# CLIENT

# **ROXWIND LLC**

13 ELM STREET, SUITE 200 COHASSET, MASSACHUSETTS 02025 ATTN: LINDSAY DEANE-MAYER

# ROXBURY WIND PROJECT

ROXBURY TOWNSHIP, MAINE PERMIT DOCUMENTS - MAY 2018

# PREPARED BY

# STANTEC

482 PAYNE ROAD SCARBOROUGH COURT SCARBOROUGH, MAINE 04074 207.883.3355 ATTN: STEVE BUSHEY KRISTA REINHART **BROOKE BARNES** 

# DATA SOURCE

# **TOPOGRAPHIC INFORMATION:**

**AERIAL SURVEY AND PHOTO, INC.** 546 AIRPORT ROAD P.O. BOX 659 NORRIDGEWOCK, MAINE 04957 207.634.2006

HORIZONTAL DATUM: 1983 NAD (1996adj.) UTM ZONE 19 US FEET

VERTICAL DATUM: 1988 NAVD US FEET

# **BOUNDARY INFORMATION:**

**CURRENTLY BASED ON TAX MAP INFO** 

# **TOWER LOCATIONS:**

**BY OWNER** 

# WETLANDS / NATURAL RESOURCES:

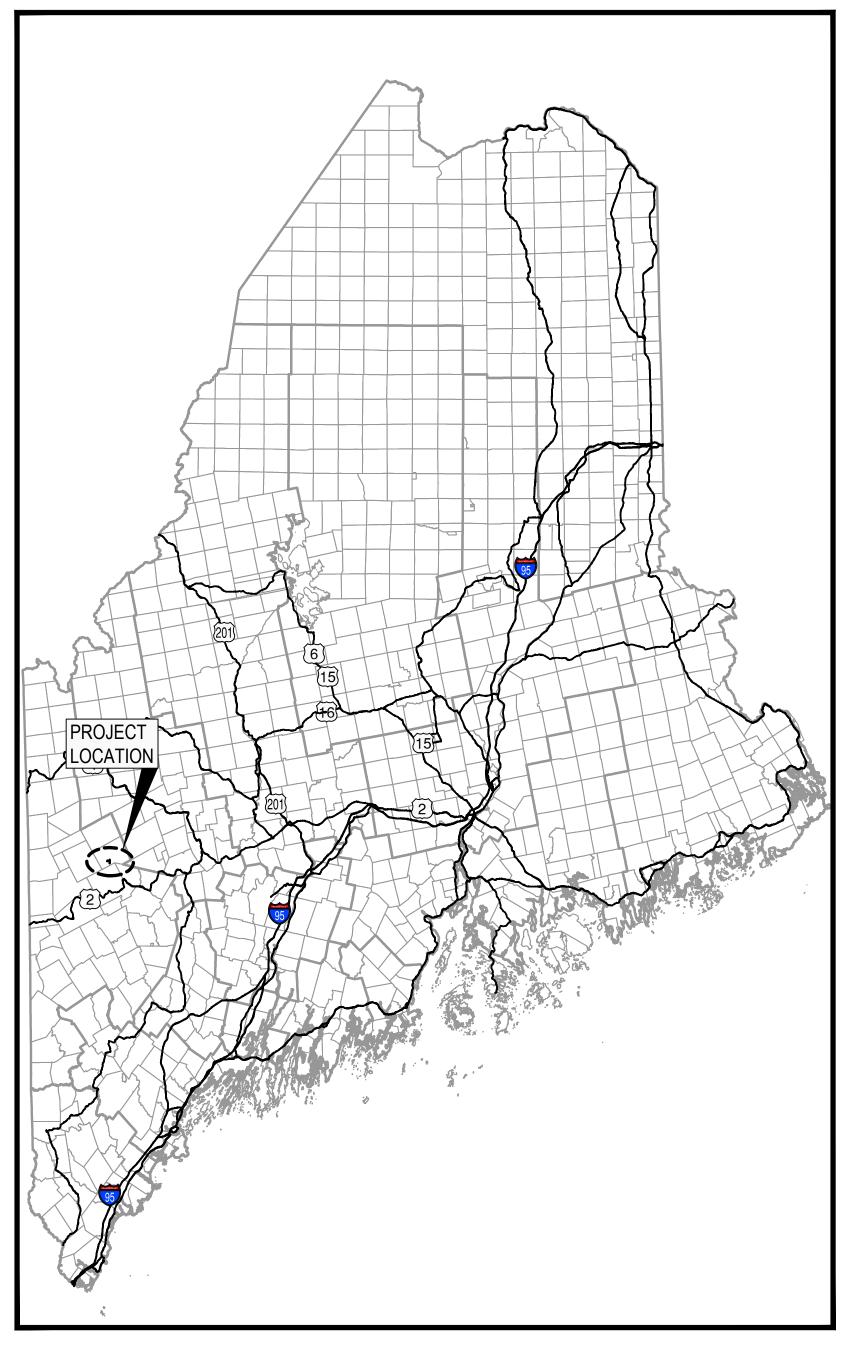
# **KLEINSCHMIDT**

141 MAIN STREET P.O. BOX 650 PITTSFIELD, ME 04967 207.487.3328

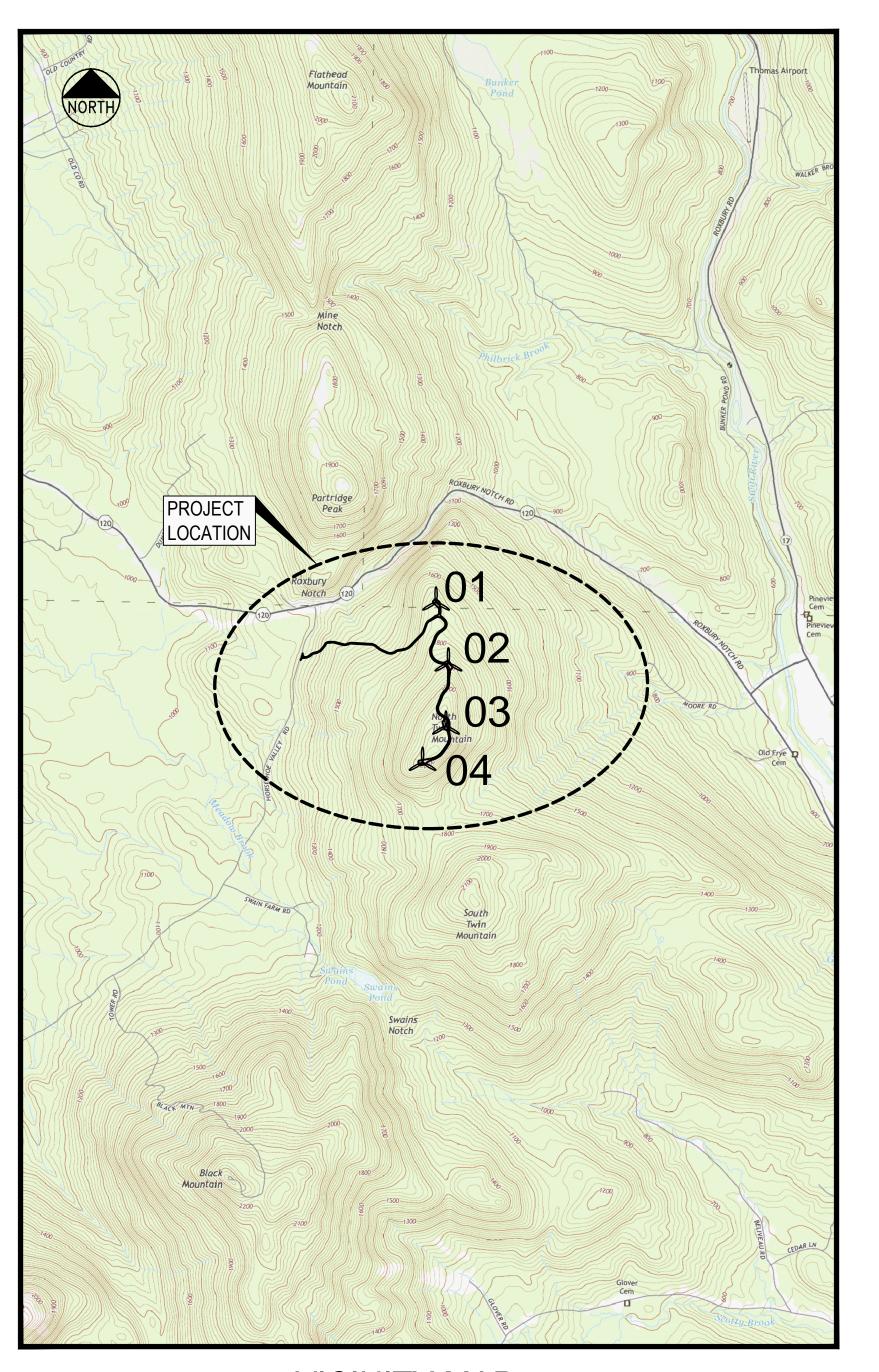
# **ELECTRICAL DESIGN:**

# SOIL SURVEY:

STANTEC **482 PAYNE ROAD** SCARBOROUGH COURT SCARBOROUGH, MAINE 04074 207.883.3355 ATTN: RODNEY KELSHAW



**LOCATION MAP** SCALE: 1" = 24 MILES



**VICINITY MAP** SCALE: 1" = 2500'

THESE PLANS REPRESENT ONLY THE TURBINE ACCESS AND OF THE WTG. SEE ADDITIONAL PLANS BY (TBD) FOR THE TRANSMISSION SYSTEM.

CIVIL COVER SHEET FOR ACCESS AND CRANE ROADS

GENERAL NOTES AND LEGEND

BACK SLOPE DETAILS

SOIL HYDROLOGY PRESERVATION DETAILS

**EROSION CONTROL NOTES** 

C-N1.3 CRANE ROAD PLAN AND PROFILE (STA 184+00 TO 189+98)

C-N1.4 CRANE ROAD PLAN AND PROFILE (STA 200+00 TO 204+77)

**INDEX** 

OVERALL ORIENTATION MAP ROADWAY AND PAD SECTION DETAILS

DITCH AND CULVERT DETAILS

EROSION CONTROL DETAILS

**EROSION CONTROL NOTES** 

ACCESS ROAD PLAN AND PROFILE (STA 100+00 TO 128+00)

CRANE ROAD PLAN AND PROFILE (STA 156+00 TO 184+00

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STORMWATER PERMIT APPLICATION PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW EPL

ROXBURY WIND PROJECT

ROXWIND LLC

ROXBURY TOWNSHIP, MAINE

Client/Project

CIVIL COVER SHEET FOR ACCESS AND CRANE ROADS

Scale Project No. **AS NOTED** 

C-1.0

Revision

# GENERAL NOTES

#### **GENERAL NOTES**

- VACANT.
- 2. PLANIMETRIC AND TOPOGRAPHIC INFORMATION ARE SHOWN IN UTM ZONE 19, US-FEET, NAD 83. VERTICAL DATUM IS NAVD 1988 US-FEET. PROJECT BENCHMARKS TO BE PROVIDED AT TIME OF CONSTRUCTION.
- 3. SOIL SURVEY INFORMATION PROVIDED BY STANTEC.
- 4. NATURAL RESOURCE DATA, INCLUDING WETLAND DELINEATION BOUNDARIES AND OTHER SENSITIVE RESOURCES, PROVIDED BY KLEINSCHMIDT.
- 5. COLLECTOR AND TRANSMISSION SYSTEM LAYOUT PROVIDED BY (TBD).
- 6. EROSION CONTROL MEASURES TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH "MAINE EROSION AND SEDIMENTATION CONTROL: BEST MANAGEMENT PRACTICE". BY MEDEP, LATEST VERSION.

#### CLEARING AND STOCKPILING OPERATIONS

- 1. INSTALL EROSION CONTROL MEASURES PRIOR TO SOIL DISTURBANCE.
- 2. ACCESS ROAD AND CRANE ROAD, EQUIPMENT LAYDOWN AREA/TURBINE AREAS: CLEAR TIMBER AND BRUSH WITHIN LIMIT OF DISTURBANCE. STUMPS TO BE REMOVED IN AREAS WHERE STRUCTURES (ie ACCESS ROAD, CRANE ROAD AND TURBINE AREAS) ARE PROPOSED. STUMPS SHALL BE GROUND TO GRADE OR REMOVED AND GROUND ON-SITE TO GENERATE EROSION CONTROL MIX (ECM).
- 3. 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 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. MULTIPLE SEGMENTS IN DIFFERENT AREAS OF THE PROJECT MAY BE CONSTRUCTED CONCURRENTLY.
- 4. MINIMIZE THE AMOUNT OF DISTURBANCE AT ANY ONE TIME BY STAGING CONSTRUCTION AS MUCH AS PRACTICAL FOR EFFICIENT CONSTRUCTION OF THE PROJECT. WHERE FEASIBLE, CONTRACTOR OPERATIONS SHALL MAINTAIN THE NATURAL COVER MATERIAL OR USE NATURAL VEGETATIVE BUFFER STRIPS TO AID IN SEDIMENT RETENTION AND TO REDUCE THE POTENTIAL OF SOIL EROSION.
- 5. STRIPPED TOPSOIL SHALL BE STOCKPILED ON-SITE WITHIN DISTURBED AREAS FOR USE IN STABILIZING ACCESS ROAD DITCHES AND FOR FINAL STABILIZATION OF ROAD SHOULDERS, TURBINE AREAS, LAYDOWN AREAS AND SLOPES. AN EROSION CONTROL BARRIER SHALL BE INSTALLED AROUND SOIL STOCKPILES THAT ARE EXPECTED TO REMAIN UNDISTURBED FOR MORE THAN 48 HOURS OR PRIOR TO A STORM EVENT. THE BARRIERS SHALL BE ADEQUATELY LOCATED AND REINFORCED TO PREVENT COLLAPSE DURING A STORM EVENT AND THE POTENTIAL SLUMPING OF THE PILE. IF NO ACTIVITY IS SCHEDULED WITHIN 30 DAYS, APPLY HAY AND/OR STRAW MULCH AS SPECIFIED HEREIN, UNLESS DIRECTED OTHERWISE. 4 INCHES OF ECM MAY ALSO BE USED. HAY/STRAW MULCH MAY ALSO BE SUPPLEMENTED BY TEMPORARY SEEDING WITH ANNUAL RYEGRASS AS SPECIFIED HEREIN FOR AREAS WHERE ADDITIONAL ACTIVITY IS NOT EXPECTED FOR SEVERAL MORE WEEKS. APPLY ANCHORED MULCH OR SUPPLEMENTAL SEEDING DURING WINTER CONSTRUCTION.
- 6. STOCKPILE GENERATED ECM ON-SITE WITHIN DISTURBED AREAS.
- 7. REMOVE EXCESS SOILS FROM SITE THAT WILL NOT BE USED FOR THE FINAL DESIGN AND STABILIZATION.

#### CONSTRUCTION OF ACCESS ROAD AND CRANE ROAD

- I. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL USE SURVEY CREWS TO ACCURATELY LOCATE ALL IMPROVEMENTS INCLUDING ROADWAY CENTERLINES AND LIMITS OF DISTURBANCE. PROVIDE ADDITIONAL STAKING AND MARKING AT LOCATIONS WHERE STORMWATER CONTROL MEASURES ARE TO BE INSTALLED.
- 2. DUE TO DIFFERING SITE CONDITIONS, HORIZONTAL AND VERTICAL ADJUSTMENTS WITHIN PERMIT CONSTRAINTS MAY BE NECESSARY FOR PROPER CONSTRUCTION AND INTERPRETATION OF THE CONTRACT DRAWINGS. FIELD MODIFICATIONS WILL NOT CREATE ANY ADDITIONAL CLEARING/FILLING NATURAL RESOURCE IMPACTS AND WILL NOT IMPACT THE INTENT OF THE STORMWATER DESIGN. ALL CHANGES SHALL BE REFLECTED IN THE PROJECT RECORD DRAWINGS.

# CONSTRUCTION OF PERMANENT STORMWATER MANAGEMENT SYSTEMS

- I. GRADING TO BE CONDUCTED IN ACCORDANCE WITH PERMITTED PERMANENT STORMWATER MANAGEMENT DESIGN.
- 2. ONCE FINAL GRADES ARE ACHIEVED, EXPOSED SOIL SURROUNDING THE STORMWATER MANAGEMENT STRUCTURES SHALL BE PERMANENTLY STABILIZED AS DESCRIBED HEREIN.

# TURBINE PAD CONSTRUCTION

- I. FOLLOWING CONSTRUCTION OF THE WTG ASSEMBLY AREA SUBGRADES, BRING ASSEMBLY AREAS AND TURBINE PADS TO FINISH GRADE WITH CRUSHED AGGREGATE. SPREAD AND COMPACT MATERIAL AS NECESSARY TO THE LIMITS DEPICTED ON CONTRACT DOCUMENTS. VERTICAL ADJUSTMENTS WITHIN PERMIT CONSTRAINTS MAY BE NECESSARY TO ACCOMMODATE SPECIFIC SITE CONDITIONS. ALL ADJUSTMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION.
- 2. PORTIONS OF THE WTG ASSEMBLY AREA SURROUNDING THE TURBINE GENERATOR AND THE TURBINE PAD SHALL REMAIN AS A PERMANENT DISTURBANCE. ALL OTHER AREAS WITHIN THE WTG ASSEMBLY AREA SHALL BE PERMANENTLY STABILIZED AS DESCRIBED HEREIN.

# **CLEAN-UP AND FINAL STABILIZATION**

- 1. AT STREAM CROSSINGS, COMPLETE FINAL RESTORATION (FINISH GRADE, SEED AND MULCH) OF ALL AREAS WITHIN 250 FEET OF THE WATERBODY WITHIN 48 HOURS OF FINAL GRADING UNLESS DIRECTED OTHERWISE. ALL OTHER AREAS OF EXPOSED SOIL SHALL BE PERMANENTLY RE-VEGETATED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING.
- 2. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, ALL WORK AREAS SHALL BE CLEARED OF CONSTRUCTION DEBRIS AND OTHER MATERIALS.
- 3. SPECIFIC CLEAN-UP REQUIREMENTS TO INVOLVE REMOVAL OF ALL TEMPORARY WORK TRAILERS IF ANY REMOVAL OF MATERIAL AND EQUIPMENT, DISPOSAL OF ALL RUBBISH RESULTING FROM CLEARING CONSTRUCTION, ROUGH GRADING AND STABILIZATION OF EMBANKMENTS MADE FOR CONSTRUCTION PURPOSES, FILLING OF ANY EXCAVATION AND REPAIRING RUTS IN ACCESS ROAD AND CRANE ROAD.

