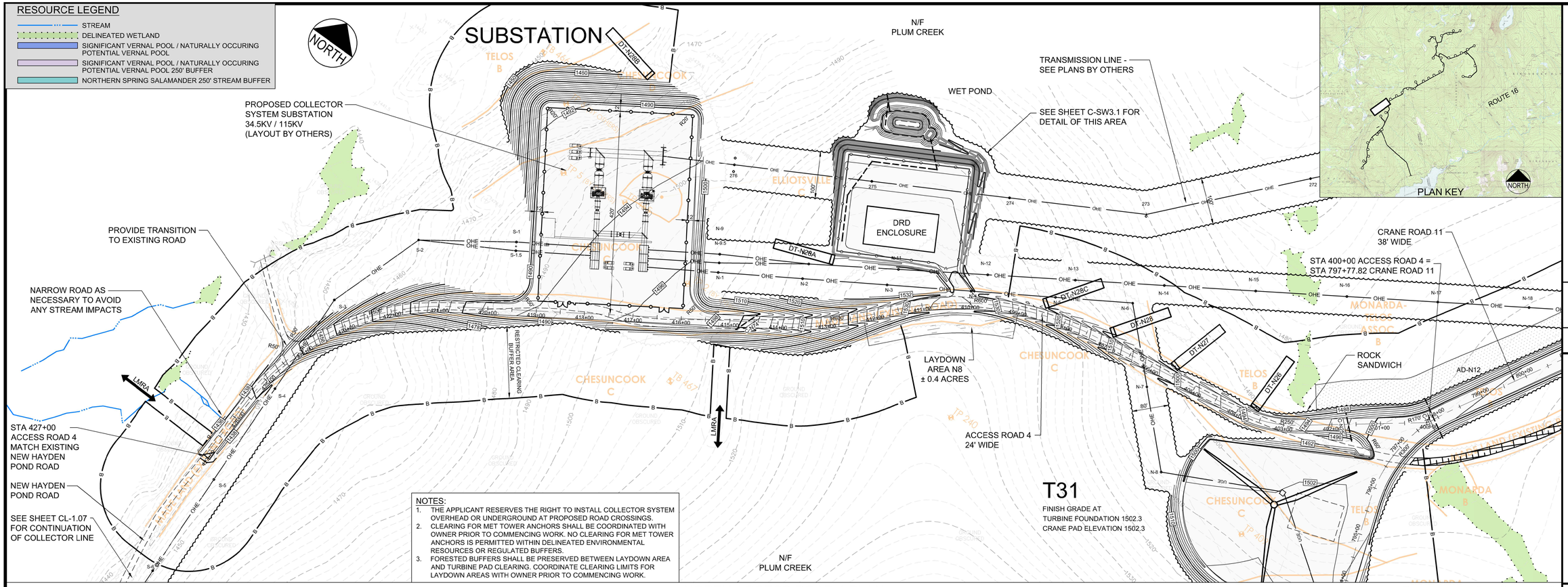
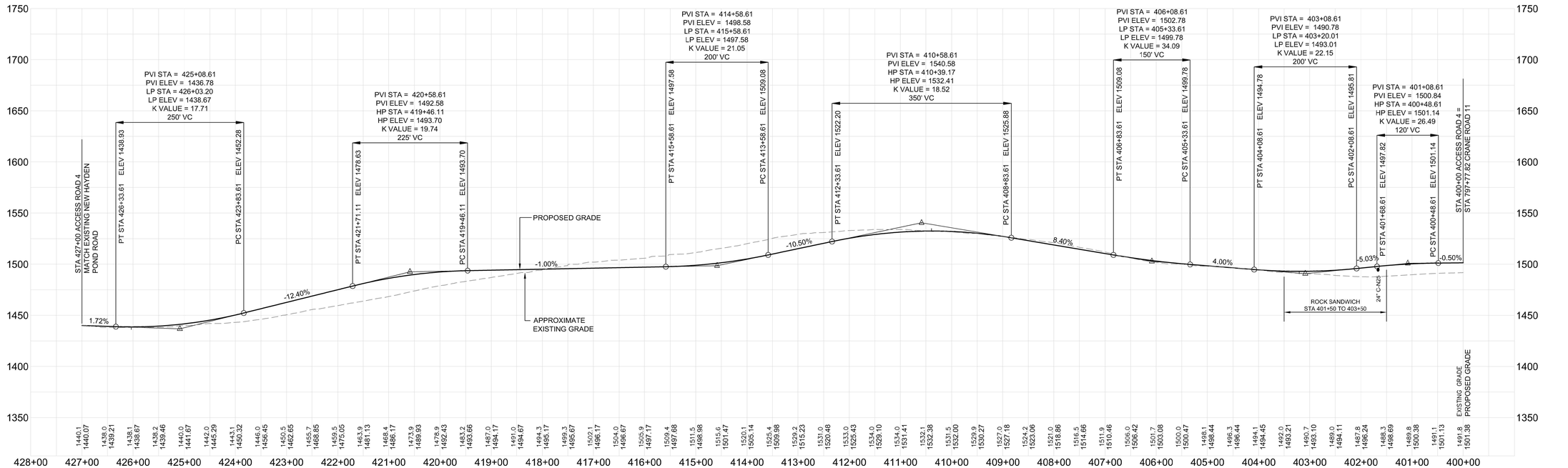


NORTH ACCESS ROAD 4 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



NORTH ACCESS ROAD 4 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

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

DRAWN: DED
DESIGNED: SJB
CHECKED: SRB
FILE NAME: VFG - NORTH AR 4
SCALE: AS NOTED
DATE: SEPT 2012
JOB NO. 3048

ACCESS ROAD 4 PLAN AND PROFILE [STA 400+00 TO 427+00]

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

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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SOUTH PORTLAND, ME 04106
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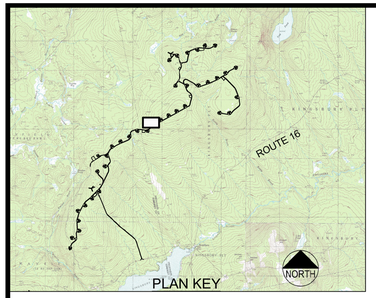

PLAN KEY

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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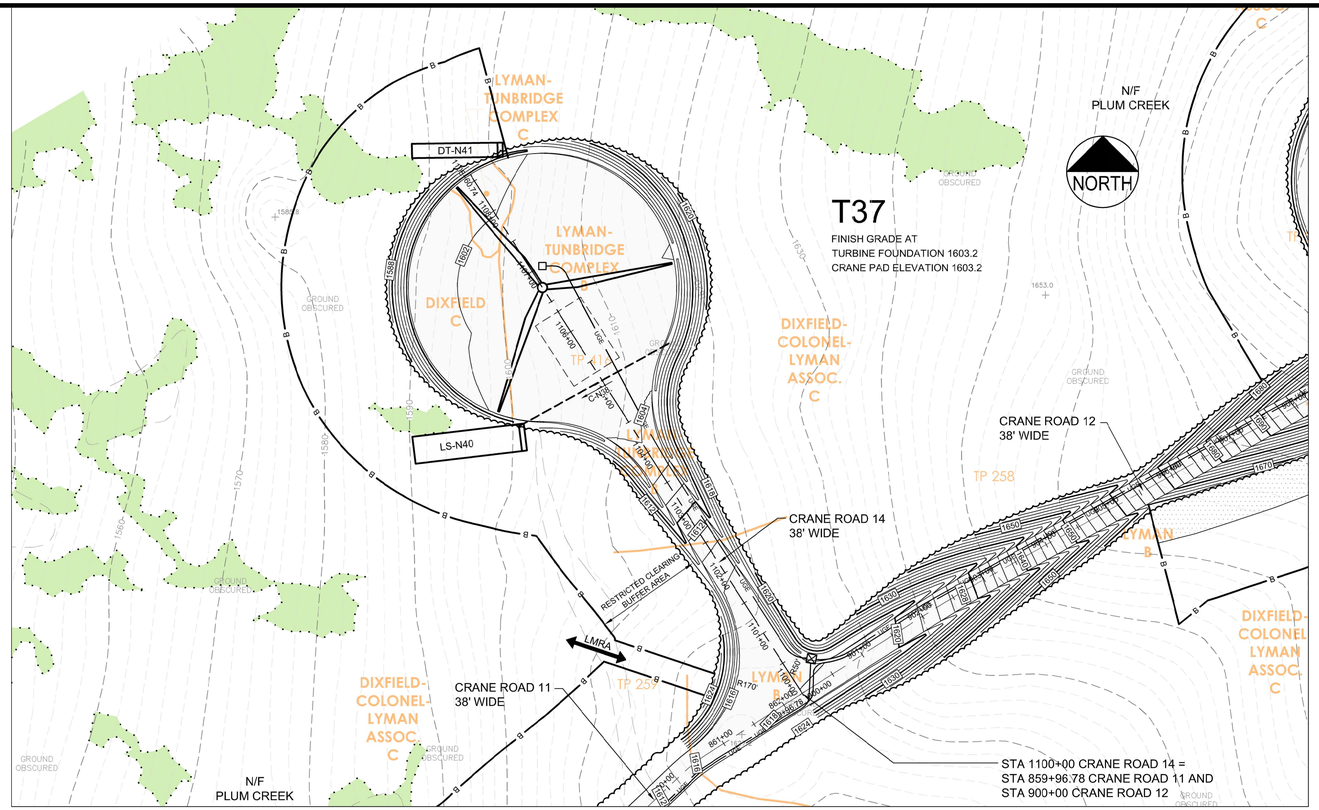
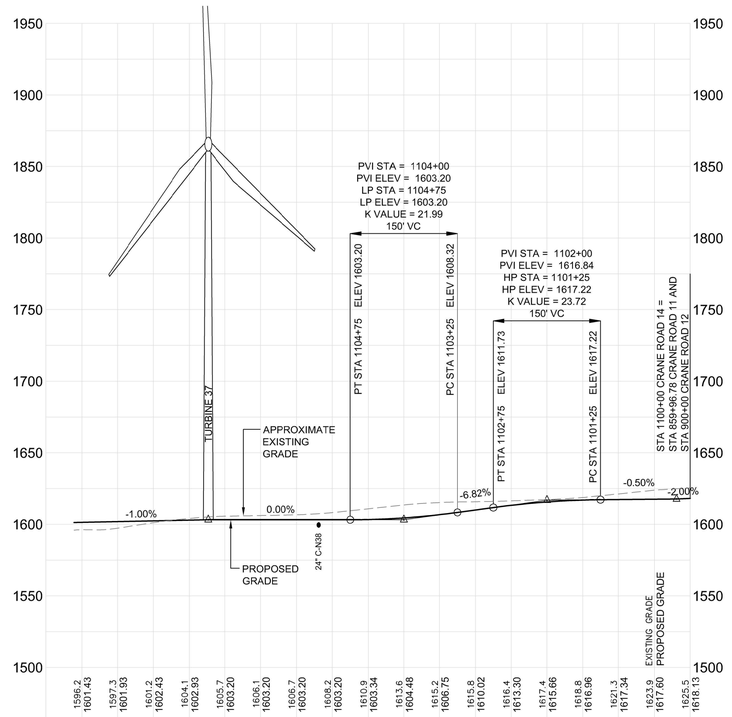


NORTH CRANE ROAD 14 PLAN

SCALE: 1" = 100'





NORTH CRANE ROAD 14 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 14 PLAN AND PROFILE
[STA 1100+00 TO 1108+61]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_14		

STATE OF MAINE
STEVEN J. BLAKE
REGISTERED
PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11655

BINGHAM WIND PROJECT

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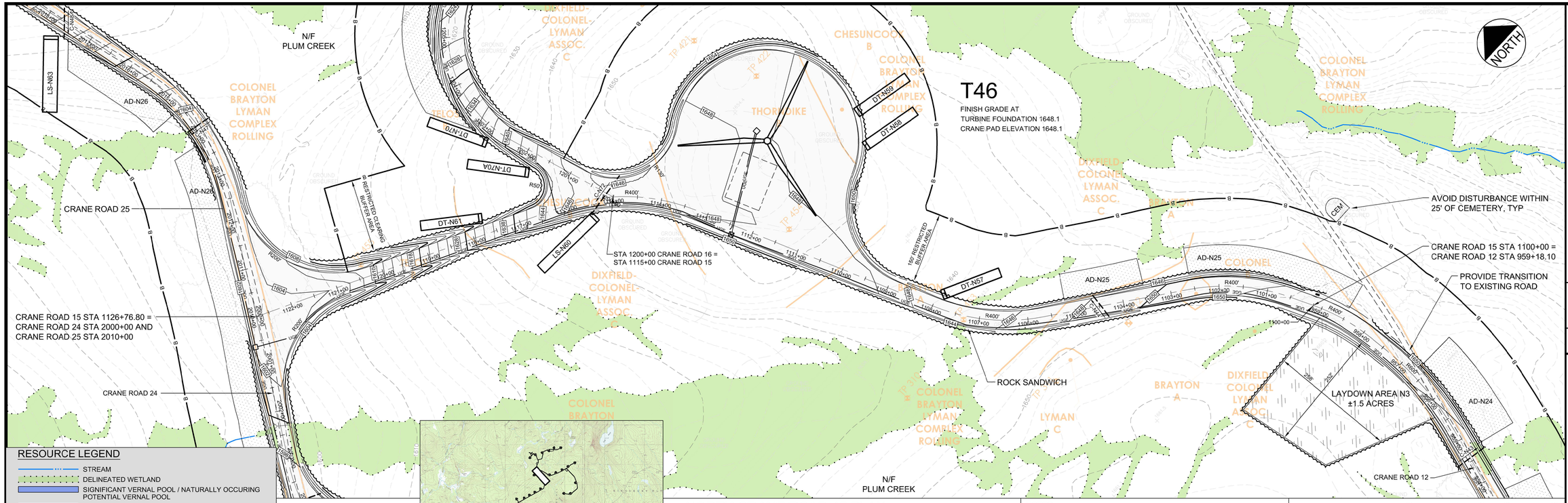
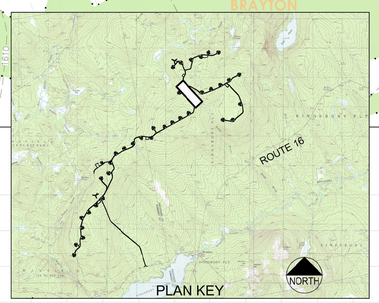


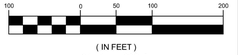
RESOURCE LEGEND

- 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



NORTH CRANE ROAD 15 PLAN

SCALE: 1" = 100'



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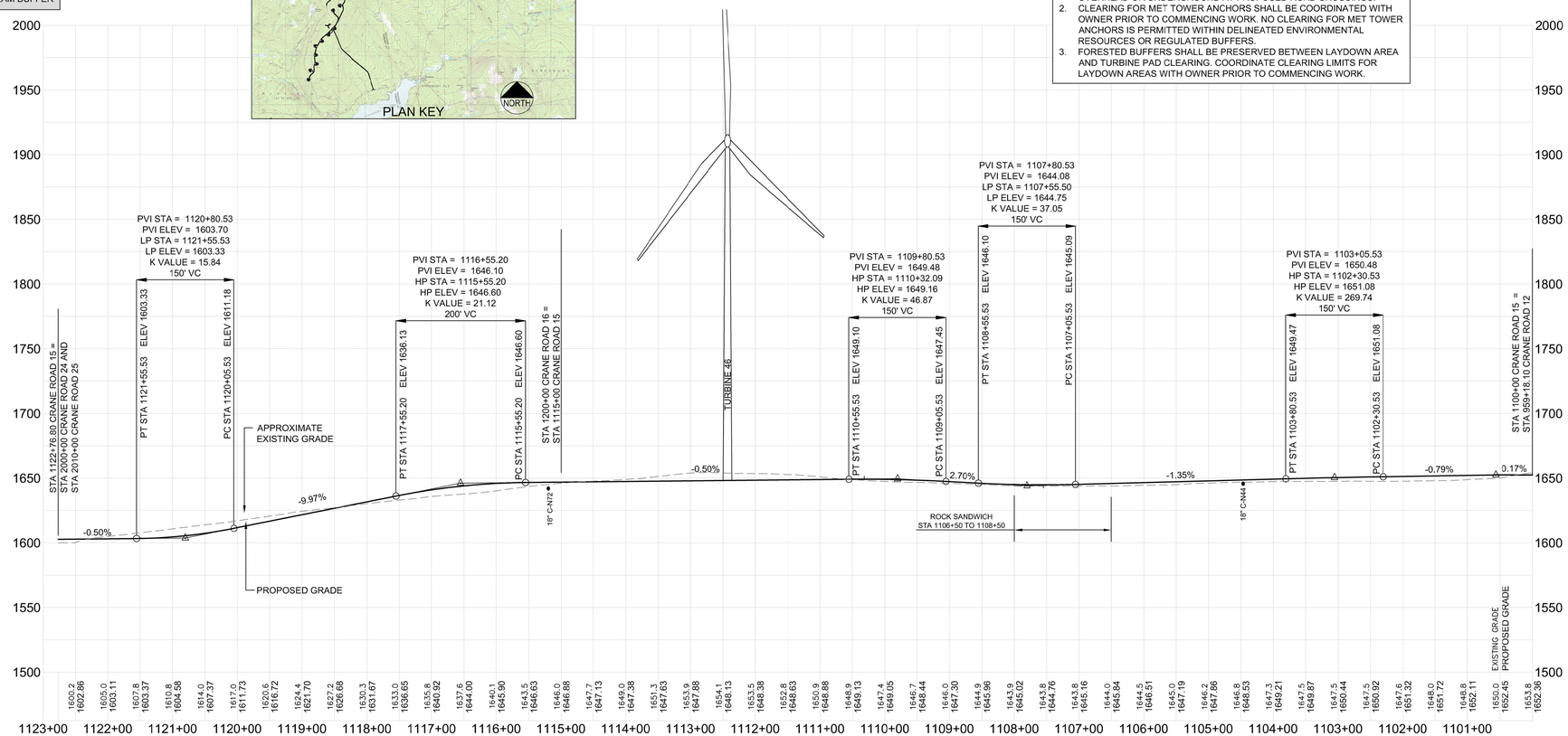


NORTH CRANE ROAD 15 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 15 PLAN AND PROFILE
[STA 1100+00 TO 1122+77]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: VFG - NORTH CR 15

STATE OF MAINE
STEVEN J. BLAKE
3695
LICENSED
PROFESSIONAL ENGINEER

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

REED & REED
WIND POWER SERVICES

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

C-N1.17

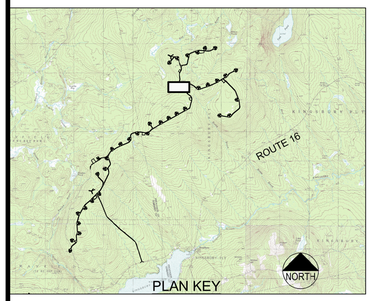
NORTH

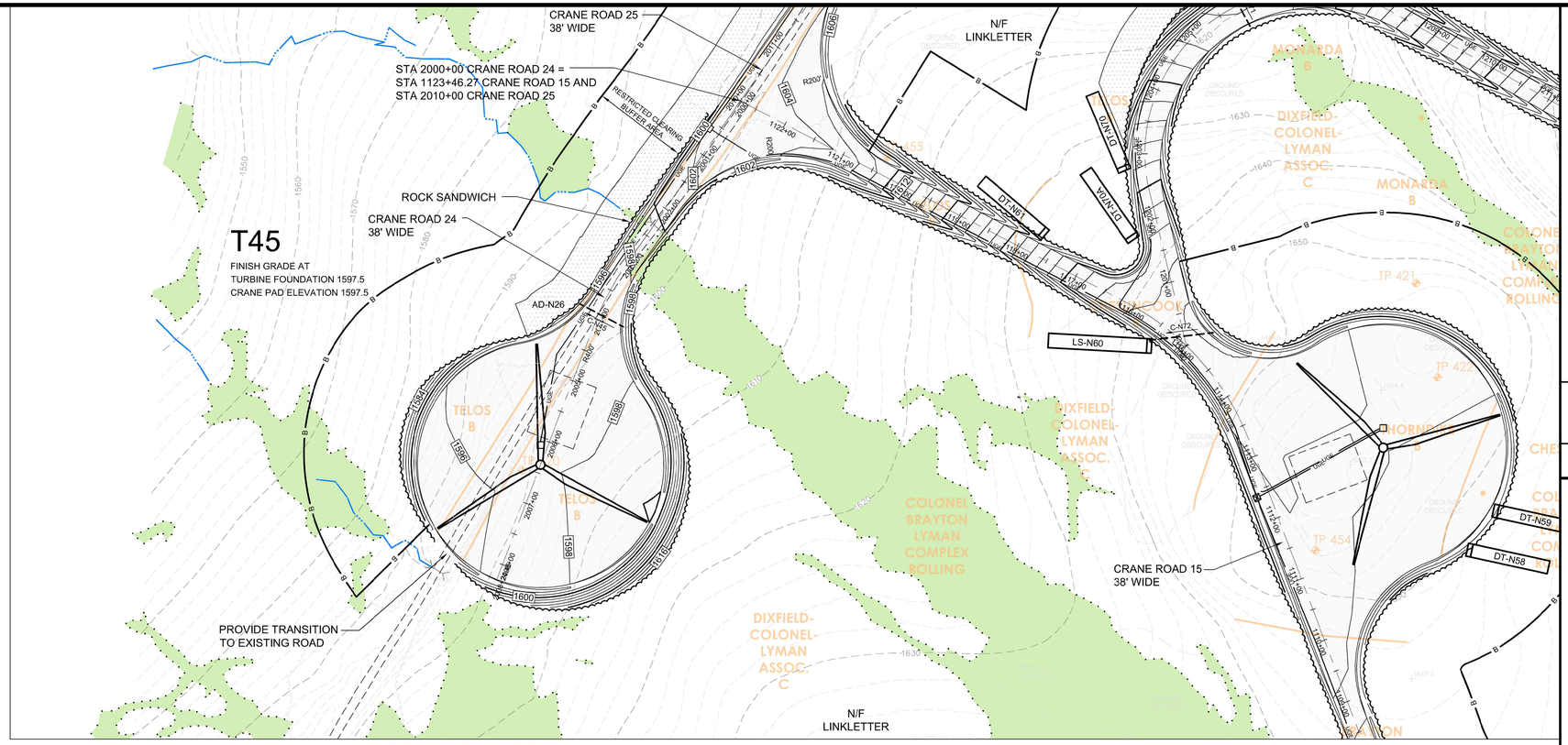
RESOURCE LEGEND

- 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.

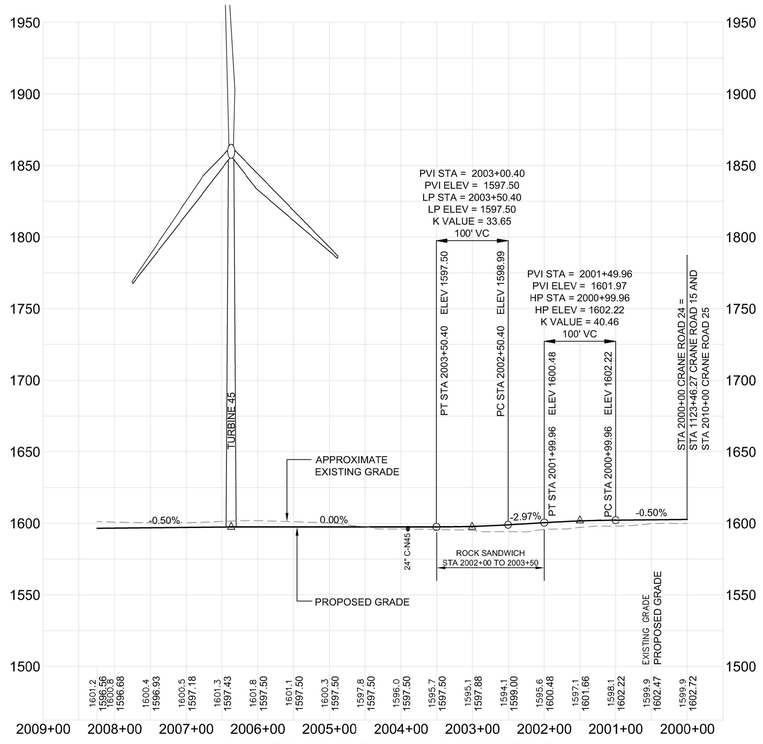




NORTH CRANE ROAD 24 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 24 PROFILE

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

1601.2	1596.56	1596.69	1600.4	1596.93	1602.3	1597.18	1601.3	1597.43	1601.8	1597.50	1601.1	1597.50	1600.3	1597.50	1597.8	1597.50	1596.0	1597.50	1595.7	1597.50	1595.1	1597.88	1594.1	1598.00	1595.6	1600.48	1597.1	1601.66	1598.1	1602.22	1599.9	1602.47	1599.9	1602.72

CRANE ROAD 24 PLAN AND PROFILE [STA 2000+00 TO 2008+25]

NO.	DATE	DESCRIPTION
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

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR 24		

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

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

REED & REED INC. — WIND POWER SERVICES

BINGHAM WIND PROJECT

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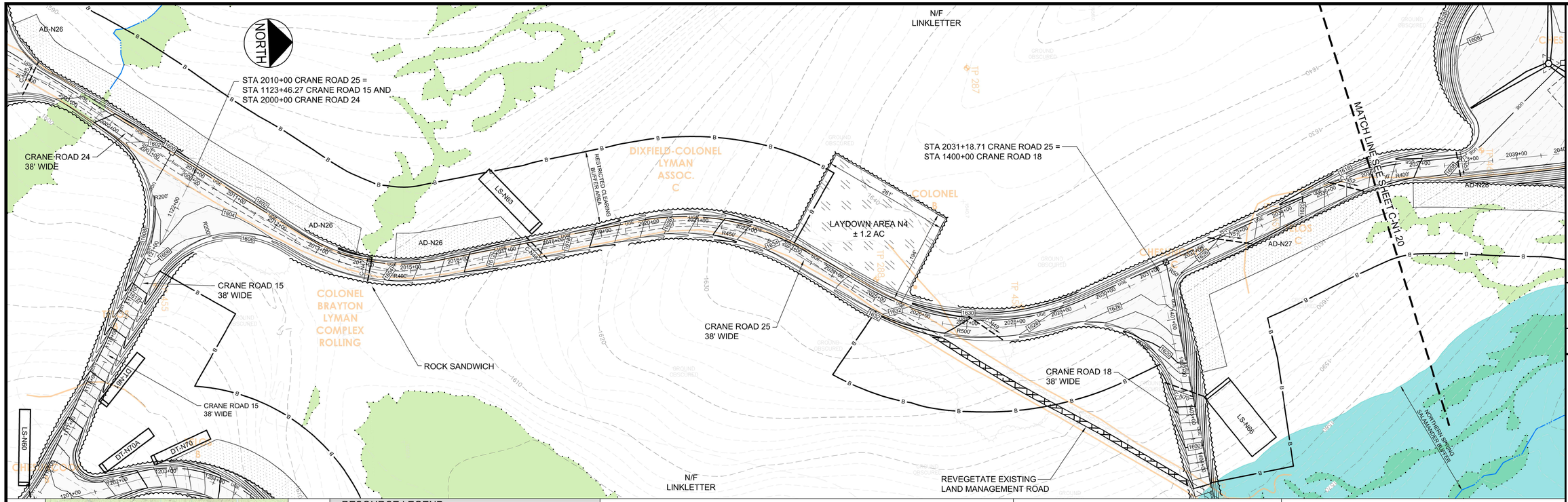
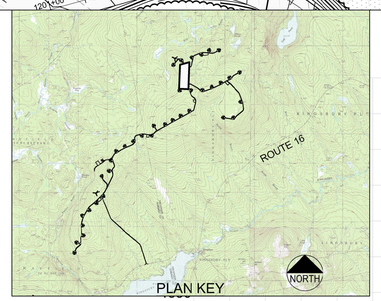
www.delucahoffman.com

SHEET

C-N1.18

PRELIMINARY - NOT FOR CONSTRUCTION





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

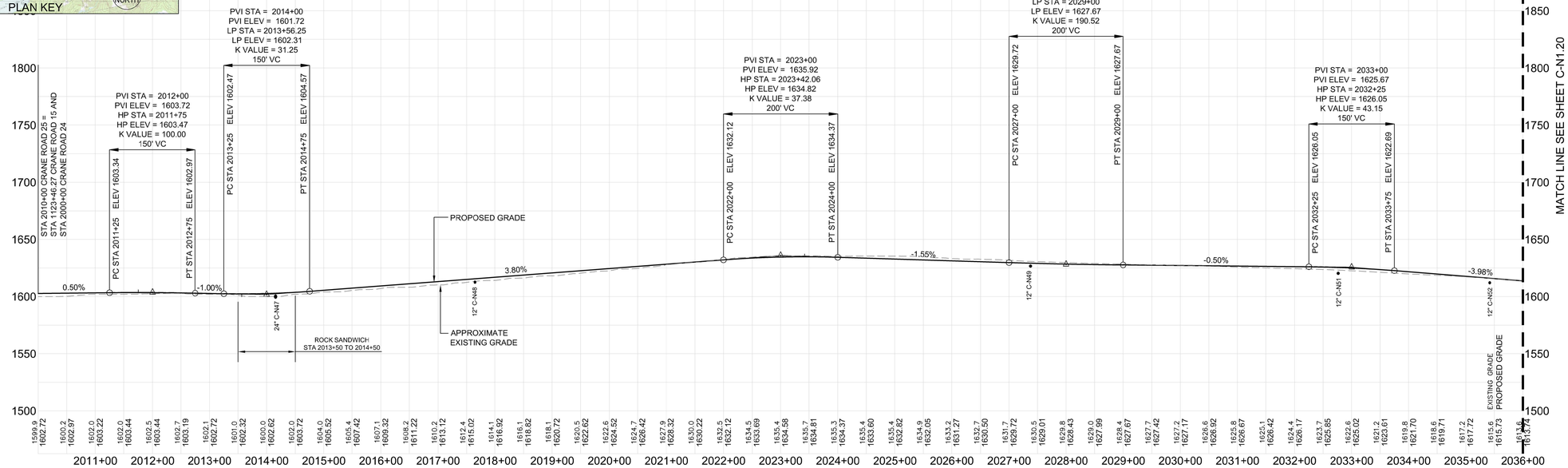
NORTH CRANE ROAD 25 PLAN

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.

