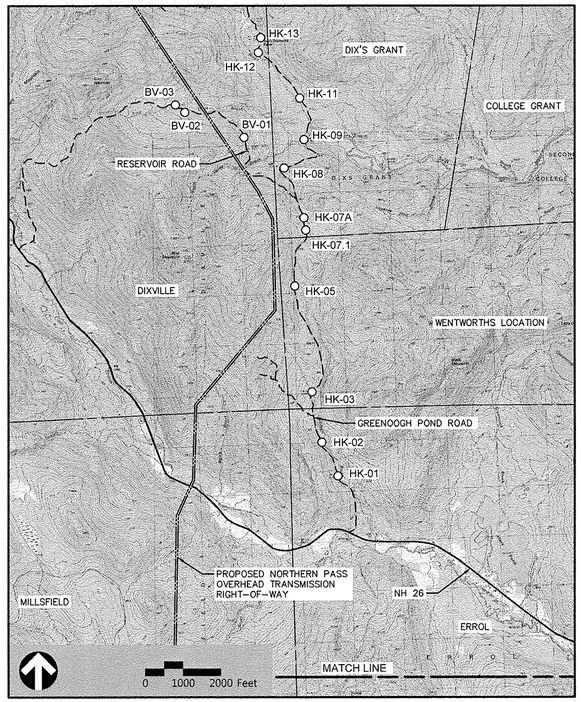
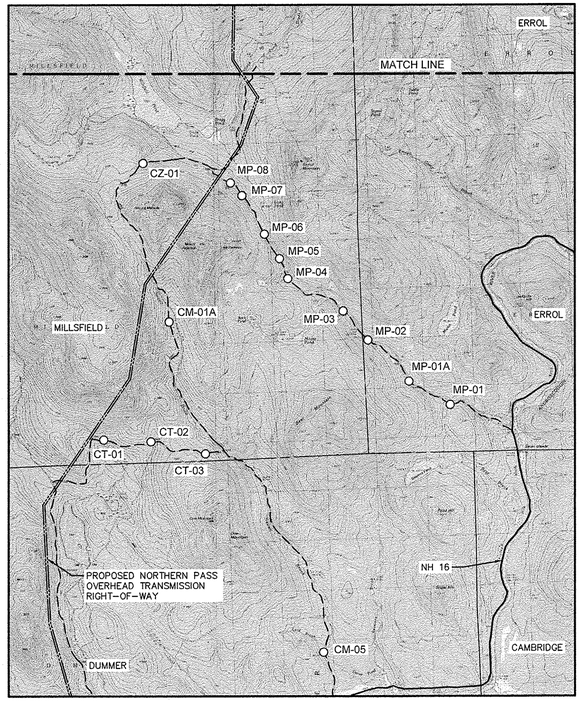
Site Plans

Issued for	Permitting
Date Issued	December 15, 2016
Latest Issue	December 15, 2016

NPT ORAR Culvert Improvements

Coos County, New Hampshire





Owner

Bayroot LLC c/o Wagner Forest Management, Ltd.
150 Oxford Road
PO Box 160
Lyme, NH 03768

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THE NORTHERN PASS℠

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NO. | REVISION | DATE | DRWN | CHKD | APPRV.

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NPT Off-ROW Access Road
Culvert Improvements
COVER SHEET
DATE: 12/15/2016
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DES.: CHK.:
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SHEET 0 OF 14