# WINTER CONSTRUCTION NOTES

- FOR WORK PROPOSED DURING THE WINTER SEASON (TYPICALLY NOVEMBER 1 APRIL 15), THE CONTRACTOR SHALL ADHERE TO THE FOLLOWING PRACTICES:
- 1. A PLAN AND SCHEDULE OF ACTIVITIES SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL PRIOR TO ANY WORK BEING DONE.
- 2. LIMIT THE TOTAL AREA OF EXPOSED SOIL TO THAT IN WHICH EARTH WORK CAN BE COMPLETED WITHIN 15 DAYS AND MULCHED WITHIN ONE DAY PRIOR TO A PRECIPITATION EVENT.
- 3. EXPOSED SOIL MAY BE LEFT BARE FOR NO MORE THAN 15 DAYS.
- 4. MULCH ALL EXPOSED SOIL WHERE NO ACTIVITY IS SCHEDULED WITHIN 7 DAYS AND PRIOR TO A FORECASTED SNOW EVENT OF MORE THAN 1 INCH.
- 5. WHERE PRACTICABLE, MULCH SHOULD BE APPLIED AT THE END OF EACH DAY'S WORK FOR AREAS THAT ARE FINAL GRADED. OTHERWISE, MULCH THE FOLLOWING DAY.
- 6. DO NOT APPLY MULCH OVER MORE THAN 1 INCH OF SNOW.
- 7. HAY OR STRAW MULCH SHALL BE APPLIED AT 140 LBS/1000 SF (APPROX. 4 BALES) AND SO THAT THE GROUND SURFACE IS NOT VISIBLE THROUGH THE MULCH.
- 8. ECM IS THE PREFERRED MULCHING MATERIAL AND SHALL BE APPLIED AT A MINIMUM 4 INCH THICKNESS WITH HIGHER AMOUNTS AS DESCRIBED HEREIN.

- 9. IF ECM IS NOT AVAILABLE, INSTALLATION OF SILT FENCE ON FROZEN GROUND MAY BE MODIFIED FROM ILLUSTRATIONS AND DETAIL DRAWINGS TO SUBSTITUTE SIX INCHES OF SUITABLE NON-ORGANIC MATERIAL OVER THE BOTTOM OF THE SILT FENCE IN LIEU OF TRENCHING AND BACKFILLING FABRIC.
- 10.A DOUBLE ROW OF EROSION CONTROL BARRIER WILL BE USED WHERE REQUIRED WITHIN 100 FEET OF WETLANDS AND WATER BODIES.
- 11.INSPECTION OF EROSION CONTROL MEASURES AND ANY NEEDED REPAIR/REPLACEMENT OF WHICH SHALL OCCUR EACH DAY.
- 12.PERMANENT SEEDING IS NOT REQUIRED DURING THE WINTER SEASON. HOWEVER, IF DONE, THE CONTRACTOR SHALL FOLLOW PROCEDURES FOR DORMANT SEEDING. THE PERMANENT SEED MIX SHALL BE APPLIED AT THREE TIMES THE STANDARD RATE AND MULCHED. RE-VEGETATION SUCCESS MUST BE INSPECTED BY THE CONTRACTOR IN THE FOLLOWING SPRING (AFTER APRIL 15) AND RE-SEEDED AS NECESSARY IF VEGETATIVE COVER IS LESS THAN 75 PERCENT. ACCEPTANCE OF DORMANT SEEDING AS SUCCESSFUL WILL NOT OCCUR UNTIL AFTER JUNE 1 OF THE FOLLOWING YEAR.

#### **GRAVEL SURFACE SPECIFICATION**

1. THE TYPICAL GRAVEL SURFACE MATERIAL TO BE USED ON THIS PROJECT SHALL CONSIST OF 12" - 24" OF PROCESSED BLAST ROCK SIMILAR TO AN MDOT TYPE D OR AS APPROVED BY ENGINEER.

#### SOIL HYDROLOGY NOTE

- 1. TO THE EXTENT POSSIBLE, EXISTING DRAINAGE FEATURES HAVE BEEN IDENTIFIED AND ARE SHOWN ON THESE DRAWINGS.
- 2. WHERE DRAINAGE FEATURES ARE IDENTIFIED DURING CONSTRUCTION THAT WERE NOT LOCATED ON THE PLANS, THE PROJECT'S FIELD ENGINEER AND CIVIL SUPERINTENDENT MAY BE REQUIRED TO REVIEW THESE AREAS WITH THE PROJECT'S WETLAND/SOIL SCIENTIST EXPERT AND/OR DESIGN ENGINEER TO DETERMINE THE APPROPRIATE PROJECT DETAIL TO BE EMPLOYED AT SUCH AREAS.

#### PROJECT IMPLEMENTATION

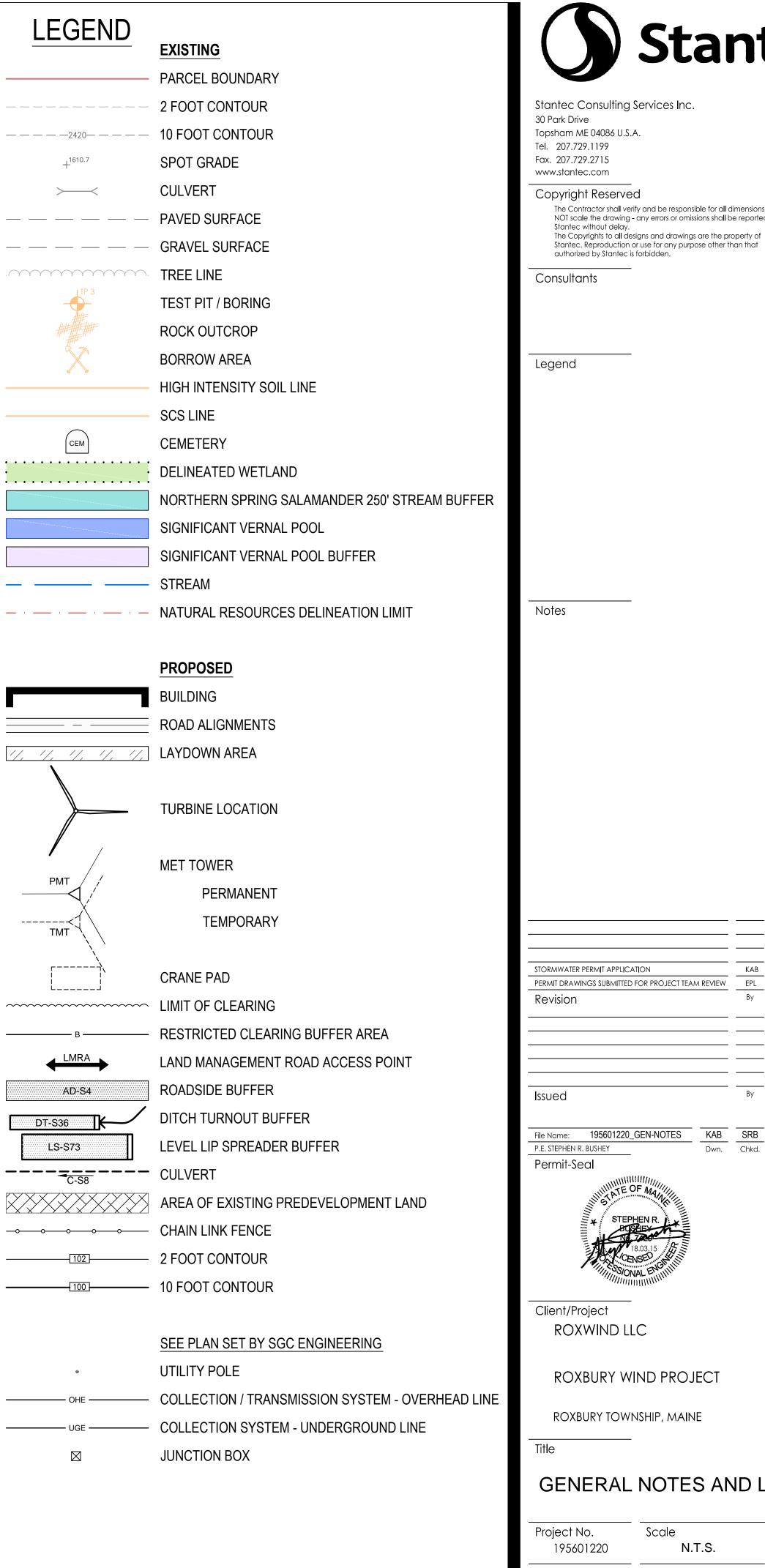
- 1. SUBSEQUENT TO CLEARING, THE ALIGNMENT OF PROJECT LAYOUT WILL BE STAKED OUT AT 50-FOOT CENTERS AND WALKED BY THE OWNER, THE GEOTECHNICAL ENGINEER, AND THE CONTRACTOR TO AGREE ON THE FOLLOWING:
- CONFIRMATION OR RECOMMENDED ADJUSTMENT OF HORIZONTAL AND VERTICAL ALIGNMENT; SELECTION OF CROSS SECTION TO BE USED IN THE AREA; LOCATIONS FOR CROSS CULVERTS; AND OTHER TOOLS TO BE EMPLOYED.
- 2. IT WILL BE NECESSARY FOR THIS EFFORT TO PRECEDE CONSTRUCTION BY A SUFFICIENT PERIOD OF TIME IN ORDER THAT ADJUSTMENTS CAN BE MADE AND THE CONTRACTOR CAN HAVE FINAL CLEARING, BLASTING, AND PROPER MATERIALS ON HAND.

### **REVEGETATION NOTES**

- 1. UPON COMPLETION OF ROADSIDE CUT AND FILL GRADING WHERE ECM MATERIAL HAS BEEN PLACED AS THE FINAL SURFACE TREATMENT, SEED MIX IS TO BE SPARSELY BROADCAST SPREAD OVER THE ECM. SEED IS TO BE DISPERSED IN LATE SUMMER/EARLY FALL WHEN GROUND CONDITIONS ARE SUFFICIENTLY MOIST, FOLLOWED BY A SECOND, LIGHTER APPLICATION IN LATE FALL. AN INSPECTION OF SEEDED AREAS IS TO BE CONDUCTED IN THE FOLLOWING LATE SUMMER TO ENSURE ADEQUATE SEEDING ESTABLISHMENT.
- 2. AT THE END OF THE PROJECT ONCE THE WIDE TRAVEL SURFACES ARE NO LONGER NEEDED THE SAME SEEDING REQUIREMENTS NOTED ABOVE ARE TO BE APPLIED TO ALL ACCESS AND CRANE ROADS. REFER TO DETAILS FOR CRANE ROAD REVEGETATION LIMITS. EXCEPT FOR A 12' GRAVEL ACCESS WAY, 75'X35' CRANE PAD, 25' DIAM. FOUNDATION, AND 16' GRAVEL RING TO REMAIN ACROSS TURBINE PADS, THE PADS ARE TO BE SCARIFIED COVERED WITH 4-INCHES OF ECM AND SEEDED WITH SEED MIX AS NOTED ABOVE.
- 3. IN THE EVENT VEGETATION DOES NOT BECOME ESTABLISHED IN ANY OF THE ABOVE NOTED AREAS ADDITIONAL ECM IS TO BE ADDED AND ADDITIONAL SEED MIX BROADCAST EACH LATE SUMMER/EARLY FALL UNTIL VEGETATION BECOMES ESTABLISHED. THOSE AREAS IN WHICH VEGETATION DOES NOT BECOME ESTABLISHED WITHIN THREE YEARS WILL BE INDIVIDUALLY ASSESSED TO DETERMINE IF SOIL MOISTURE, SEED, AND GROWING CONDITIONS (E.G., DEPTH OF ORGANIC MATERIAL, SUN EXPOSURE) ARE SUITABLE. BASED ON THAT REVIEW, REASONABLE MODIFICATIONS, INCLUDING DIRECT TRANSPLANTING OF SEEDLINGS IF NECESSARY, WILL BE UNDERTAKEN TO CORRECT DEFICIENCIES.

Side Slope Treatment Option	Recommended Maintenance Procedure
Loam and Seed with Mulch and Mesh	- Mowing. - Replacement of washout areas.
Erosion Control Mix with Mesh	- Replacement of lost Erosion Control Mix.
Stone Face	- Washing to remove sediment Replacing displaced stone Filling gaps with new stone.
Reinforced Turf or Reinforced Erosion Control Mix	- Mowing Replacement of damaged/removed reinforcement.
Rip Rap	- Removal of sediment Replacing displaced stones Filling gaps with new stone.
Alternate Fill with Reinforcement	- Mowing Reparation of damaged mesh.
Reinforced Embankment	- Removal of larger vegetation.
Rock Face	- Remove loose rock from rock face Stabilize deteriorated areas.

Turbine ID	NORTHING	EASTING	Pedestal Elevation (ft.)
1	N 44° 37' 30.72"	E 70° 37' 3.72"	1,758
2	N 44° 37' 15.24"	E 70° 36' 59.04"	1,902
3	N 44° 37' 0.12"	E 70° 36' 59.4"	2,114
4	N 44° 36' 49.32"	E 70° 37' 7.68"	2,120





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File Name: 195601220 GEN-NOTES KAB