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 25 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 25 PLAN AND PROFILE [STA 2010+00 TO 2036+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: VFG - NORTH CR_25

STATE OF MAINE STEVEN J. BLAKE 11695 REGISTERED PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

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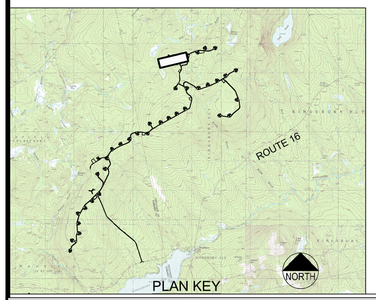
SHEET

C-N1.19



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.
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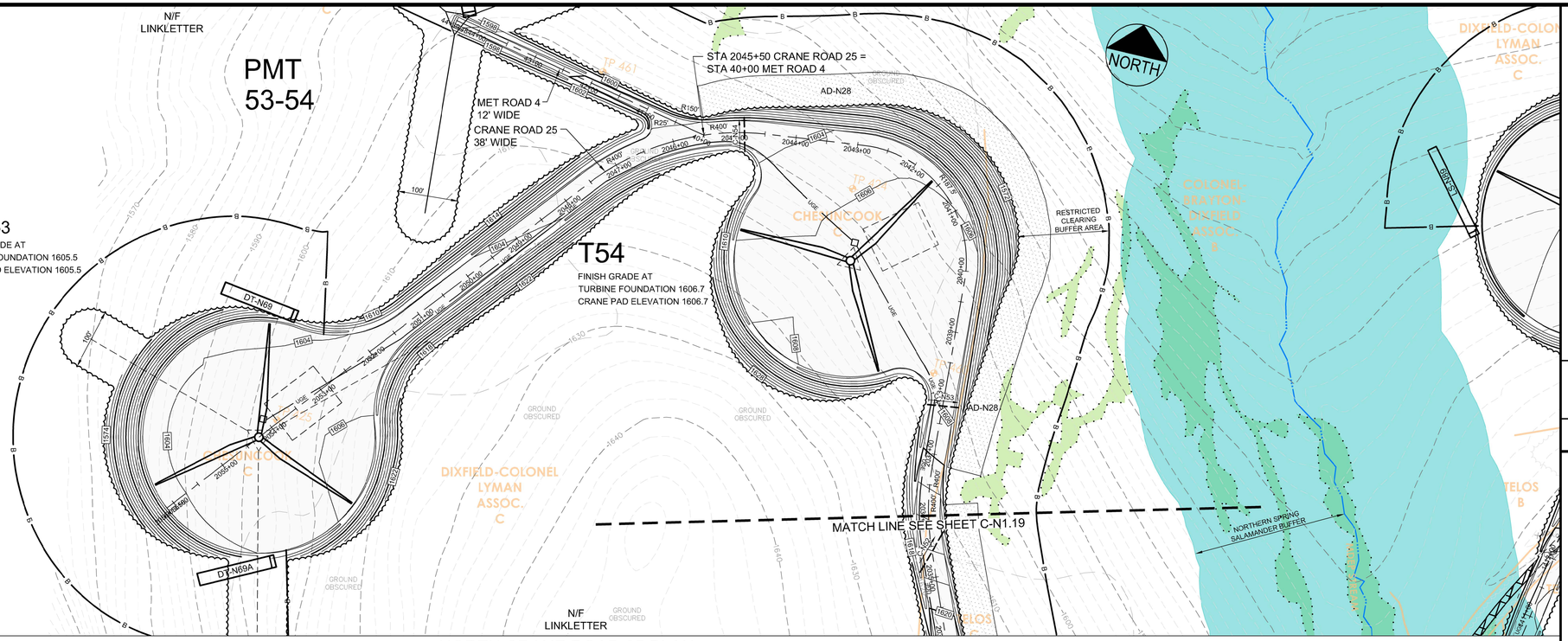
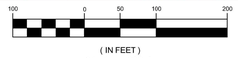
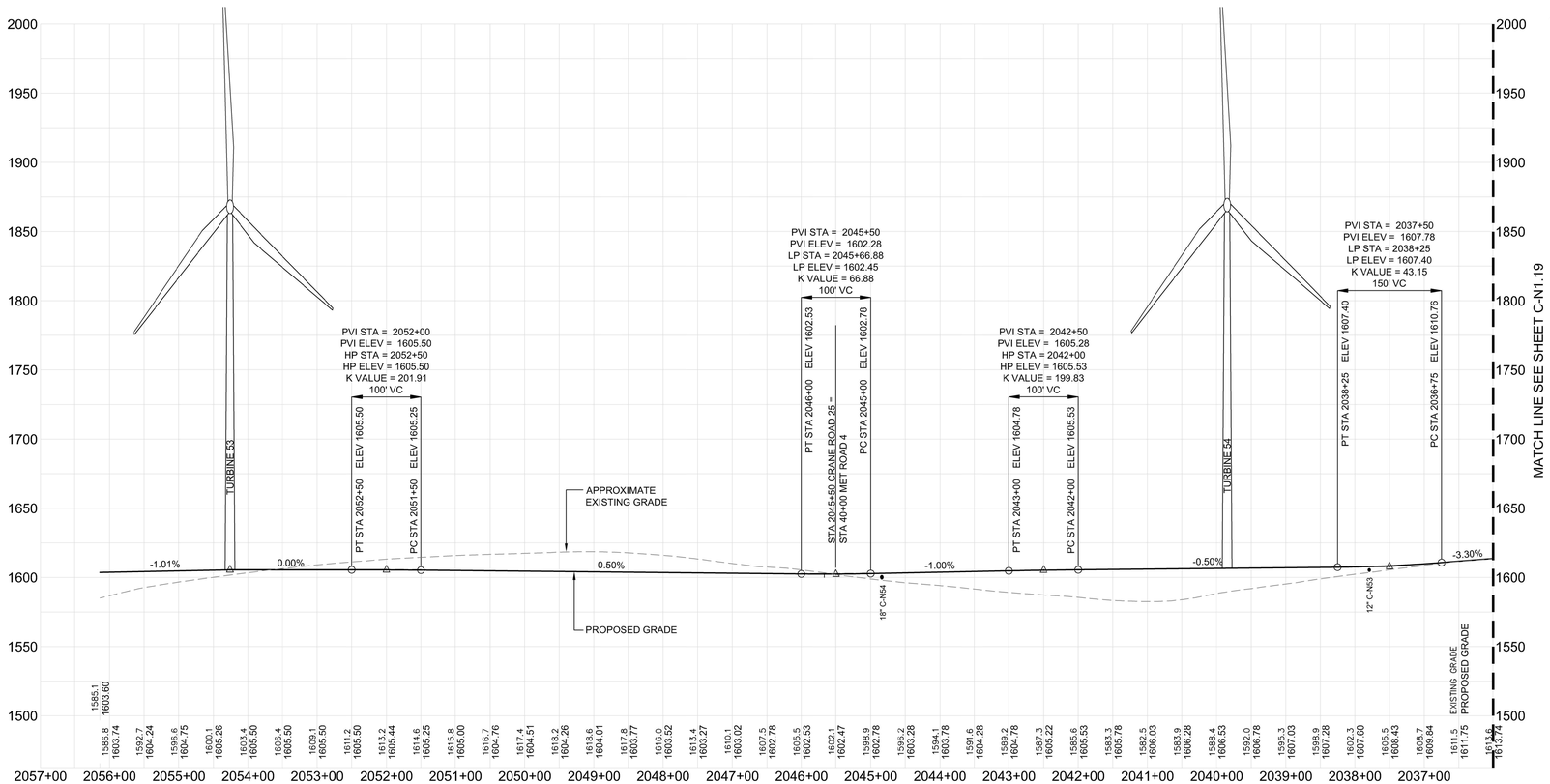


NORTH CRANE ROAD 25 PLAN

SCALE: 1" = 100'





NORTH CRANE ROAD 25 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

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	
NO.	DATE	DESCRIPTION	

CRANE ROAD 25 PLAN AND PROFILE
[STA 2036+00 TO 2056+14]

DRAWN:	DED
DESIGNED:	SJB
CHECKED:	SRB
FILE NAME:	VFG - NORTH CR_25
SCALE:	AS NOTED
DATE	SEPT 2012
JOB NO.	3048

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

BINGHAM WIND PROJECT

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SHEET

C-N1.20

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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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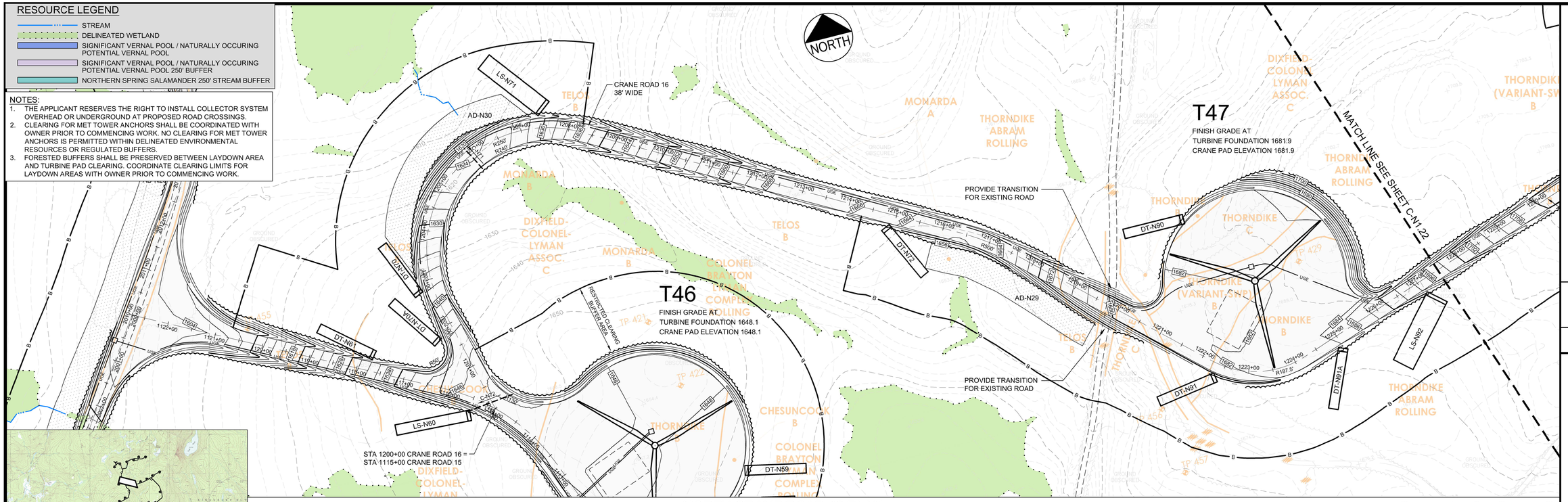
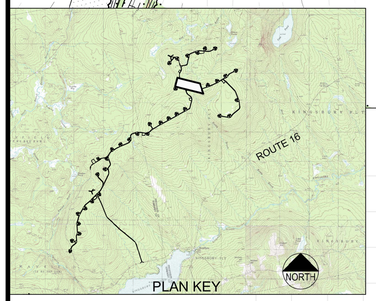


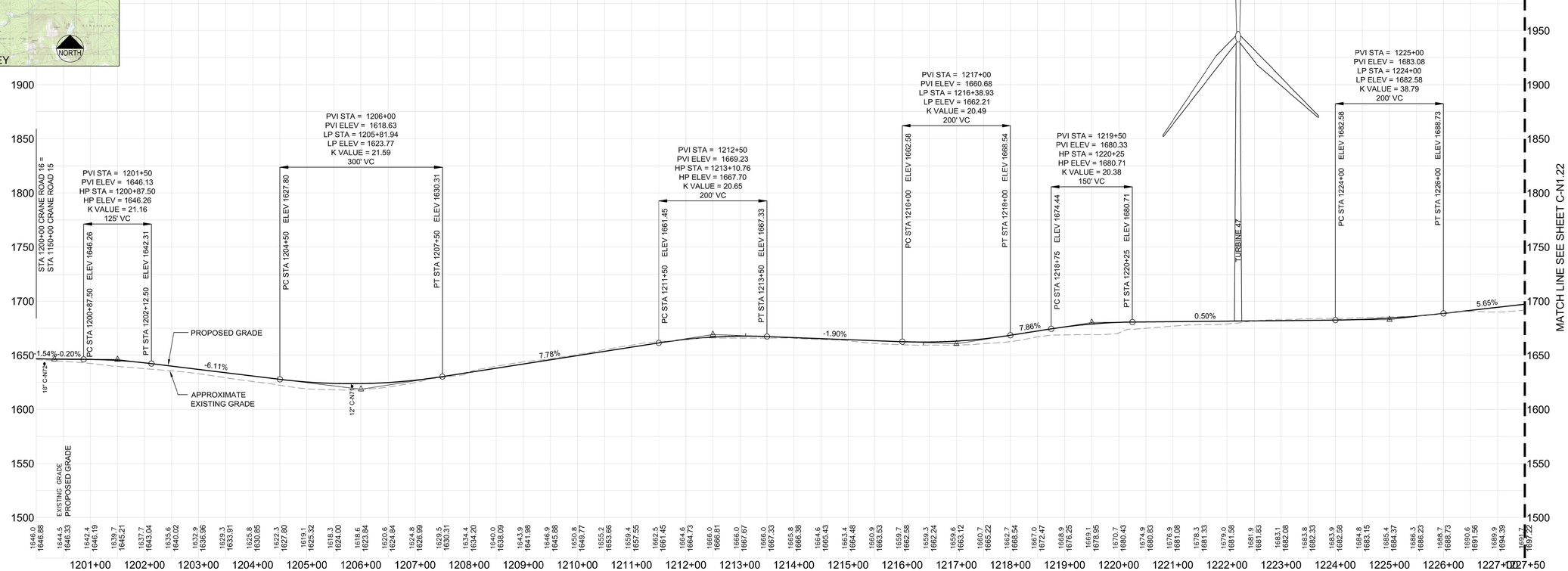
NORTH CRANE ROAD 16 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



PLAN KEY



NORTH CRANE ROAD 16 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

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

DRAWN: DED | 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
3695
REGISTERED PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

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SOUTH PORTLAND, ME 04106
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SHEET
C-N1.21

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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:
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.
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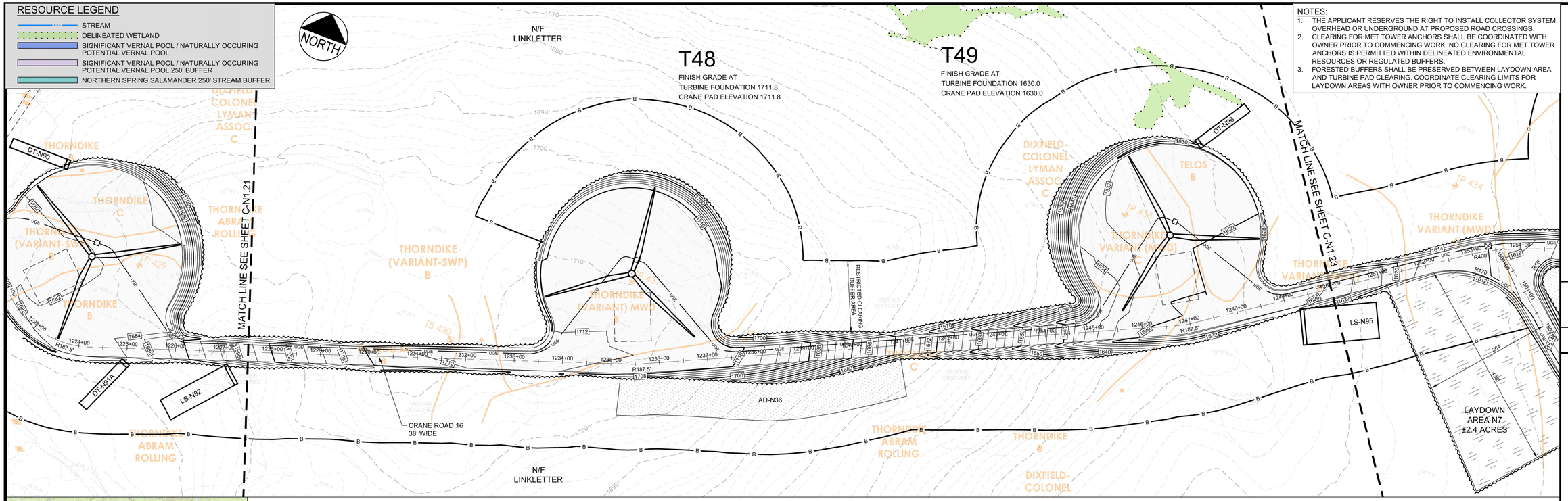
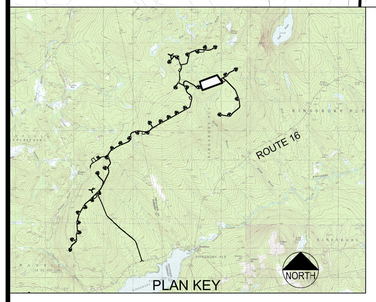
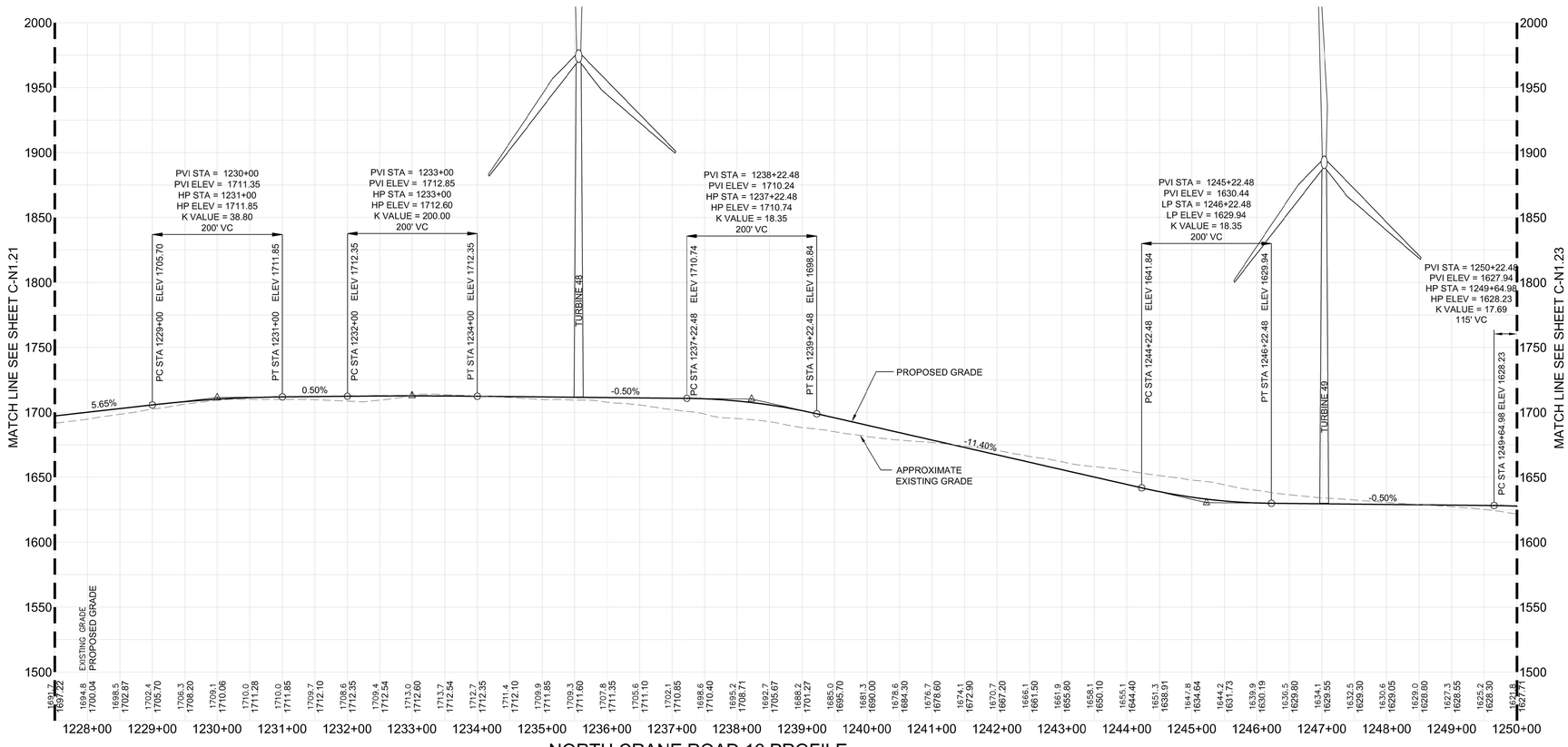


NORTH CRANE ROAD 16 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.





NORTH CRANE ROAD 16 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 16 PLAN AND PROFILE
[STA 1227+50 TO 1250+00]

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

STATE OF MAINE — STEVEN J. BLAKE II — 11695 — LICENSED PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

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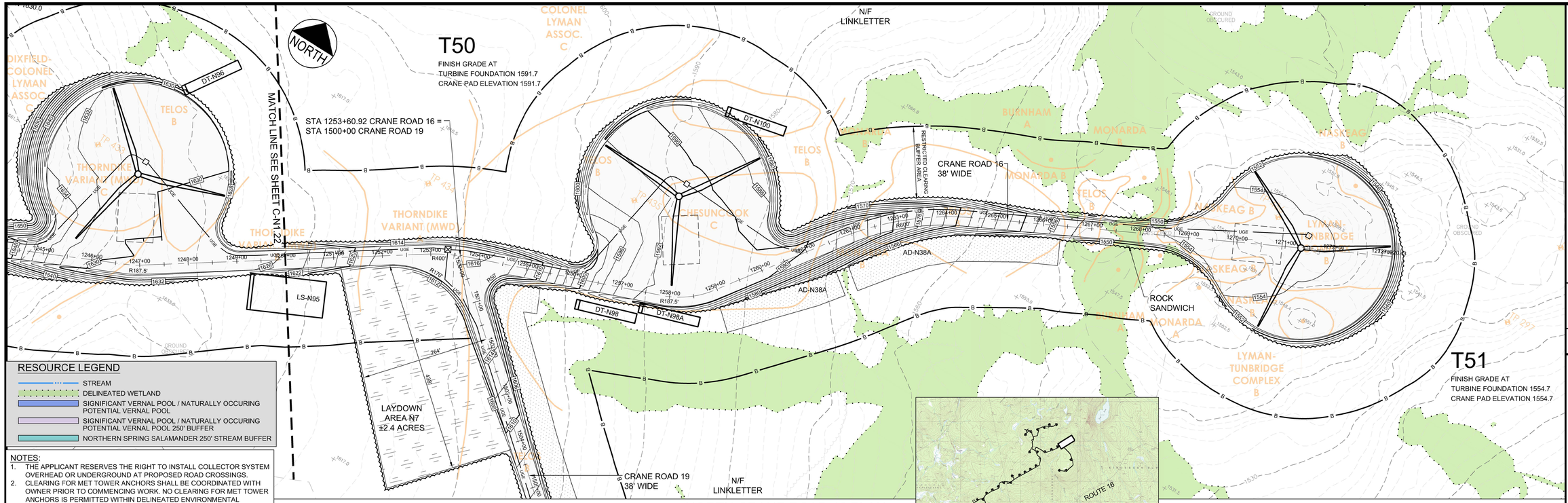
207.775.1121
www.delucahoffman.com

SHEET
C-N1.22



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.
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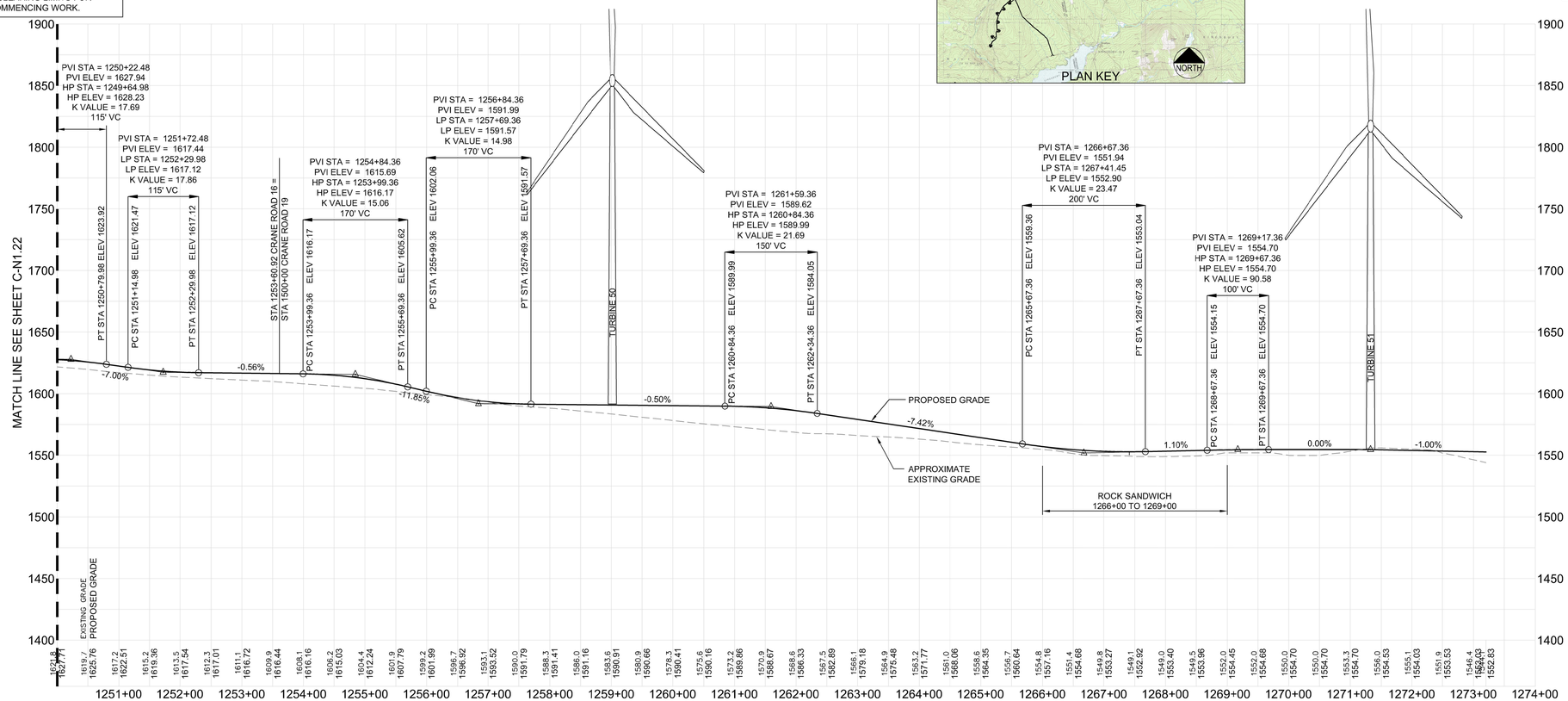
NORTH CRANE ROAD 16 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 16 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 16 PLAN AND PROFILE
[STA 1250+00 TO 1273+20]

DRAWN:
DESIGNED: DED
CHECKED: SJB
FILE NAME: SRB
SCALE: AS NOTED
DATE: SEPT 2012
JOB NO. 3048
VFG - NORTH CR. 16

STATE OF MAINE
STEVEN J. BLAKE
3695
LICENSED
PROFESSIONAL ENGINEER

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

RED RISE
WIND POWER SERVICES

BINGHAM WIND PROJECT

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SHEET

C-N1.23

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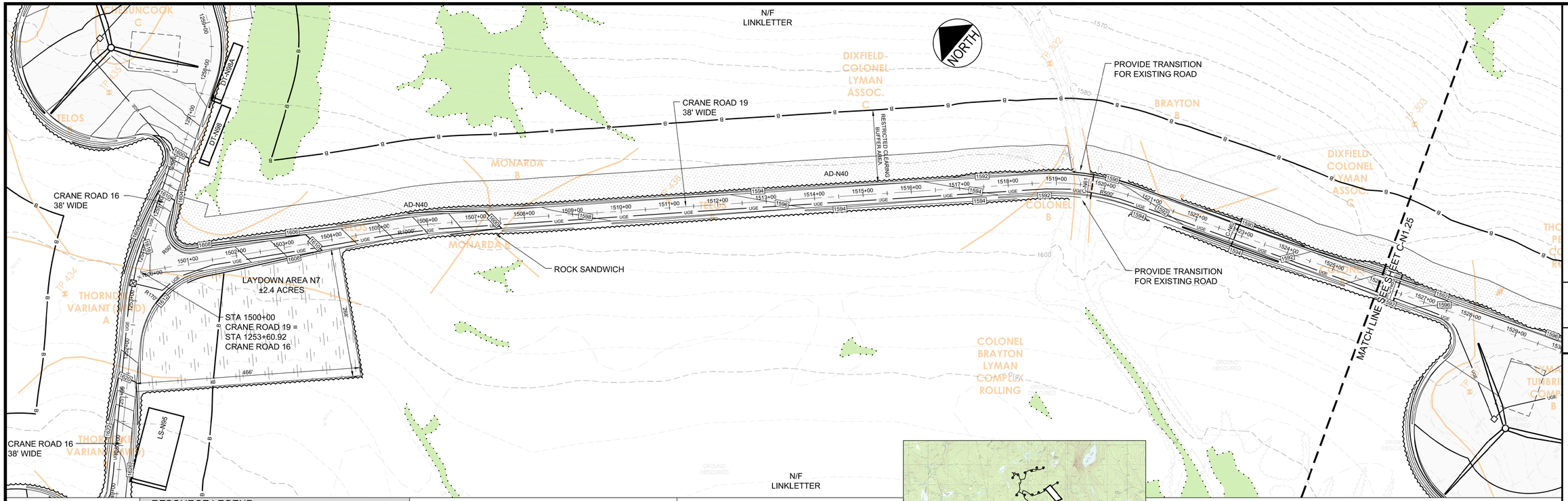

RESOURCE LEGEND

- STREAM
- DELINEATED WETLAND
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL 250' BUFFER
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NOTES:

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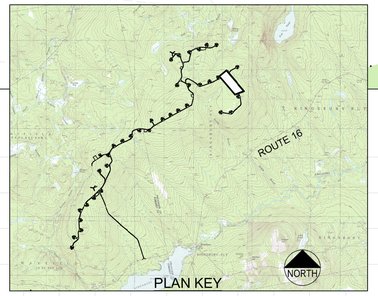
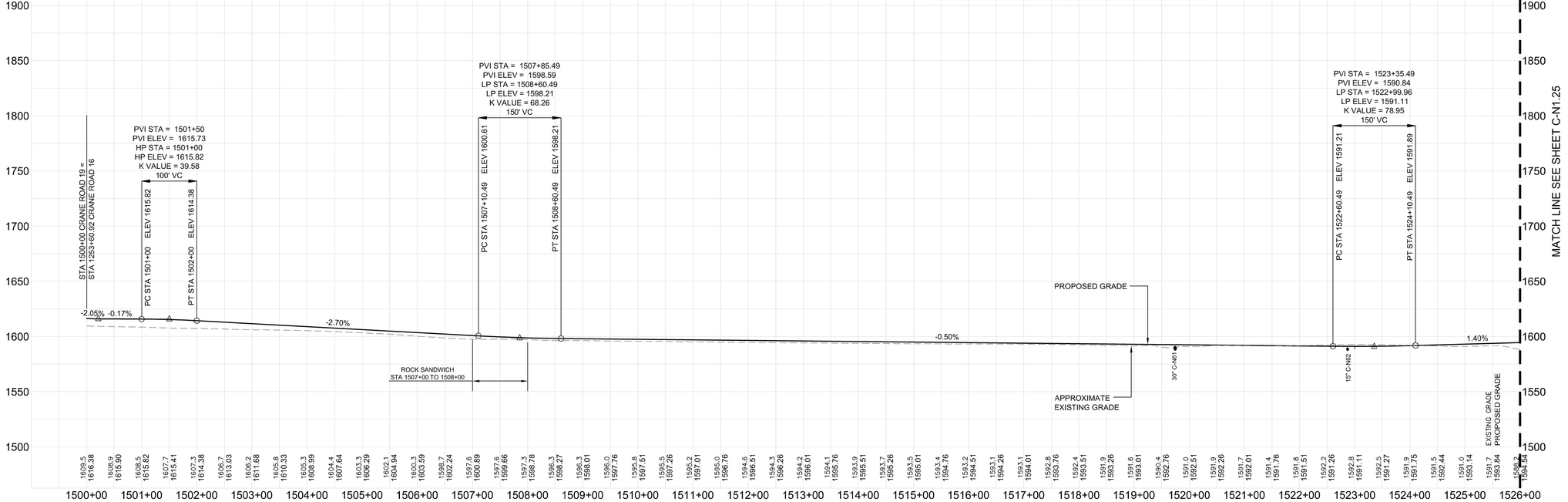
NORTH CRANE ROAD 19 PLAN

SCALE: 1" = 100'



(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 19 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 19 PLAN AND PROFILE [STA 1500+00 TO 1526+00]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE:	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_19		

STATE OF MAINE
STEVEN J. BLAKE II
3695
REGISTERED
PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11695

REED & REED INC.

BINGHAM WIND PROJECT

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207.775.1121
www.delucahoffman.com

SHEET

C-N1.24

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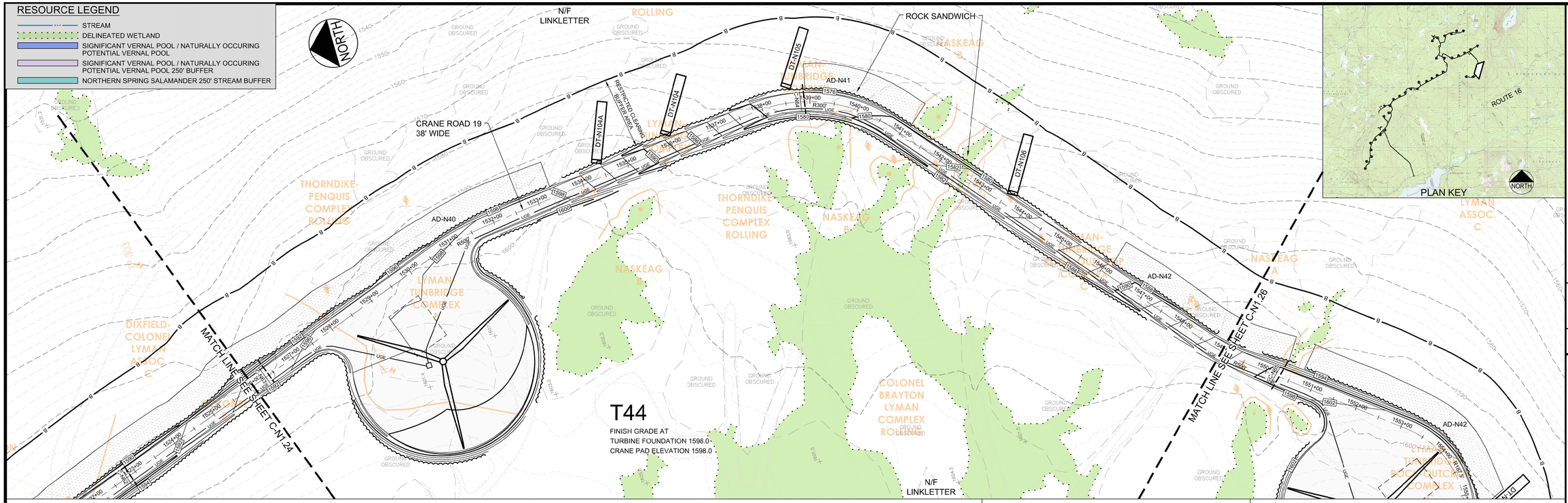
RESOURCE LEGEND

- 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



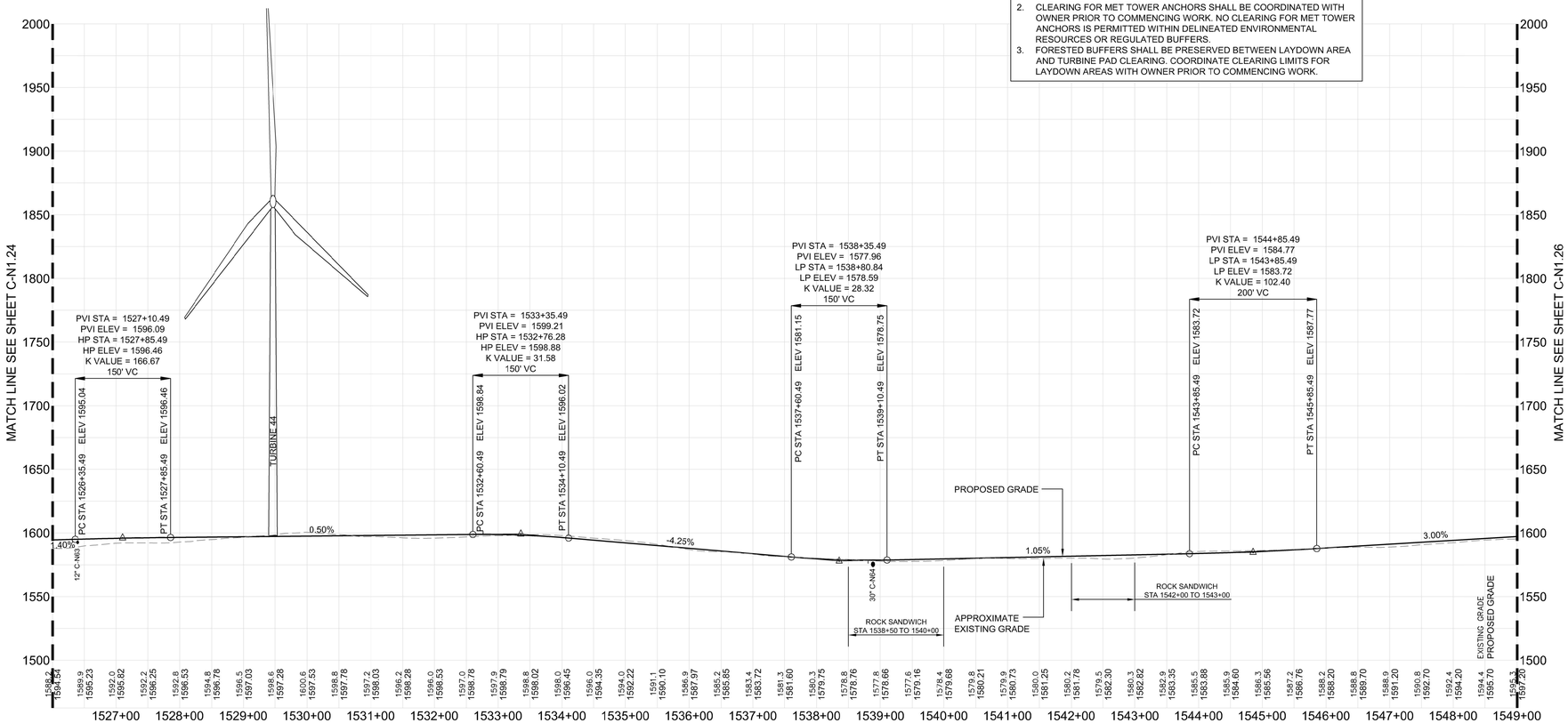
NORTH CRANE ROAD 19 PLAN

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.