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Legend

Exist.	Prop.	
		PROPERTY LINE
		PROJECT LIMIT LINE
		RIGHT-OF-WAY/PROPERTY LINE
		EASEMENT
		BUILDING SETBACK
		PARKING SETBACK
10+00	10+00	BASELINE
		CONSTRUCTION LAYOUT
		ZONING LINE
		TOWN LINE
		LIMIT OF DISTURBANCE
	A	WETLAND LINE WITH FLAG
		FLOODPLAIN
BLSF		BORDERING LAND SUBJECT TO FLOODING
BZ		WETLAND BUFFER ZONE
NDZ		NO DISTURB ZONE
200'RA		200' RIVERFRONT AREA
		GRAVEL ROAD
EOP		EDGE OF PAVEMENT
BB	BB	BITUMINOUS BERM
BC	BC	BITUMINOUS CURB
CC	CC	CONCRETE CURB
	CG	CURB AND GUTTER
CC	ECC	EXTRUDED CONCRETE CURB
CC	MCC	MONOLITHIC CONCRETE CURB
CC	PCC	PRECAST CONC. CURB
SGE	SGE	SLOPED GRAN. EDGING
VGC	VGC	VERT. GRAN. CURB
		LIMIT OF CURB TYPE
		SAWCUT
		BUILDING
	EN	BUILDING ENTRANCE
	LD	LOADING DOCK
		BOLLARD
D	D	DUMPSTER PAD
		SIGN
		DOUBLE SIGN
		STEEL GUARDRAIL
		WOOD GUARDRAIL
		PATH
		TREE LINE
		WIRE FENCE
		FENCE
		STOCKADE FENCE
		STONE WALL
		RETAINING WALL
		STREAM / POND / WATER COURSE
		DETENTION BASIN
		HAY BALES
		SILT FENCE
		COMPOST MULCH TUBE
4	4	MINOR CONTOUR
20	20	MAJOR CONTOUR
10	10	PARKING COUNT
	C10	COMPACT PARKING STALLS
DYL	DYL	DOUBLE YELLOW LINE
SL	SL	STOP LINE
		CROSSWALK
		ACCESSIBLE CURB RAMP
		ACCESSIBLE PARKING
VAN	VAN	VAN-ACCESSIBLE PARKING

Exist.	Prop.	
		CONCRETE
		HEAVY DUTY PAVEMENT
		BUILDINGS
		RIPRAP
		CONSTRUCTION ENTRANCE
27.35 TC×	27.35 TC×	TOP OF CURB ELEVATION
26.85 BC×	26.85 BC×	BOTTOM OF CURB ELEVATION
132.75 ×	132.75 ×	SPOT ELEVATION
45.0 TW× 38.5 BW×	45.0 TW× 38.5 BW×	TOP & BOTTOM OF WALL ELEVATION
		BORING LOCATION
		TEST PIT LOCATION
MW	MW	MONITORING WELL
UD	UD	UNDERDRAIN
12"D	12"D	DRAIN
6"RD	6"RD	ROOF DRAIN
12"S	12"S	SEWER
FM	FM	FORCE MAIN
OHW	OHW	OVERHEAD WIRE
6"W	6"W	WATER
4"FP	4"FP	FIRE PROTECTION
	2"DW	DOMESTIC WATER
3"G	G	GAS
E	E	ELECTRIC
STM	STM	STEAM
T	T	TELEPHONE
FA	FA	FIRE ALARM
CATV	CATV	CABLE TV
		CATCH BASIN
		DOUBLE CATCH BASIN
		GUTTER INLET
		DRAIN MANHOLE
TD		TRENCH DRAIN
		PLUG OR CAP
CO	CO	CLEANOUT
		FLARED END SECTION
		HEADWALL
S		SEWER MANHOLE
CS	CS	CURB STOP & BOX
WV	WV	WATER VALVE & BOX
TSV	TSV	TAPPING SLEEVE, VALVE & BOX
		SIAMESE CONNECTION
HYD	HYD	FIRE HYDRANT
WM	WM	WATER METER
PIV	PIV	POST INDICATOR VALVE
W	W	WATER WELL
GG	GG	GAS GATE
GM	GM	GAS METER
E	EMH	ELECTRIC MANHOLE
EM	EM	ELECTRIC METER
		LIGHT POLE
T	TMH	TELEPHONE MANHOLE
T	T	TRANSFORMER PAD
		UTILITY POLE
		GUY POLE
		GUY WIRE & ANCHOR
HH	HH	HAND HOLE
PB	PB	PULL BOX
Matchline		MATCHLINE