SRB

Chkd. Dsgn. YY.MM.DD

Client/Proiect ROXWIND LLC

ROXBURY TOWNSHIP, MAINE

GENERAL NOTES AND LEGEND

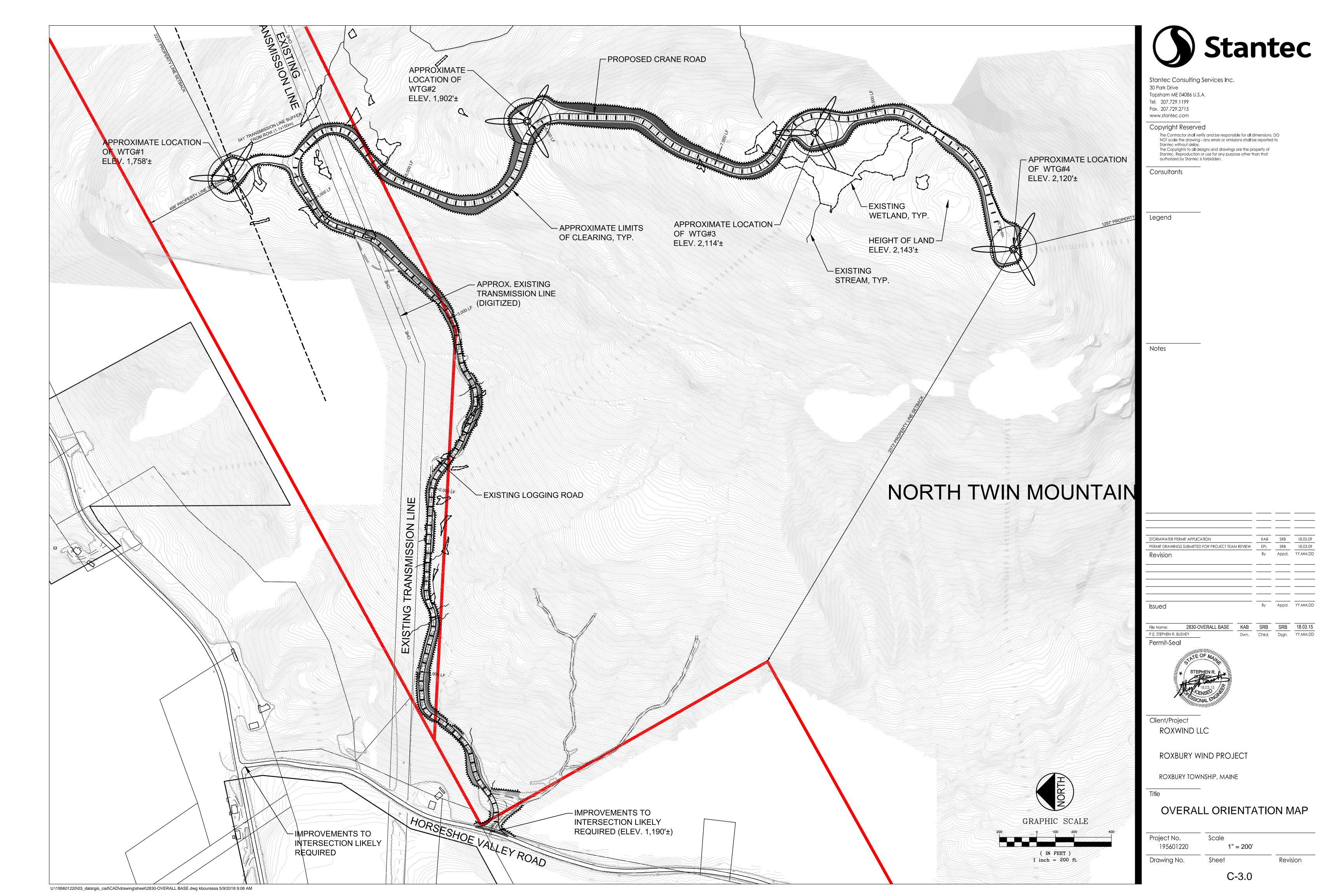
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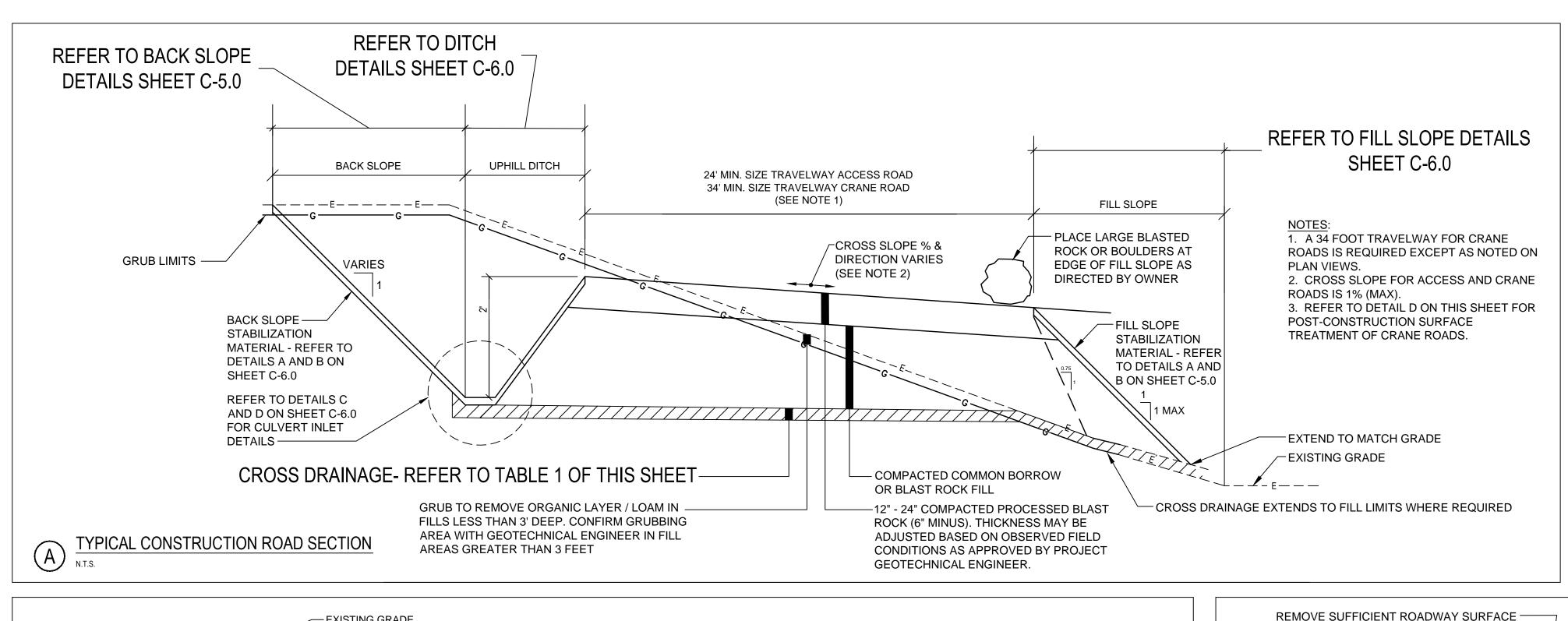
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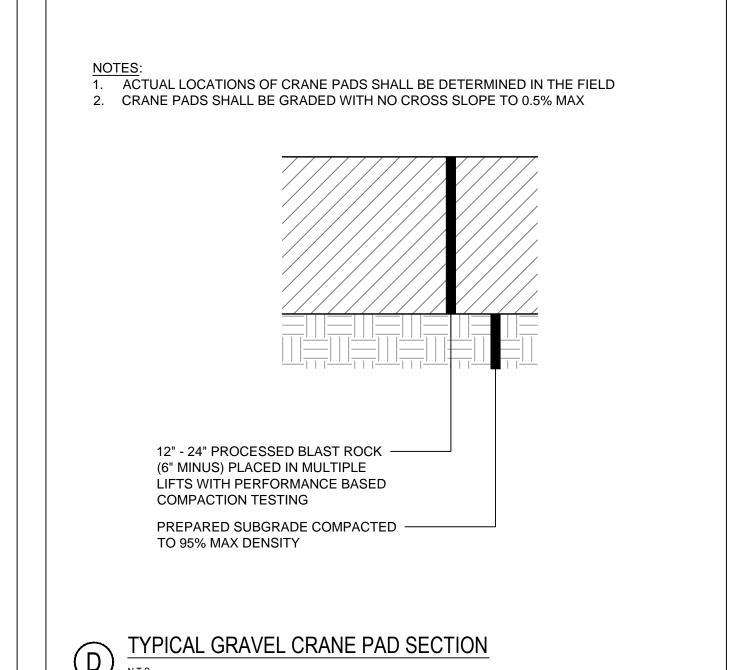
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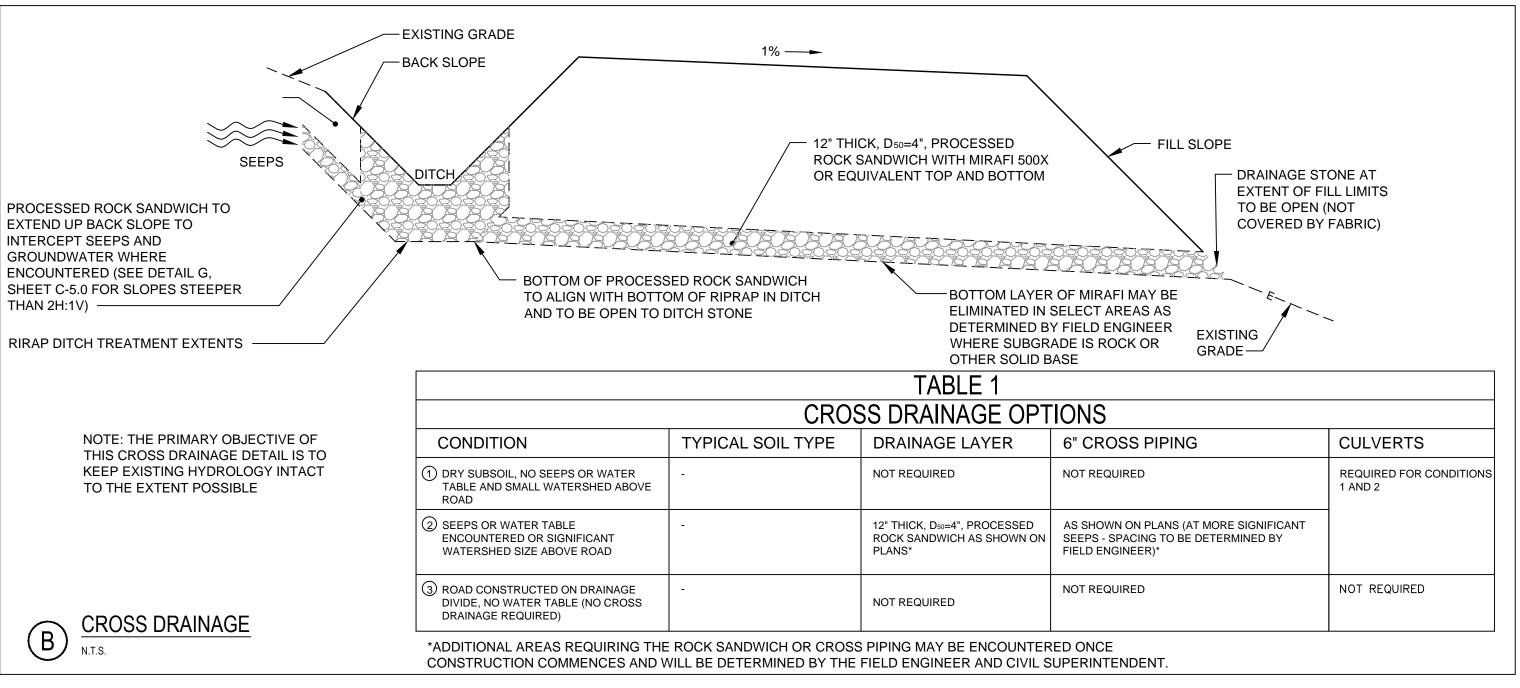
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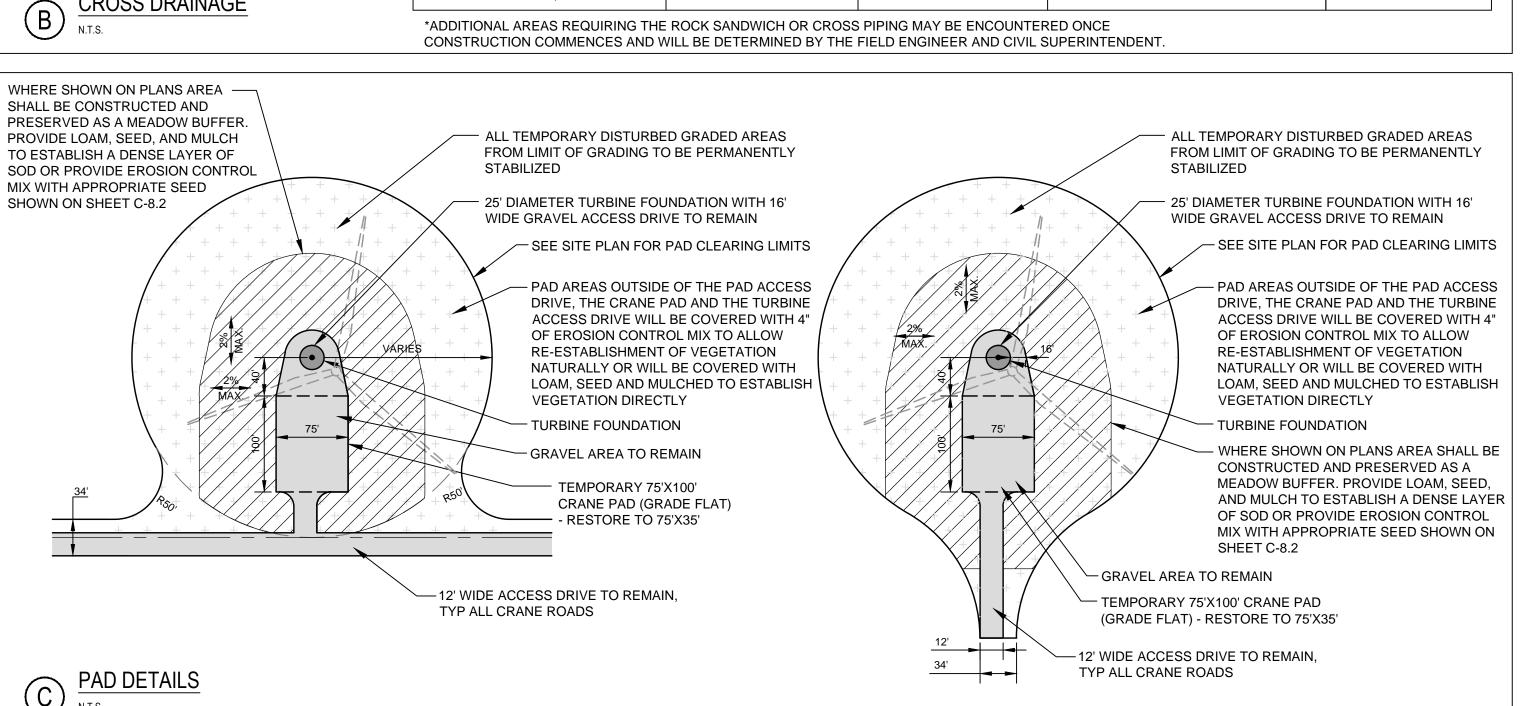
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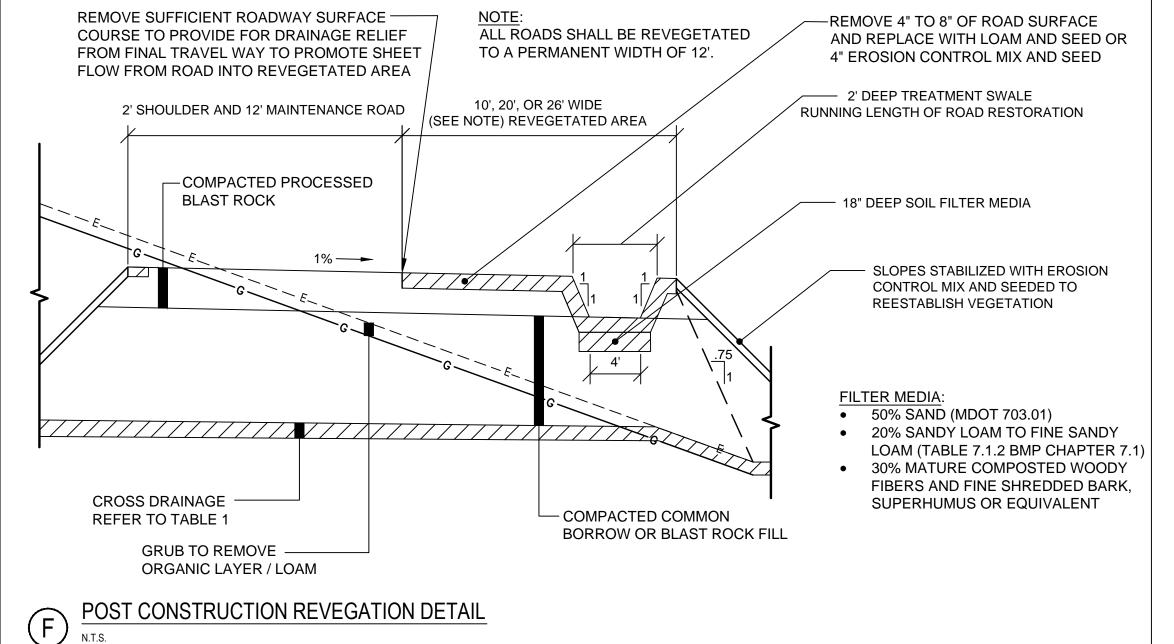












GENERAL ROADWAY CROSS SECTION NOTES (APPLICABLE TO ALL SECTIONS):

- 1. ALL PROPOSED ROADWAY GRADES, CUTS, FILLS AND SLOPES SUBJECT TO FINAL GEOTECHNICAL INVESTIGATION PRIOR TO
- 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 5 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.

GENERAL ROADWAY CROSS SECTION NOTES (APPLICABLE TO ALL SECTIONS)



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Legend

Notes

STORMWATER PERMIT APPLICATION PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW Issued

195601220\_DETAILS KAB P.E. STEPHEN R. BUSHEY Permit-Seal



Client/Project ROXWIND LLC

ROXBURY WIND PROJECT

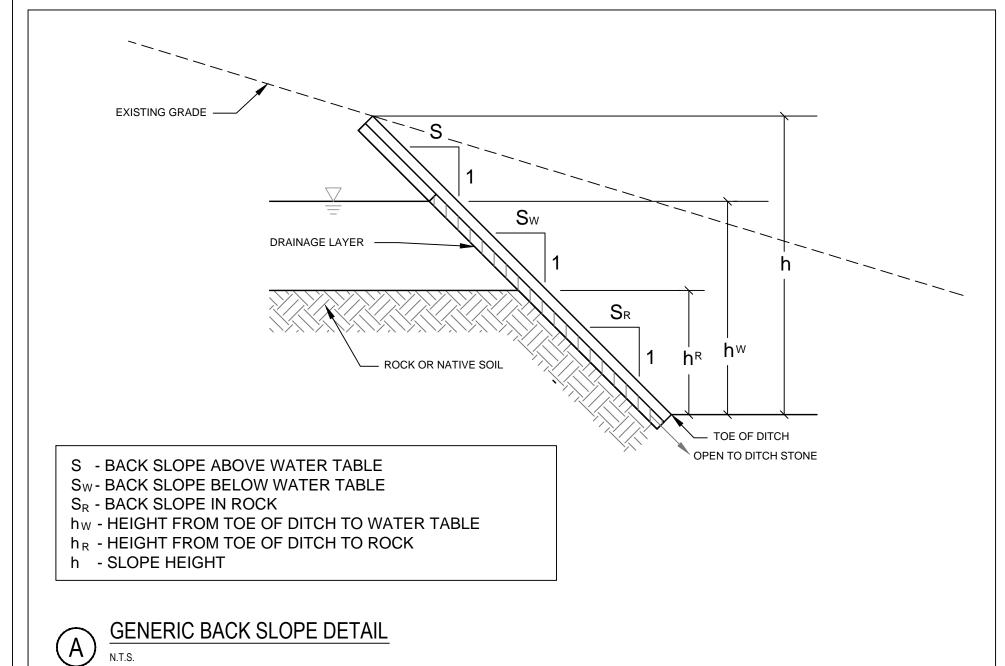
ROXBURY TOWNSHIP, MAINE

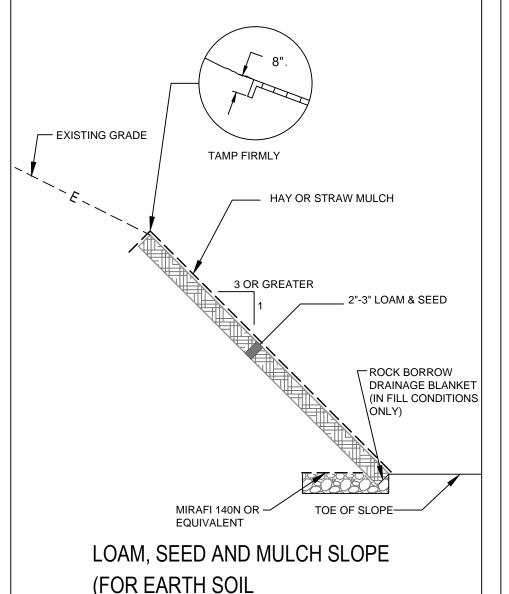
ROADWAY AND PAD SECTION **DETAILS** 

Project No. Scale 195601220 Drawing No.