NORTH CRANE ROAD 19 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 19 PLAN AND PROFILE [STA 1526+00 TO 1549+00]

DRAWN:	DED
DESIGNED:	SJB
CHECKED:	SRB
FILE NAME:	VFG - NORTH CR_19
SCALE:	AS NOTED
DATE	SEPT 2012
JOB NO.	3048

STATE OF MAINE — STEVEN J. BLAKE II — 11695 — LICENSED PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

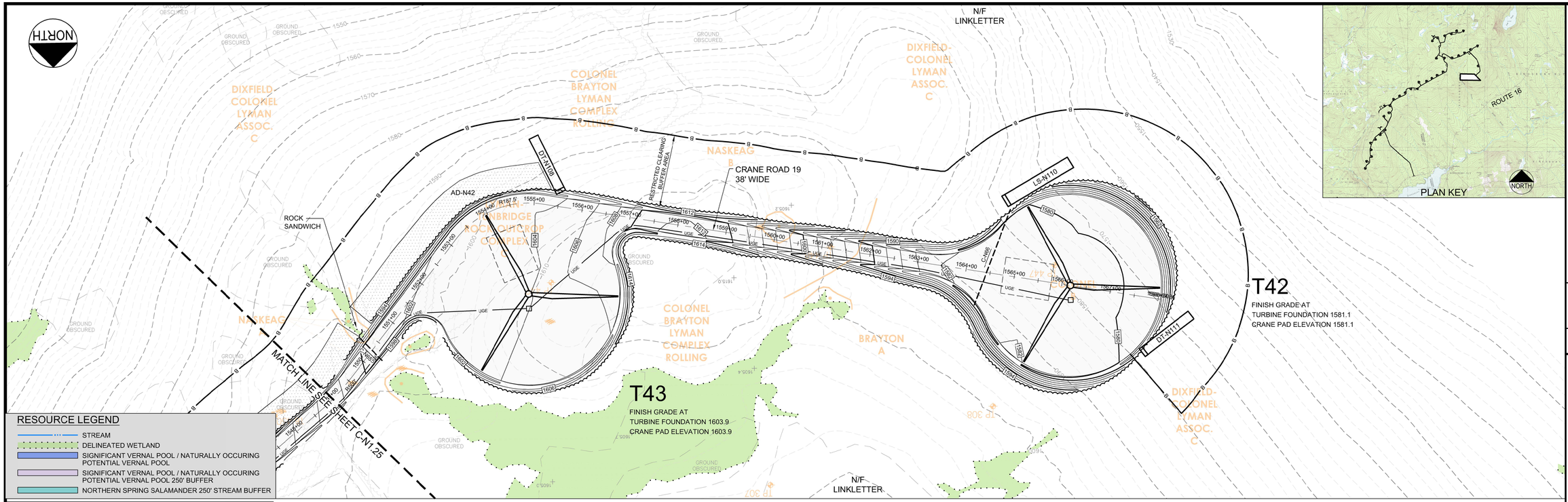
BLUE SKY WEST, LLC

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

SHEET

C-N1.25

R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\NORTH\VFG - NORTH CR_19.dwg davis_d 8/1/2013 11:41 AM



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

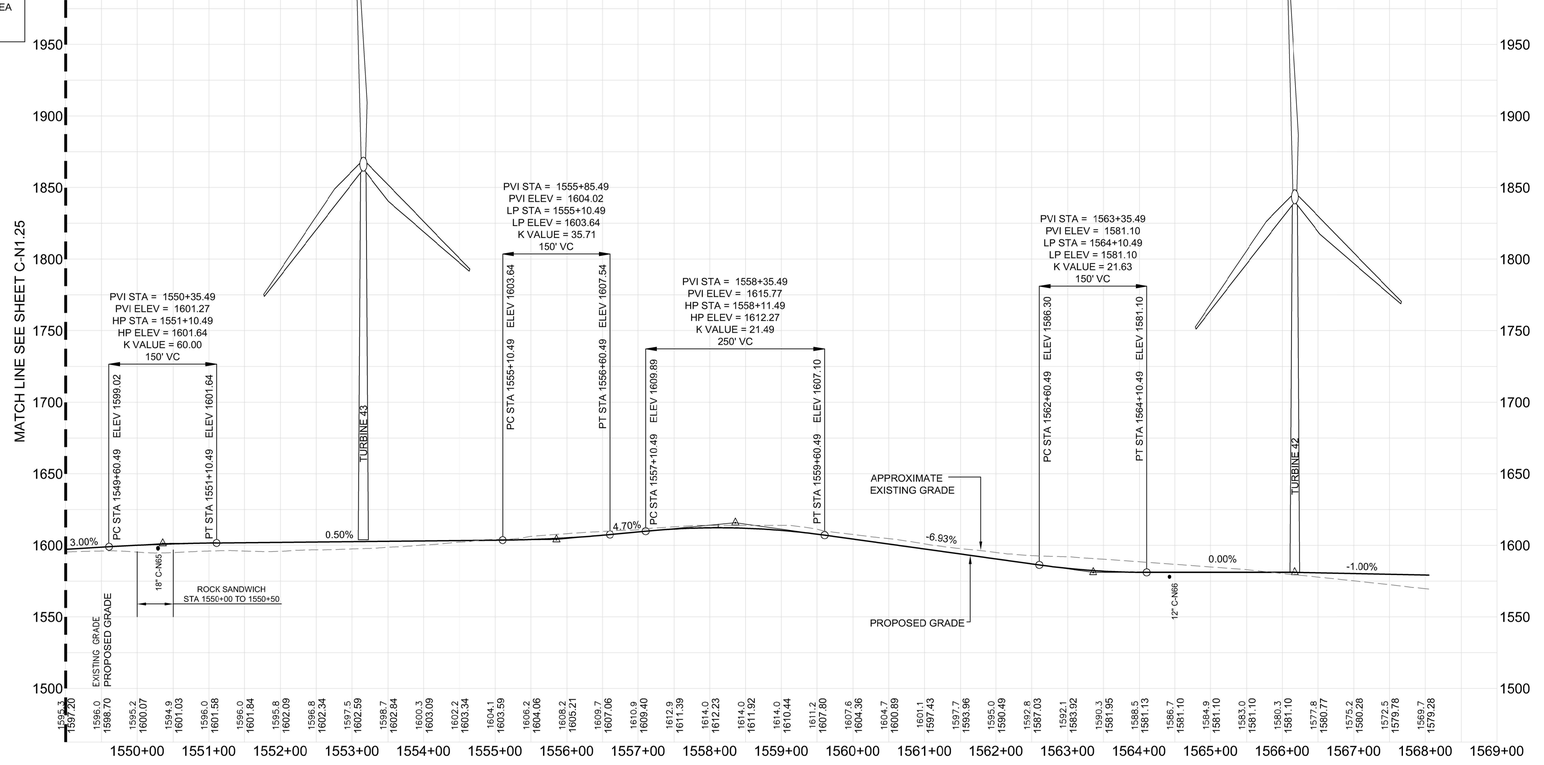
NOTES:

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 19 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



NORTH CRANE ROAD 19 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 19 PLAN AND PROFILE
[STA 1549+00 TO 1568+05]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_19		

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

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

BINGHAM WIND PROJECT

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778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
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SHEET

C-N1.26

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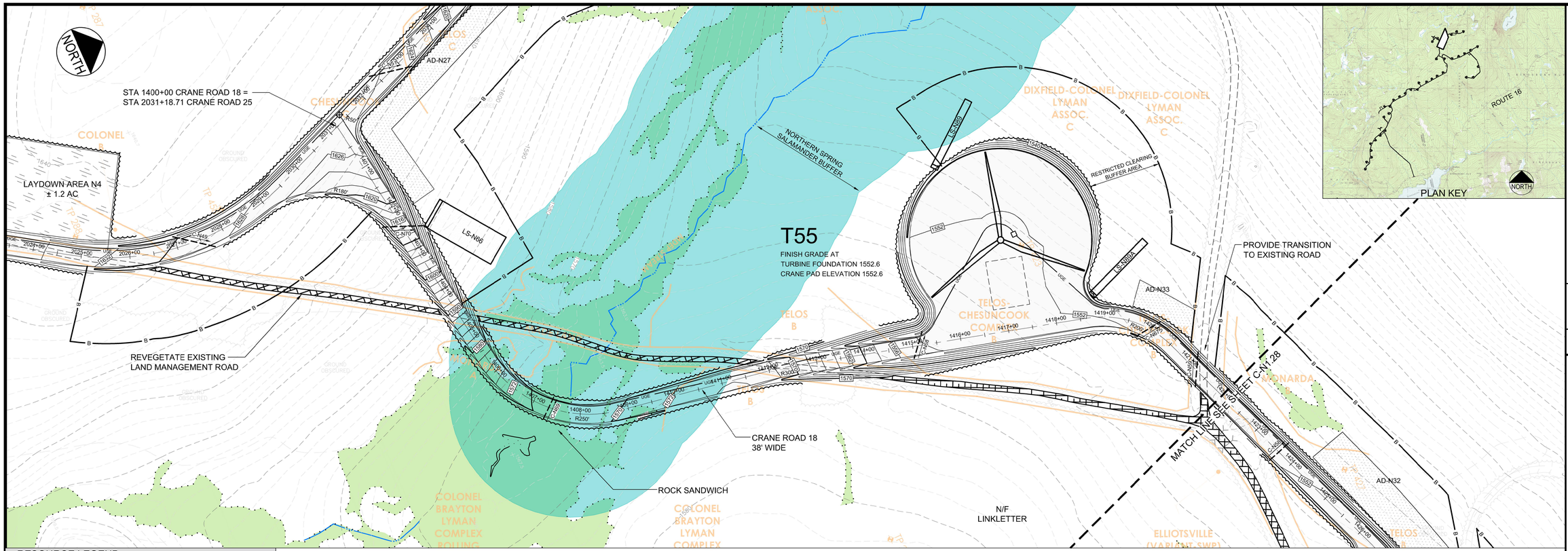


RESOURCE LEGEND

- 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

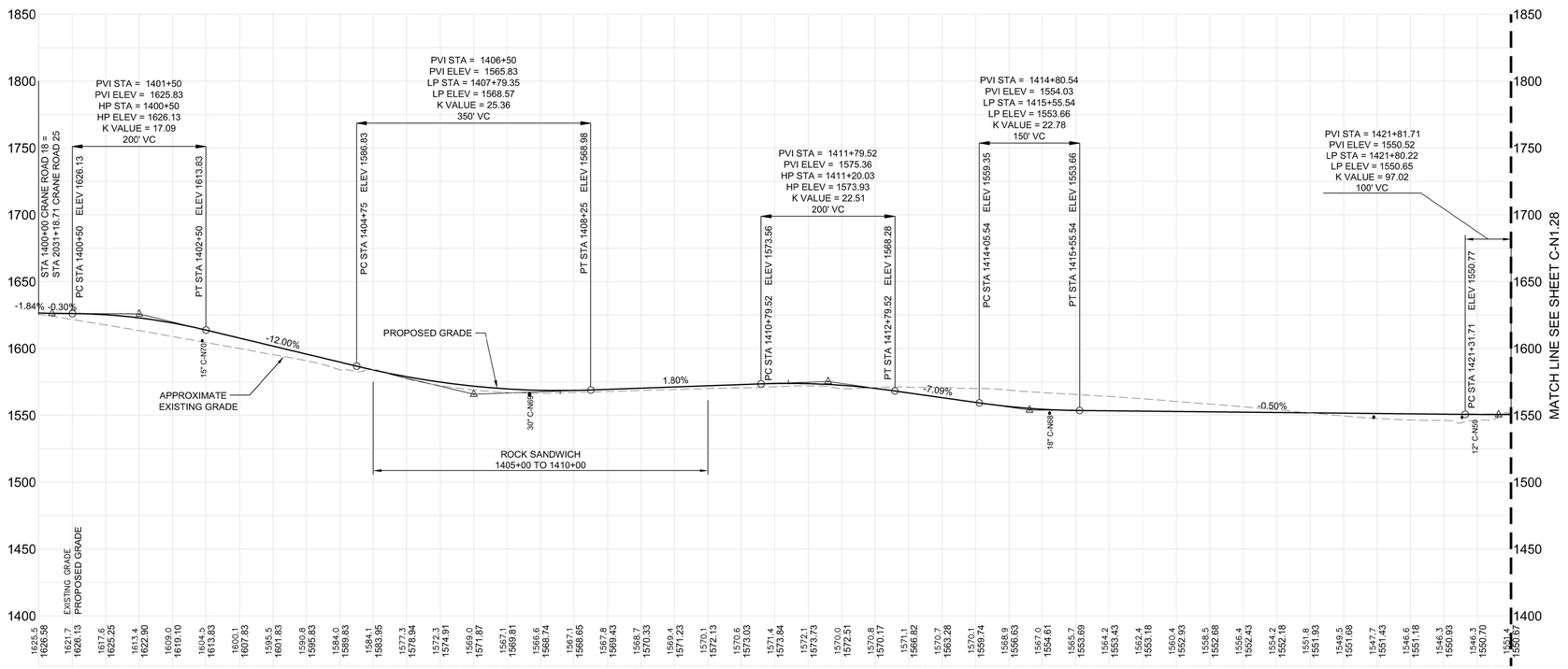
NOTES:

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 18 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = ft.



NORTH CRANE ROAD 18 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 18 PLAN AND PROFILE [STA 1400+00 TO 1422+00]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR. 17		

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

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

BINGHAM WIND PROJECT

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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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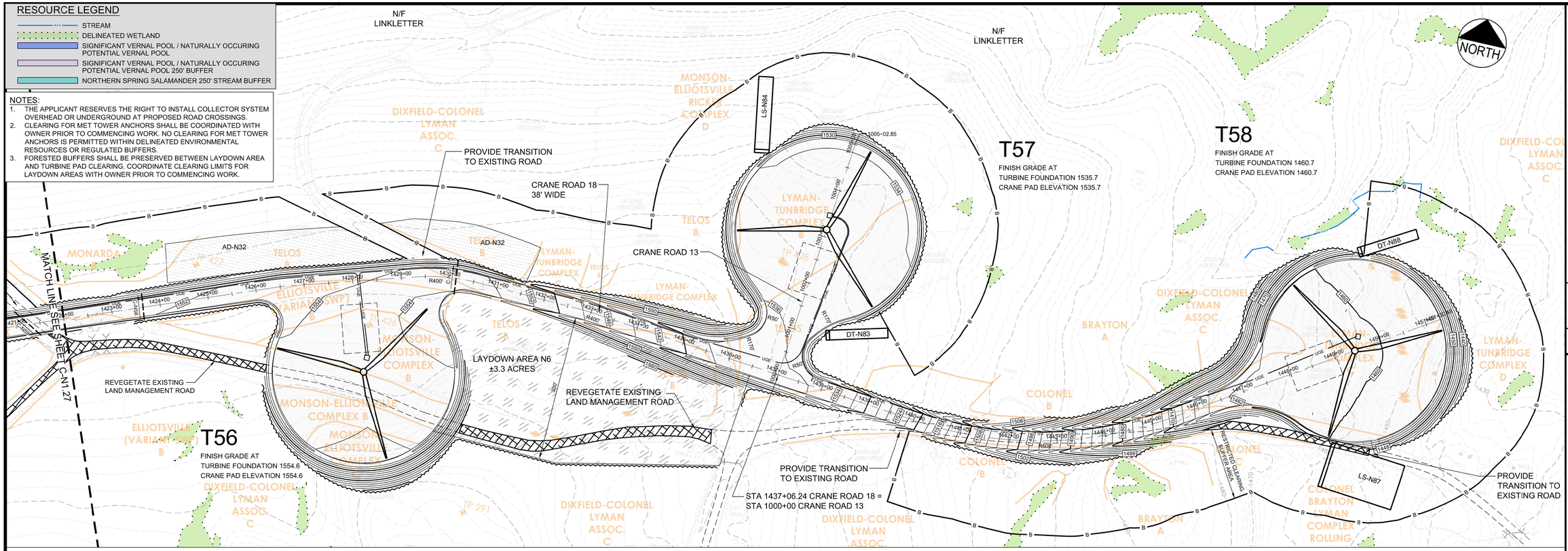
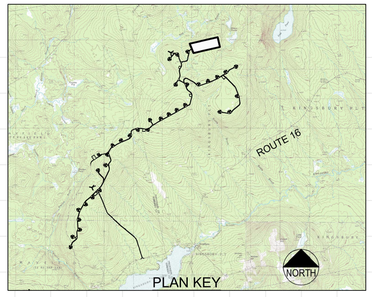


NORTH CRANE ROAD 18 PLAN

SCALE: 1" = 100'



(IN FEET)
1 inch = 100 ft.

NORTH CRANE ROAD 18 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 18 PLAN AND PROFILE
[STA 1422+00 TO 1451+31]

DRAWN:	DED
DESIGNED:	SJB
CHECKED:	SRB
FILE NAME:	VFG - NORTH CR_18
SCALE:	AS NOTED
DATE	SEPT 2012
JOB NO.	3048

STATE OF MAINE — STEVEN J. BLAKE II — 11695 — REGISTERED PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

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778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
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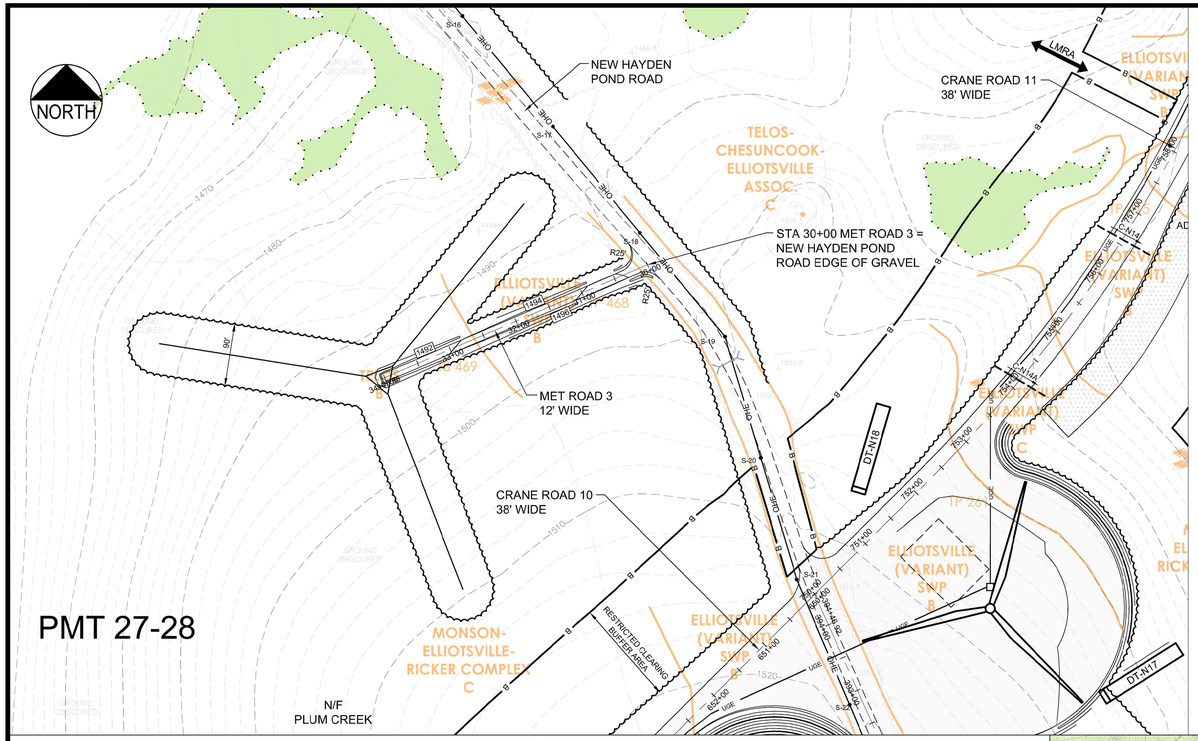
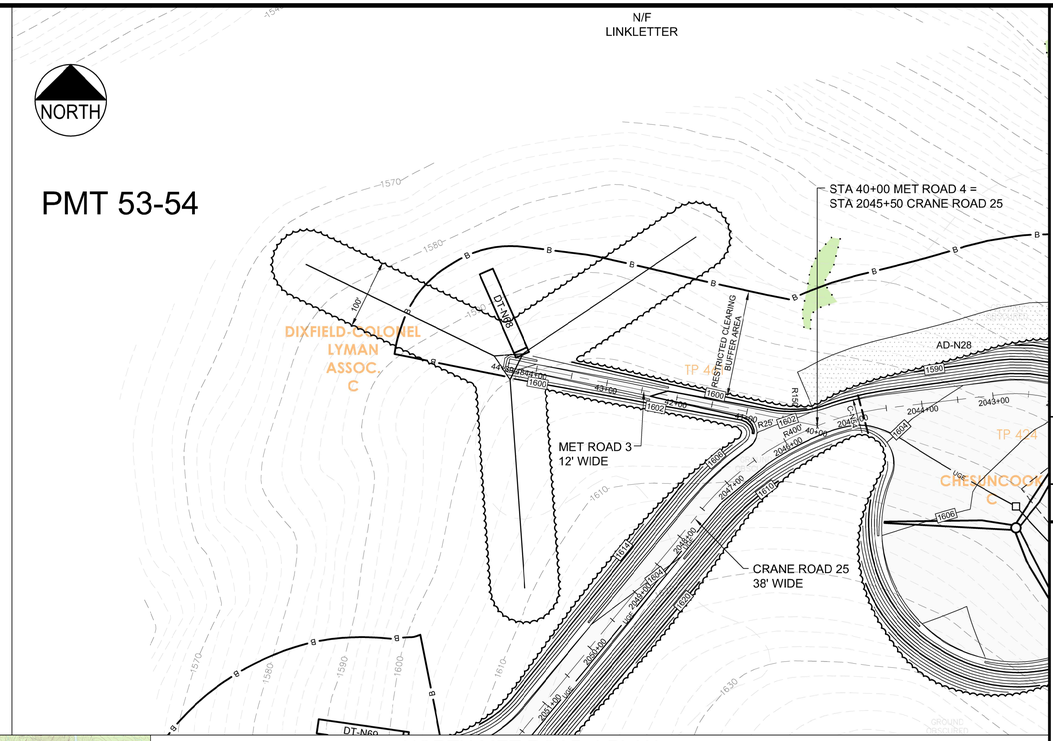
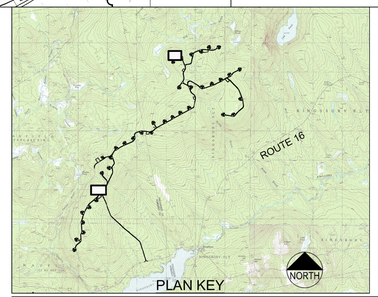


NORTH MET ROAD 3 PLAN
SCALE: 1" = 100'



NORTH MET ROAD 4 PLAN
SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.

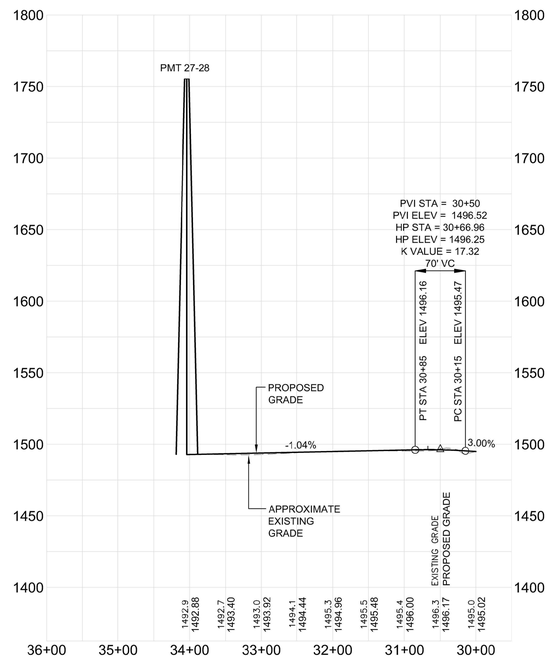


PLAN KEY

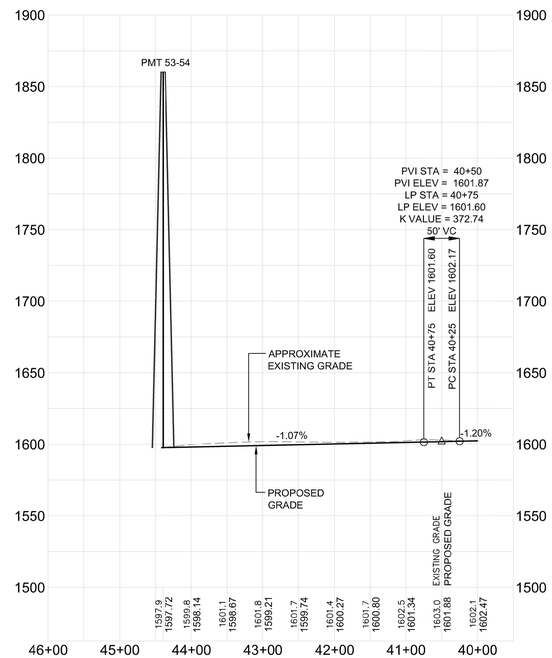
RESOURCE LEGEND

- 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 MET ROAD 3 PROFILE
SCALE: H 1" = 100'
V 1" = 50'



NORTH MET ROAD 4 PROFILE
SCALE: H 1" = 100'
V 1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

MET ROAD 3 PLAN AND PROFILE [STA 30+00 TO 34+04]
MET ROAD 4 PLAN AND PROFILE [STA 40+00 TO 44+40]

DRAWN:	DED	SCALE: AS NOTED
DESIGNED:	SJB	DATE: SEPT 2012
CHECKED:	SRB	JOB NO.: 3048
FILE NAME:	VFG - NORTH CR_14	

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

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778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

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C-N1.29

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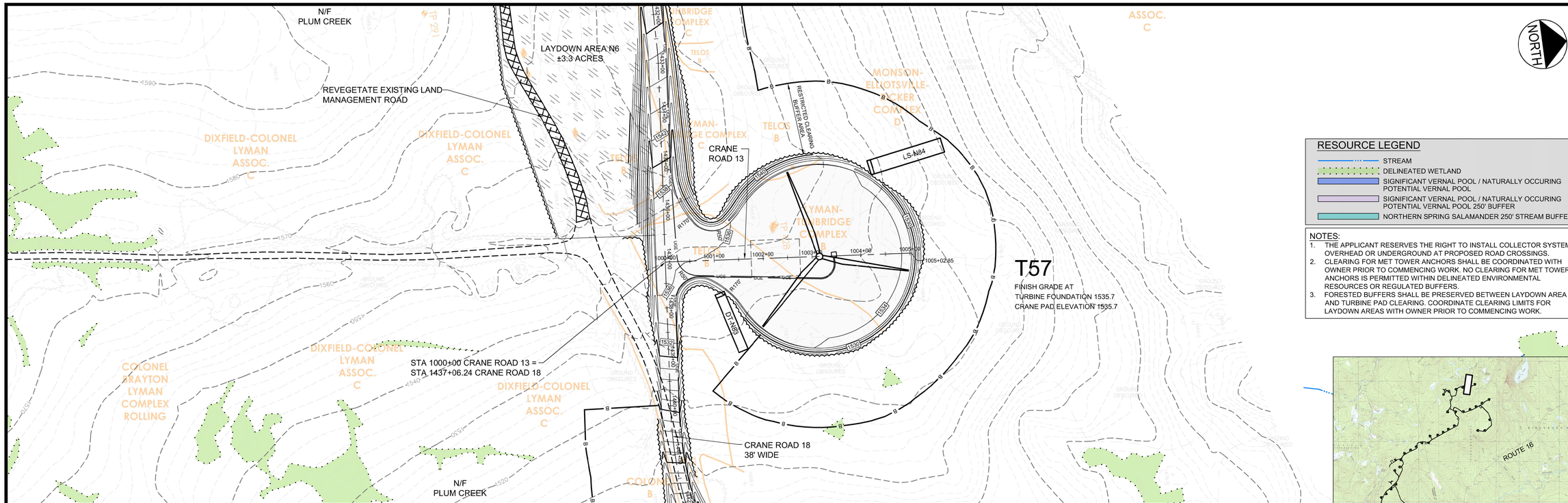
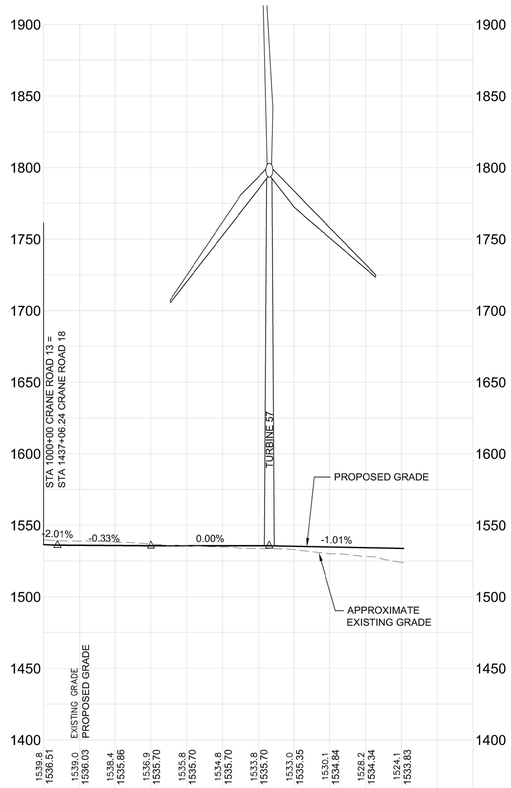


NORTH CRANE ROAD 13 PLAN

SCALE: 1" = 100'



NORTH CRANE ROAD 13 PROFILE

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

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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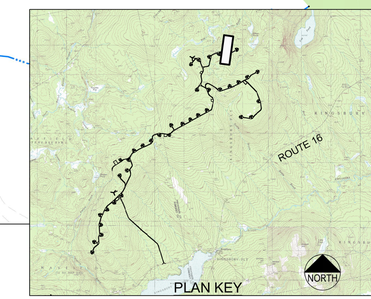

PLAN KEY

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 13 PLAN AND PROFILE
[STA 1000+00 TO 1005+03]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	VFG - NORTH CR_13		

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

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SHEET

C-N1.30

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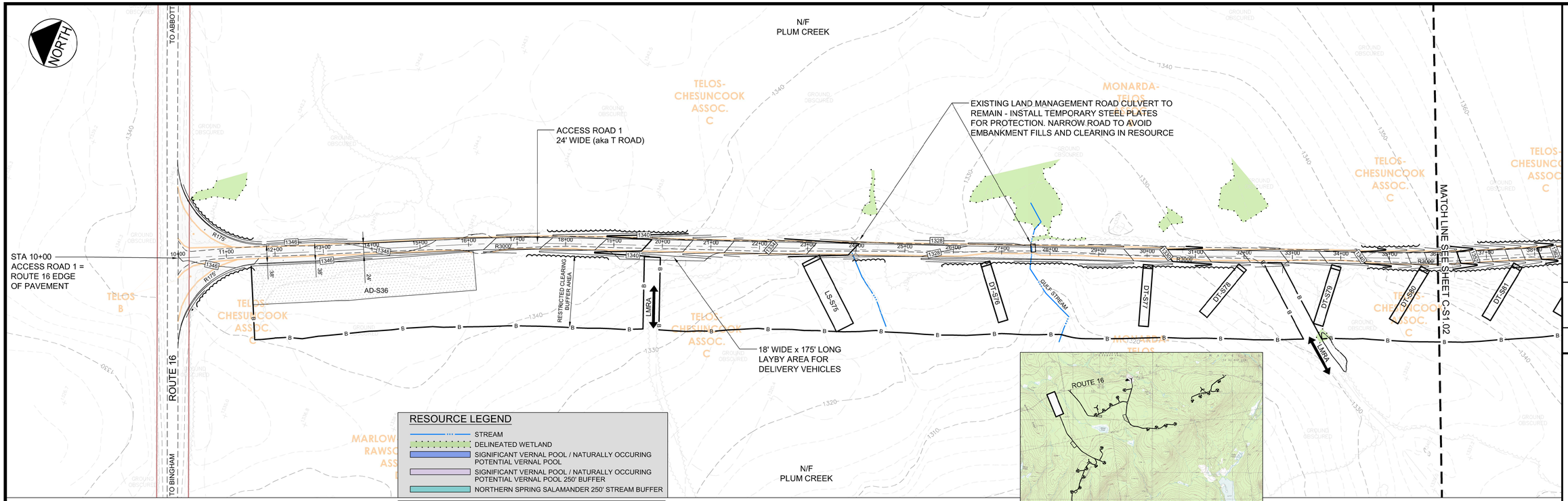

RESOURCE LEGEND

- 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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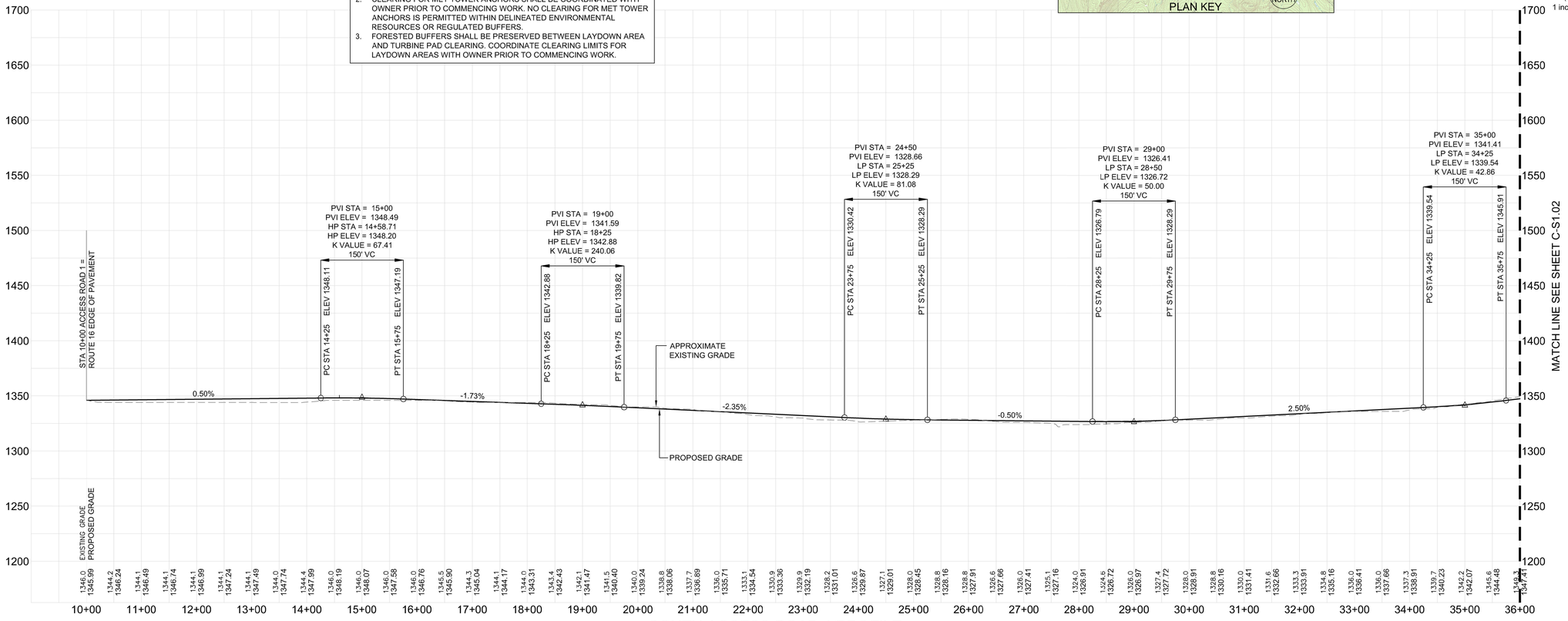
SOUTH ACCESS ROAD 1 PLAN

SCALE: 1" = 100'

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.



SOUTH ACCESS ROAD 1 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

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

ACCESS ROAD 1 PLAN AND PROFILE [STA 10+00 TO 36+00]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	SOUTH AR_1		

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

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

BINGHAM WIND PROJECT

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778 MAIN STREET SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
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SHEET

C-S1.01

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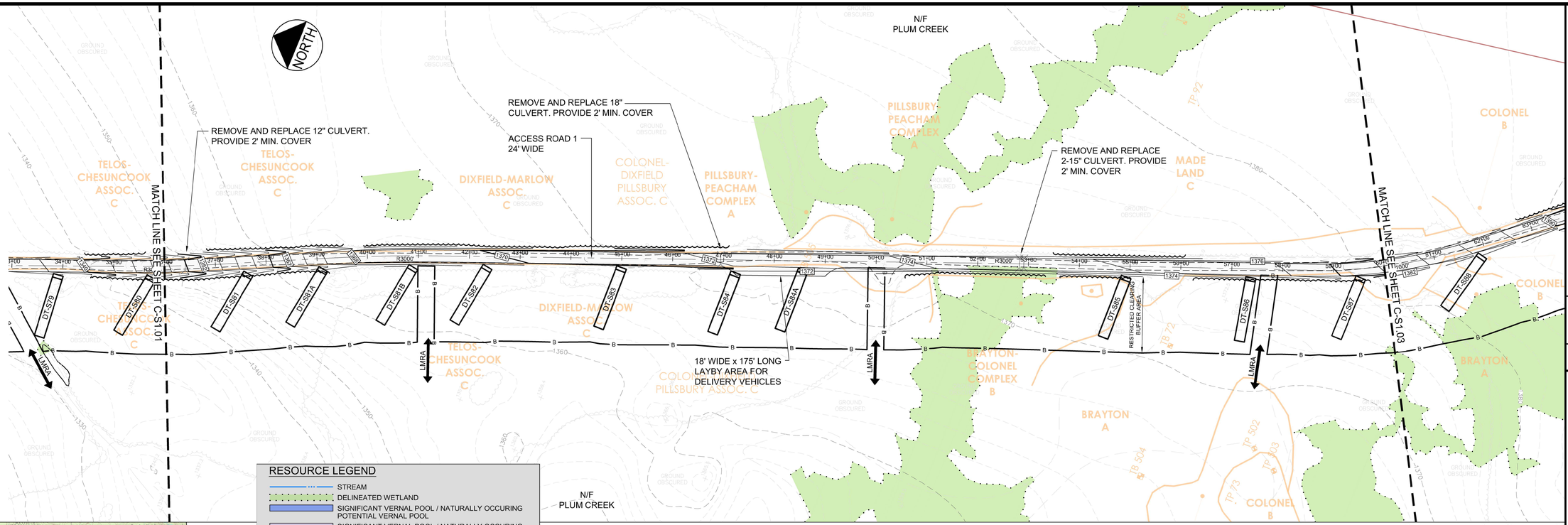

SOUTH ACCESS ROAD 1 PLAN

SCALE: 1" = 100'

100 0 50 100 200

(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:

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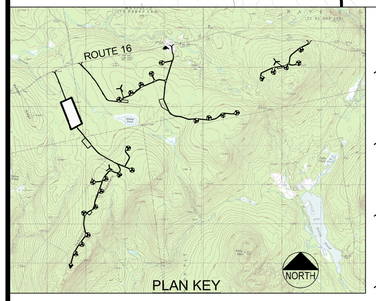
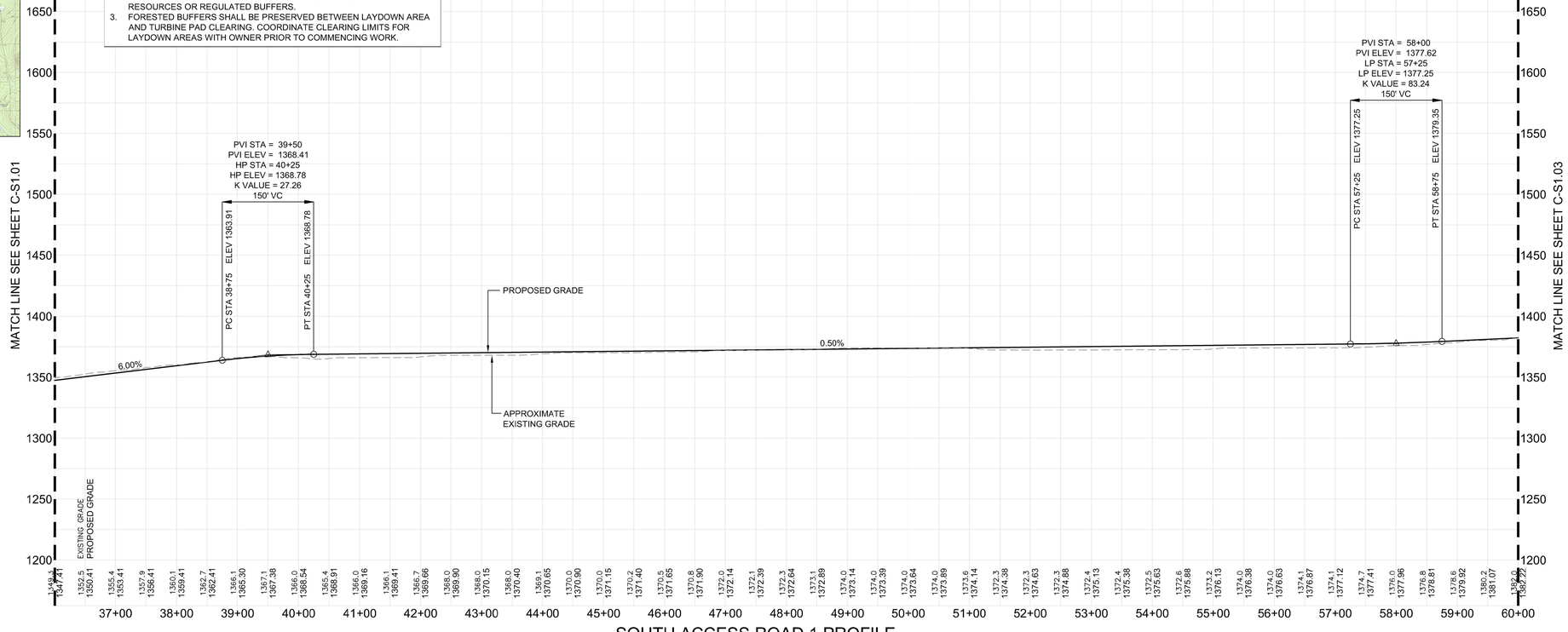


PLAN KEY



SOUTH ACCESS ROAD 1 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

ACCESS ROAD 1 PLAN AND PROFILE
[STA 36+00 TO 60+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: SOUTH AR_1

STATE OF MAINE
STEVEN J. BLAKE
3695
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

C-S1.02

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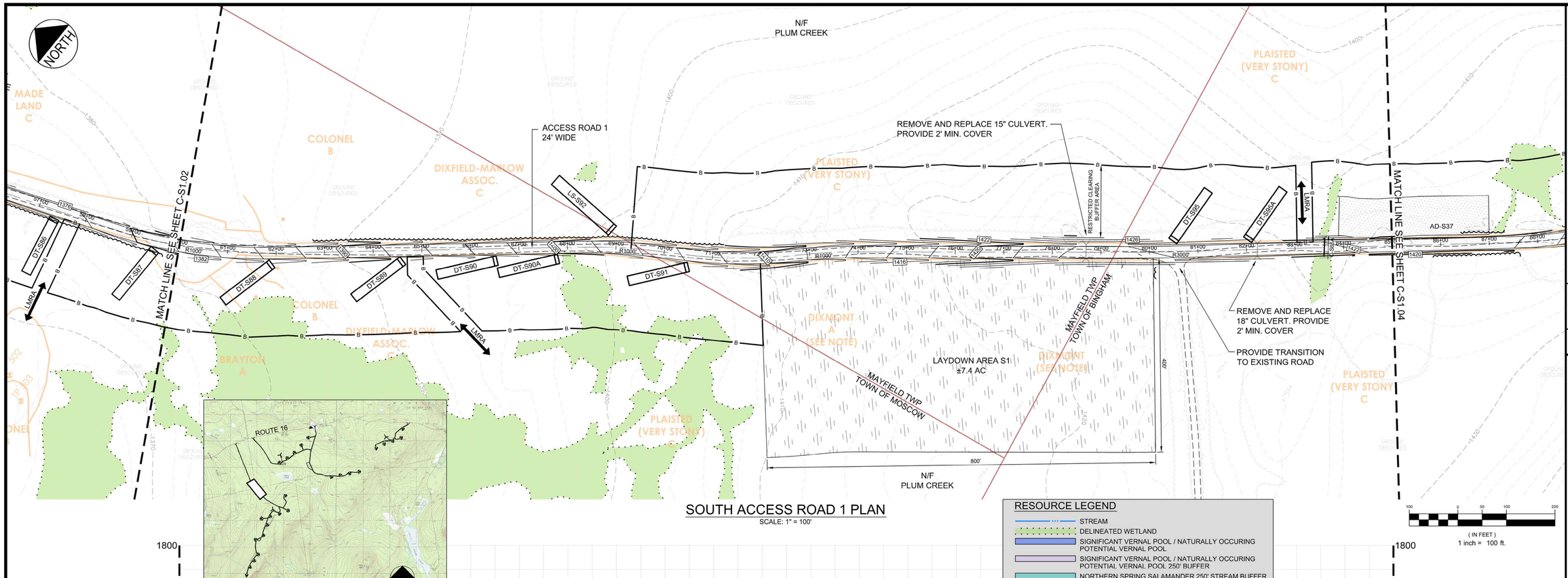
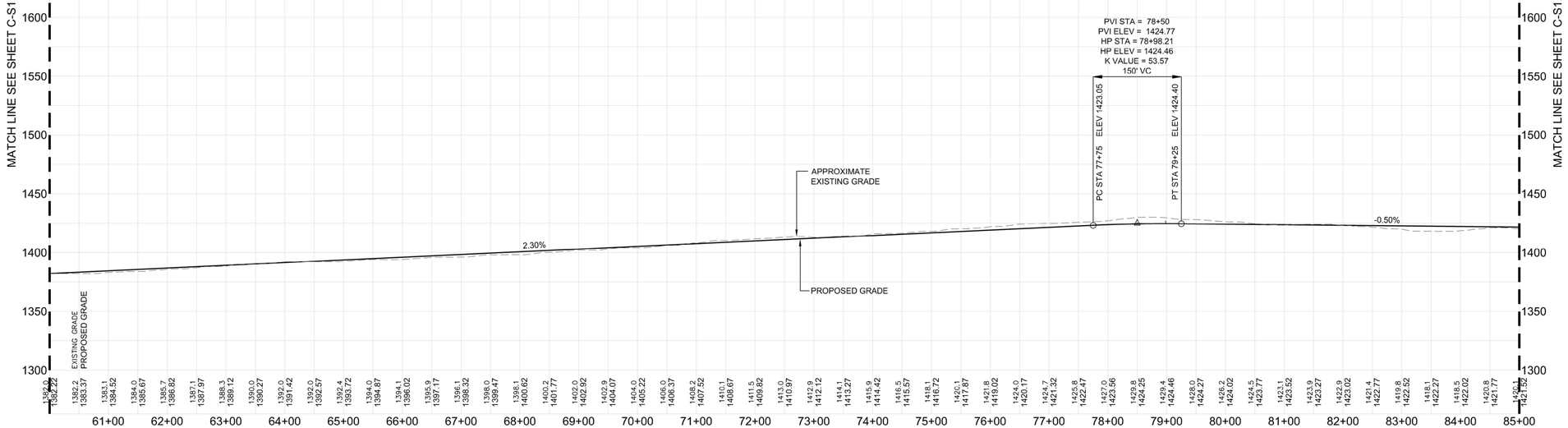


RESOURCE LEGEND

- 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:

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.



SOUTH ACCESS ROAD 1 PROFILE
SCALE: H 1" = 100'
V 1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

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

ACCESS ROAD 1 PLAN AND PROFILE [STA 60+00 TO 85+00]

DRAWN:	DED
DESIGNED:	SJB
CHECKED:	SRB
FILE NAME:	SOUTH AR_1
SCALE:	AS NOTED
DATE	SEPT 2012
JOB NO.	3048

STATE OF MAINE — STEVEN J. BLAKE II — 11695 — REGISTERED PROFESSIONAL ENGINEER

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

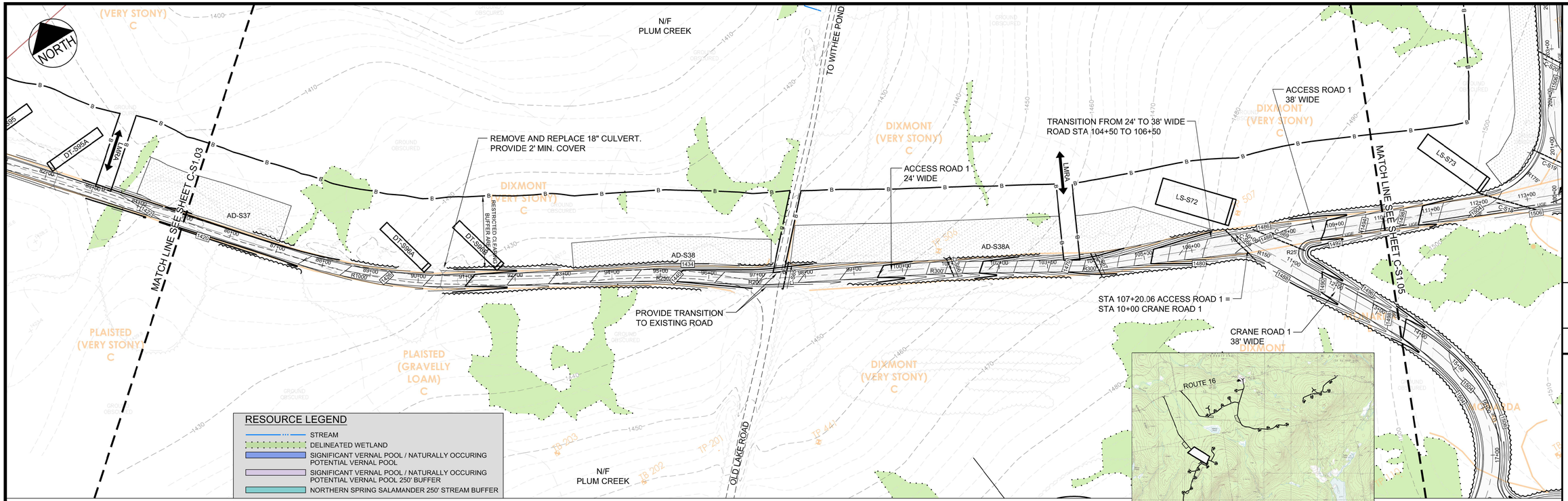
BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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

SHEET

C-S1.03



SOUTH ACCESS ROAD 1 PLAN

SCALE: 1" = 100'

NOTES:

1. THE APPLICANT RESERVES THE RIGHT TO INSTALL COLLECTOR SYSTEM OVERHEAD OR UNDERGROUND AT PROPOSED ROAD CROSSINGS.
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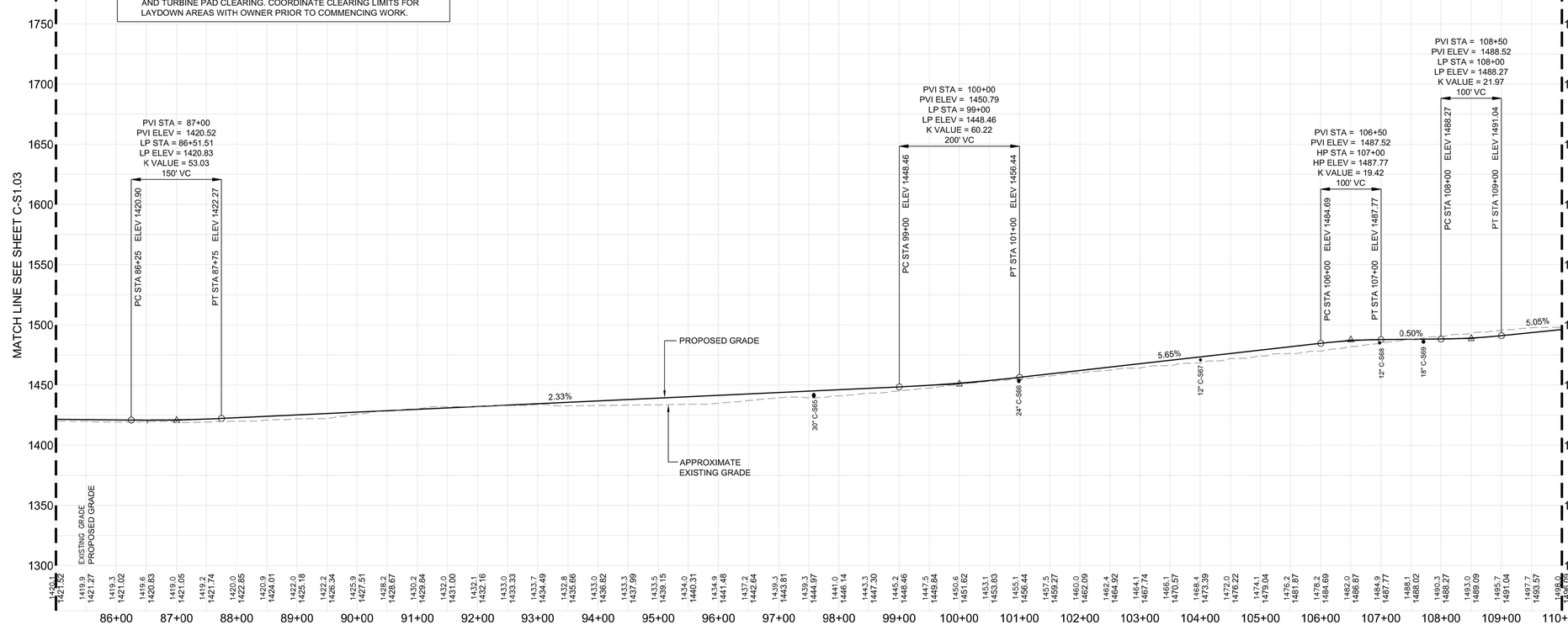

SOUTH ACCESS ROAD 1 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

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

ACCESS ROAD 1 PLAN AND PROFILE [STA 85+00 TO 110+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: SOUTH AR_1

STATE OF MAINE — STEVEN J. BLAKE II — 11695 — REGISTERED PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

RES

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SHEET

C-S1.04

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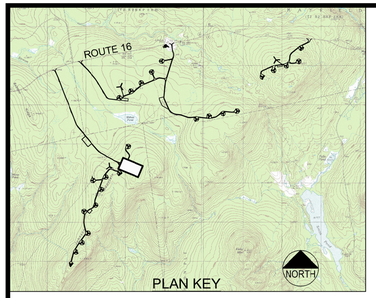
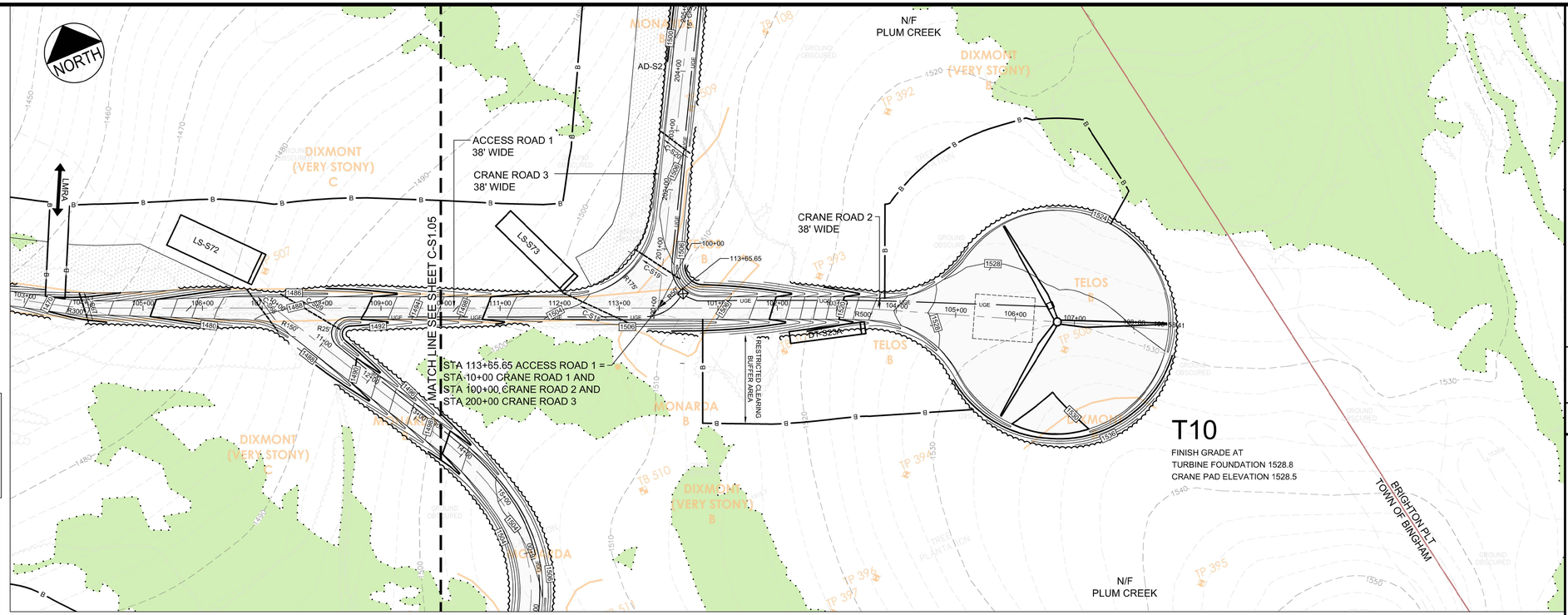




RESOURCE LEGEND

- 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

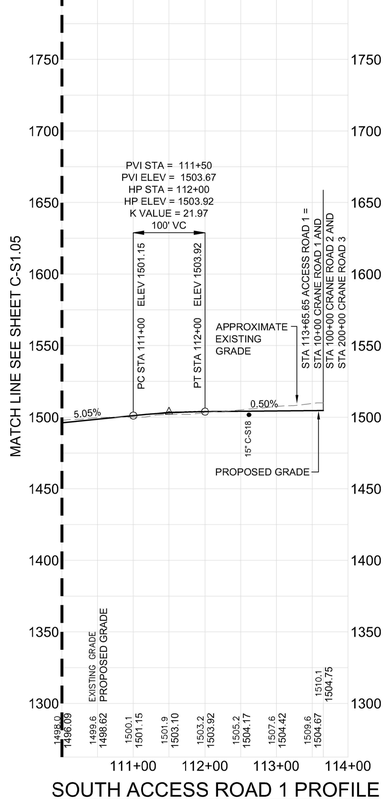
NOTES:

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.

SOUTH ACCESS ROAD 1 PLAN

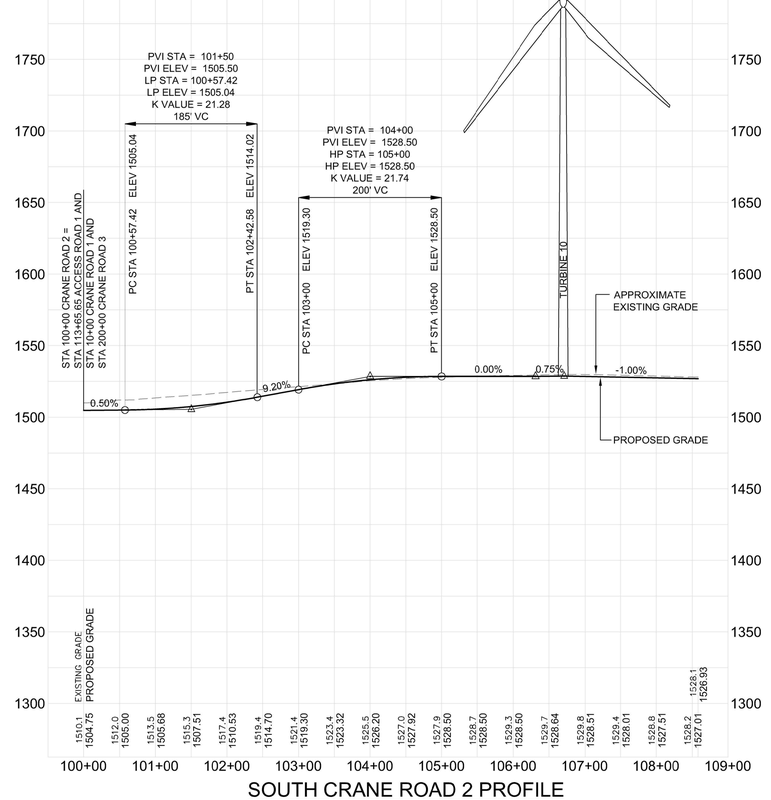
SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



SOUTH ACCESS ROAD 1 PROFILE

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



SOUTH CRANE ROAD 2 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

ACCESS ROAD 1 PLAN AND PROFILE [STA 110+00 TO 113+66] CRANE ROAD 2 PLAN AND PROFILE [STA 100+00 TO 108+59]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	SOUTH AR_1		

STATE OF MAINE
STEVEN J. BLAKE
3695
REGISTERED PROFESSIONAL ENGINEER

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

SHEET

C-S1.05

CRANE ROAD 4
38' WIDE

NORTH

N/F
PLUM CREEK

PMT
8-9

STA 10+00
CRANE ROAD 1 =
STA 107+20.06
ACCESS ROAD 1

ACCESS ROAD 1
38' WIDE

CRANE ROAD 3
38' WIDE

STA 24+50.45
CRANE ROAD 1 =
STA 10+00 MET ROAD 1

MATCH LINE SEE SHEET C-S1.07

DT-S9

CRANE ROAD 1
38' WIDE

CRANE ROAD 2
38' WIDE

T08
TMT 08
FINISH GRADE AT
TURBINE FOUNDATION 1520.3
CRANE PAD ELEVATION 1520.4

T09
TMT 09
FINISH GRADE AT
TURBINE FOUNDATION 1502.0
CRANE PAD ELEVATION 1502.5

N/F
PLUM CREEK

PLAN KEY

ROUTE 16

NORTH

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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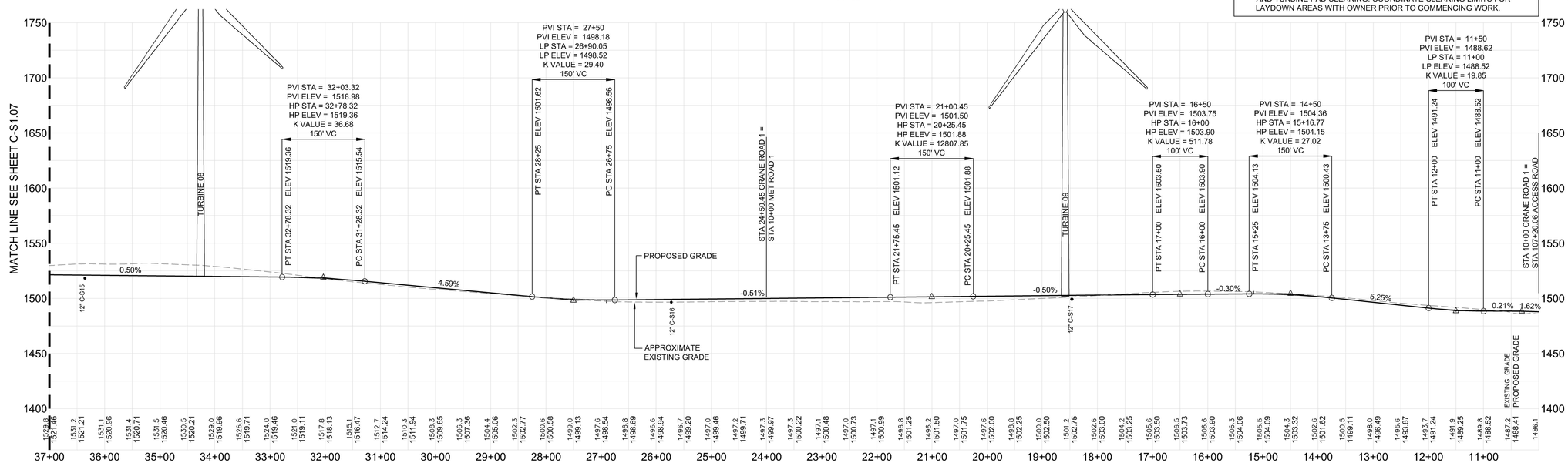
(IN FEET)
1 inch = 100 ft.

SOUTH CRANE ROAD 1 PLAN
SCALE: 1" = 100'



SOUTH CRANE ROAD 1 PROFILE
SCALE: H 1" = 100'
V 1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 1 PLAN AND PROFILE
[STA 10+00 TO 37+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: SOUTH CR_1

STATE OF MAINE
STEVEN J. BLAKE
3695
REGISTERED
PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

RED EFC
RENEWABLE ENERGY

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

SHEET
C-S1.06

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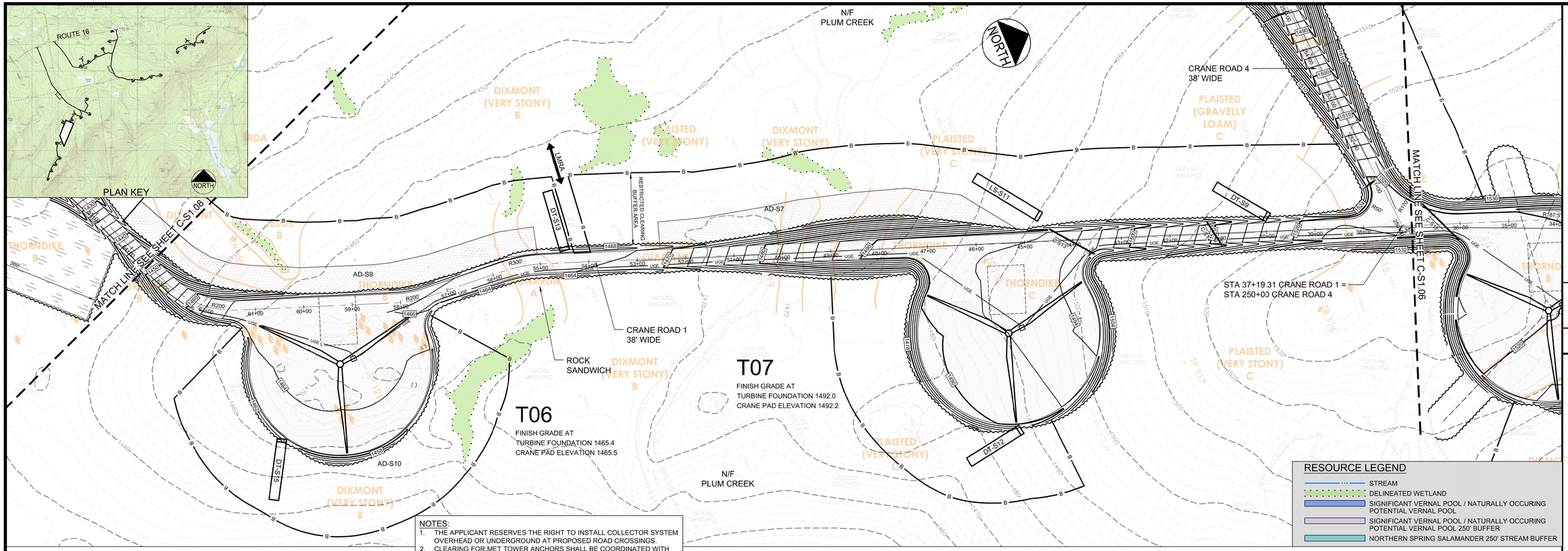

NOTES:
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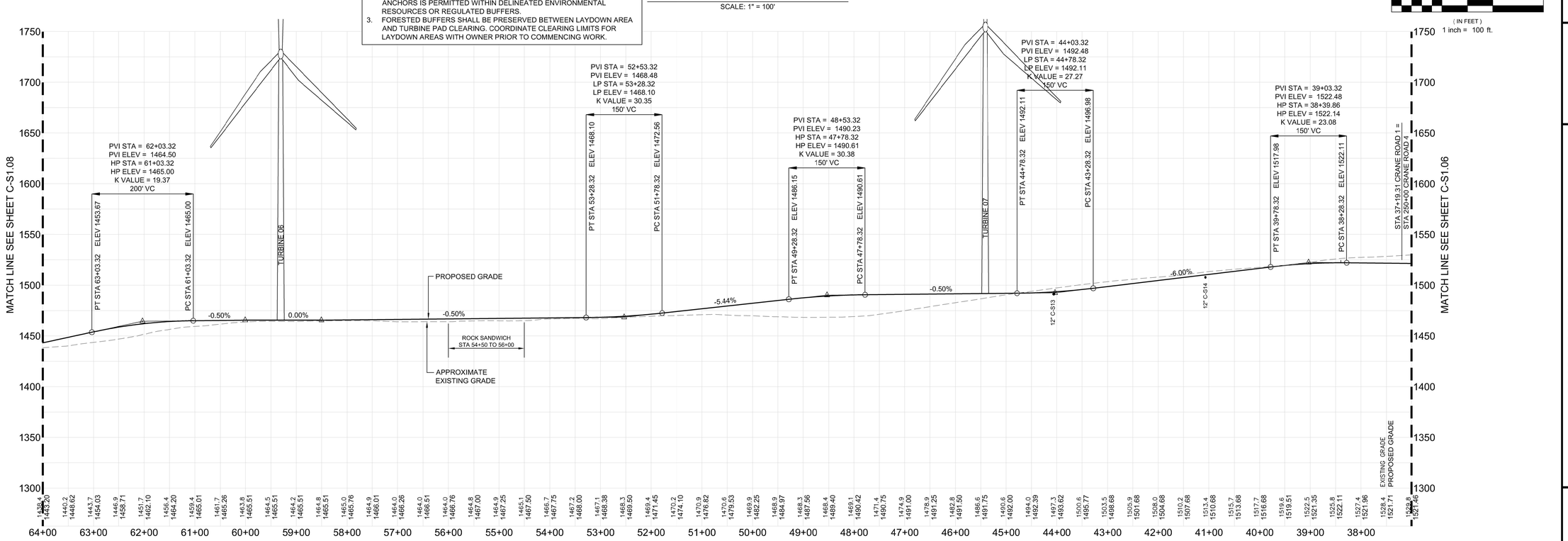
SOUTH CRANE ROAD 1 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



SOUTH CRANE ROAD 1 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 1 PLAN AND PROFILE
[STA 37+00 TO 64+00]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	SOUTH CR_1		

STATE OF MAINE
STEVEN J. BLAKE
REGISTERED
LICENSED
PROFESSIONAL ENGINEER
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