AS NOTED Sheet Revision

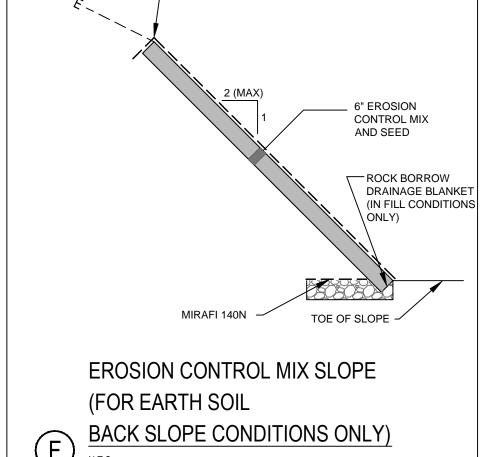
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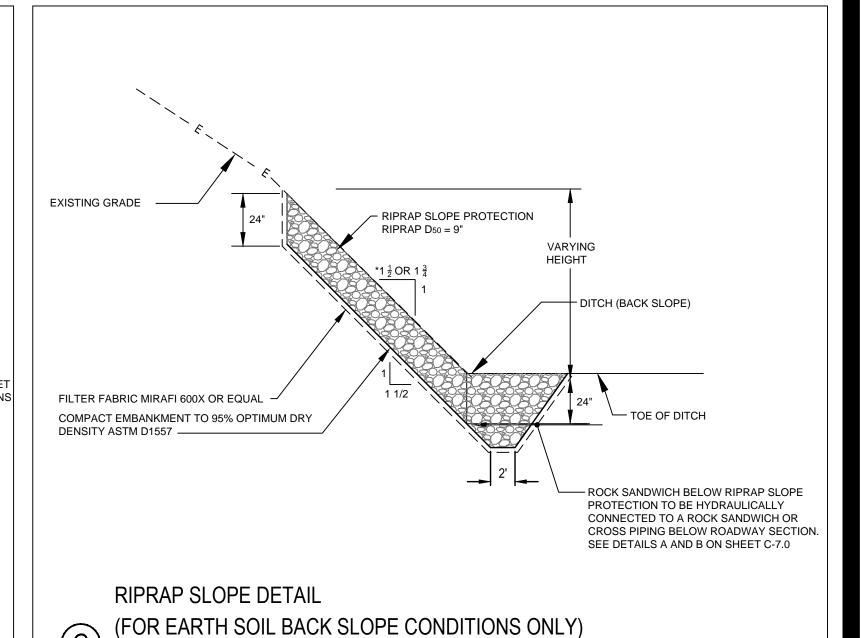
BACK SLOPE CONDITIONS ONLY)

FOR EARTH FILL CONDITIONS



TAMP FIRMLY

EXISTING GRADE





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STORMWATER PERMIT APPLICATION KAB SRB 18.05.09 PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW 195601220\_DETAILS P.E. STEPHEN R. BUSHEY Permit-Seal



Client/Project **ROXWIND LLC** 

ROXBURY WIND PROJECT

ROXBURY TOWNSHIP, MAINE

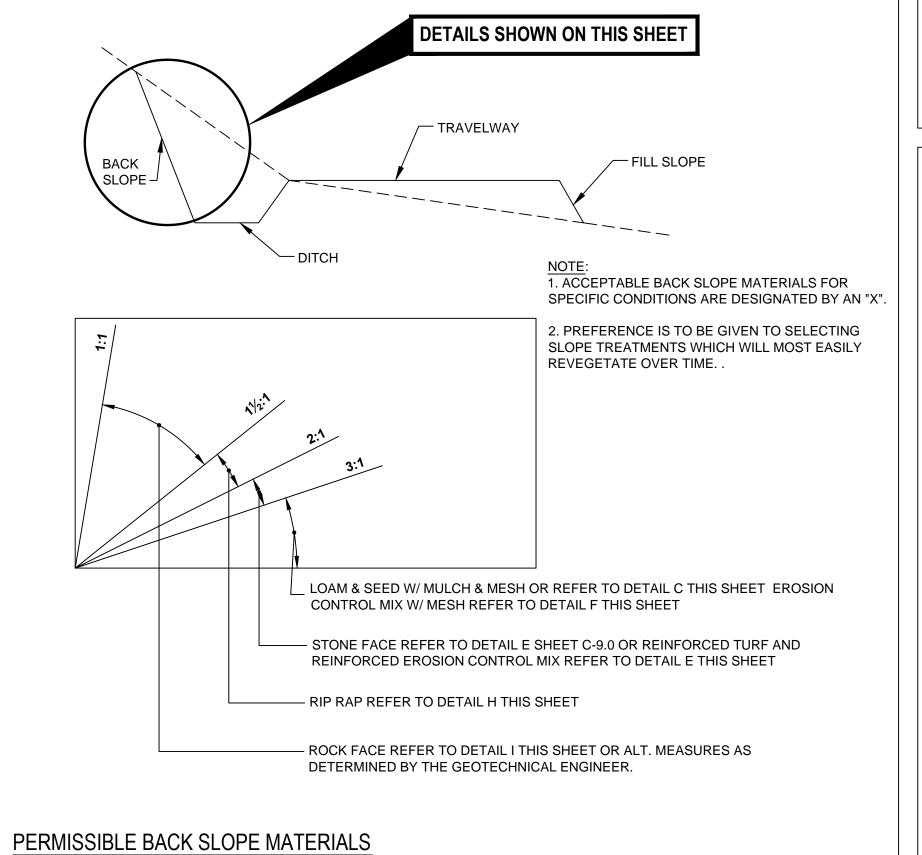
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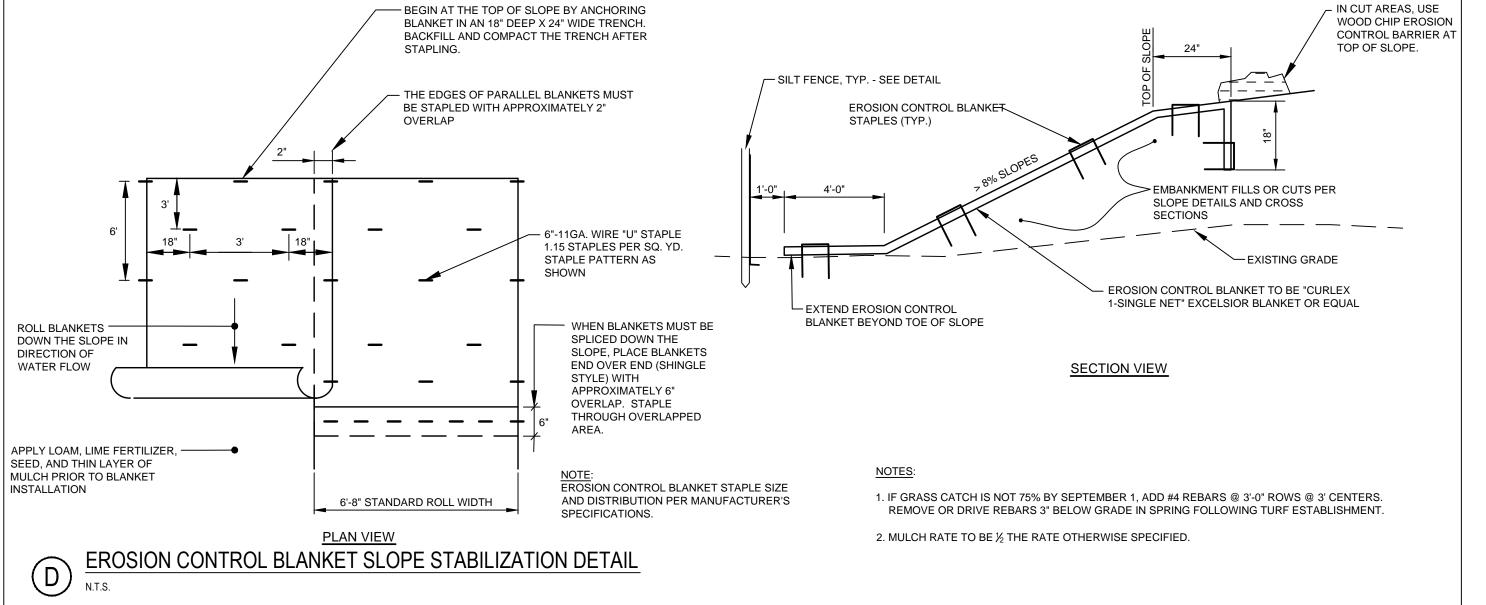
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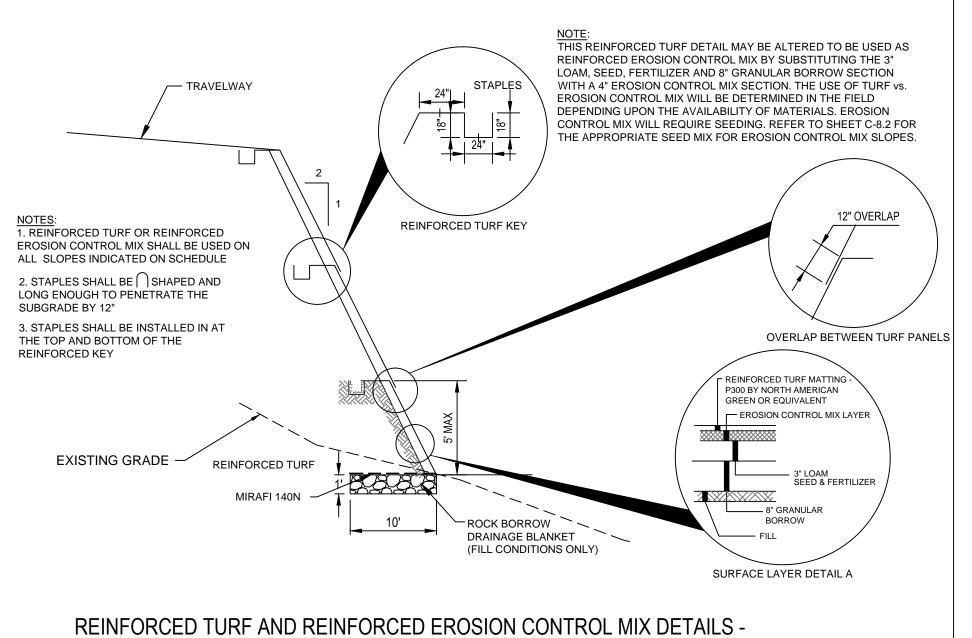
Scale Project No. AS NOTED 195601220 Sheet Revision Drawing No.

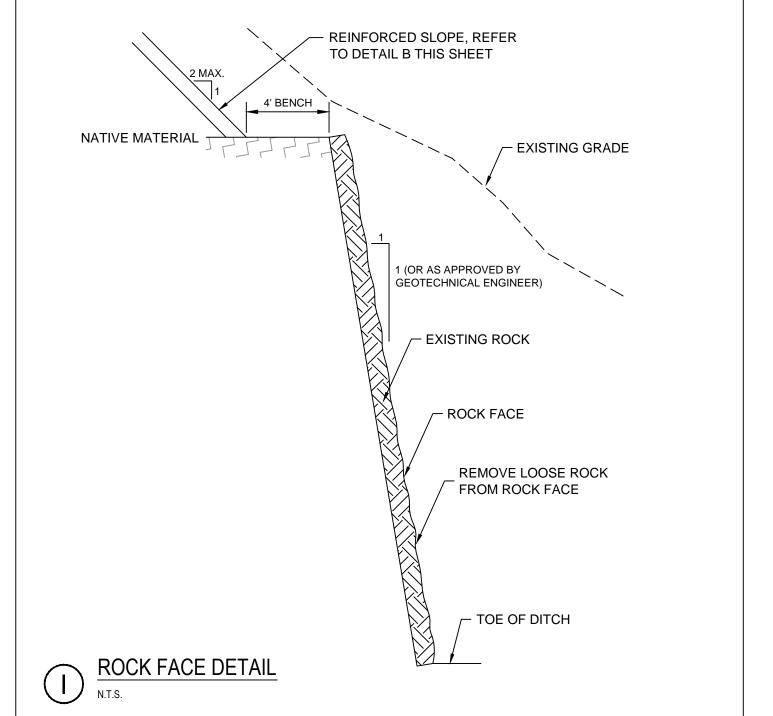
BE DETERMINED BY LOAM SEED **EROSION** EXPOSED **GEOTECHNICAL** AND MULCH | CONTROL MIX | STONE FACE | RIPRAP | TABLE W/ ROCK 1:1 N/A 2:1 TABLE; ABOVE 1.5 to 1.75:1 N/A Varies N/A Varies 2:1 N/A Varies N/A Varies TABLE WITH ROCK 1:1 Varies

ALT. MEASURES TO









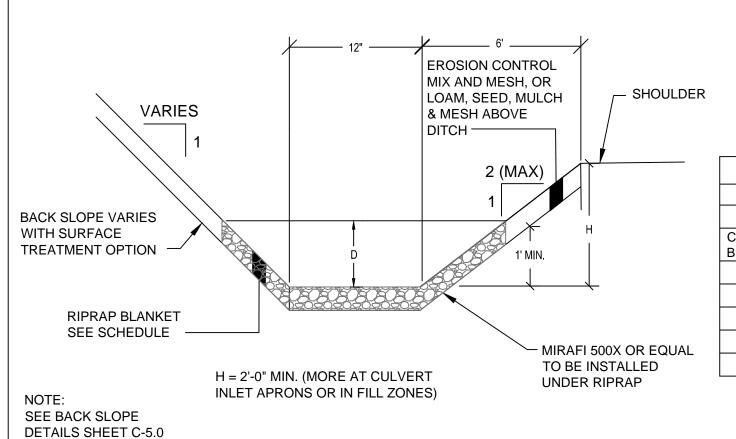


TABLE 2							
	ACCEPTABL	E DITCH LIN	IING RIPRAP MA	TERIAL SIZE	, DEPTH & THIC	KNESS	
		DITCH GR	ADIENT 0-5%	DITCH GRA	ADIENT 5-10%	DITCH GRA	ADIENT 10-15%
CULVERT SIZE BELOW DITCH	D	RIPRAP SIZE	RIPRAP THICKNESS	RIPRAP SIZE	RIPRAP THICKNESS	RIPRAP SIZE	RIPRAP THICKNESS
12"	11"	3"	7"	3"	7"	6"	14"
18"	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

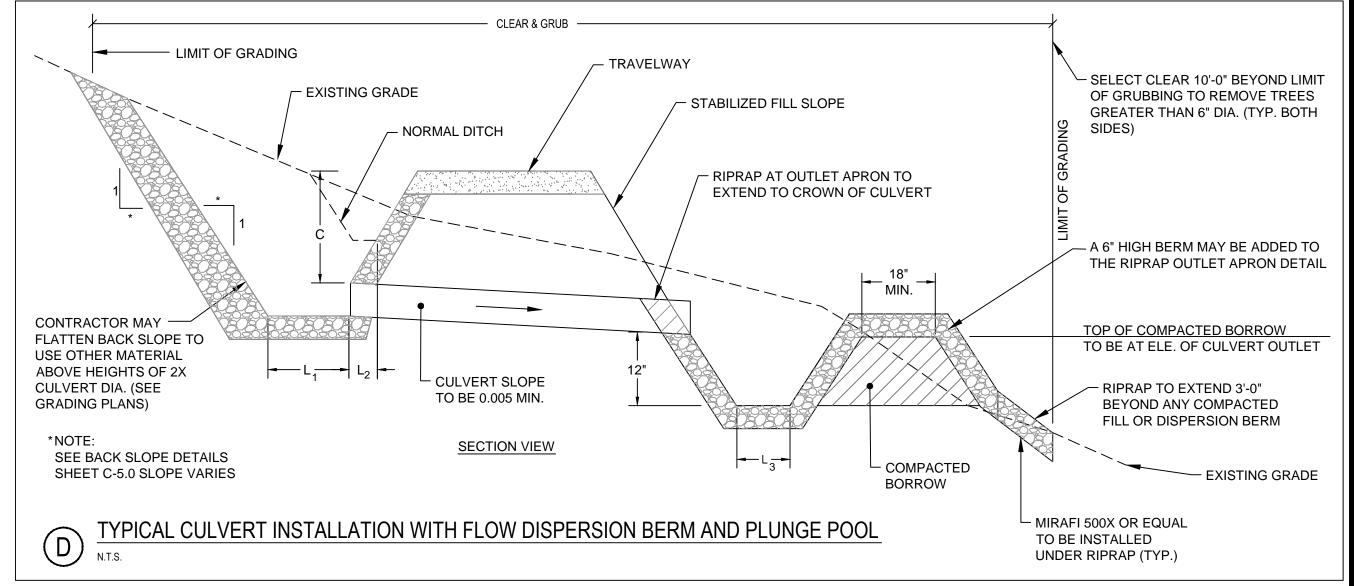
CULVERT —

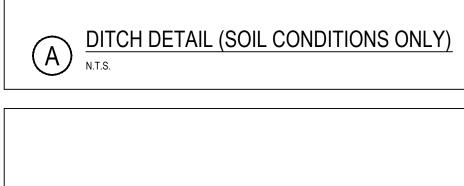
— ACCESS ROAD ──¬

**→** 1/2"/FT

FABRIC KEY (TYP. IN

BACK SLOPE AND UNDER SHOULDER)





3:1 RIPRAP

2:1 RIPRAP

DIRECTION OF FLOW

CULVERT -

BOTTOM OF DITCH (RIPRAP)



TOP OF RIPRAP

NORMAL DITCH

**NOTE: REFER TO TABLE 3 THIS** 

SHEET FOR DIMENSIONS

**CULVERT INLET SECTION VIEW** 

(VARIES-SEE TABLE 2)

N.T.S.

EXISTING GRADE

FABRIC KEY IN

REFER TO CULVERT INLET END

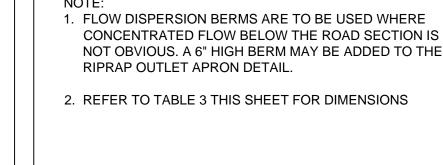
SECTION VIEW WITH DOWN

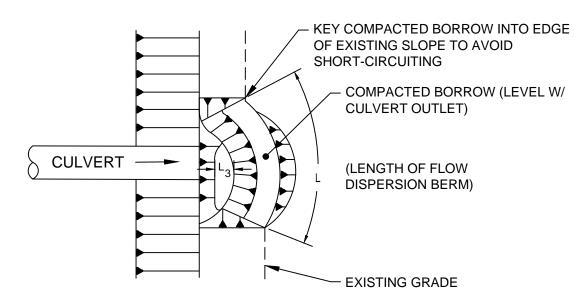
GRADIENT DITCH BERM

DITCH

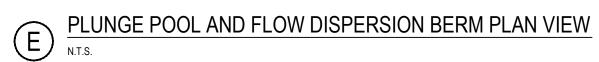
BOTTOM OF NORMAL

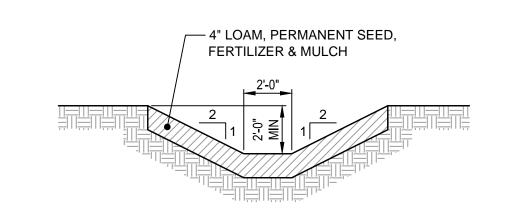
DITCH (1'-0" WIDE)





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.

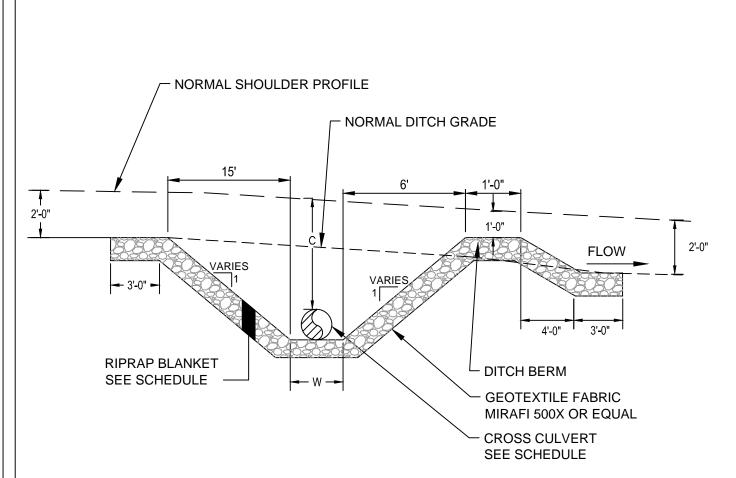




#### NOTES:

- 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.
- 2. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE WATERWAY.
- 3. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
- 4. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE WATERWAY.
- 5. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF IN UPLAND AREAS SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
- 6. GRASSED WATERWAY SHALL BE FINISHED AND STABILIZED AS FOLLOWS:
- A. A MINIMUM OF 2" SCREENED LOAM OR 4" EROSION CONTROL MIX SHALL BE PROVIDED AS TOPSOIL EROSION CONTROL MIX SHALL BE APPROVED BY THE ENGINEER.
- B. DURING THE WINTER MONTHS, THE PERIMETER SWALE IS TO BE LINED WITH EROSION CONTROL BLANKET. EROSION CONTROL BLANKET SHALL BE APPROVED BY THE ENGINEER.
- C. THE GRASSED WATERWAY IS TO BE ANCHOR-MULCHED (OR PROTECTED WITH EROSION CONTROL MATTING) AND SEEDED TO ENCOURAGE A GOOD CATCH OF GRASS AT THE COMPLETION OF CONSTRUCTION WHEN WINTER CONDITIONS HAVE SUBSIDED. SEED MIX SHALL BE: NEW ENGLAND LOGGING ROAD SEED MIX AS MANUFACTURED BY "NEW ENGLAND WETLAND PLANTS, INC." AMHERST, MA. OR EQUIVALENT.

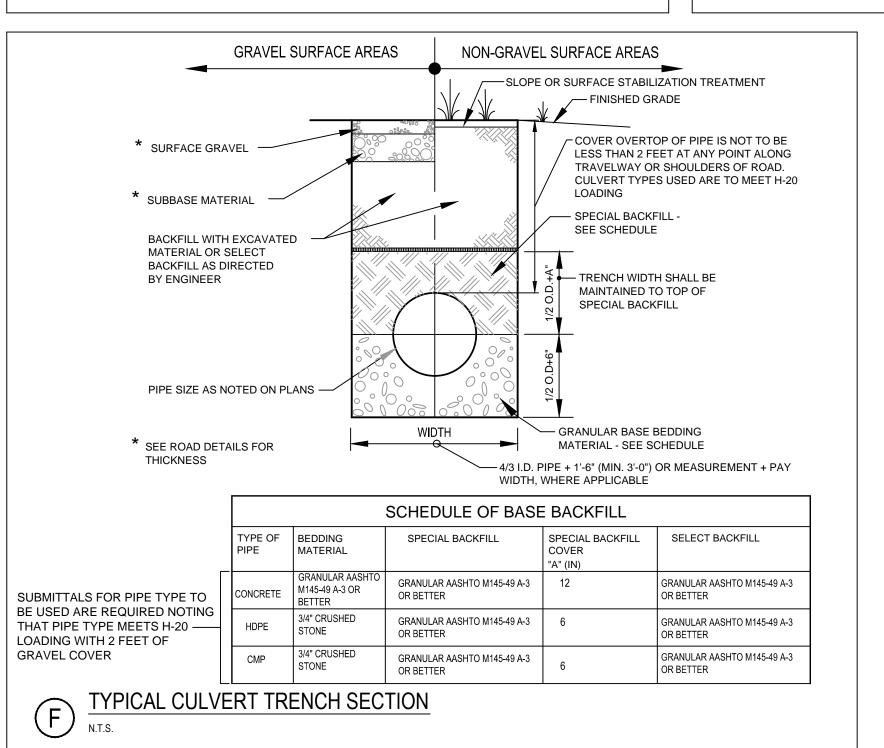


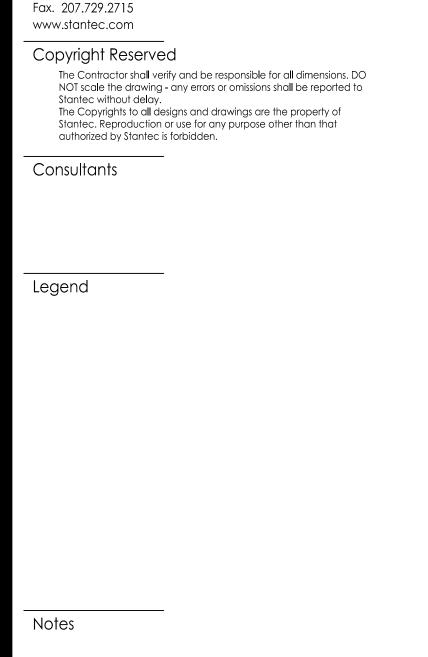


		T	ABLE	3				
		NSIONAL SCH TS AND FLOW						
CULVERT	RIPRA	AP BLANKET						
DIAMETER	D <sub>50</sub>	THICKNESS	W	С	<sup>L</sup> <sub>1</sub>	L <sub>2</sub>	<sup>L</sup> 3	L
12"	6"	14"	2'	36"	2'	4'	8'	8'
18"	6"	14"	4'	30"	4'	4'	*	*
24"	6"	14"	6'	24"	6'	4'	*	*
30"	12"	27"	8'	24"	8'	5'	*	*
36"	12"	27"	8'	24"	8'	6'	*	*

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

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





Stantec Consulting Services Inc.

30 Park Drive

Tel. 207.729.1199

Topsham ME 04086 U.S.A.

STORMWATER PERMIT APPLICATION	KAB	SRB	18.05.09
PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW	EPL	SRB	18.03.09
Revision	By	Appd.	YY.MM.DI
Januard .		Annd	YY MM T
Issued	Ву	Appd.	YY.MM.D
File Name: 195601220_DETAILS KAB	SRB	SRB	18.03.04

File Name: 195601220\_DETAILS KAB SRB SRB 18.03.04
P.E. STEPHEN R. BUSHEY Dwn. Chkd. Dsgn. YY.MM.DI

Permit-Seal



Client/Project
ROXWIND LLC

ROXBURY WIND PROJECT

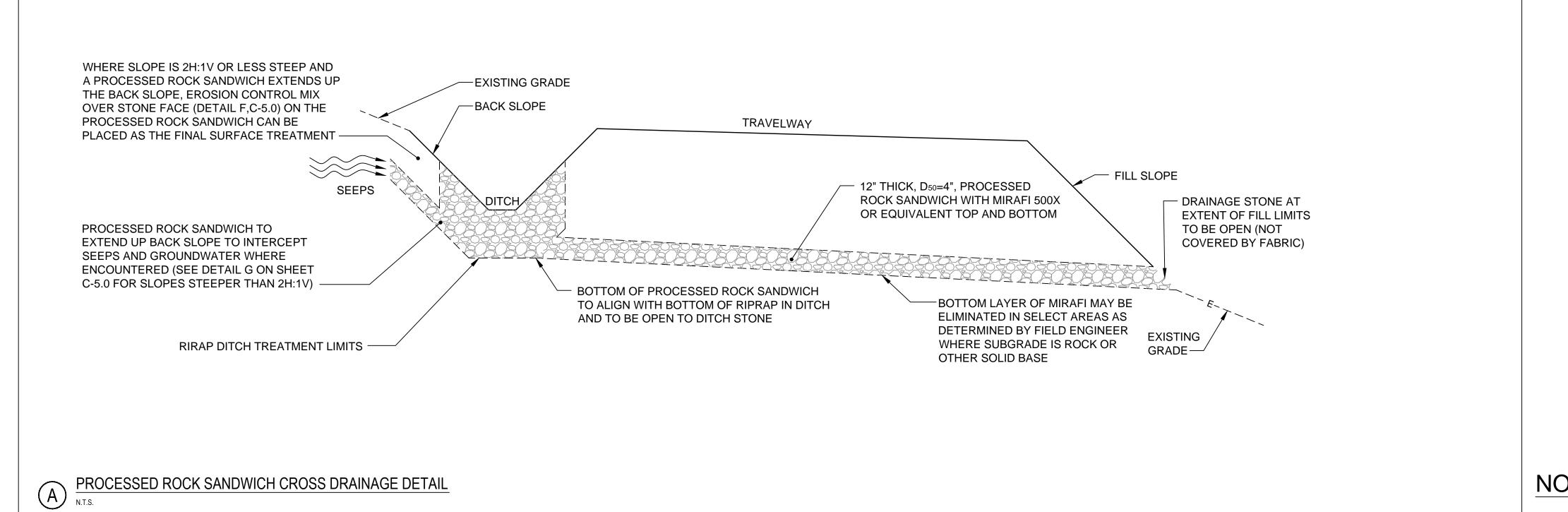
ROXBURY TOWNSHIP, MAINE

Title

DITCH AND CULVERT DETAILS

Project No. 195601220	Scale AS NOTED	
Drawing No.	Sheet	Revision

C-6.0



# Stantec

Stantec Consulting Services Inc.

Topsham ME 04086 U.S.A. Tel. 207.729.1199 Fax. 207.729.2715

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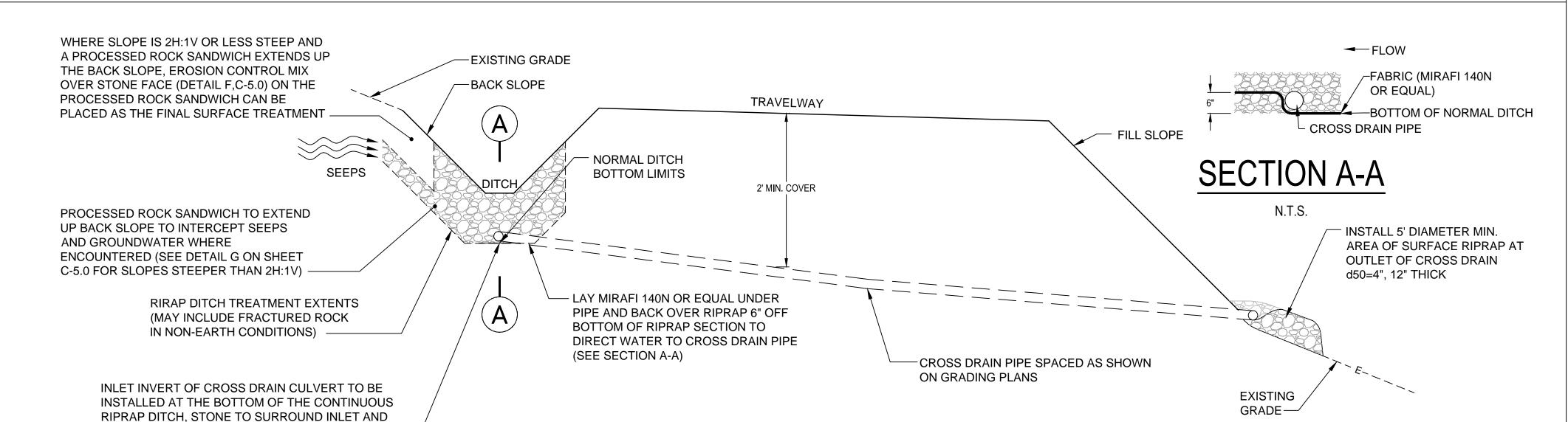
Consultants

Legend

Notes

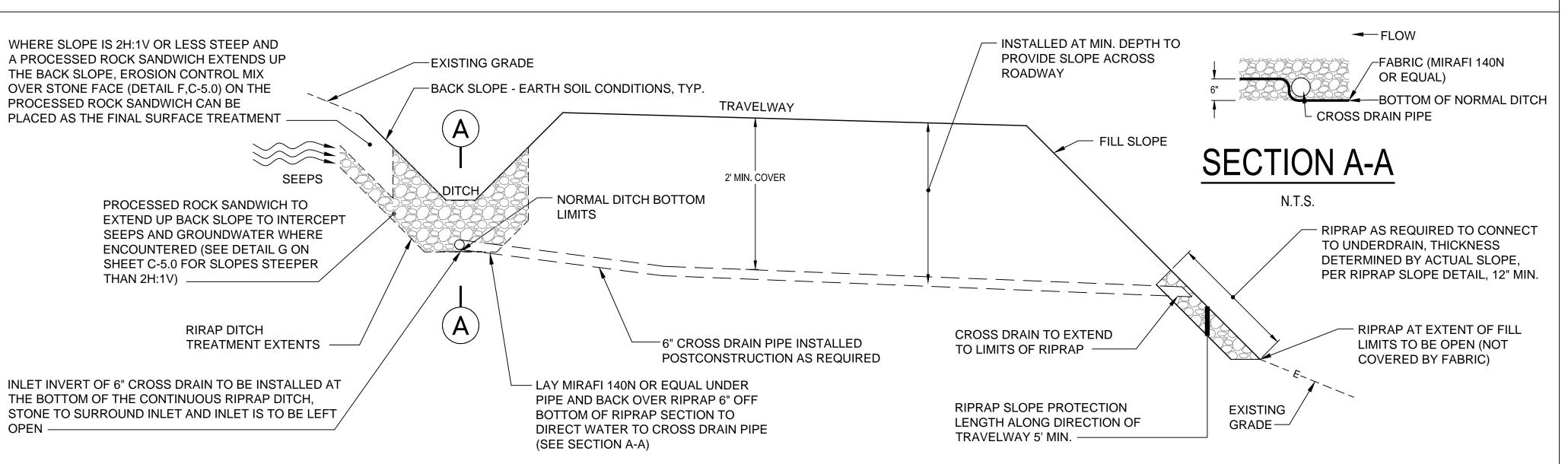
# NOTES:

- 1. THE PRIMARY OBJECTIVE OF THESE CROSS DRAINAGE DETAILS IS TO KEEP EXISTING HYDROLOGY INTACT TO THE EXTENT POSSIBLE BY MAINTAINING SEEP AND SHALLOW PERCHED GROUND WATER FLOW.
- 2. THESE CROSS DRAINAGE DETAILS DO NOT REPLACE REQUIRED CULVERTING FOR STORMWATER CONVEYANCE. SEE OTHER DETAILS FOR STORMWATER FLOW CONTROL VIA DITCH AND CULVERTING.
- 3. THE POST CONSTRUCTION CROSS DRAINAGE DETAIL WILL BE INSTALLED WHERE SEEPS ARE OBSERVED AFTER CONSTRUCTION OF THE ROADWAYS AND DETAIL A OR B CONSTRUCTION WAS NOT PROVIDED.
- 4. ROCK SANDWICHES MAY NOT BE REQUIRED IF ROADWAY IS CONSTRUCTED WITH BLAST ROCK. COORDINATE WITH FIELD ENGINEER AND THIRD PARTY INSPECTOR.



# (B) PIPED CROSS DRAINAGE OPTION DETAIL

INLET IS TO BE LEFT OPEN



STORMWATER PERMIT APPLICATION

PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

Revision

By Appd. YY.MM.DD

Issued

By Appd. YY.MM.DD

File Name: 195601220\_DETAILS KAB SRB SRB 18.03.04

P.E. STEPHEN R. BUSHEY Dwn. Chkd. Dsgn. YY.MM.DD

Permit-Seal

Client/Project ROXWIND LLC

ROXBURY WIND PROJECT

ROXBURY TOWNSHIP, MAINE

Title

SOIL HYDROLOGY
PRESERVATION DETAILS

Project No.
195601220

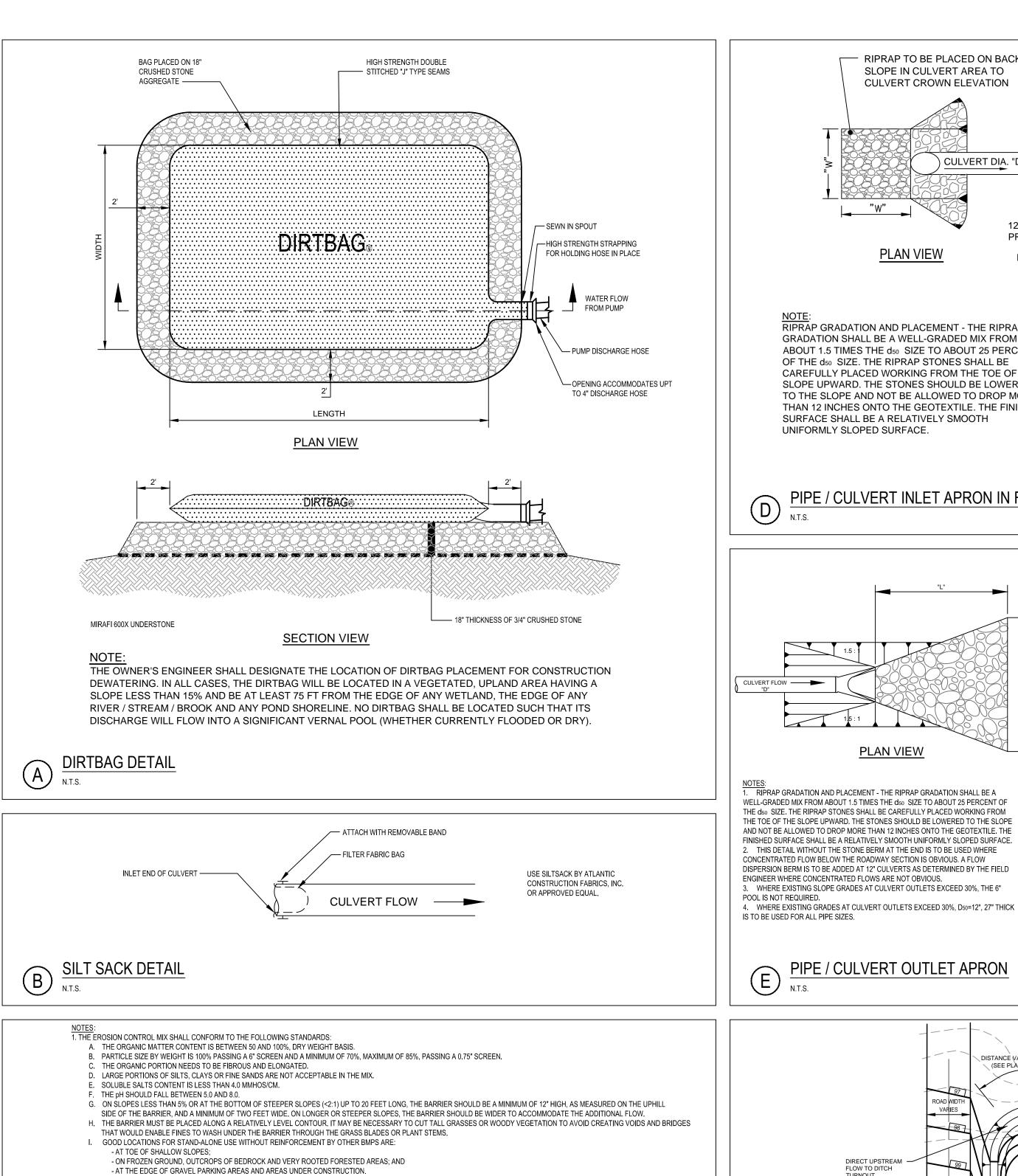
Drawing No.