SHEET
C-S1.07

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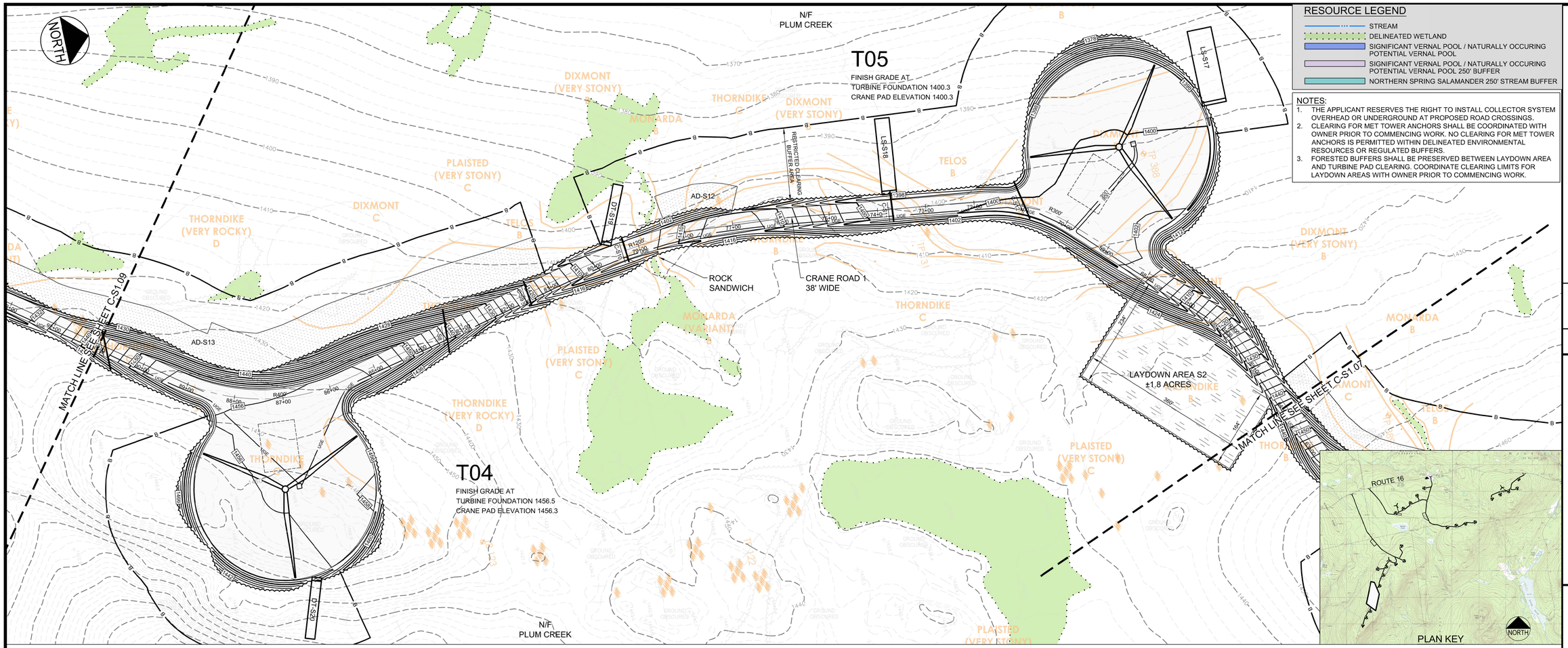
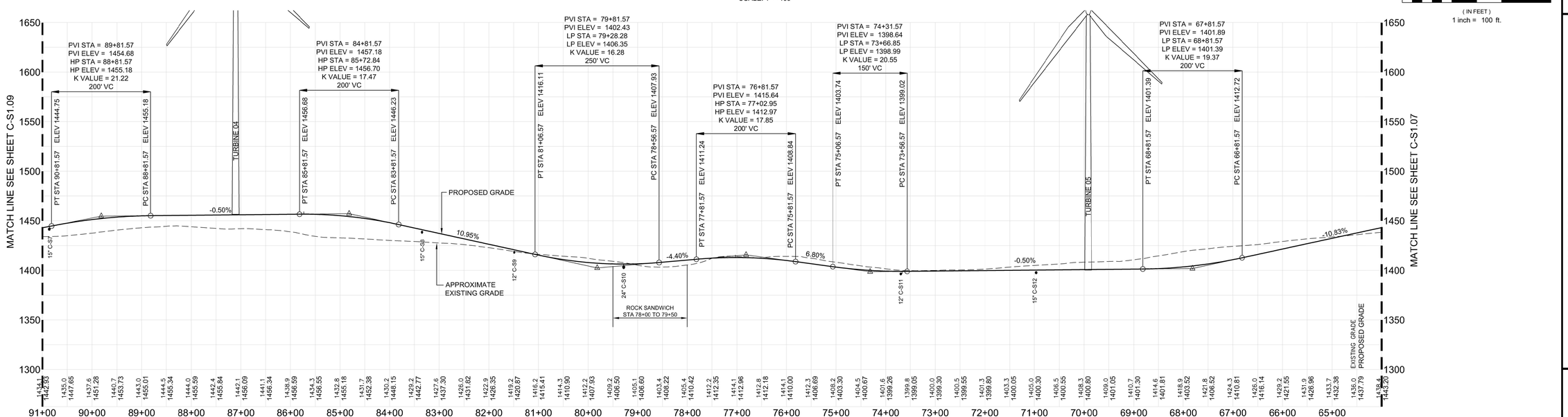


SOUTH CRANE ROAD 1 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



SOUTH CRANE ROAD 1 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 1 PLAN AND PROFILE [STA 64+00 TO 91+00]

DRAWN: DED
DESIGNED: SJB
CHECKED: SRB
FILE NAME: SOUTH CR_1
SCALE: AS NOTED
DATE: SEPT 2012
JOB NO. 3048

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

BINGHAM WIND PROJECT

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778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

SHEET
C-S1.08

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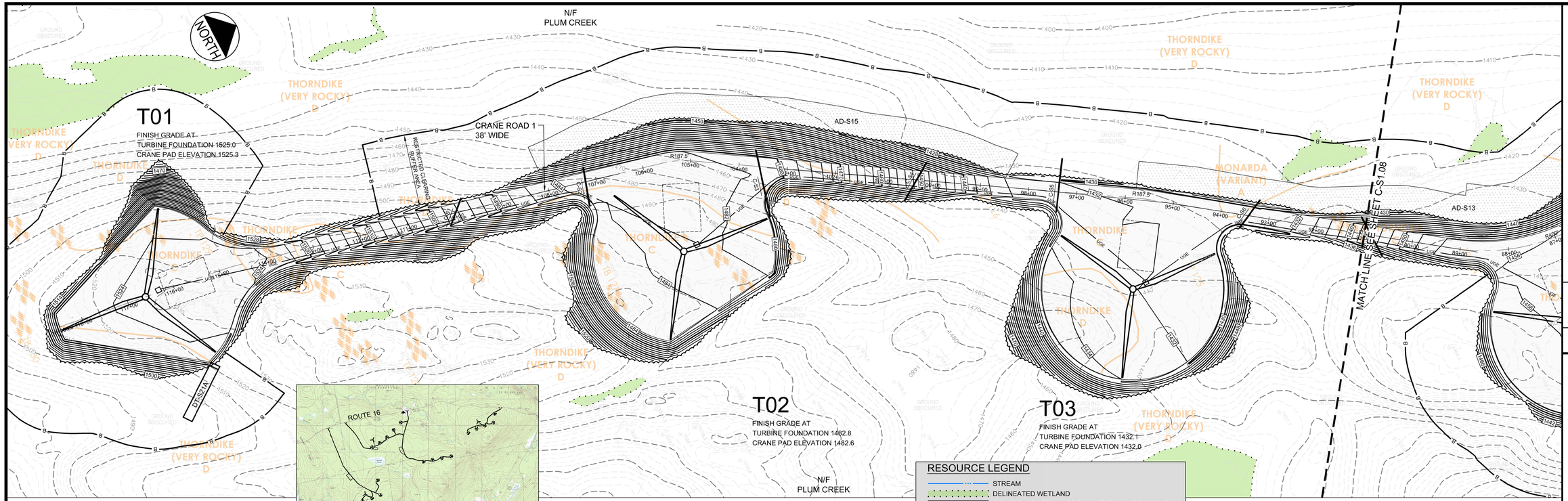

SOUTH CRANE ROAD 1 PLAN

SCALE: 1" = 100'

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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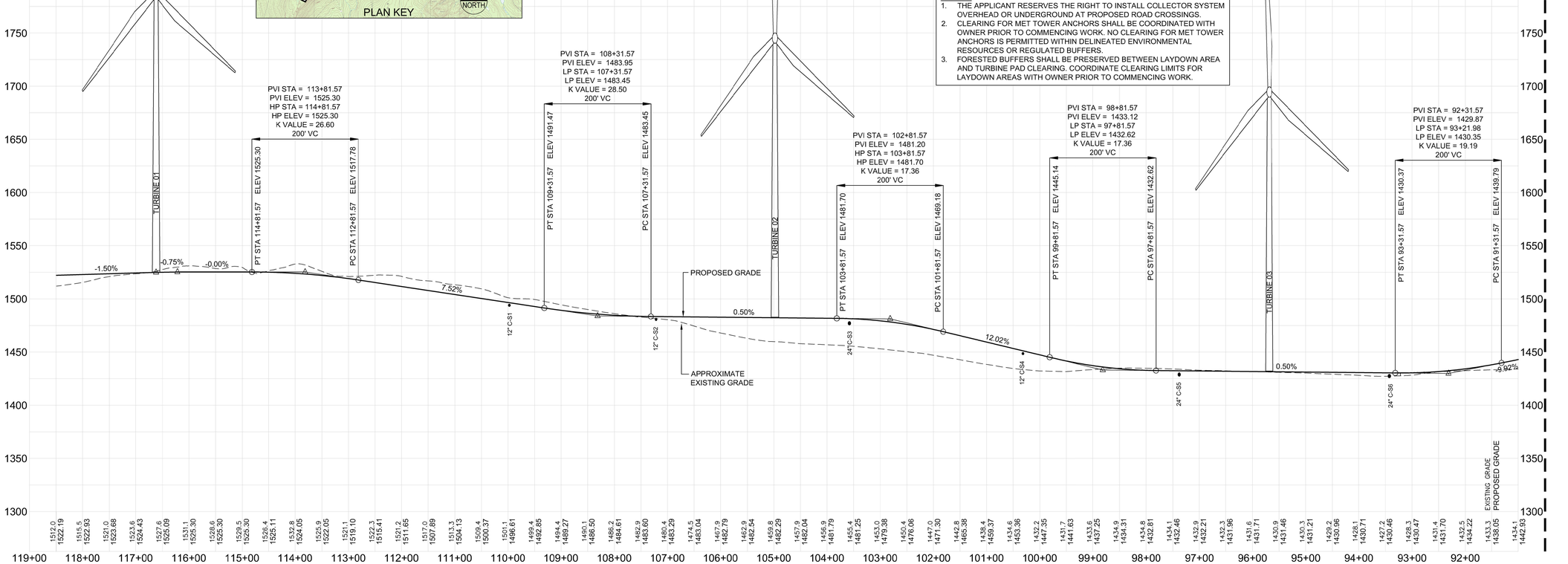
100 0 50 100 200
(IN FEET)
1" = 100 ft.



SOUTH CRANE ROAD 1 PROFILE

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

MATCH LINE SEE SHEET C-S1.08

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 1 PLAN AND PROFILE [STA 91+00 TO 118+49]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: SOUTH CR_1

STATE OF MAINE STEVEN J. BLAKE 11695 LICENSED PROFESSIONAL ENGINEER

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

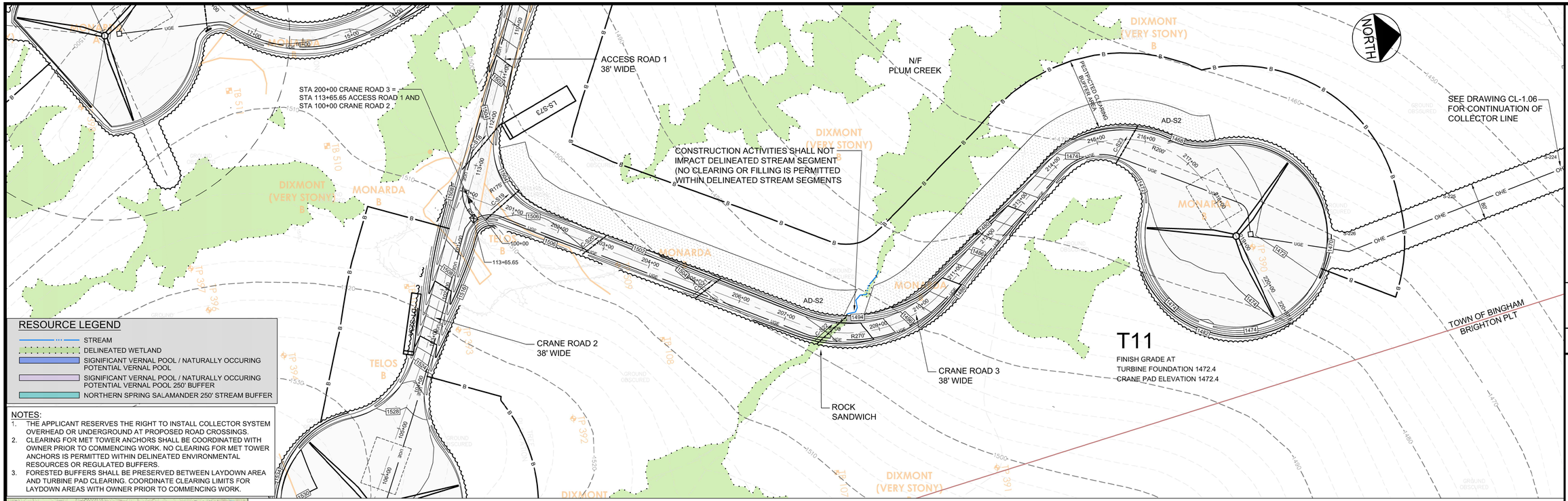
BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

RES RENEWABLE ENERGY SOLUTIONS

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

SHEET
C-S1.09



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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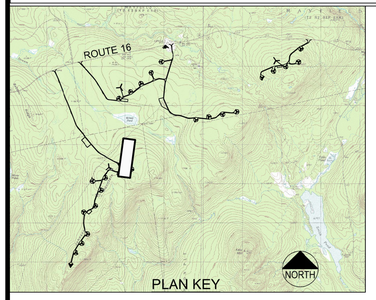
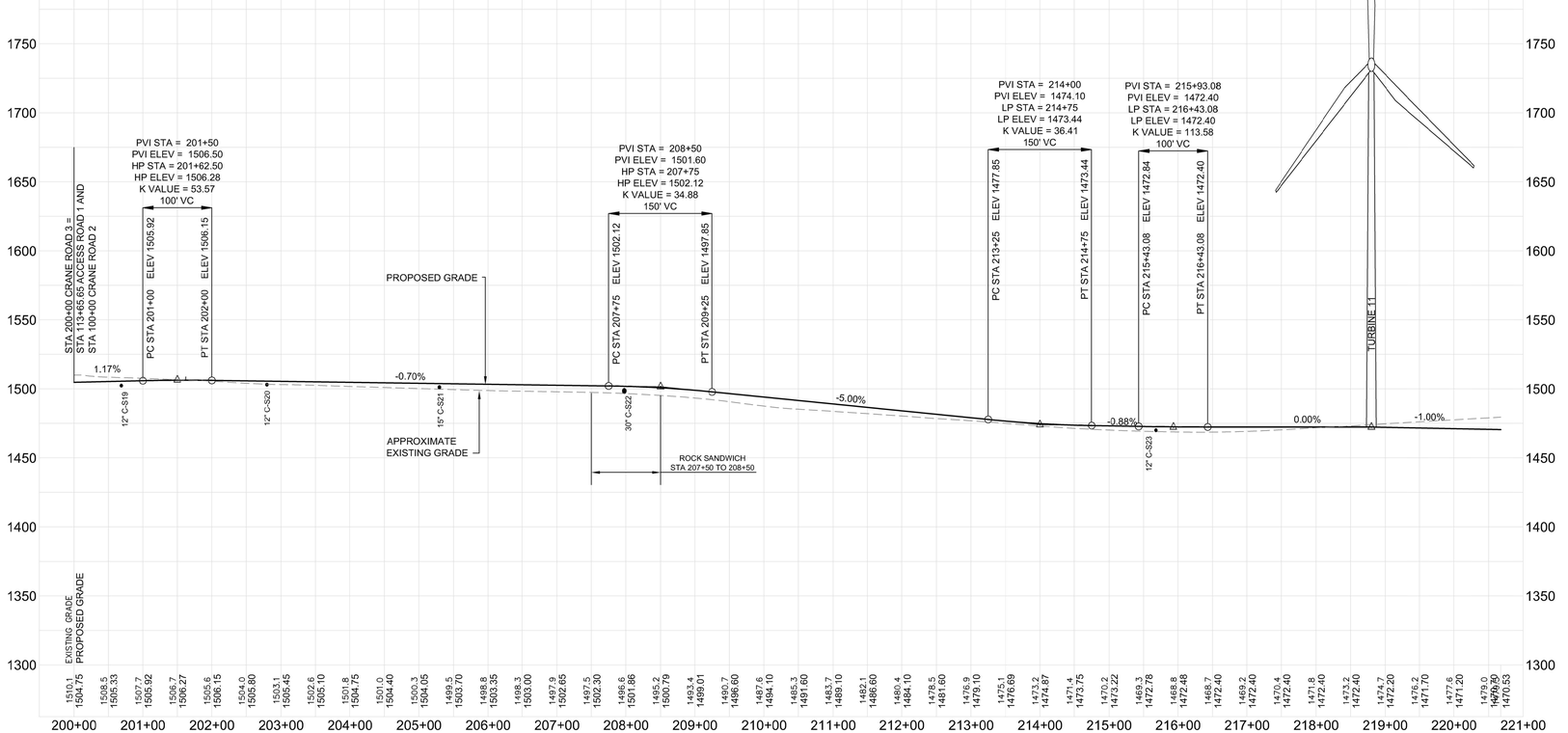


SOUTH CRANE ROAD 3 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



SOUTH CRANE ROAD 3 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 3 PLAN AND PROFILE [STA 200+00 TO 219+75]

DRAWN:	DED
DESIGNED:	SJB
CHECKED:	SRB
FILE NAME:	SOUTH CR_3
SCALE:	AS NOTED
DATE:	SEPT 2012
JOB NO.	3048

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

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

BINGHAM WIND PROJECT

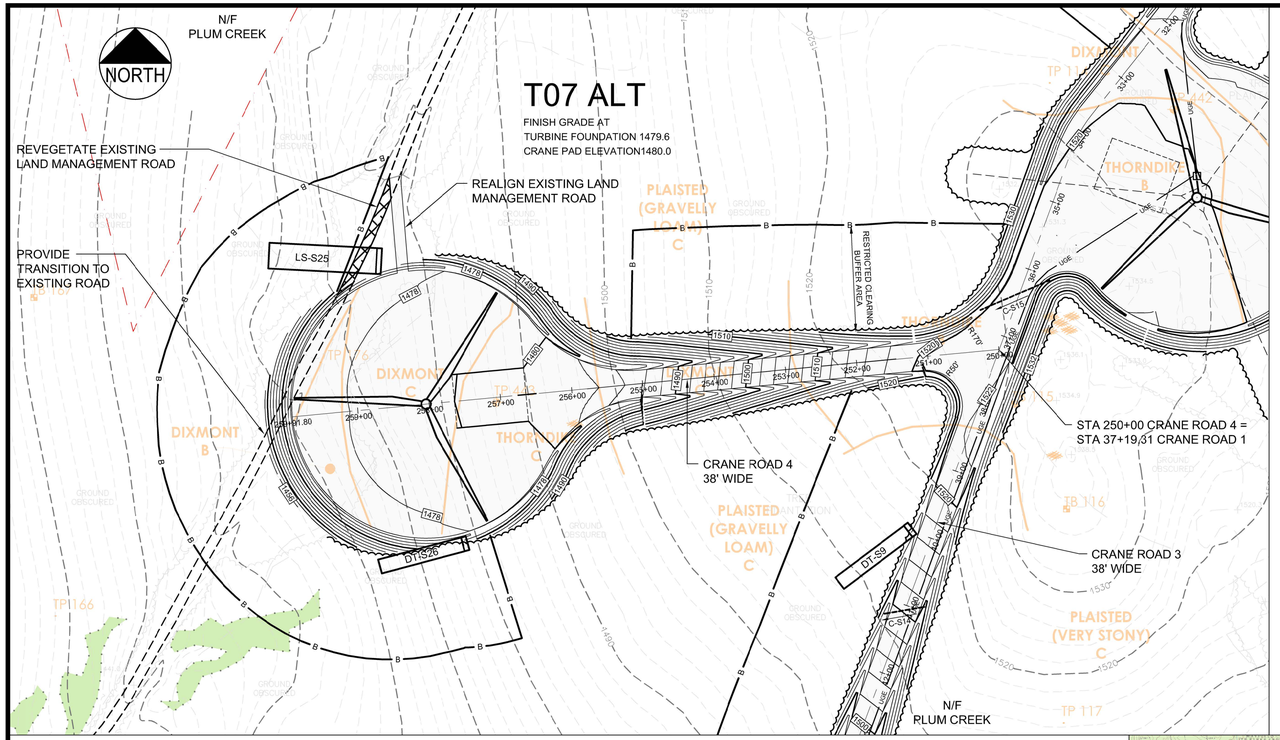
BLUE SKY WEST, LLC

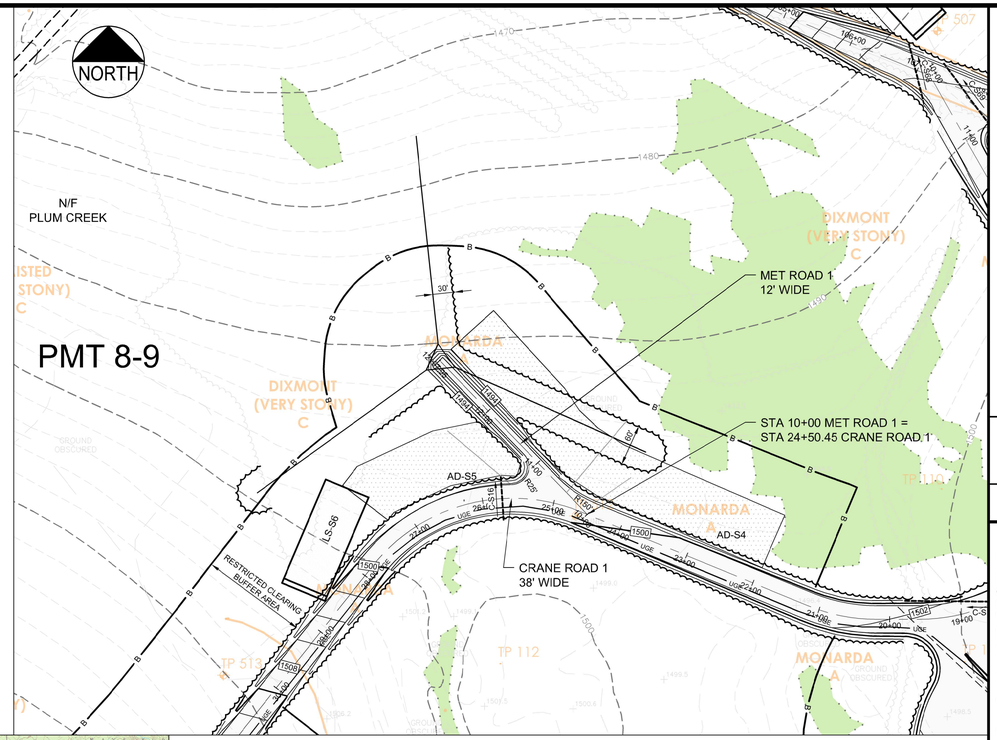
REED & REED
smart power solutions

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

SHEET

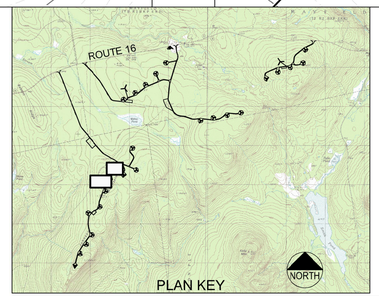
C-S1.10





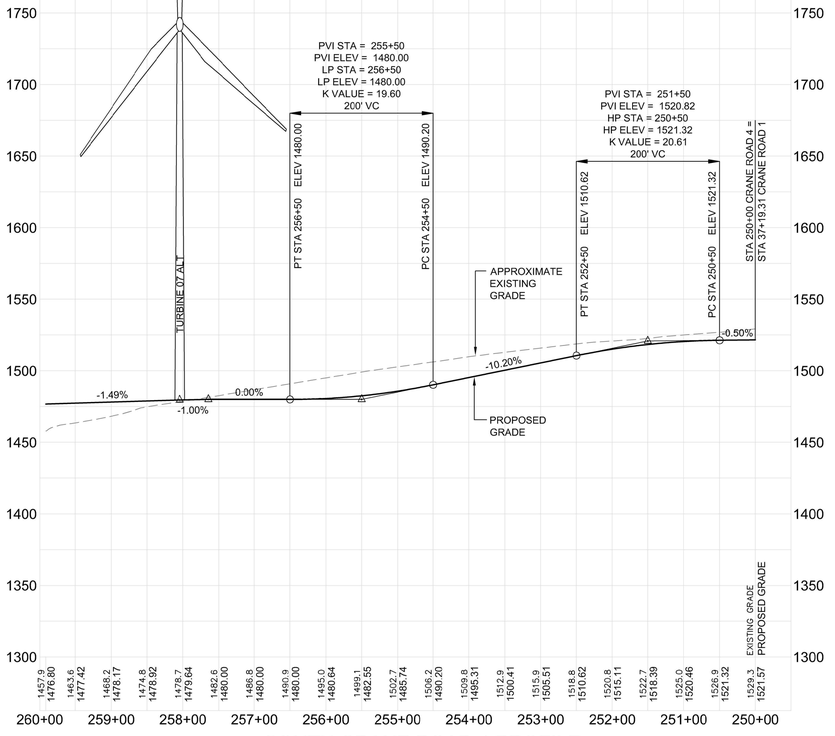
SOUTH CRANE ROAD 4 PLAN

SCALE: 1" = 100'



SOUTH CRANE ROAD 4 PROFILE

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



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.

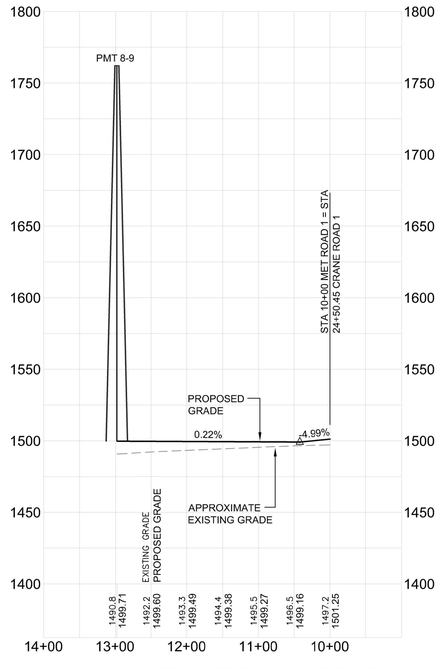
SOUTH MET ROAD 1 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.

SOUTH MET ROAD 1 PROFILE

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



PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 4 PLAN AND PROFILE
[STA 250+00 TO 259+92]
MET ROAD 1 PLAN AND PROFILE
[STA 10+00 TO 12+28]

DRAWN:	DED
DESIGNED:	SJB
CHECKED:	SRB
FILE NAME:	SOUTH CR_1
SCALE:	AS NOTED
DATE	SEPT 2012
JOB NO.	3048

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

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

REED & REED INC.

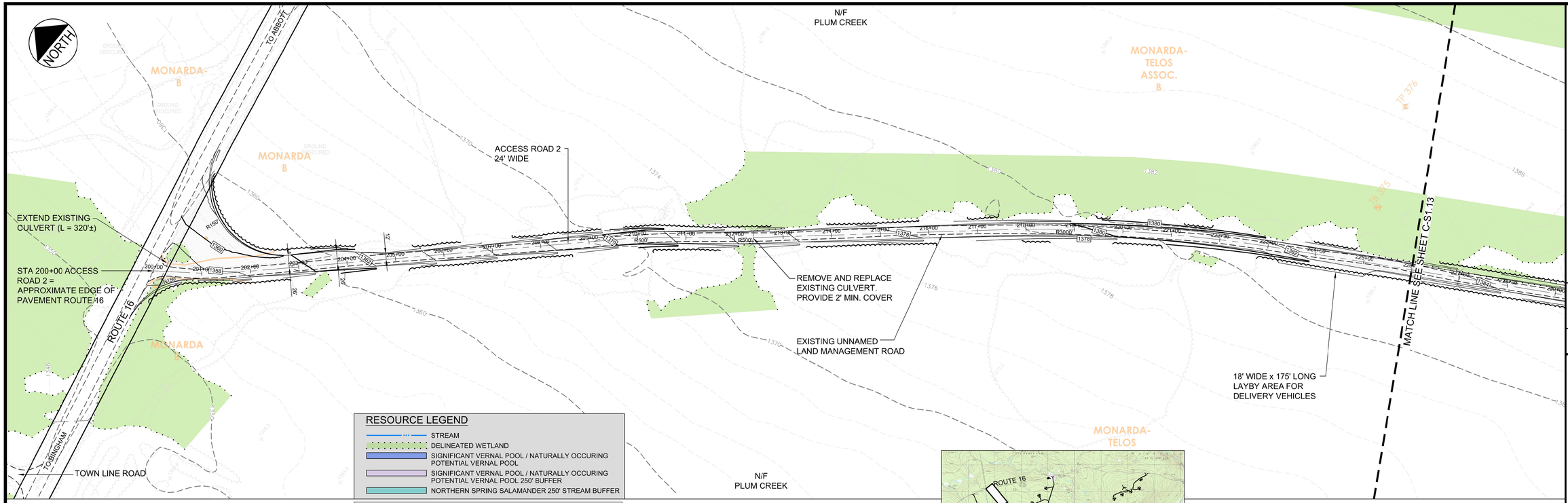
BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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

SHEET

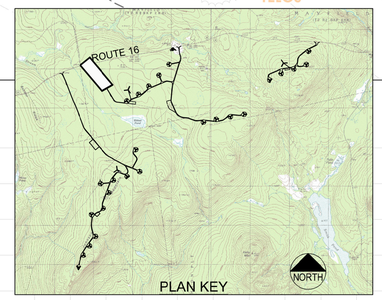
C-S1.11



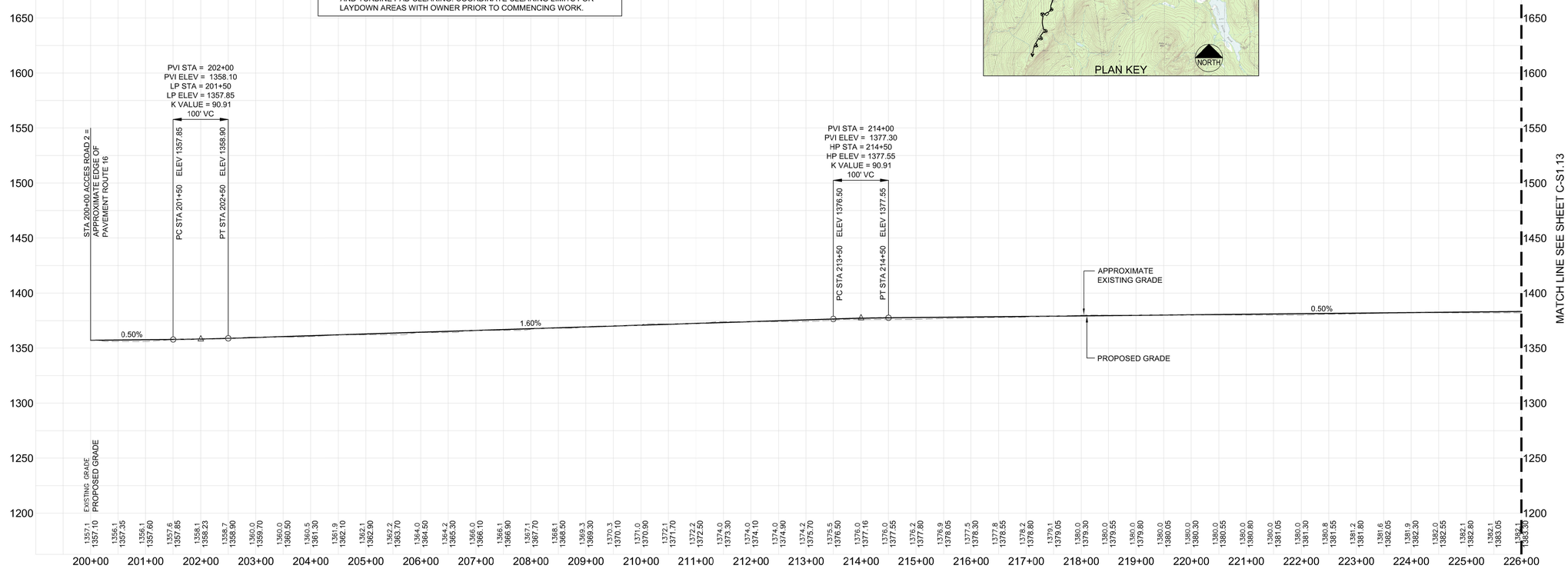
SOUTH ACCESS ROAD 2 PLAN

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 ACCESS ROAD 2 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

ACCESS ROAD 2 PLAN AND PROFILE [STA 200+00 TO 226+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO.: 3048
FILE NAME: SOUTH AR_2

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

RES RENEWABLE ENERGY SERVICES

DeLuca-Hoffman Associates, Inc.
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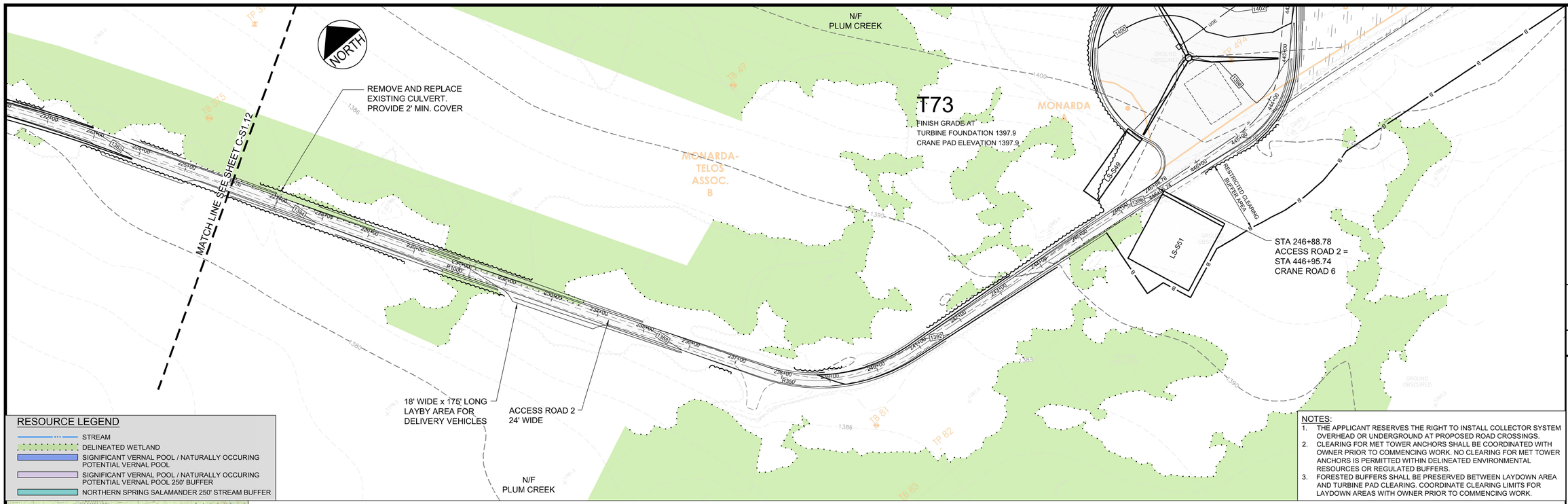
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

SHEET
C-S1.12

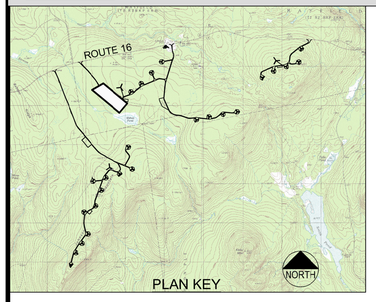


RESOURCE LEGEND

- 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.



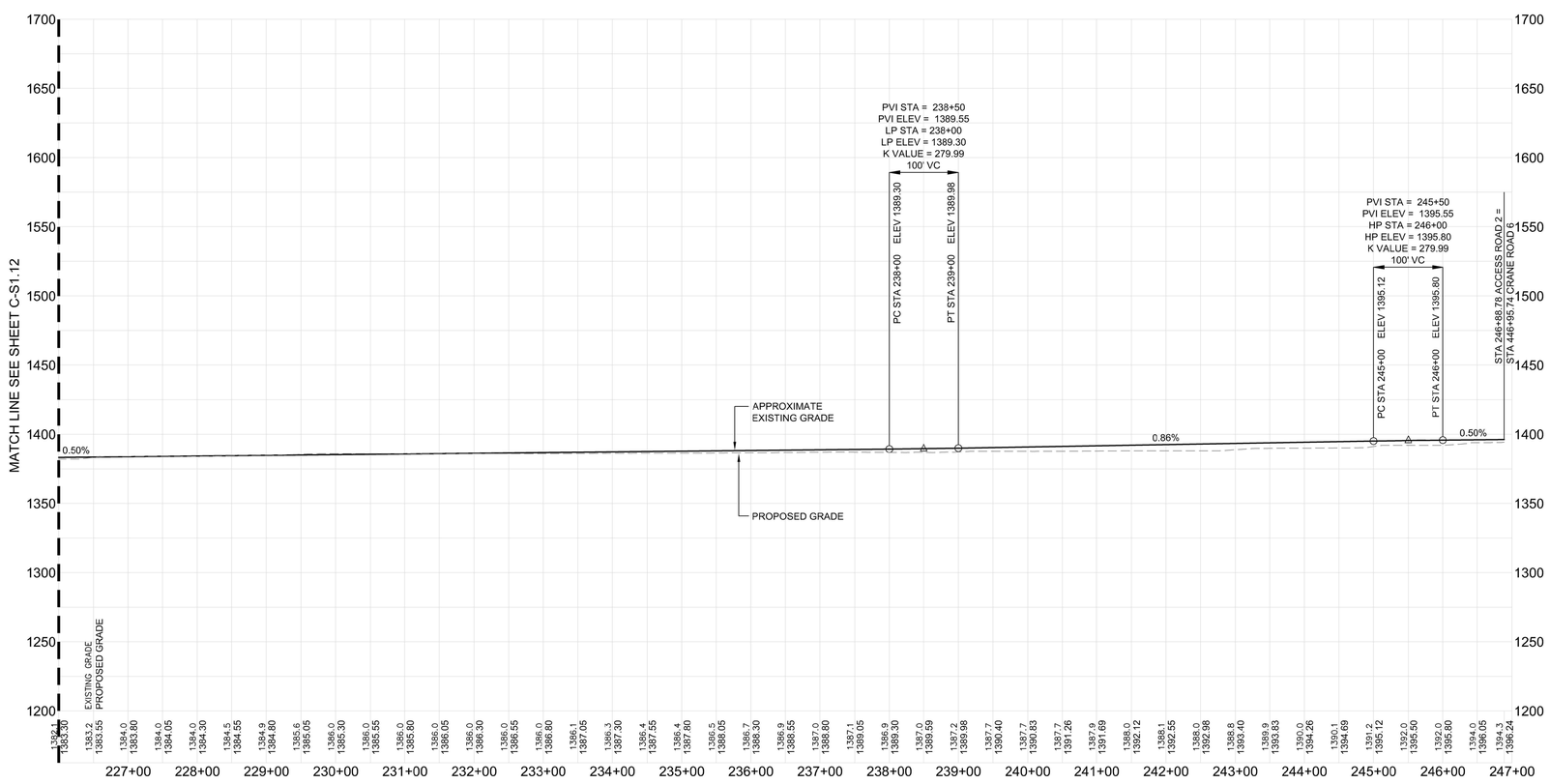
PLAN KEY

SOUTH ACCESS ROAD 2 PLAN

SCALE: 1" = 100'

100 0 50 100 200

(IN FEET)
1 inch = 100 ft.



SOUTH ACCESS ROAD 2 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

ACCESS ROAD 2 PLAN AND PROFILE
[STA 226+00 TO 246+89]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	SOUTH AR_2		

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

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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SOUTH PORTLAND, ME 04106
207.775.1121
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SHEET

C-S1.13

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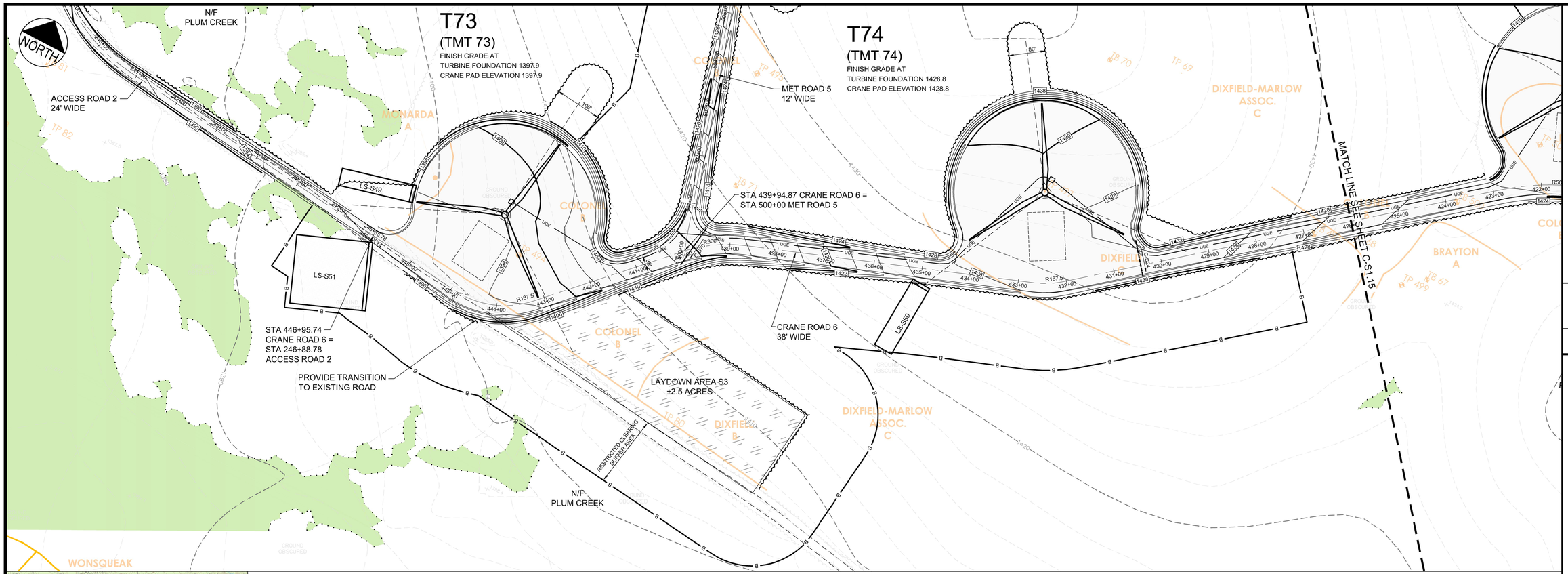
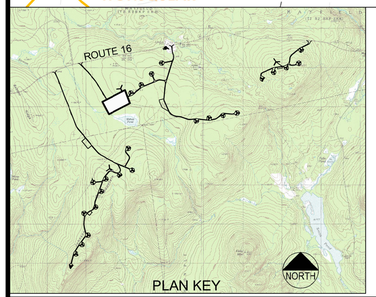


SOUTH CRANE ROAD 6 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



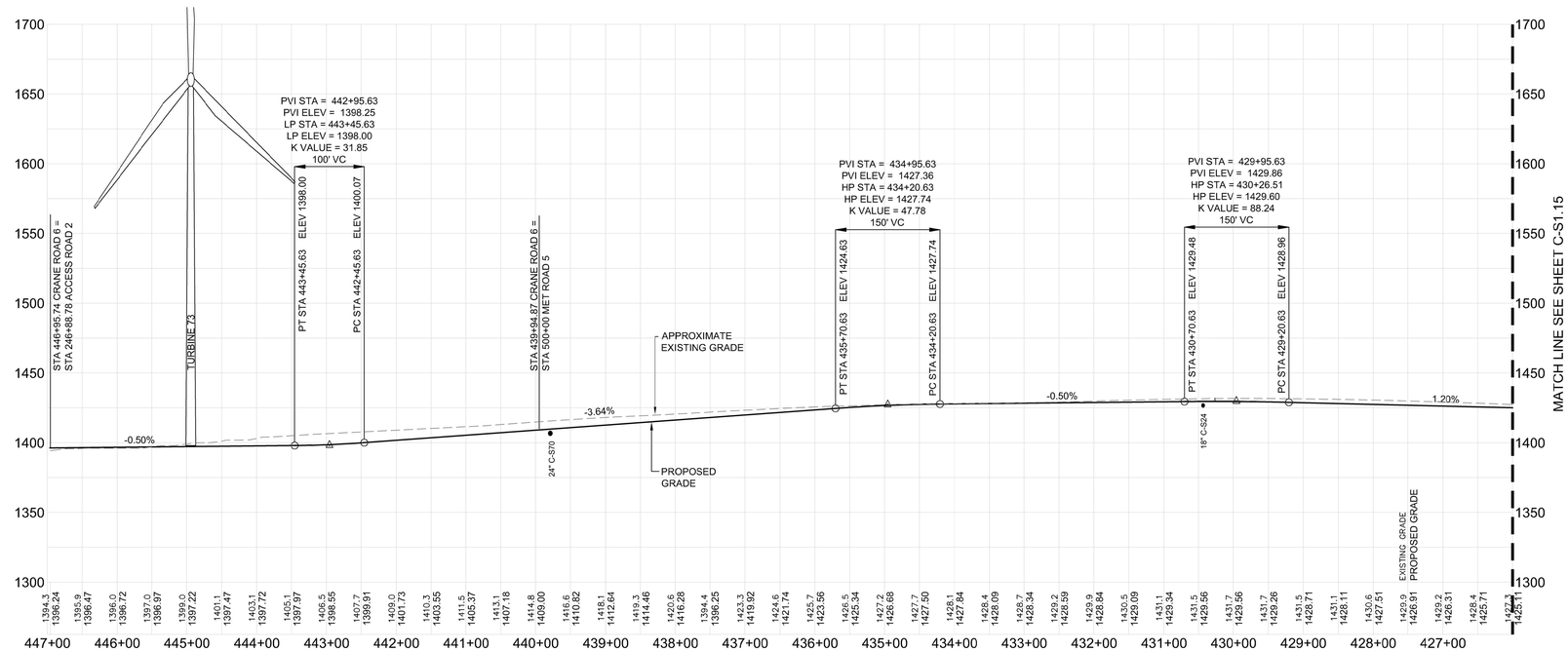
PLAN KEY

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.



SOUTH CRANE ROAD 6 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 6 PLAN AND PROFILE
[STA 426+00 TO 436+00]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE:	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	SOUTH CR_6		

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

RES

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778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
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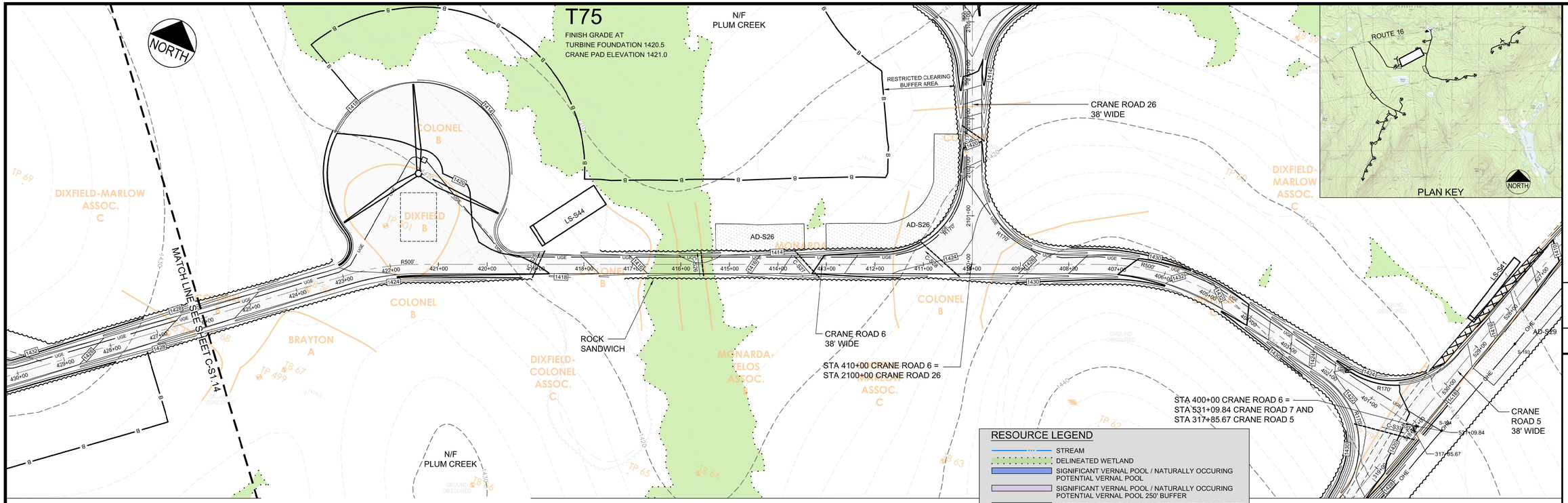
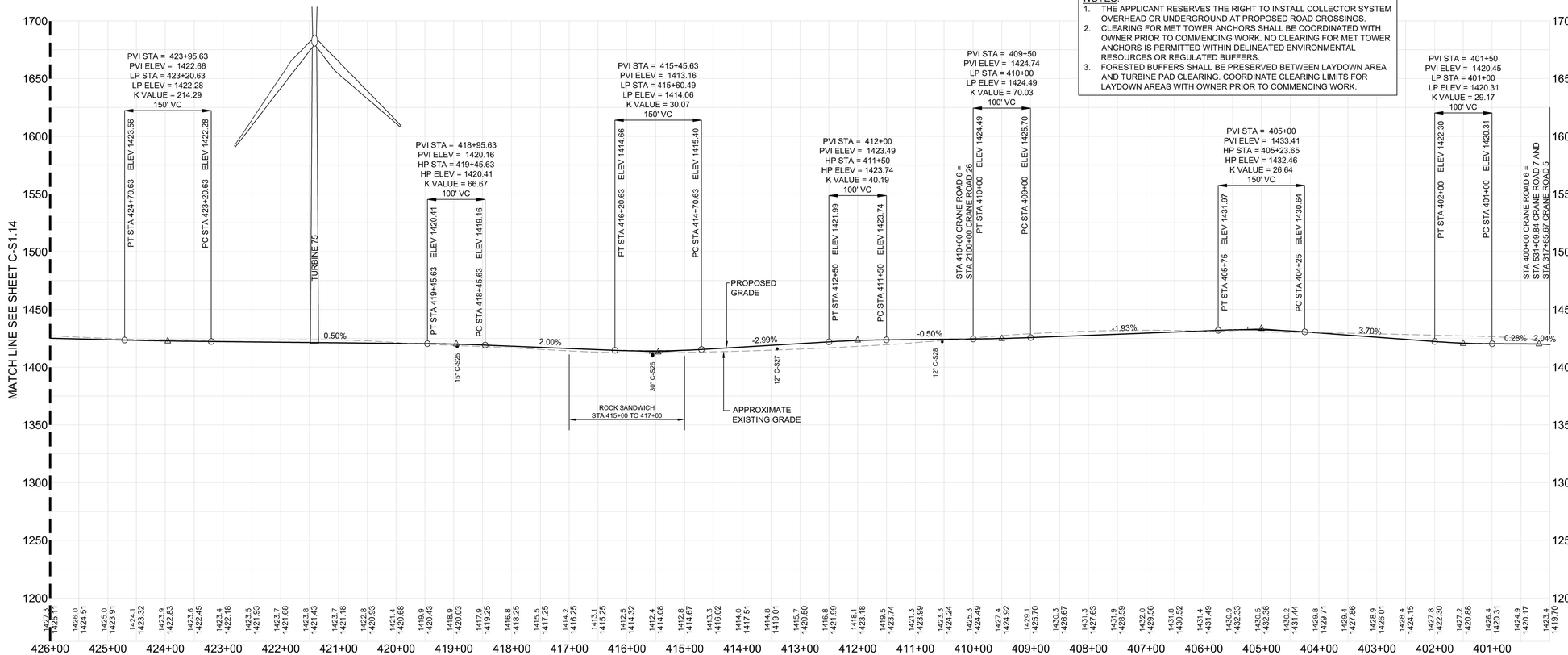
SHEET

C-S1.14



SOUTH CRANE ROAD 6 PLAN

SCALE: 1" = 100'



SOUTH CRANE ROAD 6 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 6 PLAN AND PROFILE [STA 400+00 TO 426+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: SOUTH CR_6

STATE OF MAINE
STEVEN J. BLAKE
3695
REGISTERED
PROFESSIONAL ENGINEER

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

REED & REED INC.

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 5
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

SHEET
C-S1.15

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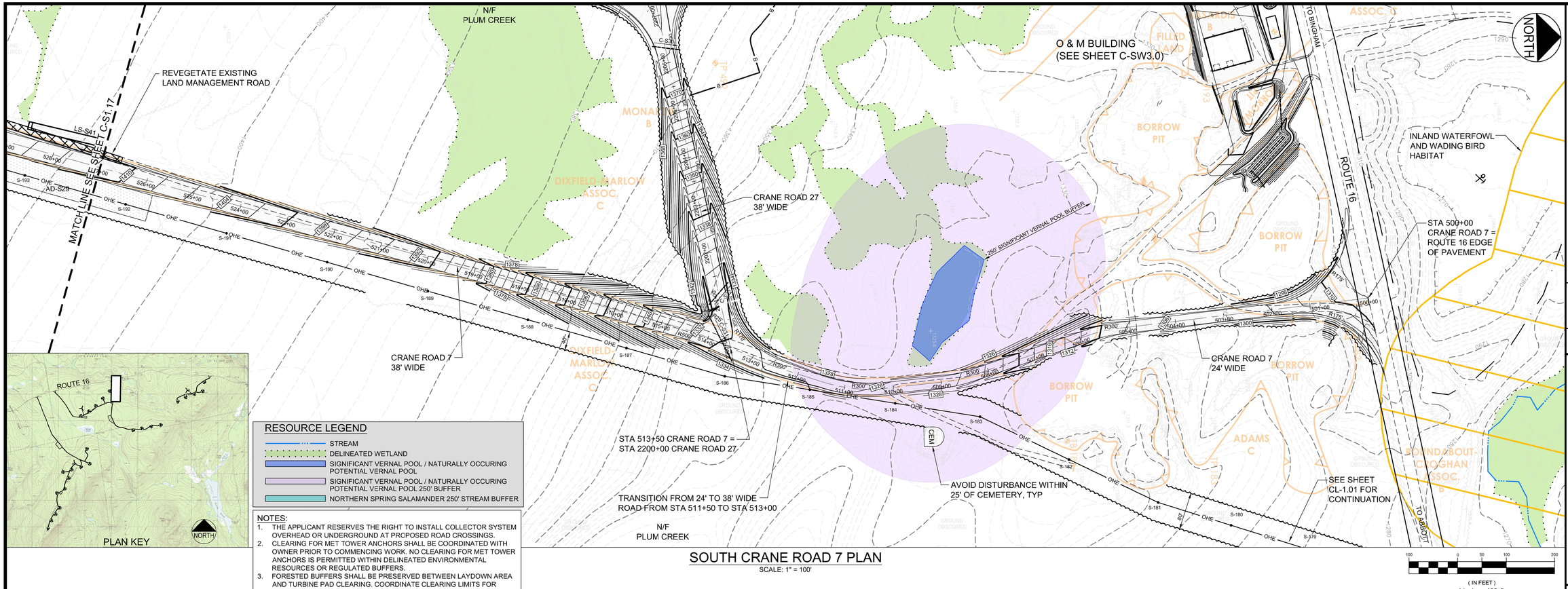


RESOURCE LEGEND

- 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

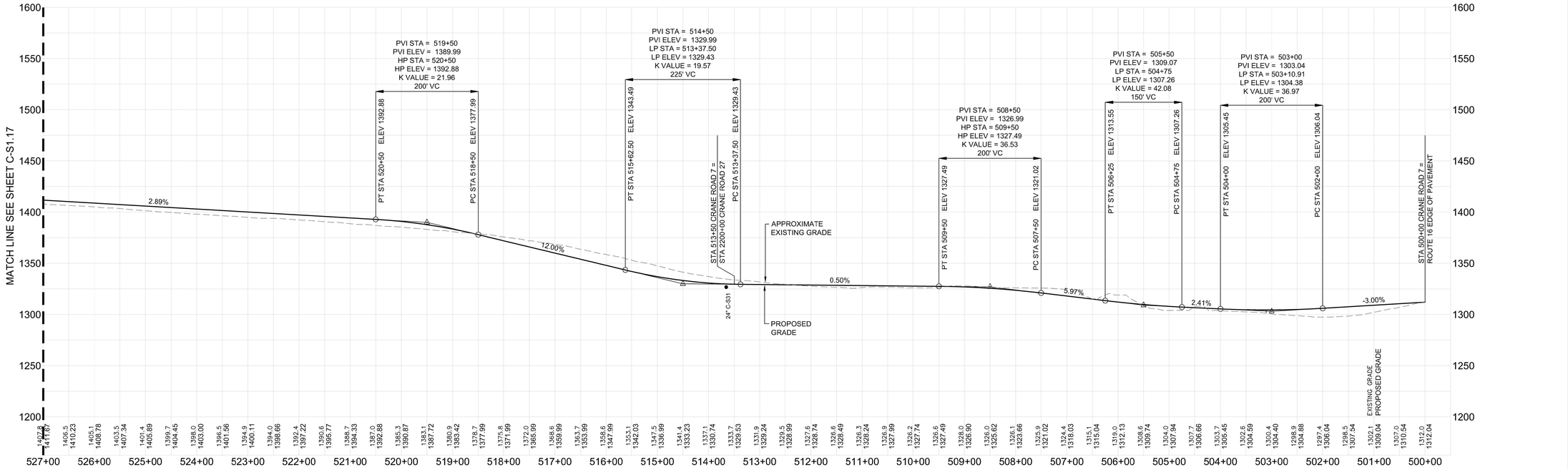
NOTES:

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.

SOUTH CRANE ROAD 7 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



SOUTH CRANE ROAD 7 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\SOUTH\VFG - SOUTH CR_7.dwg davis_d 8/1/2013 9:42 AM

NO.	DATE	DESCRIPTION
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

CRANE ROAD 7 PLAN AND PROFILE [STA 500+00 TO 527+00]

DRAWN:	DED
DESIGNED:	SJB
CHECKED:	SRB
FILE NAME:	SOUTH CR_7
SCALE:	AS NOTED
DATE	SEPT 2012
JOB NO.	3048

STATE OF MAINE
STEVEN J. BLAKE
3695
REGISTERED
PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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778 MAIN STREET SUITE 1
SOUTH PORTLAND, ME 04106
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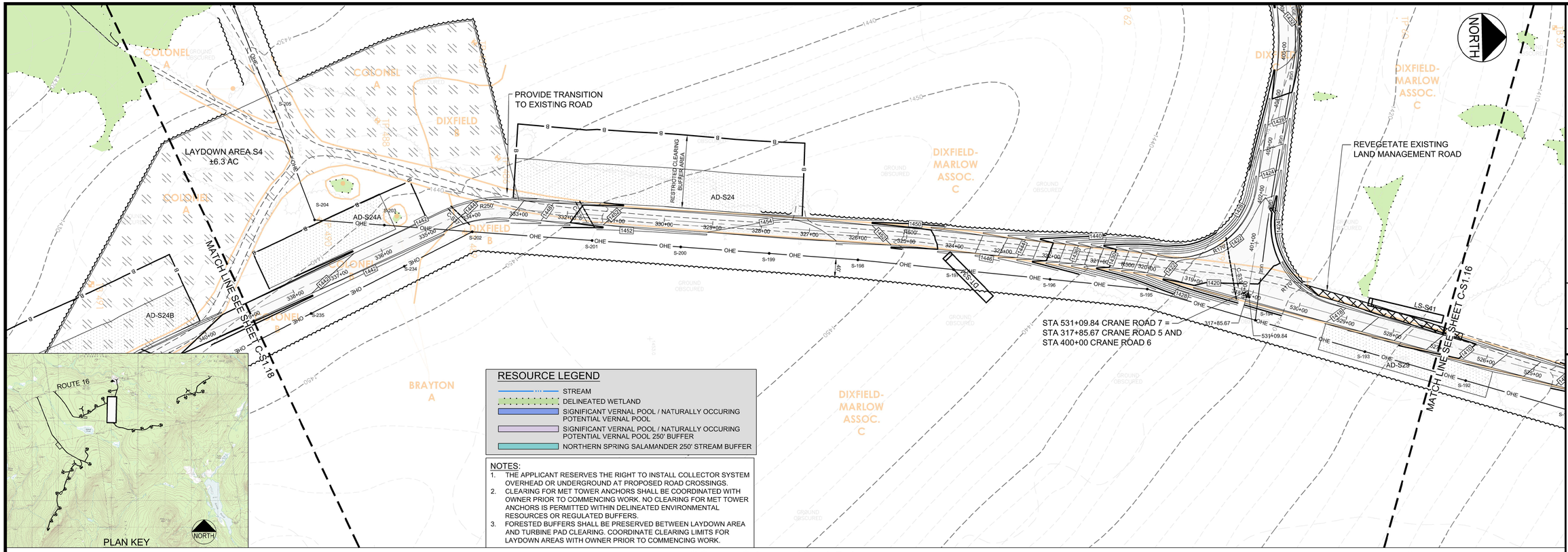
SHEET

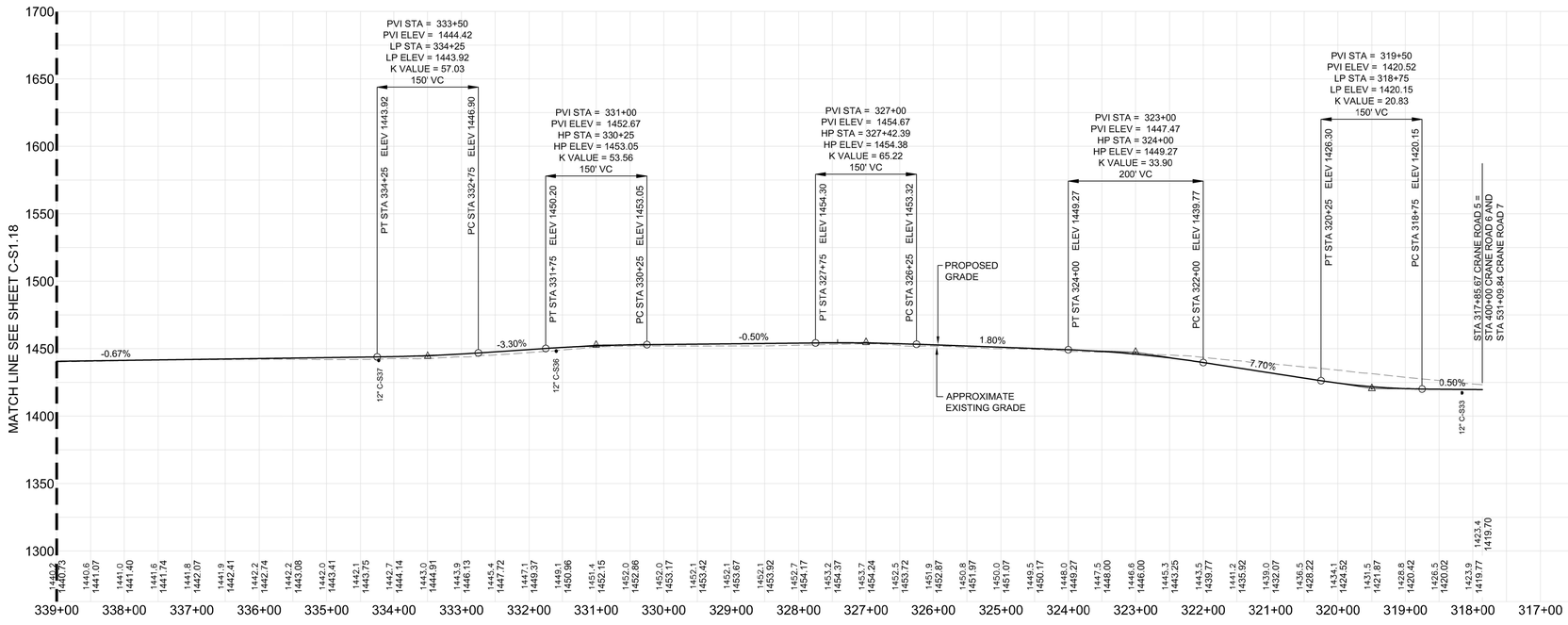
C-S1.16



SOUTH CRANE ROAD 7 PLAN

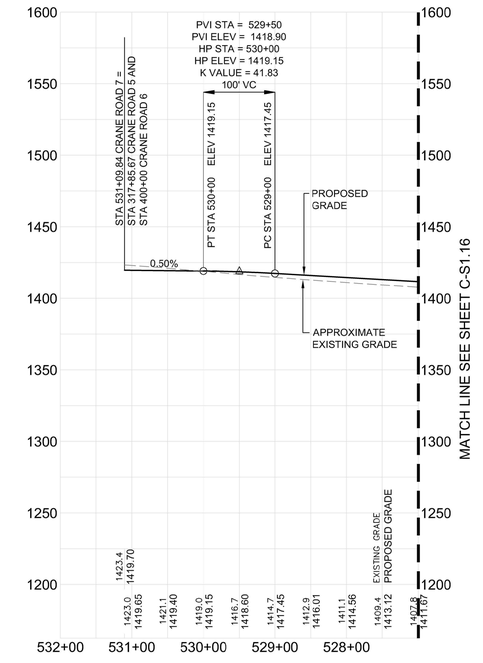
SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



SOUTH CRANE ROAD 5 PROFILE

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



SOUTH CRANE ROAD 7 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 7 PLAN AND PROFILE [STA 527+00 TO 531+10] CRANE ROAD 5 PLAN AND PROFILE [STA 317+86 TO STA 339+00]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE:	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	SOUTH CR_7		

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

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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778 MAIN STREET SUITE 5
SOUTH PORTLAND, ME 04106
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www.delucahoffman.com

SHEET

C-S1.17

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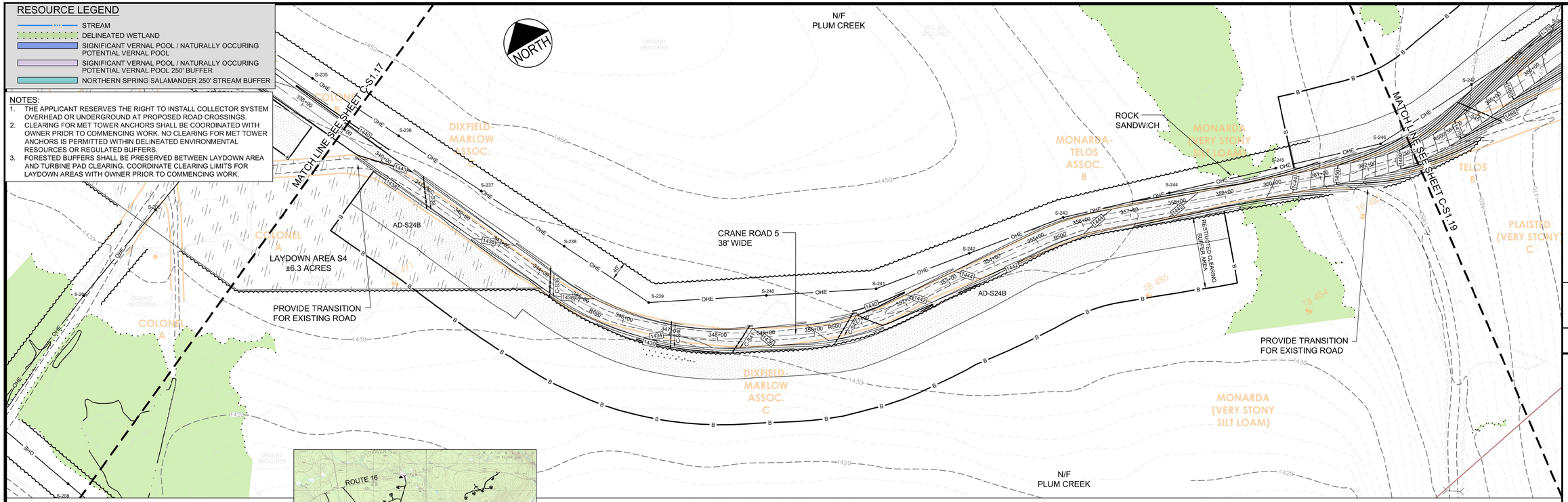
RESOURCE LEGEND

- 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:

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.



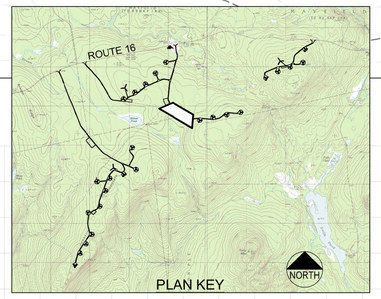
SOUTH CRANE ROAD 5 PLAN

SCALE: 1" = 100'

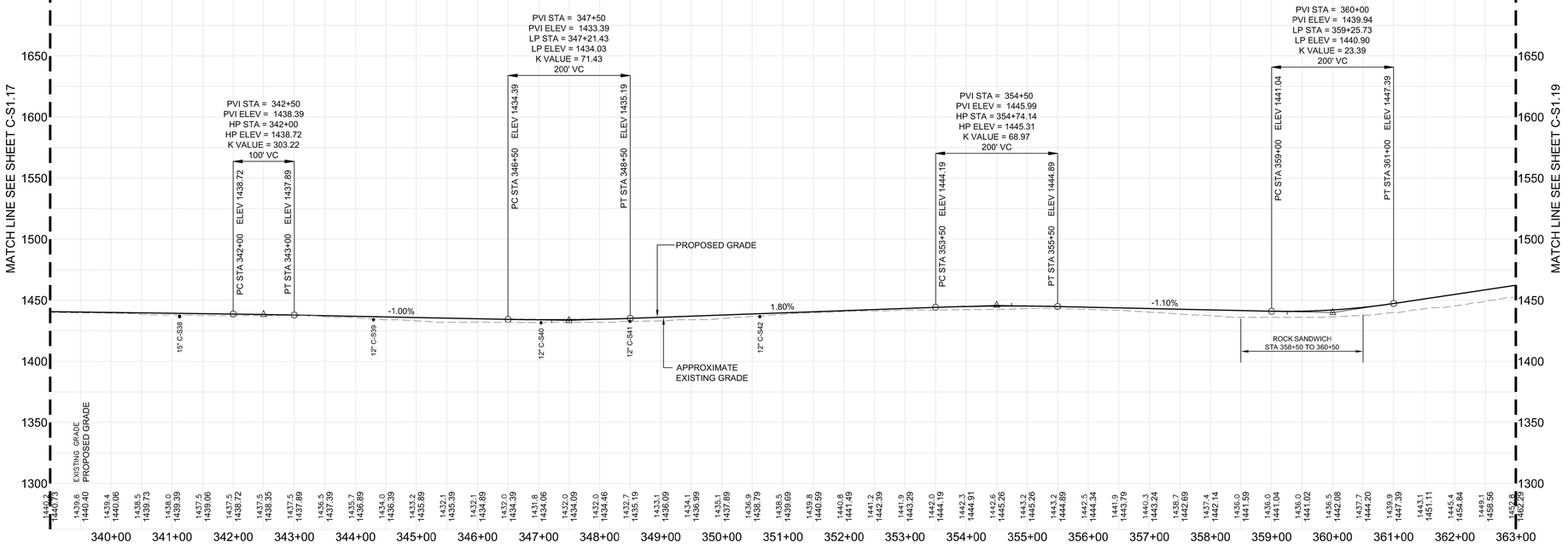
100 0 50 100 200

(IN FEET)

1 inch = 100 ft.