Scale
AS NOTED
Sheet

C-7.0

Revision

POST CONSTRUCTION PIPED CROSS DRAINAGE DETAIL

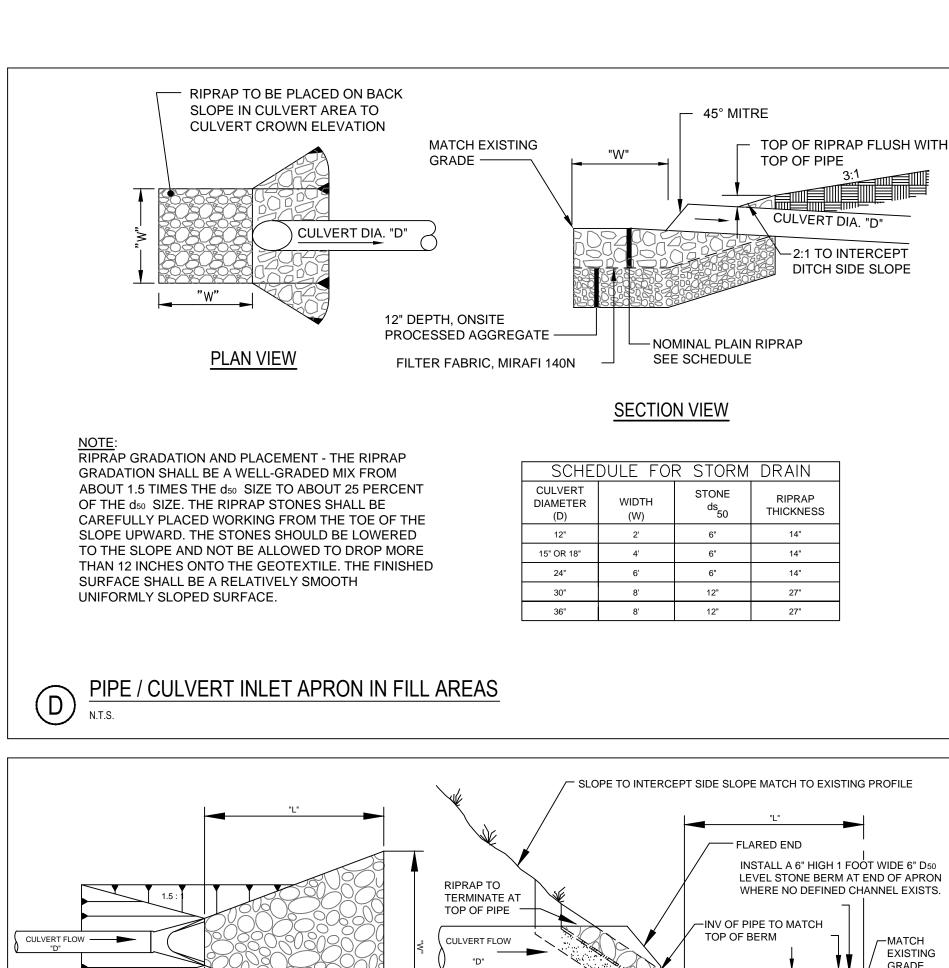


GROUND

— BERM SHALL BE KEYED A MIN. OF 4"

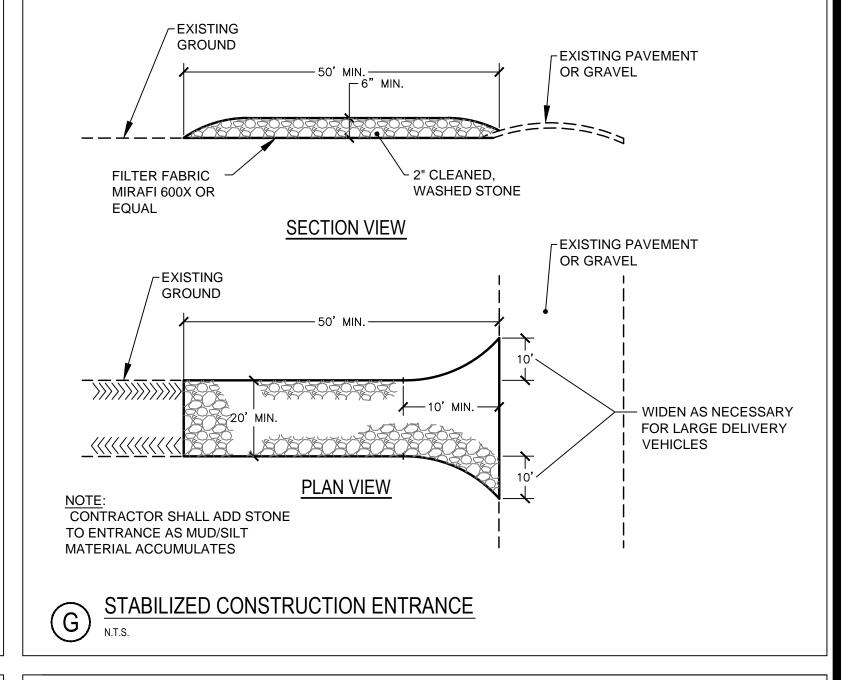
INTO EXISTING GROUND

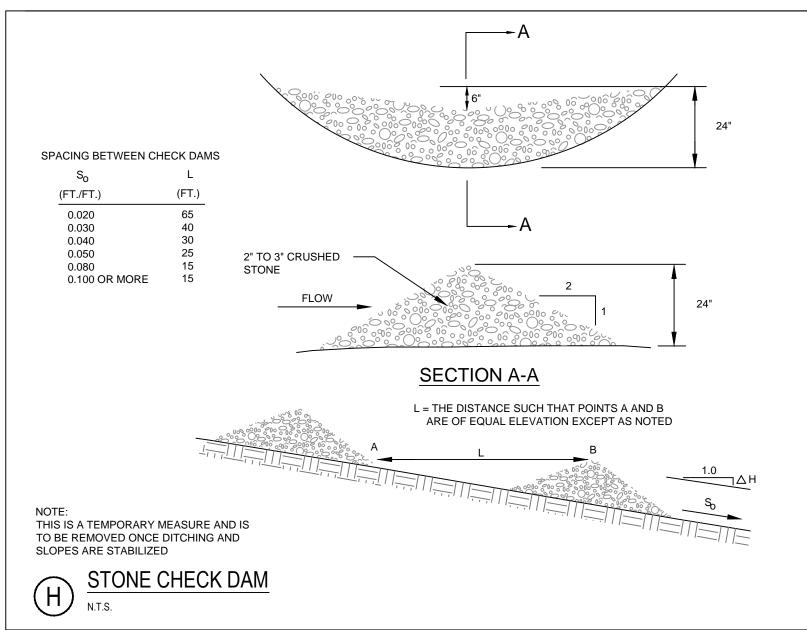
RUNOFF



**PLAN VIEW** 

PIPE / CULVERT OUTLET APRON





**EXISTING** 

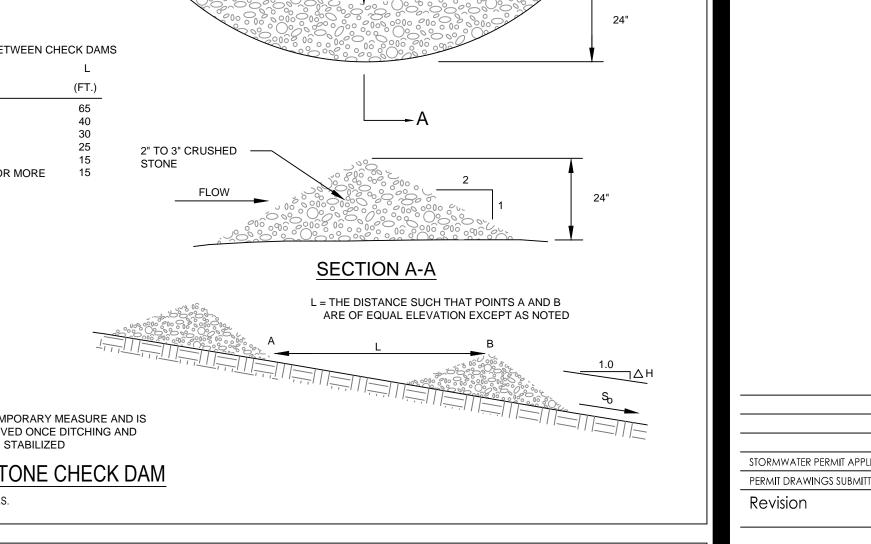
— NOMINAL PLAIN RIPRAP SEE SCHEDULE BELOW

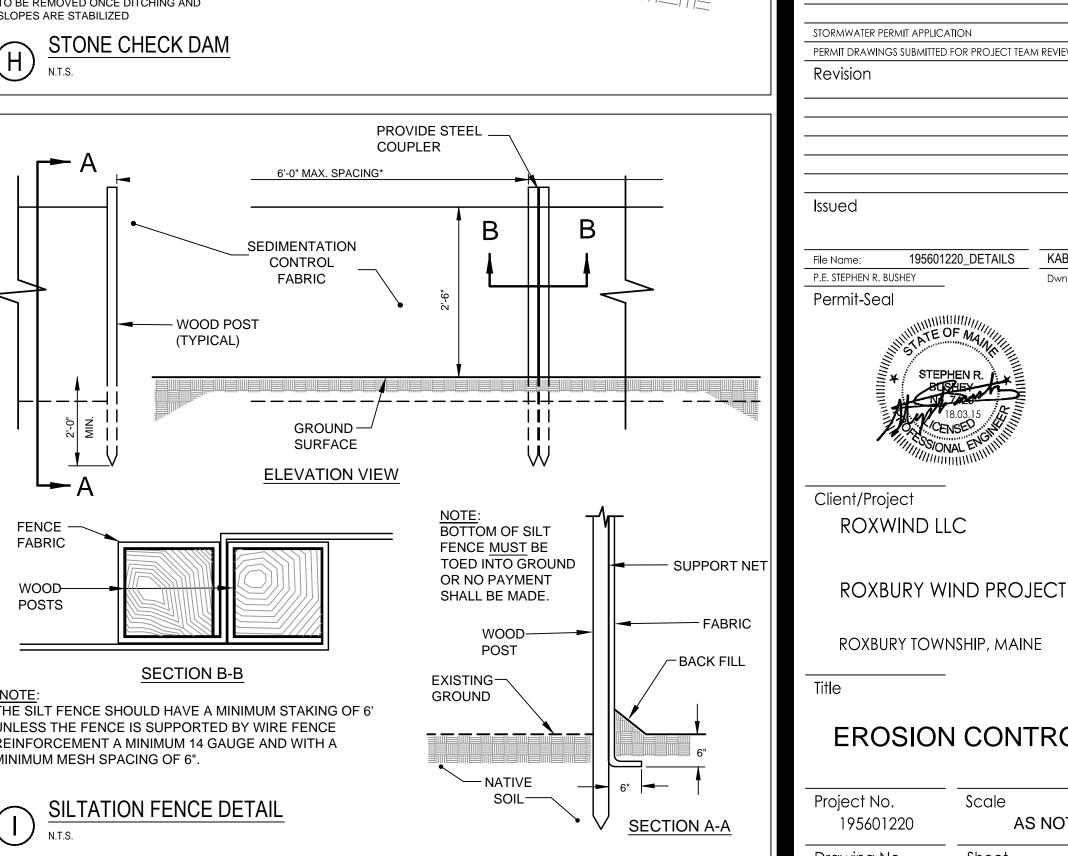
- MIRAFI 140 N

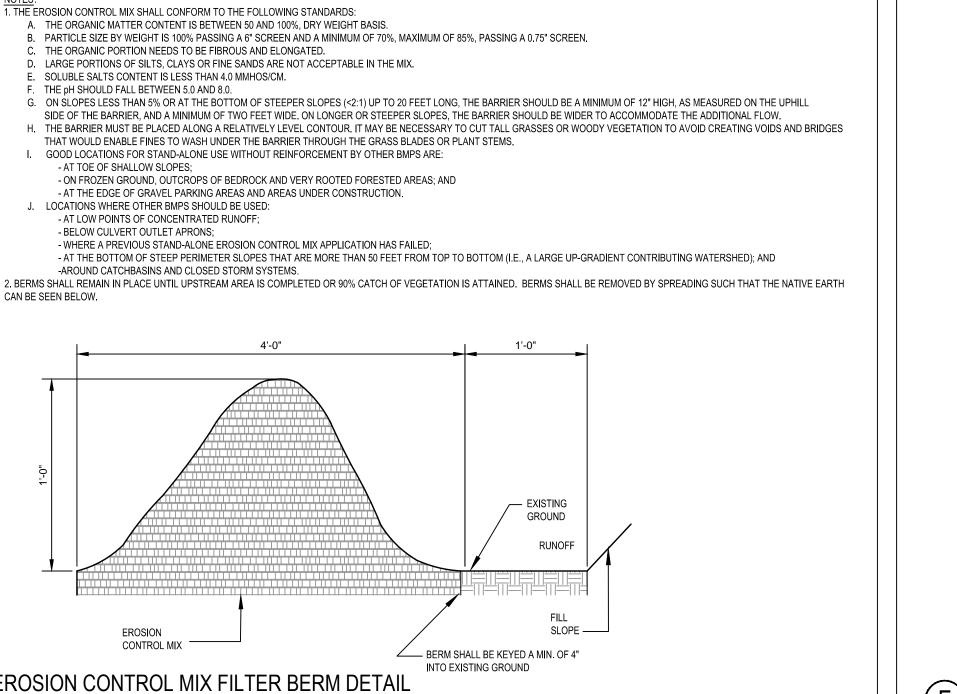
PROCESSED AGGREGATE

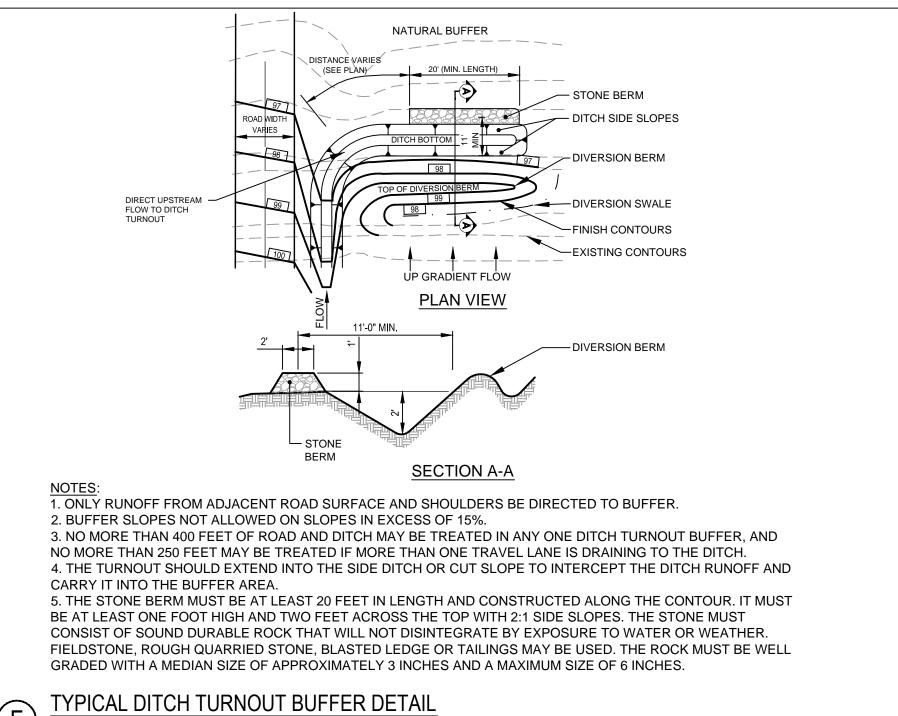
-12" DEPTH, ONSITE

- SEE NOTE 4









**SECTION VIEW** 

SCHEDULE FOR STORM DRAIN

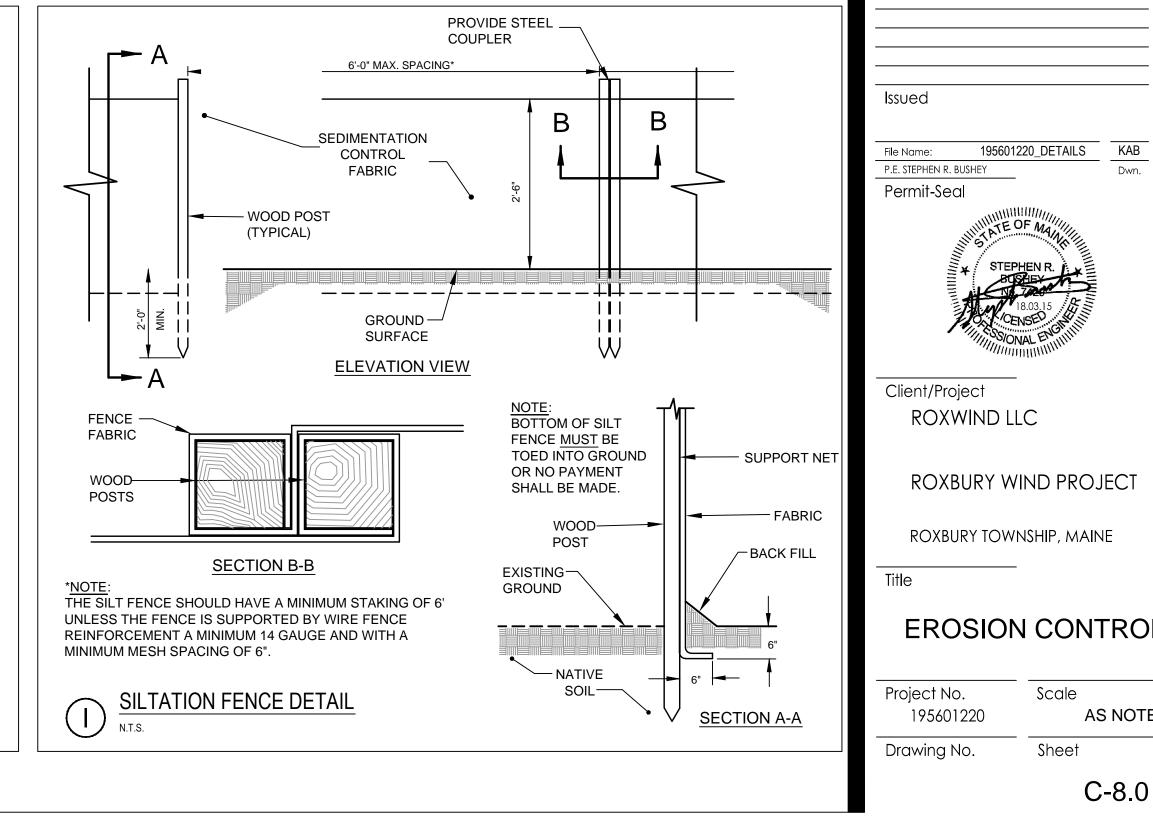
\*LENGTH (L) WILL NEED TO BE LONGER TO ACHIEVE

ds<sub>50</sub> THICKNESS

12"

DIAMETER LENGTH\* WIDTH
(D) (L) (W)

INVERT ELÉVATION IN SOME AREAS



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PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

**EROSION CONTROL DETAILS** 

AS NOTED Revision

EROSION CONTROL MIX FILTER BERM DETAIL

EROSION

CONTROL MIX

J. LOCATIONS WHERE OTHER BMPS SHOULD BE USED:

- BELOW CULVERT OUTLET APRONS:

- AT LOW POINTS OF CONCENTRATED RUNOFF;

-AROUND CATCHBASINS AND CLOSED STORM SYSTEMS.