PLAN KEY



SOUTH CRANE ROAD 5 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 5 PLAN AND PROFILE
[STA 339+00 TO 363+00]

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

STATE OF MAINE
STEVEN J. BLAKE
PE 16695
REGISTERED PROFESSIONAL ENGINEER

P.E. STEVEN J BLAKE II
LIC. # 16695

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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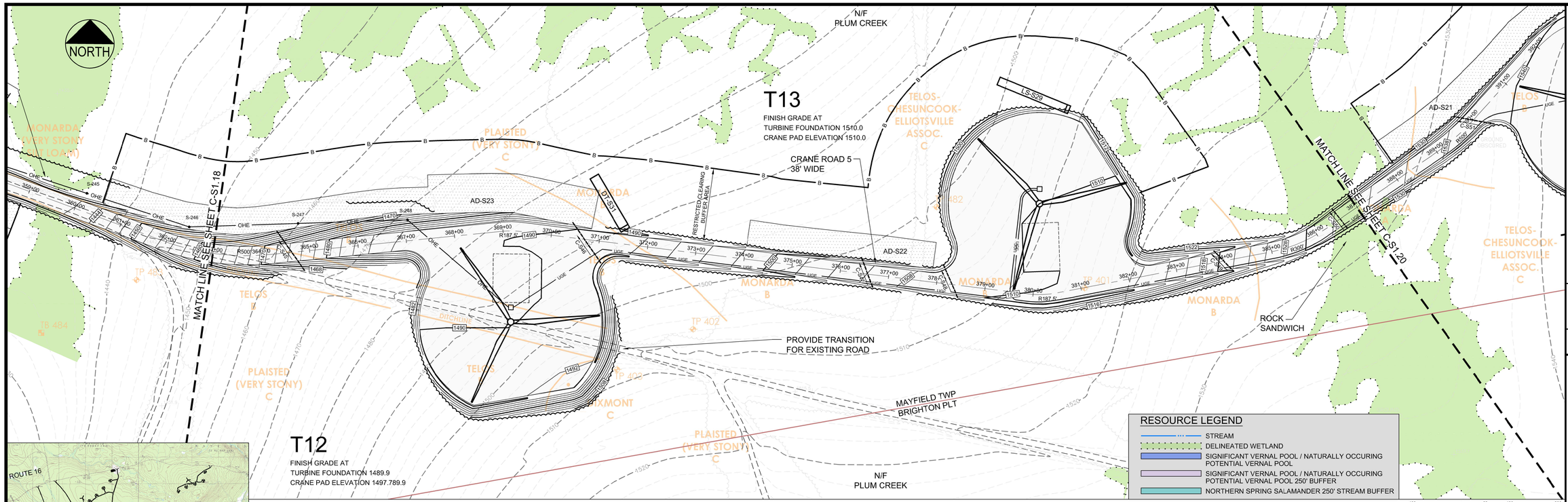
SHEET

C-S1.18

R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\SOUTH\VFG - SOUTH CR_5.dwg davis_d 8/1/2013 9:14 AM



SOUTH CRANE ROAD 5 PLAN

SCALE: 1" = 100'

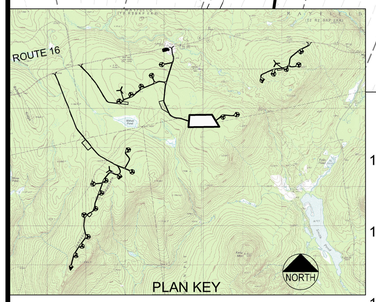
RESOURCE LEGEND

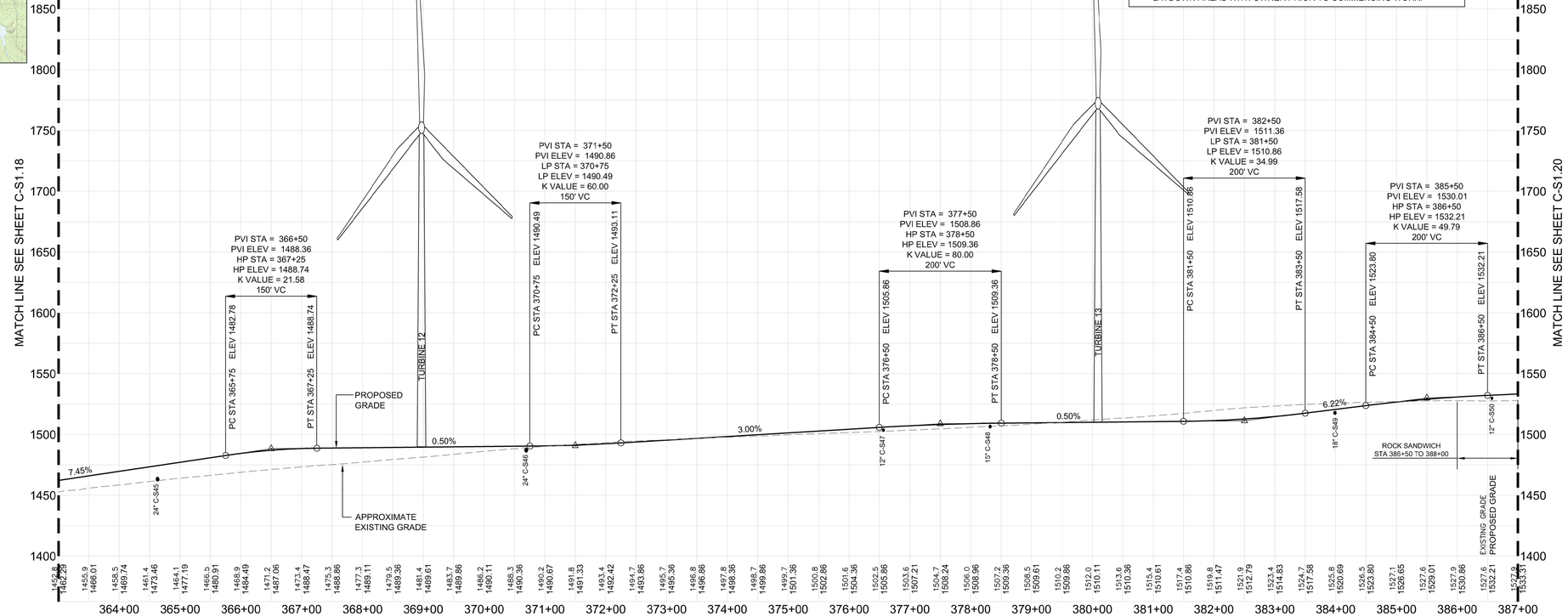
- STREAM
- DELINEATED WETLAND
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL 250' BUFFER
- NORTHERN SPRING SALAMANDER 250' STREAM BUFFER

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.

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.





SOUTH CRANE ROAD 5 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

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

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

STATE OF MAINE
STEVEN J. BLAKE
3695
REGISTERED
PROFESSIONAL ENGINEER
P.E. STEVEN J. BLAKE II
LIC. # 11695

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

RES
RENEWABLE ENERGY SERVICES

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778 MAIN STREET, SUITE 4
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207.775.1121
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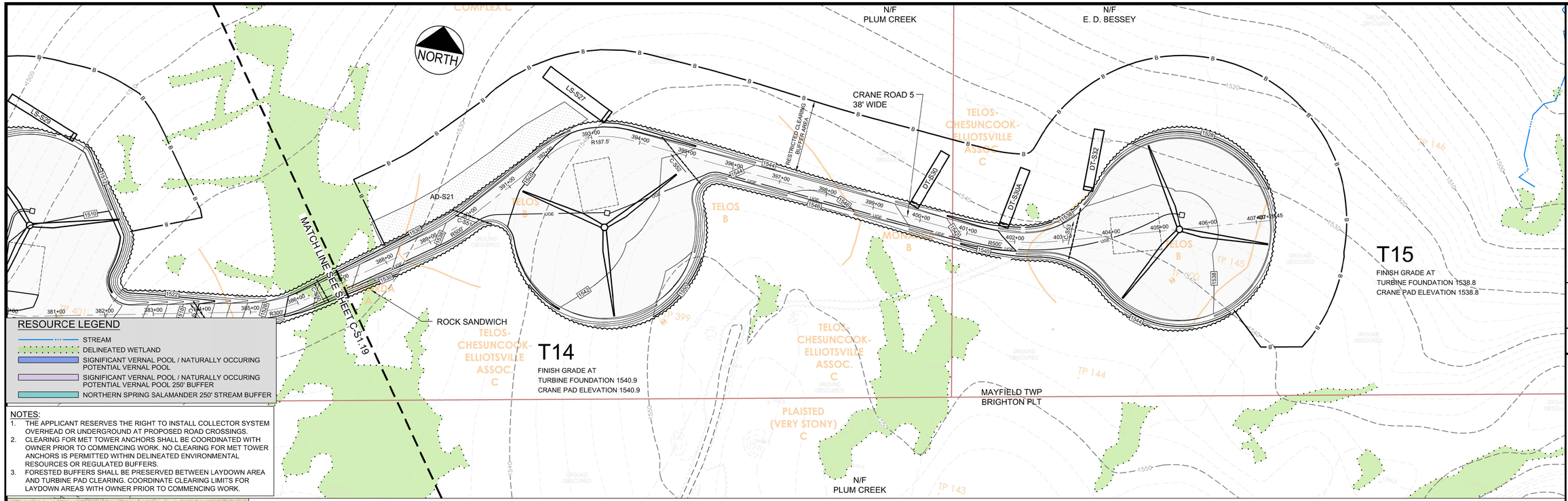
SHEET
C-S1.19

R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\SOUTH\VFG - SOUTH CR_5.dwg davis_d 8/1/2013 9:12 AM



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.
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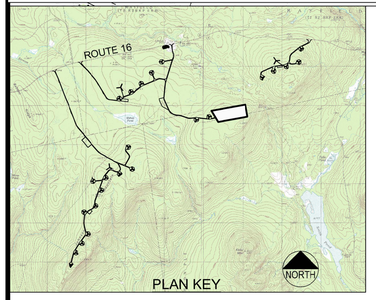
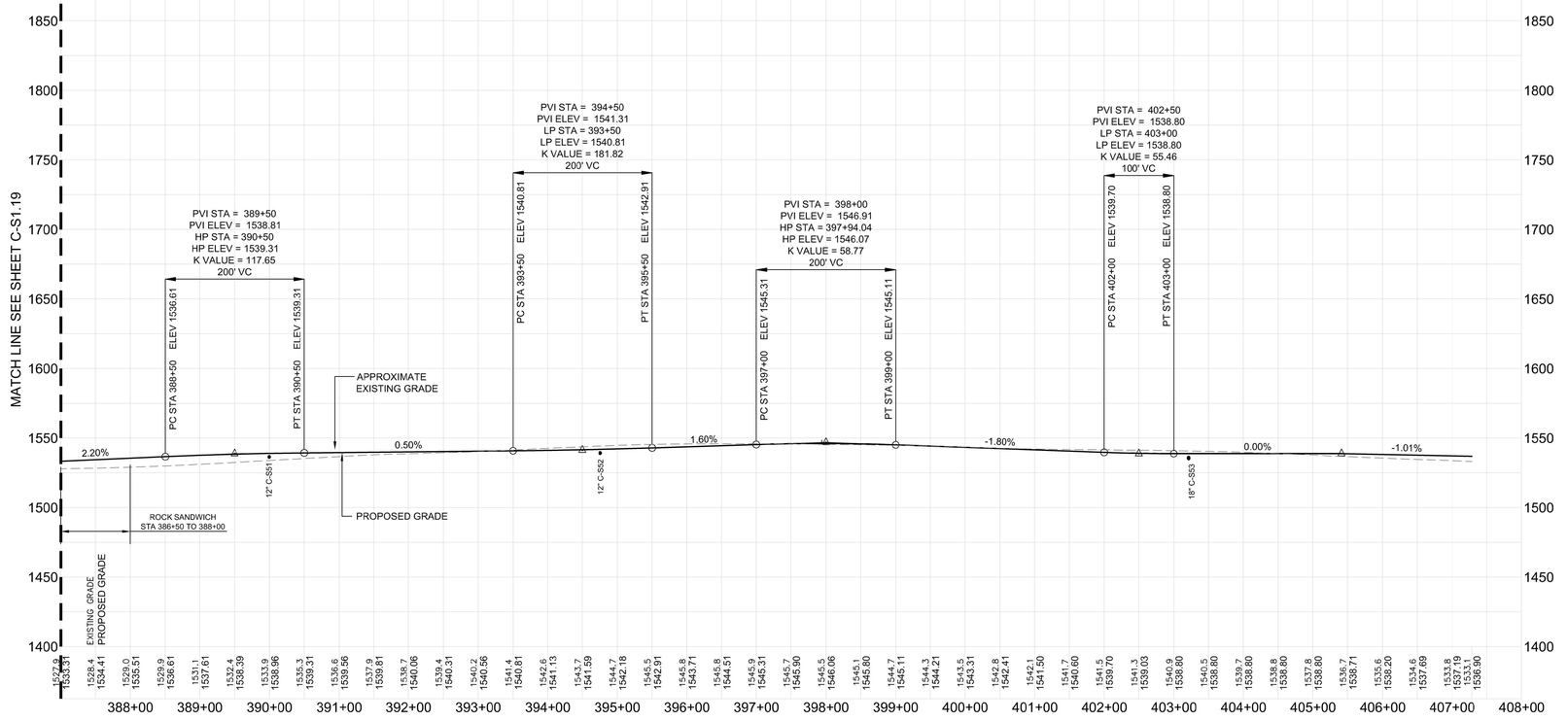


PLAN KEY

SOUTH CRANE ROAD 5 PLAN

SCALE: 1" = 100'

(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
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

CRANE ROAD 5 PLAN AND PROFILE
[STA 387+00 TO 407+28]

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

STATE OF MAINE
STEVEN J. BLAKE
3695
REGISTERED
PROFESSIONAL ENGINEER

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

REED & REED
www.reed-reed.com

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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

C-S1.20

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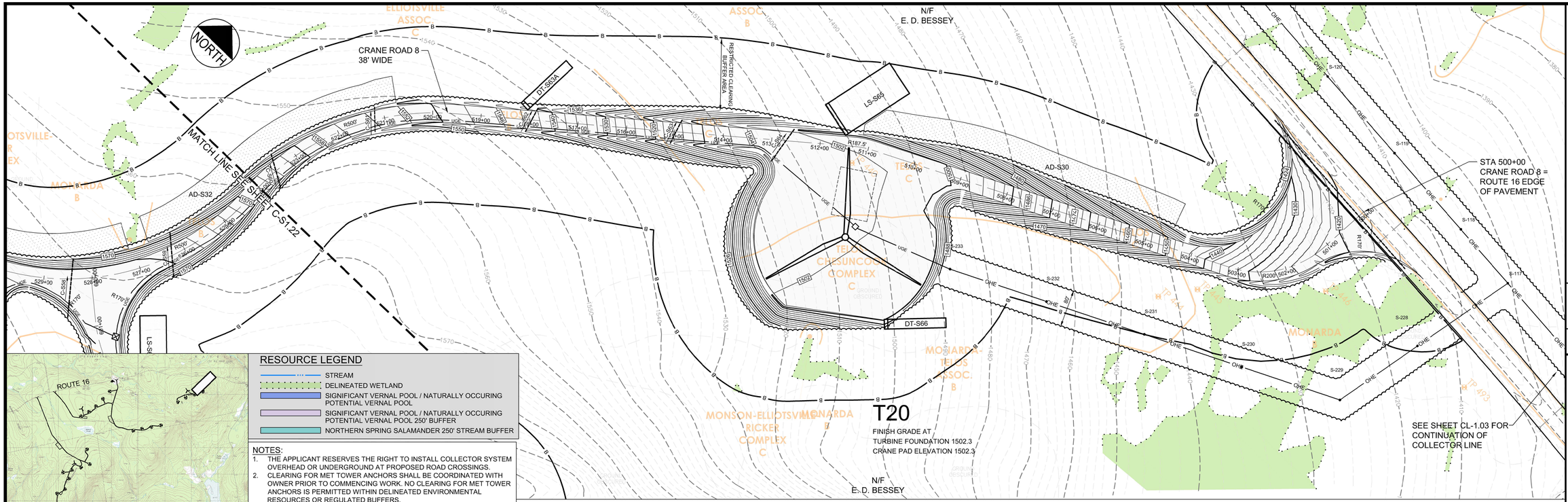
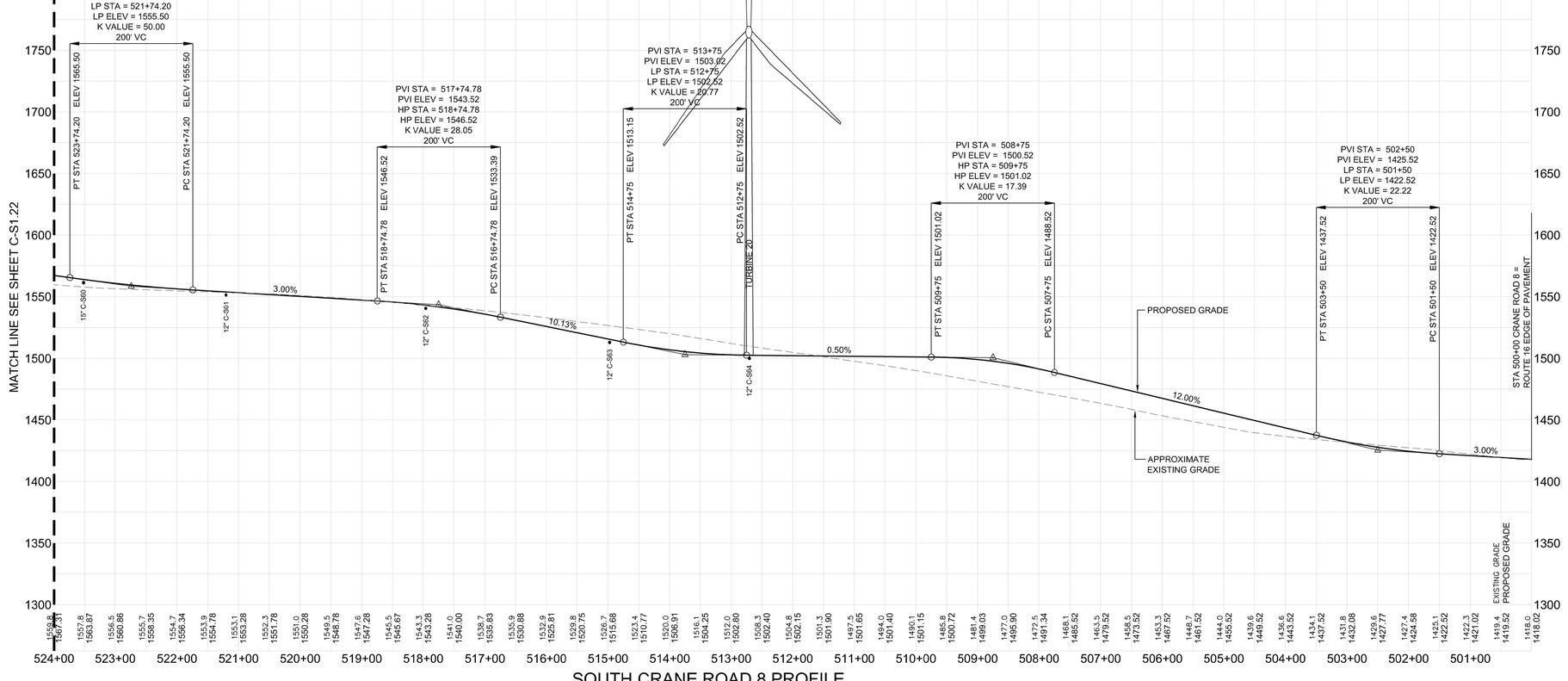


SOUTH CRANE ROAD 8 PLAN

SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



SOUTH CRANE ROAD 8 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 8 PLAN AND PROFILE [STA 500+00 TO 524+00]

DRAWN: DED | SCALE: AS NOTED
DESIGNED: SJB | DATE: SEPT 2012
CHECKED: SRB | JOB NO. 3048
FILE NAME: SOUTH CR_8

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET SUITE 8
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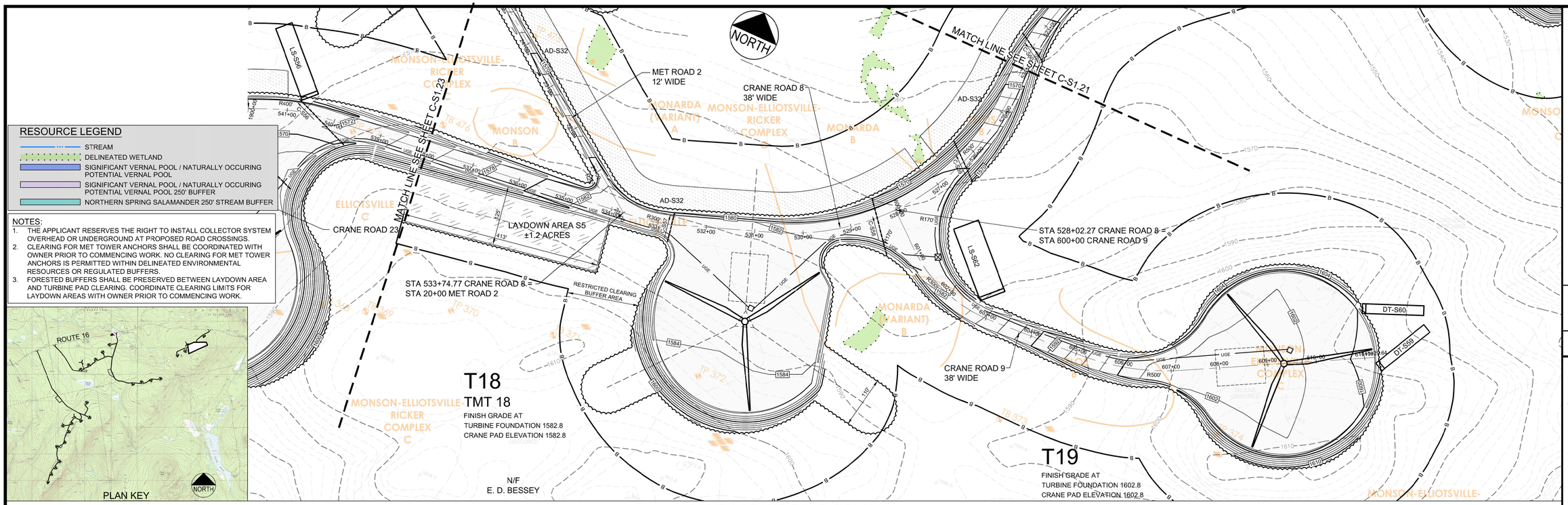
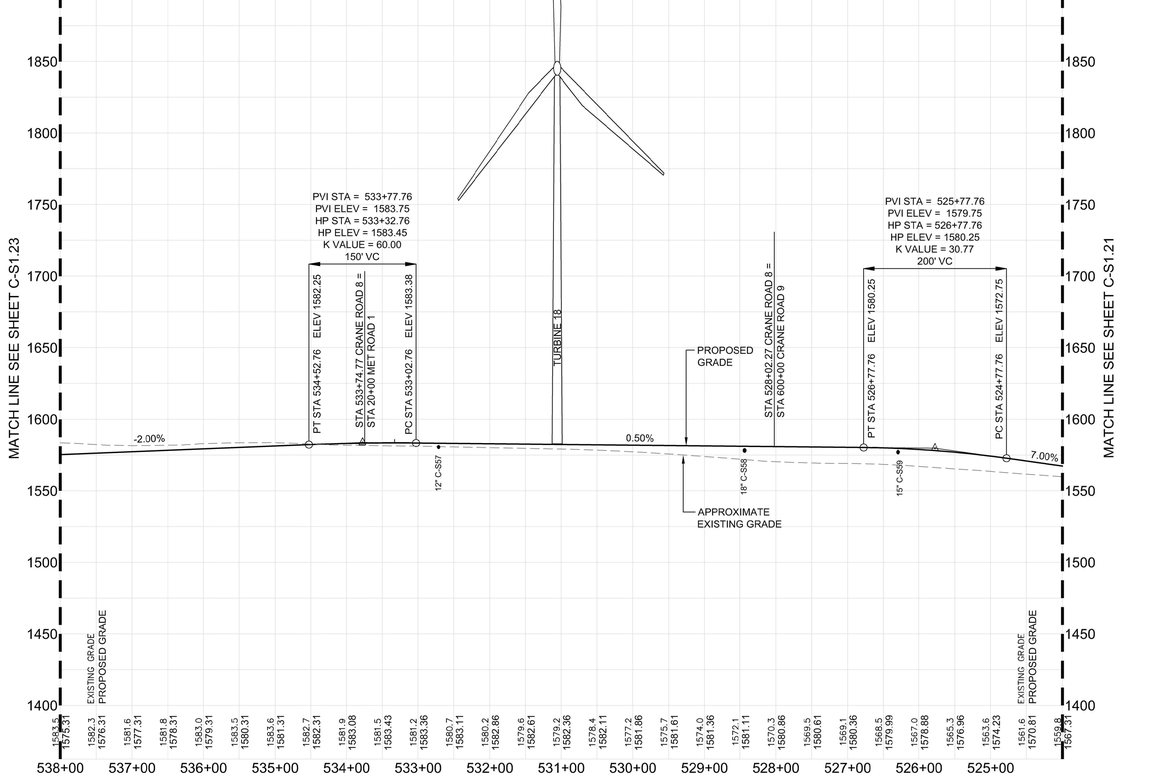
SHEET
C-S1.21



SOUTH CRANE ROAD 8 PLAN

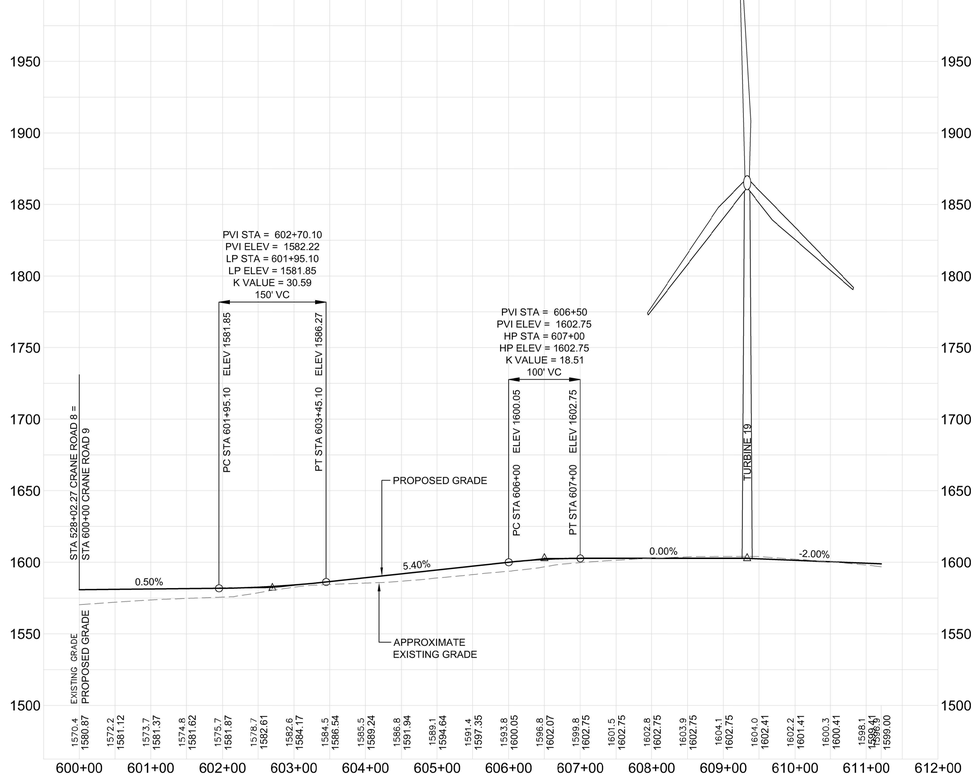
SCALE: 1" = 100'

(IN FEET)
1 inch = 100 ft.



SOUTH CRANE ROAD 8 PROFILE

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



SOUTH CRANE ROAD 9 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
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

CRANE ROAD 8 PLAN AND PROFILE [STA 524+00 TO 538+00] CRANE ROAD 9 PLAN AND PROFILE [STA 600+00 TO 611+21]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE:	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	SOUTH CR_8		

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

RED OAK POWER SERVICES

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
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SHEET
C-S1.22

R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\SOUTH\VFG - SOUTH CR_8.dwg davis_d 8/1/2013 9:38 AM

N/F
E. D. BESSEY

NORTH

STA 541+79.85 CRANE ROAD 8 =
STA 1900+00 CRANE ROAD 23

CRANE ROAD 8
38' WIDE

CRANE ROAD 23

LAYDOWN AREA S5
±1.2 ACRES

MATCH LINE SEE SHEET C-S1.22

AD-S32

AD-S33

AD-S35

LS-S54

LS-S56

RESTRICTED CLEARING BUFFER AREA

DT-S55

DT-S56

NORTHERN SPRING SALAMANDER 250' STREAM BUFFER

MONSON-ELLIOTSVILLE-RICKER COMPLEX

TELOS-CHESUNCOOK-ELLIOTSVILLE-ALLAGASH COMPLEX

ELLIOTSVILLE C

MONSON B

RICKER C

T16

FINISH GRADE AT
TURBINE FOUNDATION 1487.7
CRANE PAD ELEVATION 1487.7

T17

FINISH GRADE AT
TURBINE FOUNDATION 1568.2
CRANE PAD ELEVATION 1568.2

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.
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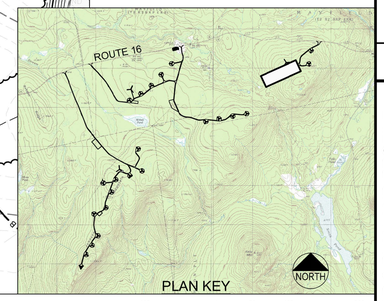
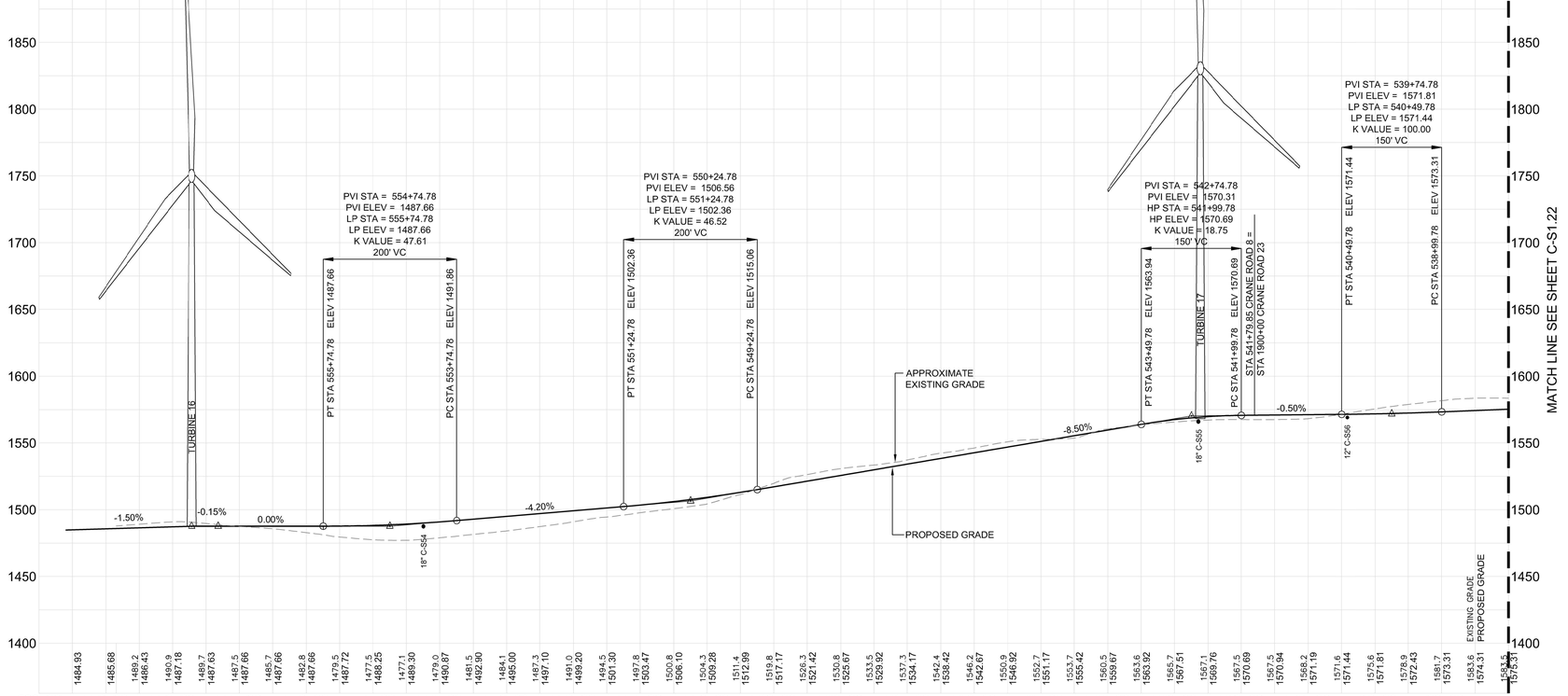


PLAN KEY

SOUTH CRANE ROAD 8 PLAN

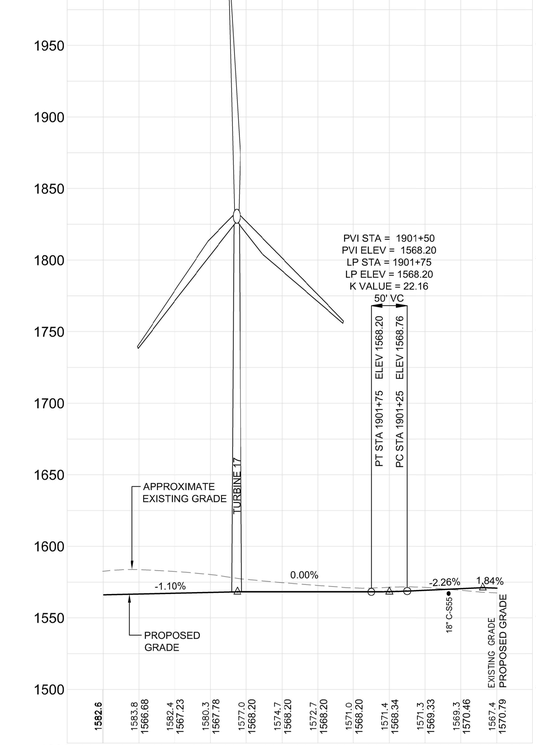
SCALE: 1" = 100'

100 0 50 100 200
(IN FEET)
1 inch = 100 ft.