- WHERE A PREVIOUS STAND-ALONE EROSION CONTROL MIX APPLICATION HAS FAILED;

#### **Basic Standards**

#### 1.0 Introduction

The following plan has been developed to provide a strategy for controlling erosion and sedimentation associated with the Roxbury 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 Oxford County, Maine, and includes 4 wind turbines, existing and redeveloped access road and crane road and 34.5-kilovolt electrical collector lines (the majority of which will be buried alongside project roads). 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 Applicant in constructing wind projects in New England.

Details of erosion and sedimentation control during the construction of roadways and turbine pads can be found in the civil design plan

#### 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 the project Stormwater Management Report. For additional information on roadside restoration and treatment swales, the contractor shall reference the Maine Stormwater Best Management Practices Manual, Volume III: BMP Technical Design Manual Chapter 7, Filtration BMP and Chapter 8, Conveyance and Distribution Systems (revised May 2016).

#### 2.0 Field Adjustments

The Applicant expects that minor adjustments will be made during final design work and during construction based on conditions encountered in the field. As described below, the Applicant has identified possible changes that could occur 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

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.
- Maintenance within the footprint of existing roads with exception of any in-stream work or wetland impacts to be used for
- 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 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.

#### 3.0 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.

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
- Roadside Buffer adjacent to the downhill side of a road: This buffer is used for flow from a roadway when it directly enters the
- 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.

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, 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 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.

# 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

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 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 and place geotextile fabric over matting to control/contain soil.
- 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
- Remove barrier erosion controls following final stabilization/restoration of the crossing.

#### 4.0 Erosion Control Measures

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.

Filter Bed - The soil filter must be at least 19 inches deep and must extend across the entire filter area. this soil mixture should be a uniform mix, free of stones, stumps, roots, or other similar objects larger than two inches. No materials or substances that may be harmul to plant growth can be mixed within the filter. Except for agricultural sources, most organic sources may be acceptable for the organic component of the media. Soil filter media consist of a silty sand soil or soil mixture combined with a mature, moderately fine shredded bark or wood fiber mulch20% to 25% by volume (no less than 10% by dry weight). The resulting micture should have 8% to 12% passing the No. 200 sieve and a clay content of less than 2%. The proportions of the mixture can be adjusted so it will contatin sufficient fines and organic matter. As an example, the soil filter media may contain the following (by volume): 1) 50% of sand (Maine DOT specification #703.01 is close but it contains insufficient fine materials for the filter media.), 2) 20% of sandy loam to fine sandy loam (Table7.1.2) and 3) 30% of mature composted woody fibers and fine shredded bark, superhumus or equivalent (adjusted for mineral soil content).

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

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

- 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

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.

### 5.0 Erosion Control Execution

#### 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 may be 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,

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

- 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
- 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

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

- Loam will be spread over disturbed areas and graded to a uniform depth and a natural appearance. Loam shall be as specified or approved by the Engineer.
- Final seeding shall be completed within 7 days following final topsoil and loam grading for non-critical areas. Final seeding shall be completed within 48 hours or prior to any storm event, whichever occurs first, following topsoil and loam grading for critical areas. All final fertilizing and seeding shall adhere to these specifications.
- Seeded areas shall be mulched the same work day. Mulch shall consist of straw/hay, hydro-mulch, or any suitable 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.
- O Loaming, seeding, and mulching will not be done over snow cover. If snow exists, it must be removed prior to placement
- O 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.
- O Where temporary seeding is required, the rates specified in the Temporary Seeding and Mulching Schedule below shall
- 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
- Erosion control mix utilized for permanent stabilization and to promote natural revegetation may be used in lieu of loaming and

Temporary Seeding and Mulching Schedule - During construction, all disturbed areas shall adhere to the schedules specified in Tables 1 and 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 1: Stabilization Schedule and Table 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 1 and 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.



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Revision

Permit-Seal

Client/Proiect ROXWIND LLC

P.E. STEPHEN R. BUSHEY

ROXBURY WIND PROJECT

ROXBURY TOWNSHIP, MAINE

**EROSION CONTROL NOTES** 

Scale Project No. 195601220 AS NOTED Drawing No. Sheet

C-8.1

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

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

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

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

# 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.

# 6.0 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.



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No

STORMWATER PERMIT APPLICATION

PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW

Revision

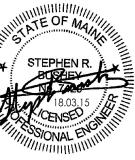
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Permit-Seal

P.E. STEPHEN R. BUSHEY



Client/Project
ROXWIND LLC

ROXBURY WIND PROJECT

ROXBURY TOWNSHIP, MAINE

Title

# **EROSION CONTROL NOTES**

Project No. Scale 195601220

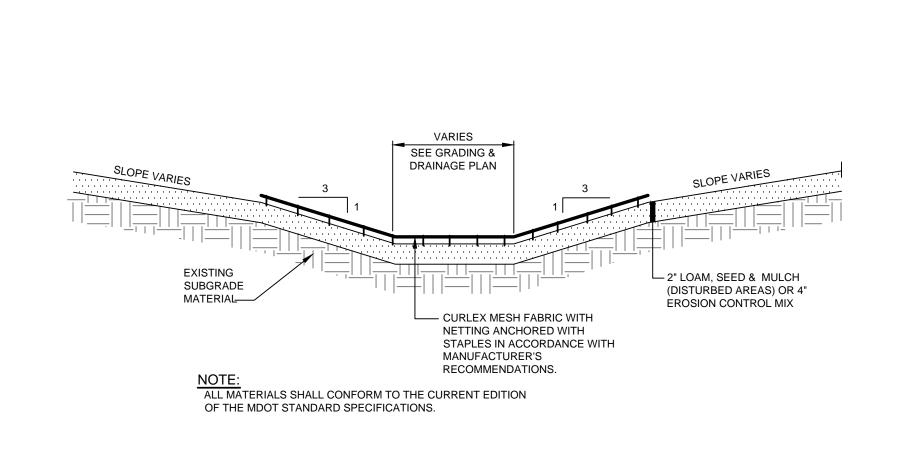
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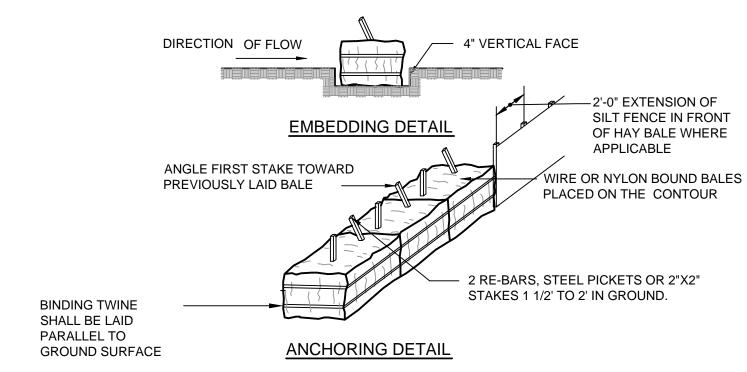
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Revision

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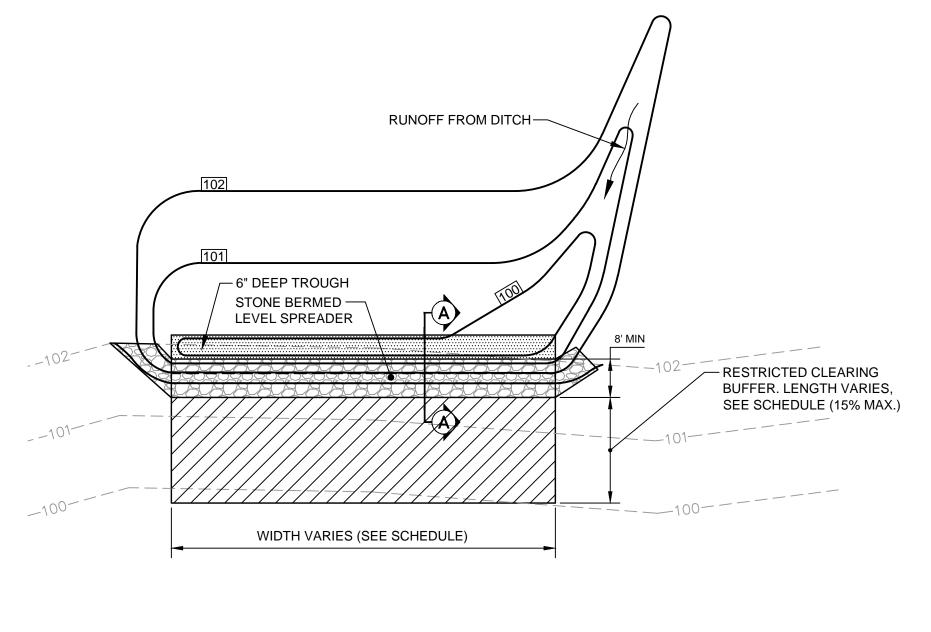
# A VEGETATED SWALE DETAIL N.T.S.

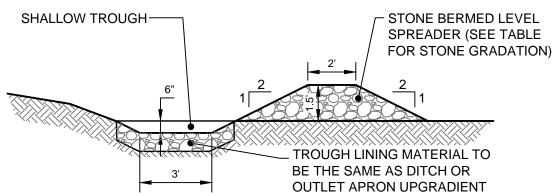


# CONSTRUCTION SPECIFICATIONS

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

# 



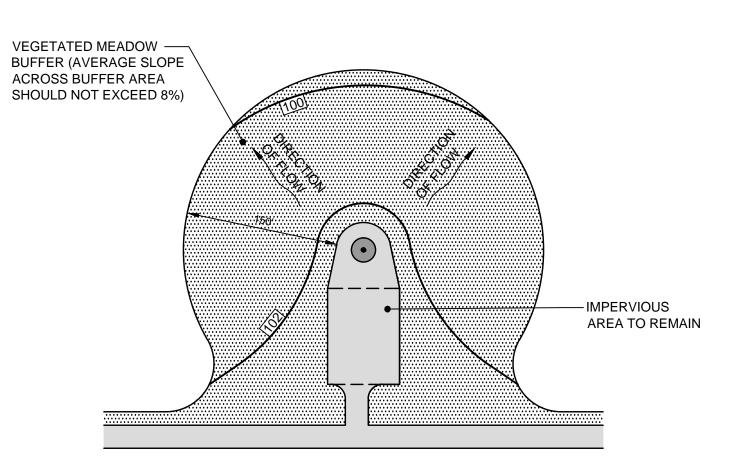


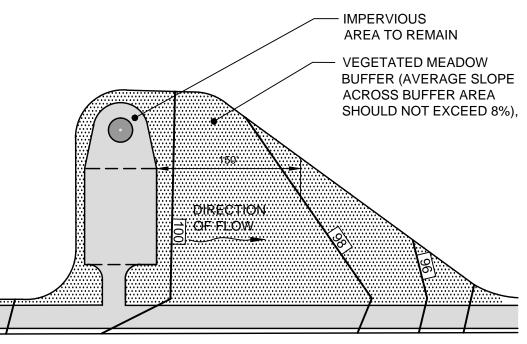
# **SECTION A-A**

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					

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.

# STONE BERMED LEVEL SPREADER DETAIL



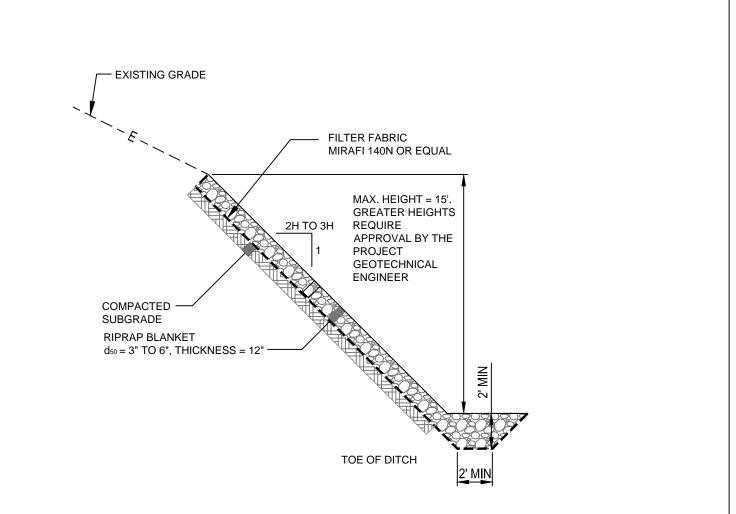


# **SCENARIO #1**

# **NOTES:**

- 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-8.2 FOR APPROPRIATE SEED MIXES.
- SHOULD TURBINE PAD AREAS BE REDUCED DURING CONSTRUCTION, REMAINING FORESTED AREAS MAY BE COUNTED AS BUFFER AREA.





 $\frac{\text{STONE FACE DETAIL}}{\text{N.T.S.}}$ 



Client/Project **ROXWIND LLC** 

ROXBURY TOWNSHIP, MAINE

ROXBURY WIND PROJECT

MISCELLANEOUS DETAILS

Scale Project No. Drawing No. Sheet

AS NOTED Revision

C-9.0

 $\begin{array}{c}
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\text{C} & \frac{\text{TYPICAL TURBINE PAD BUFFER}}{\text{N.T.s.}}
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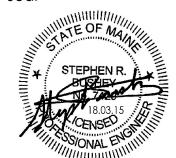
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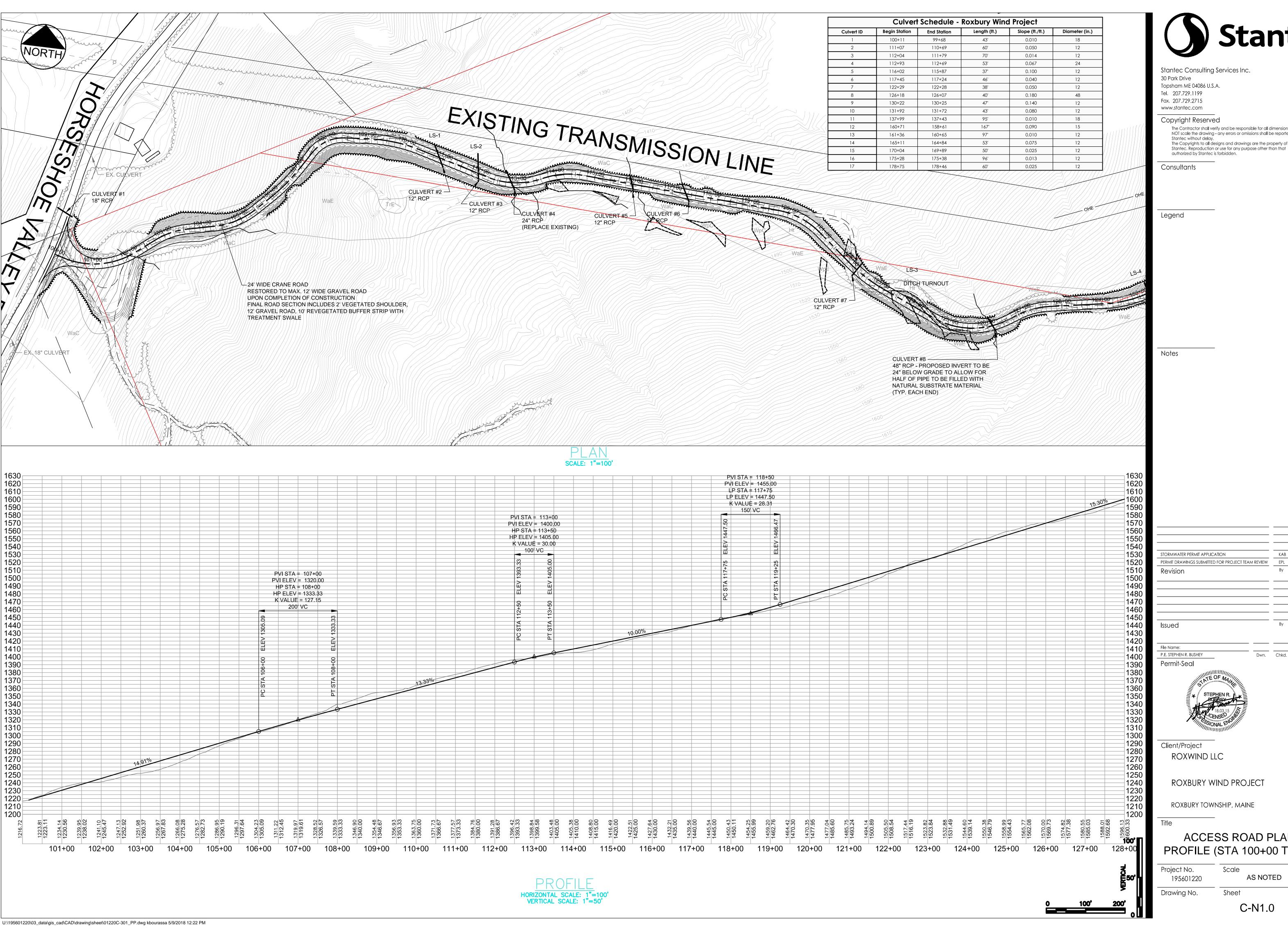
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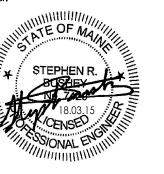
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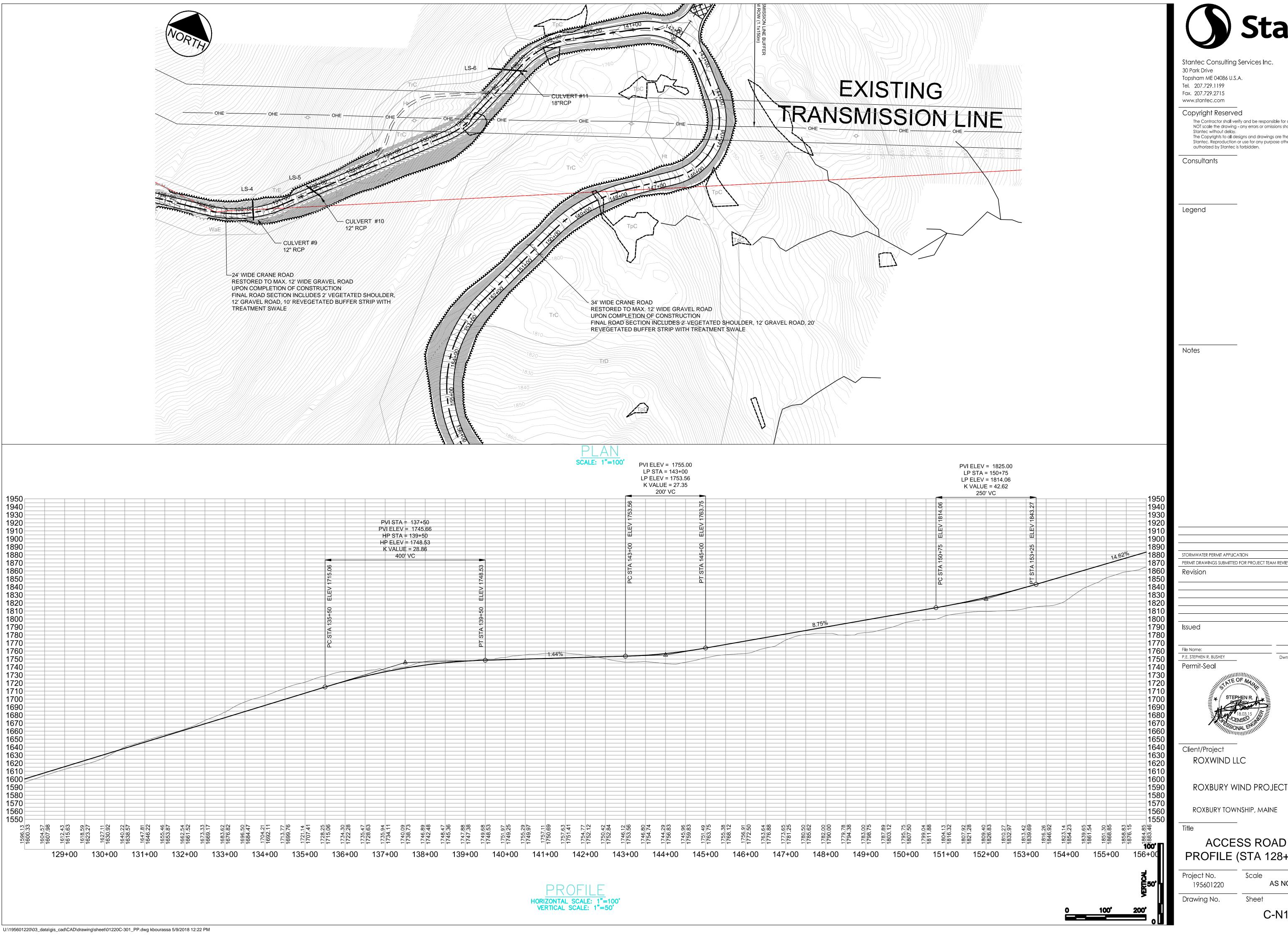
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ACCESS ROAD PLAN AND PROFILE (STA 100+00 TO 128+00)