SOUTH CRANE ROAD 8 PROFILE

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



SOUTH CRANE ROAD 23 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
5	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

CRANE ROAD 8 PLAN AND PROFILE
[STA 538+00 TO 559+85]
CRANE ROAD 23 PLAN AND PROFILE
[STA 1900+00 TO STA 1905+51]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	SOUTH CR_8		

STATE OF MAINE
STEVEN J. BLAKE
3695
REGISTERED PROFESSIONAL ENGINEER

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

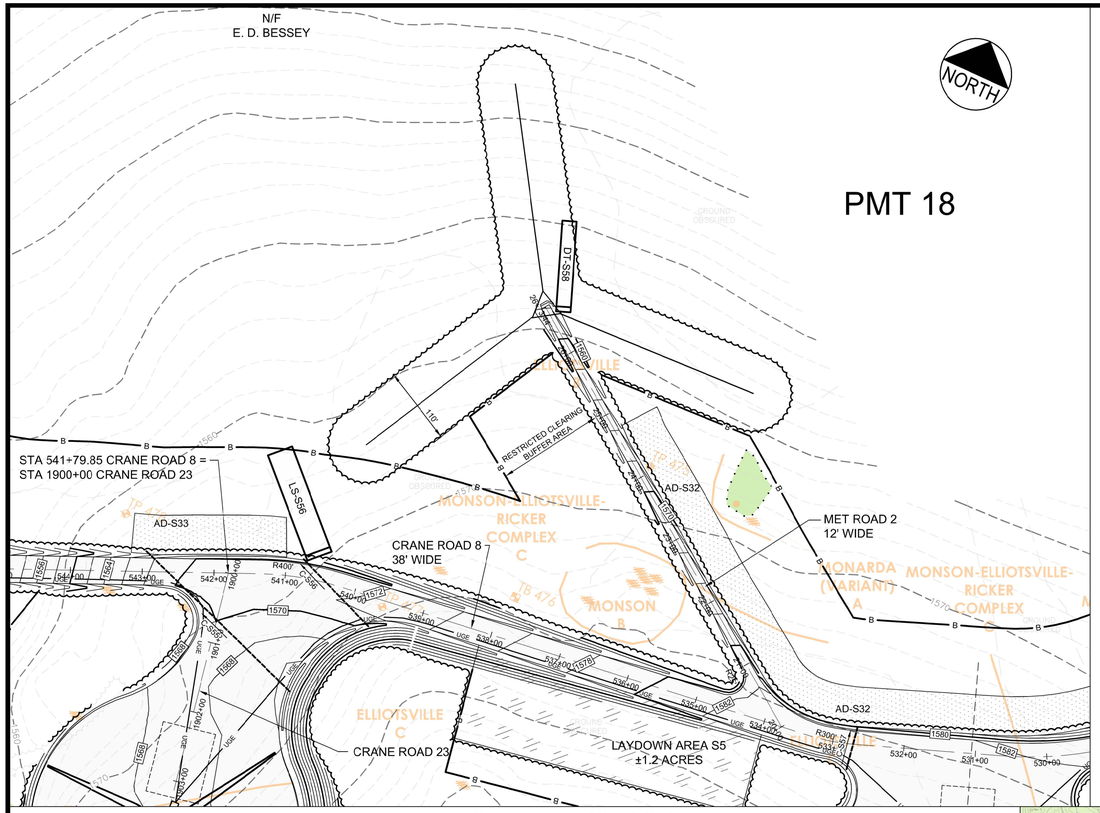
BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

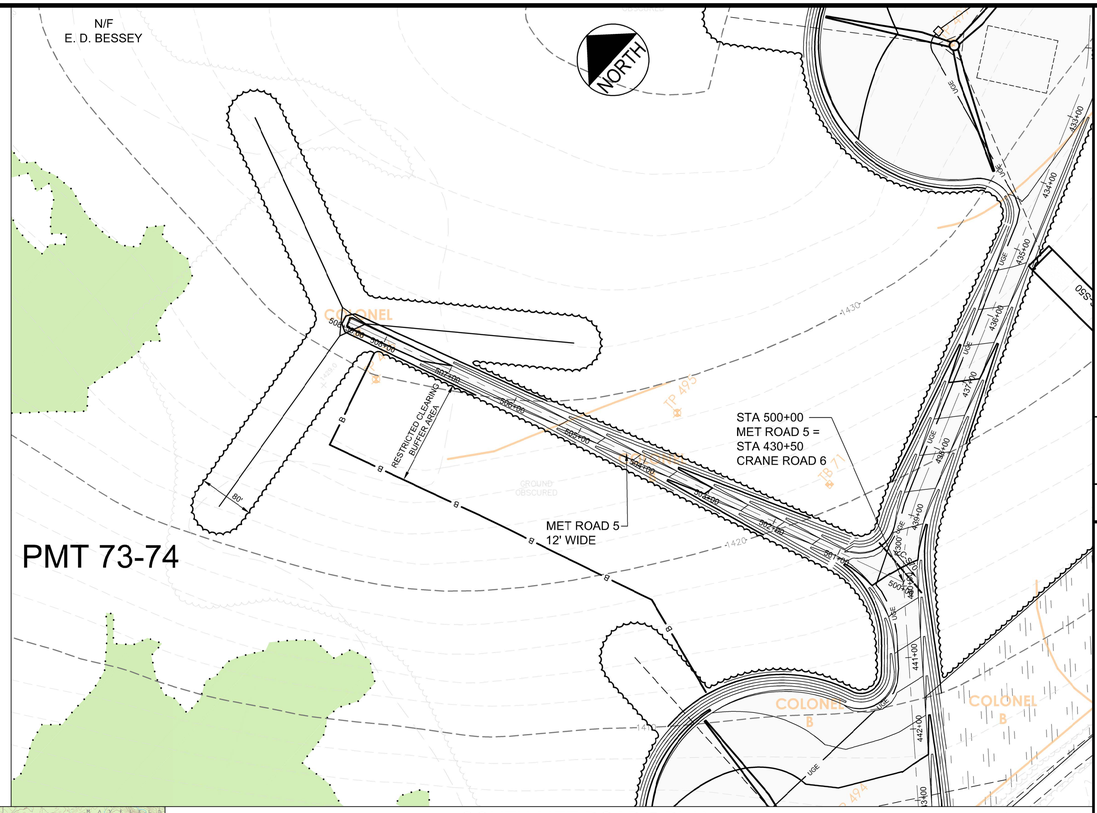
DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
www.delucahoffman.com

SHEET
C-S1.23

R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\SOUTH\VFG - SOUTH CR_8.dwg davis_d 8/1/2013 9:35 AM

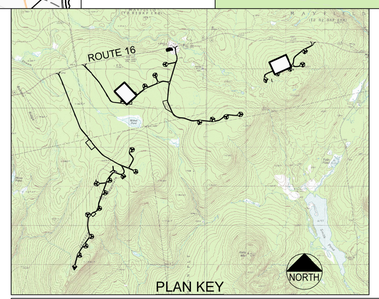


SOUTH MET ROAD 2 PLAN
SCALE: 1" = 100'



SOUTH MET ROAD 5 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.
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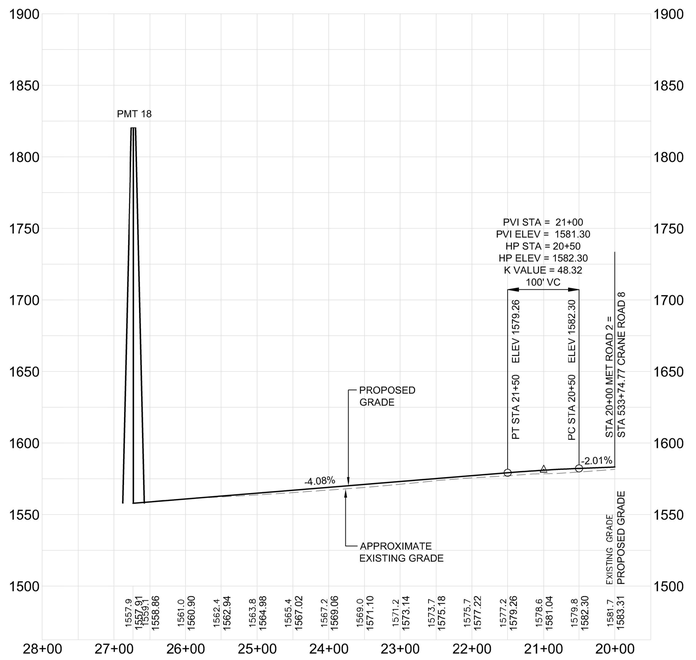
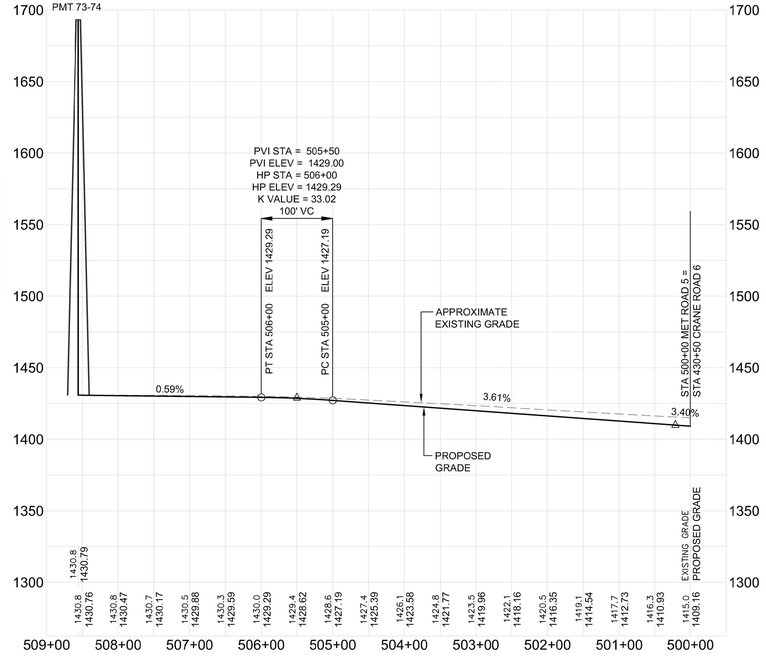


SOUTH MET ROAD 2 PROFILE
SCALE: H 1" = 100'
V 1" = 50'



SOUTH MET ROAD 5 PROFILE
SCALE: H 1" = 100'
V 1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
4	08.02.13	MEDEP STORMWATER AND BASIC STANDARDS COMMENT RESPONSE
3	04.09.13	PERMIT PLAN SUBMISSION
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1	12.19.12	PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

MET ROAD 2 PLAN AND PROFILE
[STA 20+00 TO 26+74]
MET ROAD 5 PLAN AND PROFILE
[STA 500+00 TO 508+56]

DRAWN:	DED	SCALE:	AS NOTED
DESIGNED:	SJB	DATE:	SEPT 2012
CHECKED:	SRB	JOB NO.	3048
FILE NAME:	SOUTH CR_8		

STATE OF MAINE · STEVEN J. BLAKE II · 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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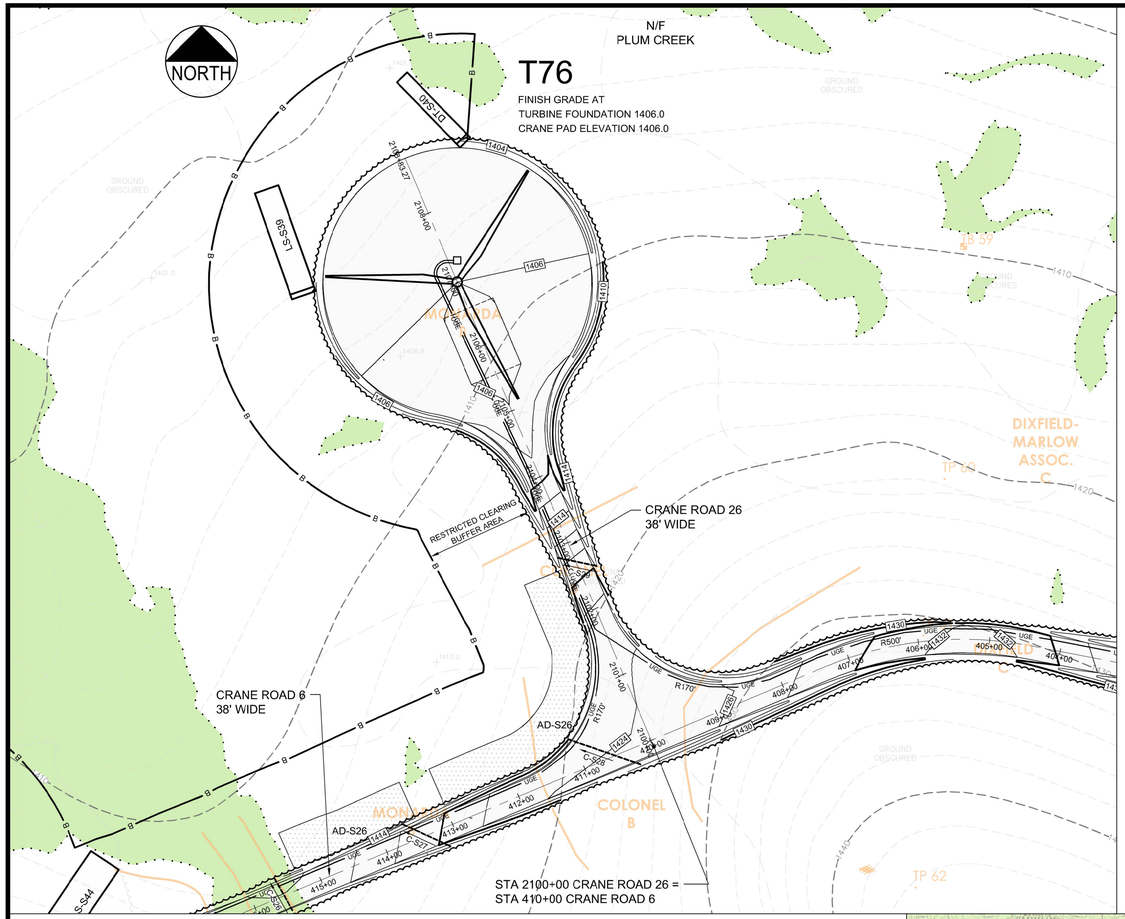
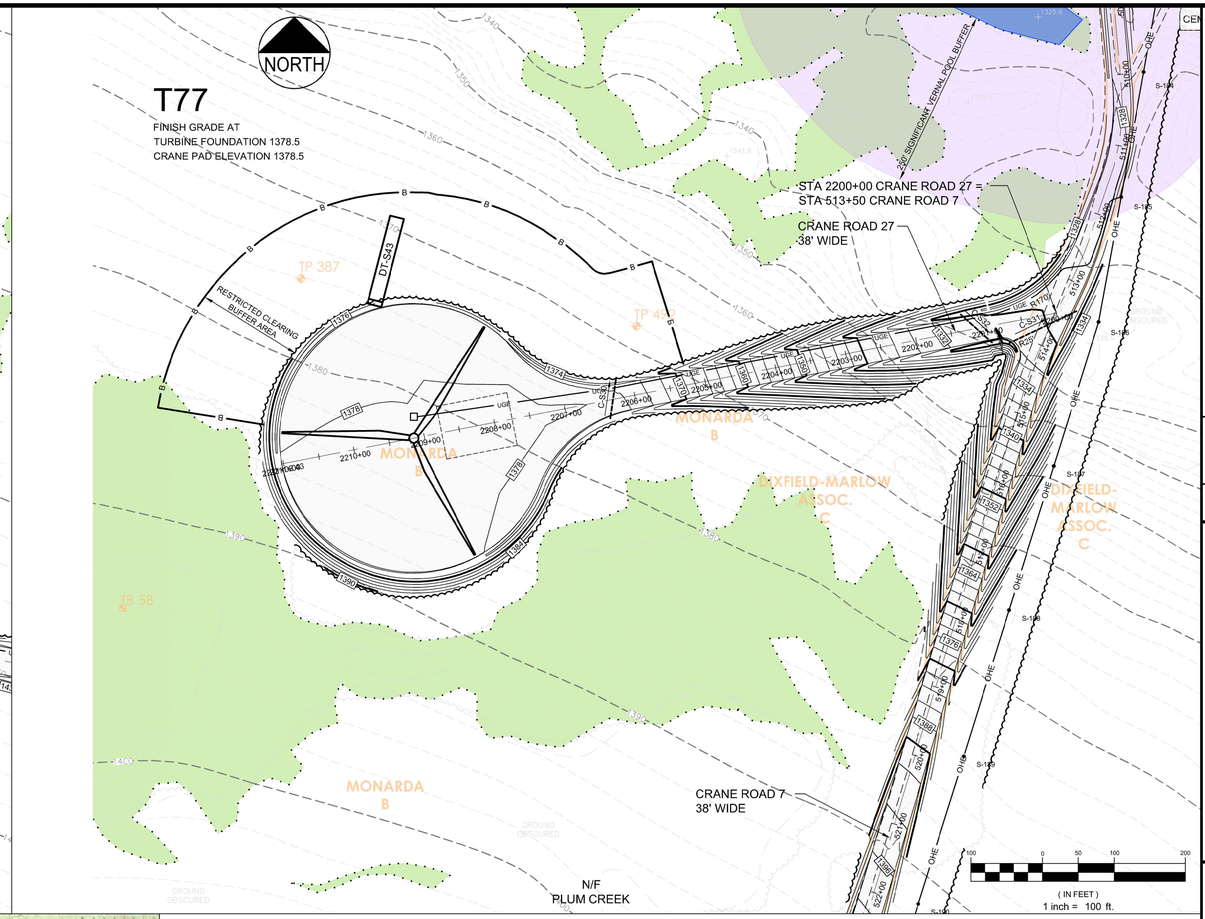
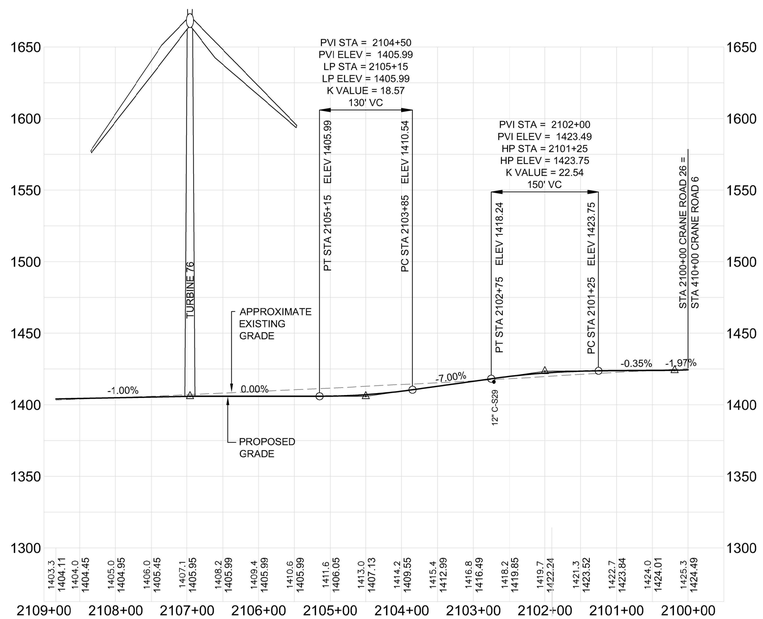
SHEET
C-S1.24





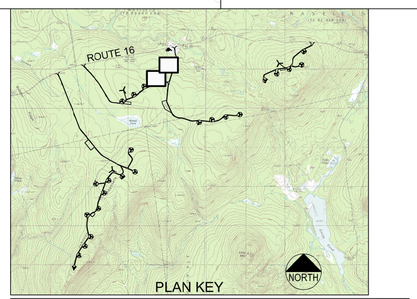
SOUTH CRANE ROAD 26 PLAN

SCALE: 1" = 100'



SOUTH CRANE ROAD 26 PROFILE

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



RESOURCE LEGEND

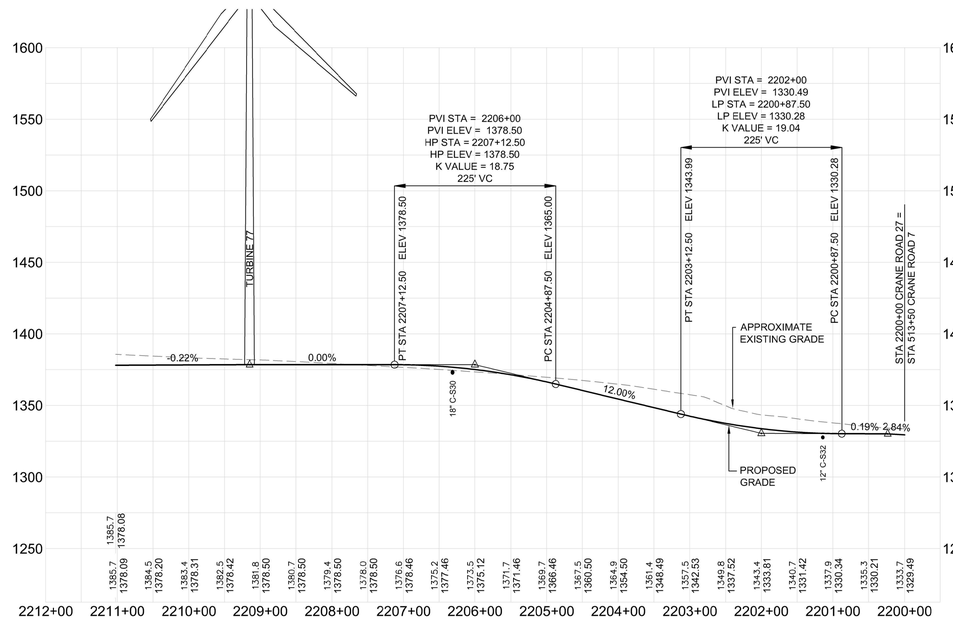
- STREAM
- DELINEATED WETLAND
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL
- SIGNIFICANT VERNAL POOL / NATURALLY OCCURING POTENTIAL VERNAL POOL 250' BUFFER
- NORTHERN SPRING SALAMANDER 250' STREAM BUFFER

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.

SOUTH CRANE ROAD 27 PLAN

SCALE: 1" = 100'



SOUTH CRANE ROAD 27 PROFILE

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

PRELIMINARY - NOT FOR CONSTRUCTION

CRANE ROAD 26 PLAN AND PROFILE [STA 2100+00 TO 2108+83]
CRANE ROAD 27 PLAN AND PROFILE [STA 2200+00 TO 2211+02]

NO.	DATE	DESCRIPTION
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

DRAWN: DED
DESIGNED: SJB
CHECKED: SRB
FILE NAME: SOUTH CR_26

SCALE: AS NOTED
DATE: SEPT 2012
JOB NO. 3048

STATE OF MAINE
STEVEN J. BLANEY
3695
LICENSED
PROFESSIONAL ENGINEER

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
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SHEET

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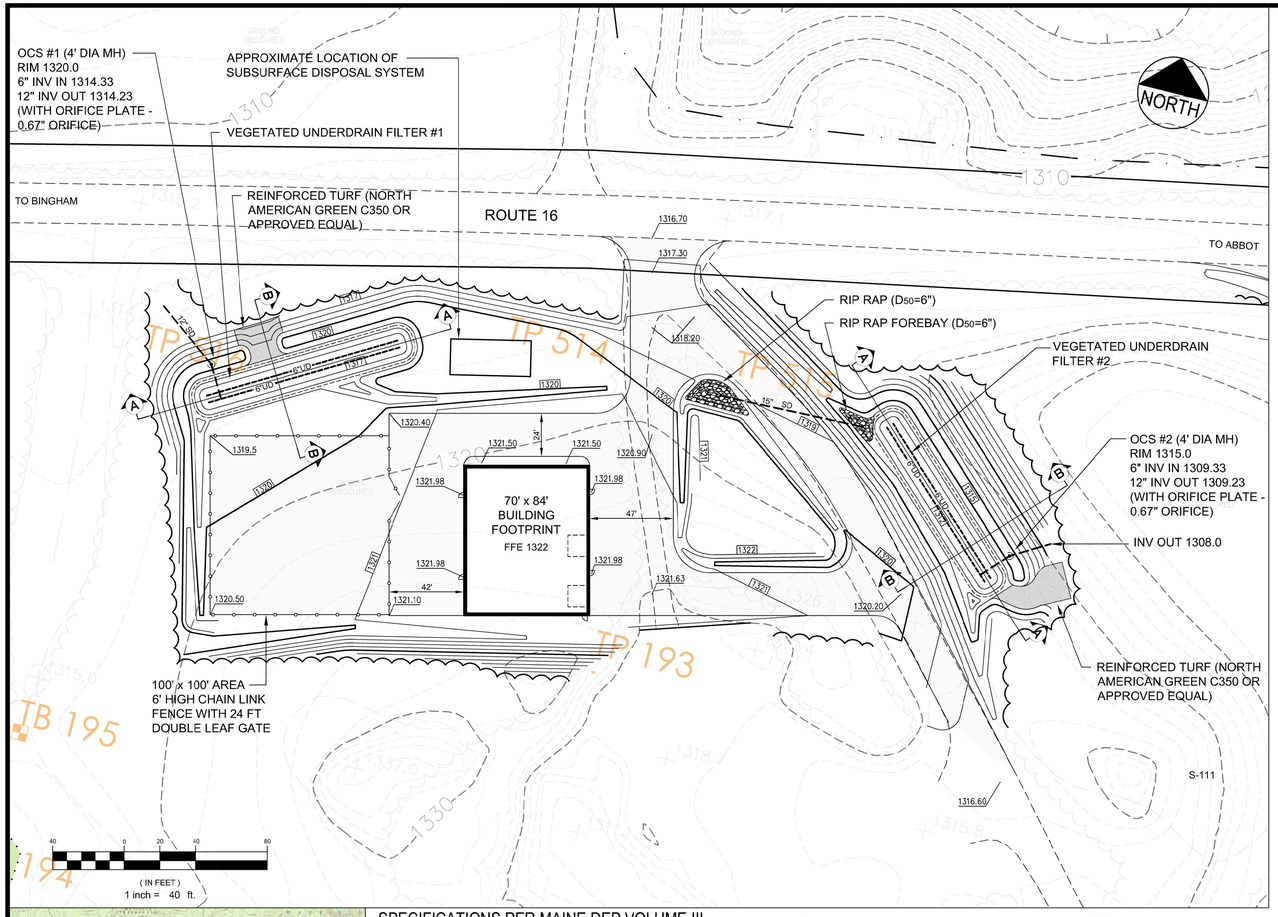
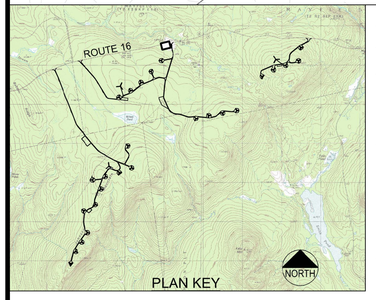
R:\3048-Bingham Wind Farm\Cadd\Permit Set\dwg\SOUTH\VFG - SOUTH CR_26.dwg davis_d 8/1/2013 9:31 AM





SPECIFICATIONS PER MAINE DEP VOLUME III - BMPs TECHNICAL DESIGN MANUAL CHAPTER 7.1.3

PIPE BEDDING

THE UNDERDRAIN MATERIAL CONSISTS OF WELL GRADED, CLEAN, COARSE GRAVEL MEETING THE MEDOT SPECIFICATION 703.22 UNDERDRAIN TYPE B FOR UNDERDRAIN BACKFILL (SEE TABLE 1). THE MATERIAL MUST CONTAIN NO MORE THAN 5% (PREFERABLY 2% OR LESS) FINES PASSING THE #200 SIEVE.

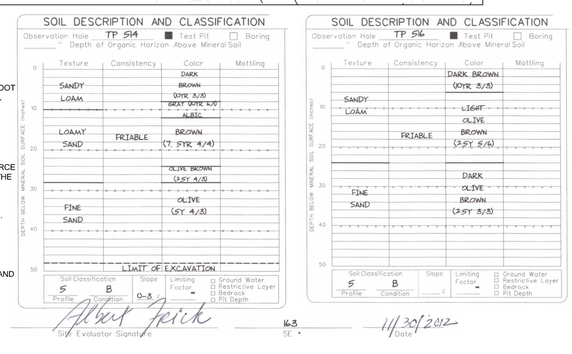
SOIL FILTER MEDIA

SOIL MEDIA MUST CONSIST OF A SILTY SAND SOIL OR SOIL MIXTURE COMBINED WITH 20% TO 25% BY VOLUME OF A MODERATELY FINE SHREDDED BARK CR WOOD FIBER MULCH OR OTHER ORGANIC SOURCE APPROVED BY THE DEPARTMENT. THE RESULTING MIXTURE MUST HAVE NO LESS THAN 8% PASSING THE #200 SIEVE. THE SOIL MEDIA SHOULD ONLY BE COMPACTED TO (90% TO 92% STANDARD PROCTOR).

THE SAND TOPSOIL USED IN THE MIXTURE MUST HAVE NO MORE THAN 2% CLAY CONTENT. THE SAND GRADATION PROVIDED IN TABLE 2 IS AN EXAMPLE OF AN APPROPRIATE SAND TO USE IN THE MIXTURE.

SEEDING MIX

NEW ENGLAND EROSION CONTROL/RESTORATION SEED MIX FOR DRY SITES, BY NEW ENGLAND WETLAND PLANTS, INC.



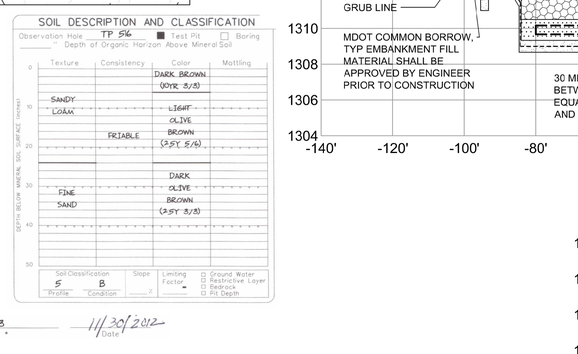


TABLE 1 MEDOT SPECIFICATIONS FOR UNDERDRAINS (MEDOT 703.22)

SIEVE SIZE	% BY WEIGHT
UNDERDRAIN TYPE B	
1"	90-100
1/2"	75-100
#4	50-100
#20	15-80
#50	0-15
#200	0-5
UNDERDRAIN TYPE C	
1"	100
3/4"	90-100
3/8"	0-75
#4	0-25
#10	0-5

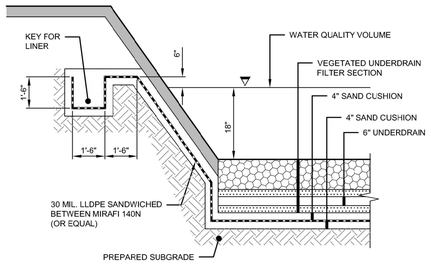
TABLE 2 MEDOT SPECIFICATIONS FOR AGGREGATE (MEDOT #703.01)

SIEVE SIZE	% BY WEIGHT
UNDERDRAIN TYPE B	
3/8"	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#60	10-30
#100	2-10
#200	0-5

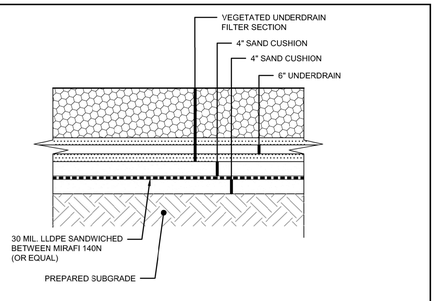
CONSTRUCTION INSPECTION AND MONITORING:

THE CONTRACTOR SHALL PROVIDE THE OWNERS REPRESENTATIVE (A LICENSED ENGINEER) WITH AT LEAST 48 HOURS NOTICE PRIOR TO CRITICAL CONSTRUCTION ACTIVITIES RELATED TO THE VEGETATED UNDERDRAIN FILTER CONSTRUCTION. THE ENGINEER SHALL PROVIDE INSPECTION AND MONITORING DURING THE FOLLOWING PHASES OF FILTER CONSTRUCTION:

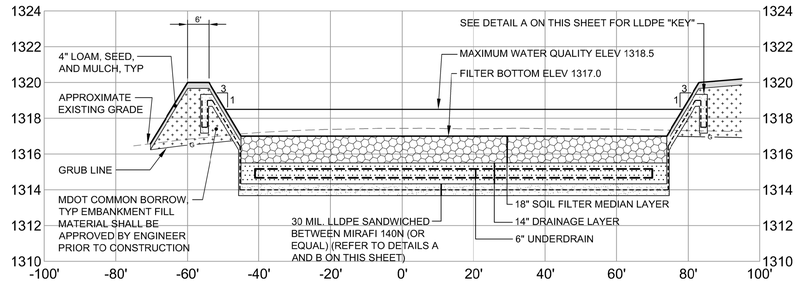
-AFTER PRELIMINARY CONSTRUCTION OF FILTER GRADES AND ONCE UNDERDRAINS ARE INSTALLED BUT NOT BACKFILLED.
-AFTER DRAINAGE LAYER IS CONSTRUCTED AND PRIOR TO THE INSTALLATION OF THE FILTER MEDIA.
-AFTER THE FILTER MEDIA HAS BEEN INSTALLED AND SEEDED.
-AFTER ONE YEAR TO INSPECT HEALTH OF VEGETATION
-ALL MATERIALS USED FOR CONSTRUCTION OF THE FILTER BASIN SHALL BE REVIEWED AND APPROVED BY THE INSPECTING ENGINEER AFTER TESTS BY A CERTIFIED LABORATORY SHOW THAT MATERIALS CONFORM TO SPEC.



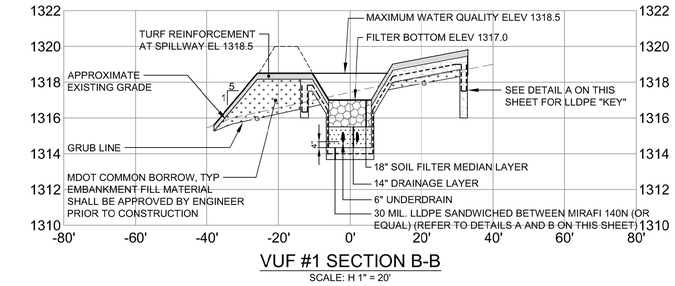
TYPICAL DETAIL
LLDPE LINER SIDE SLOPE AND TOP "KEY"
(A) N.T.S.



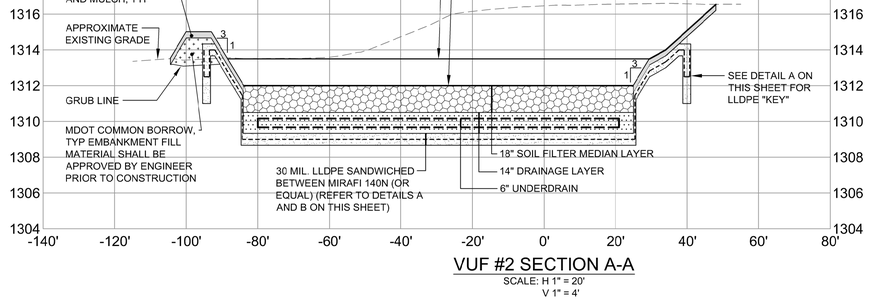
TYPICAL DETAIL LLDPE LINER
UNDER VEGETATED UNDERDRAIN FILTER
(B) N.T.S.



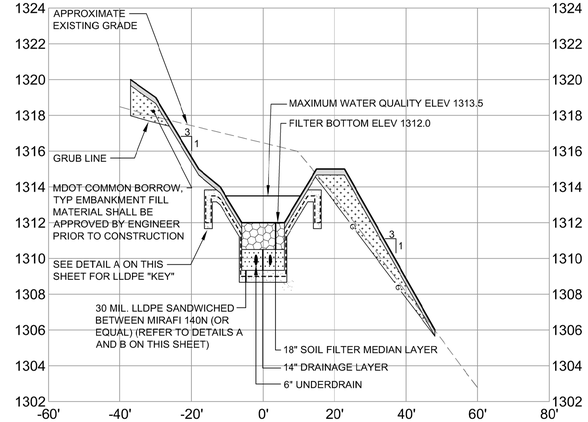
VUF #1 SECTION A-A
SCALE: H 1" = 20'
V 1" = 4'



VUF #1 SECTION B-B
SCALE: H 1" = 20'
V 1" = 4'



VUF #2 SECTION A-A
SCALE: H 1" = 20'
V 1" = 4'



VUF #2 SECTION B-B
SCALE: H 1" = 20'
V 1" = 4'

PRELIMINARY - NOT FOR CONSTRUCTION

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

O & M BUILDING SITE PLAN AND WATER QUALITY PLAN

DRAWN:
DESIGNED: DED
CHECKED: SJB
FILE NAME: SRB
SCALE: 1" = 40'
DATE: SEPT 2012
JOB NO. 3048
SOUTH OM_BLDG

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

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

BINGHAM WIND PROJECT

BLUE SKY WEST, LLC

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