C-N1.0

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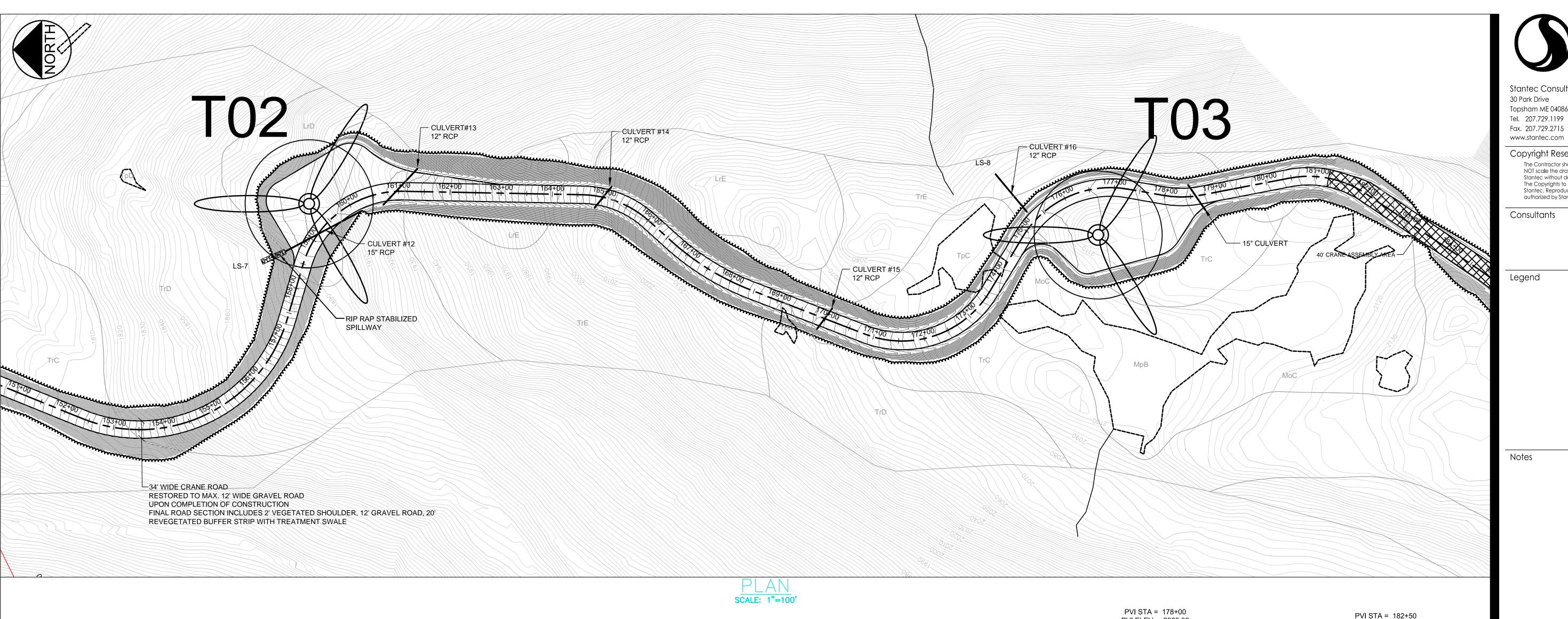
Client/Project **ROXWIND LLC** 

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ACCESS ROAD PLAN AND PROFILE (STA 128+00 TO 156+00)

Scale Project No. 195601220 AS NOTED Sheet Revision Drawing No.

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PVI ELEV = 2118.00

HP STA = 183+25 HP ELEV = 2118.40

K VALUE = 25.38

150' VC

2180 STORMWATER PERMIT APPLICATION 18.05.09 KAB SRB PERMIT DRAWINGS SUBMITTED FOR PROJECT TEAM REVIEW EPL SRB 2080 Appd. YY.MM.DD P.E. STEPHEN R. BUSHEY Dwn. Chkd. Dsgn. YY.MM.DD Permit-Seal



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ROXBURY WIND PROJECT

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CRANE ROAD PLAN AND PROFILE (STA 156+00 TO 184+00)

Scale Project No. AS NOTED

> Sheet C-N1.2

Revision

2050 2010 1990 1980 1940 1900 2116.97 2118.53 2118.99 2118.80 180+00 181+00 182+00 183+00 169+00 170+00 171+00 172+00 173+00 174+00 175+00 176+00 178+00 Drawing No. HORIZONTAL SCALE: 1"=100' VERTICAL SCALE: 1"=50'

2.00%

PVI ELEV = 2089.00

LP STA = 177+00

LP ELEV = 2087.00 K VALUE = 45.00 200' VC

PVI STA = 174+50

PVI ELEV = 2082.00

HP STA = 175+50 HP ELEV = 2084.00

K VALUE = 29.17

200' VC

PVI STA = 161+50

PVI ELEV = 1925.00

LP STA = 160+50 LP ELEV = 1923.33

K VALUE = 14.12 200 VC

PVI STA = 167+50 PVI ELEV = 2020.00

HP STA = 168+50 HP ELEV = 2028.86

K VALUE = 28.67

200 VC

PVI STA = 158+50

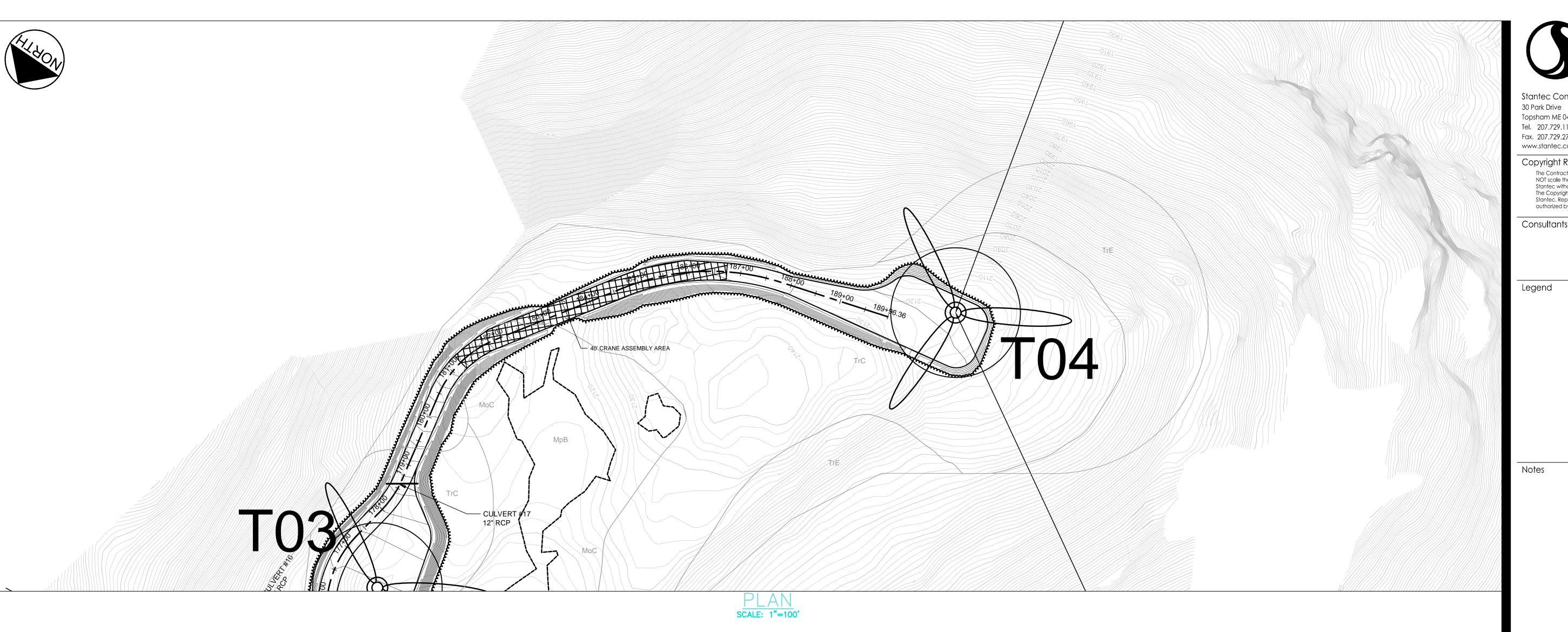
PVI ELEV = 1920.00

HP STA = 159+50

HP ELEV = 1921.67 K VALUE = 15.45 200' VC

2190 2180 2170

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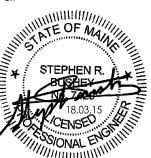
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ROXBURY WIND PROJECT

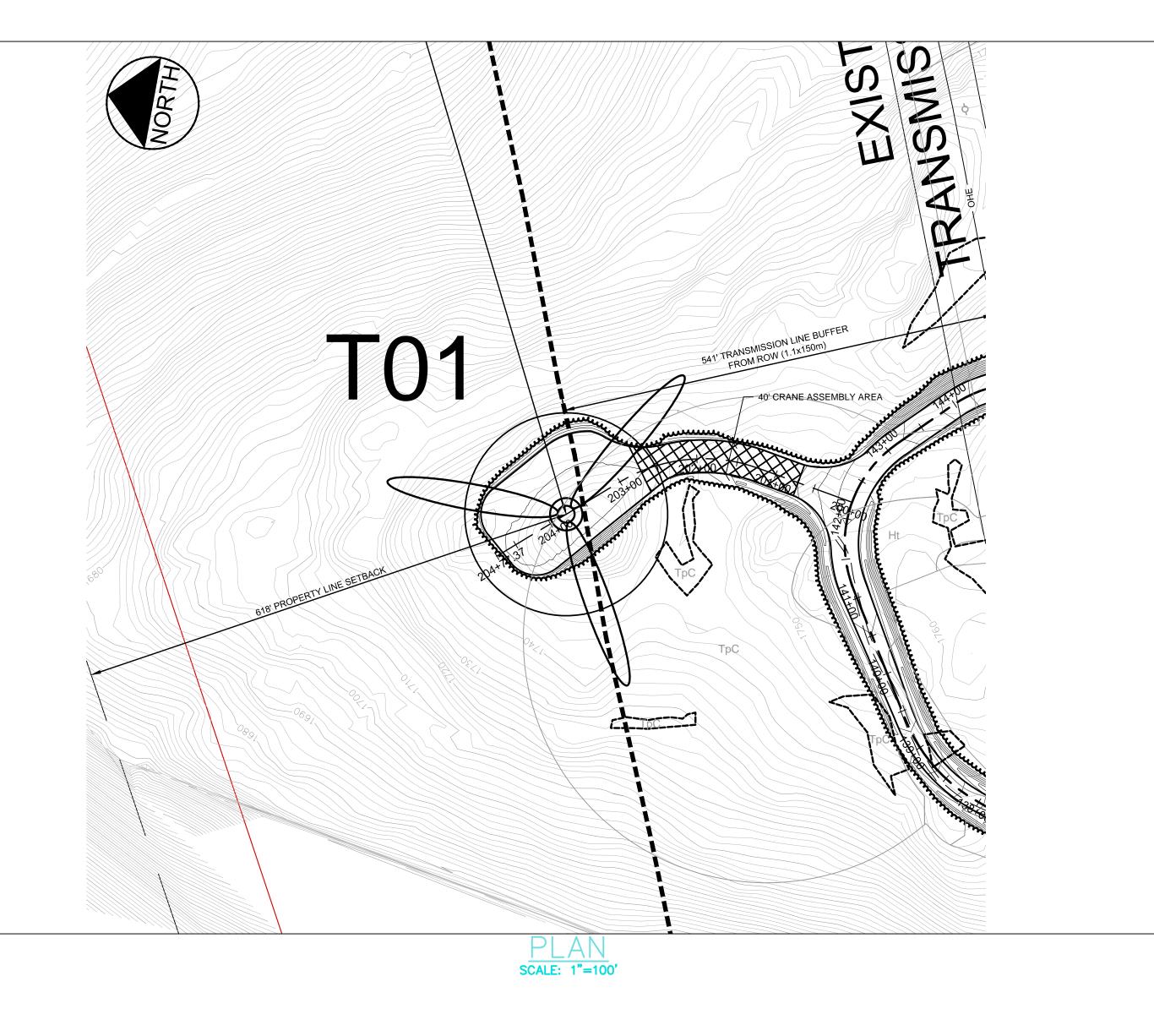
ROXBURY TOWNSHIP, MAINE

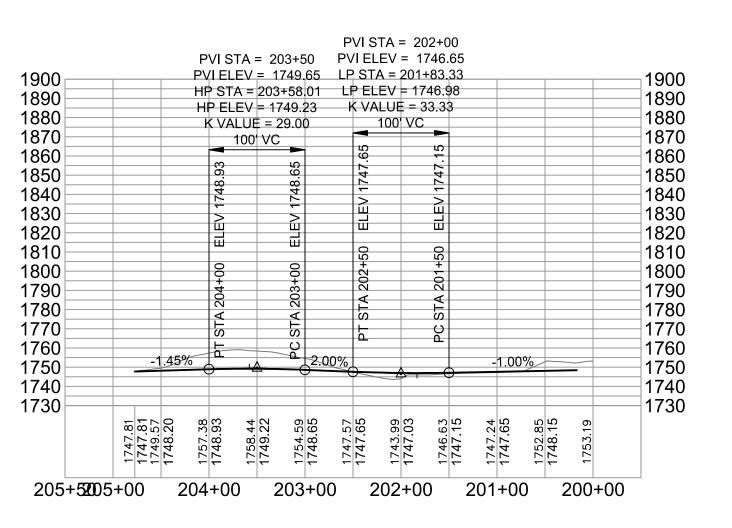
CRANE ROAD PLAN AND PROFILE (STA 184+00 TO 189+98)

Project No. Scale AS NOTED Sheet Revision Drawing No. C-N1.3

HORIZONTAL SCALE: 1"=100' VERTICAL SCALE: 1"=50'

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HORIZONTAL SCALE: 1"=100' VERTICAL SCALE: 1"=50'



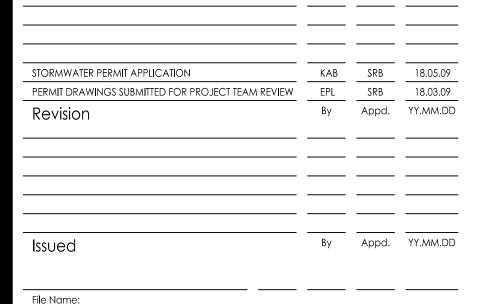
Stantec Consulting Services Inc. 30 Park Drive Topsham ME 04086 U.S.A.

Tel. 207.729.1199 Fax. 207.729.2715 www.stantec.com

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Consultants



Dwn. Chkd. Dsgn. YY.MM.DD P.E. STEPHEN R. BUSHEY Permit-Seal



Client/Project ROXWIND LLC

ROXBURY WIND PROJECT

ROXBURY TOWNSHIP, MAINE

CRANE ROAD PLAN AND PROFILE (STA 200+00 TO 204+77)

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Project No. 195601220	Scale AS NOT	ED			
Drawing No.	Sheet	Revision			
C-N1.4					