Abbreviations

General

ABAN	ABANDON
ACR	ACCESSIBLE CURB RAMP
ADJ	ADJUST
APPROX	APPROXIMATE
BIT	BITUMINOUS
BS	BOTTOM OF SLOPE
BWLL	BROKEN WHITE LANE LINE
CONC	CONCRETE
DYCL	DOUBLE YELLOW CENTER LINE
EL	ELEVATION
ELEV	ELEVATION
EXIST	EXISTING
FDN	FOUNDATION
FFE	FIRST FLOOR ELEVATION
GRAN	GRANITE
GTD	GRADE TO DRAIN
LA	LANDSCAPE AREA
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PERF	PERFORATED
PROP	PROPOSED
REM	REMOVE
RET	RETAIN
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
SWEL	SOLID WHITE EDGE LINE
SWLL	SOLID WHITE LANE LINE
TS	TOP OF SLOPE
TYP	TYPICAL

Utility

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
DCB	DOUBLE CATCH BASIN
DMH	DRAIN MANHOLE
CIP	CAST IRON PIPE
COND	CONDUIT
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
FM	FORCE MAIN
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
GI	GUTTER INLET
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
INV	INVERT ELEVATION
I=	INVERT ELEVATION
LP	LIGHT POLE
MES	METAL END SECTION
PWW	PAVED WATER WAY
PVC	POLYVINYLCHLORIDE PIPE
PIV	POST INDICATOR VALVE
RCP	REINFORCED CONCRETE PIPE
R=	RIM ELEVATION
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UG	UNDERGROUND
UP	UTILITY POLE

Notes

General

1. THE INTENT OF THIS PLAN SET IS TO SHOW PROPOSED CULVERT UPGRADES FOR CONFORMANCE WITH NHDES STREAM CROSSING RULES ENV-WT 900 FOR PERMITTING PURPOSES.
2. CONTRACTOR SHALL NOTIFY "DIG-SAFE" (1-888-344-7233) AT LEAST 72 HOURS BEFORE EXCAVATING.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
4. AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED AND PERMANENTLY STABILIZED WITH ROADWAY GRAVELS, ROCK OR STREAM CHANNEL MATERIAL SHALL RECEIVE 4 INCHES OF LOAM AND SEED.
5. WORK WITHIN THE LOCAL RIGHTS-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS. WORK WITHIN STATE RIGHTS-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
6. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
7. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
8. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
9. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
10. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
11. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS AND DOWNSTREAM RESOURCE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.

Utilities

1. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR IT'S REPRESENTATIVE(S) HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND, SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES AND THE PROPOSED WORK.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT AND CONTRACTOR'S FAILURE TO NOTIFY PRIOR TO PERFORMING ADDITIONAL WORK RELEASES OWNER FROM OBLIGATIONS FOR ADDITIONAL PAYMENTS WHICH OTHERWISE MAY BE WARRANTED TO RESOLVE THE CONFLICT.
3. SET INVERTS OF DRAINAGE CULVERTS AND DITCHES IN ACCORDANCE WITH ELEVATIONS ON THE GRADING AND DRAINAGE PLANS.
4. DRAINAGE MATERIALS SHALL BE AS FOLLOWS:
   A. STORM DRAINAGE CULVERTS SHALL BE THE SIZE AND TYPE INDICATED ON THE DRAWINGS:
   B. DRAINAGE FABRIC OR FILTER FABRIC SHALL BE MIRAFI 180N NON-WOVEN FABRIC OR AN APPROVED EQUIVALENT, UNLESS OTHERWISE NOTED.
5. WATER SUPPLY LINES WERE OBSERVED RUNNING THROUGH SEVERAL OF THE EXISTING CULVERTS. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING WATER SUPPLY LINES WHERE CULVERT IMPROVEMENTS ARE REQUIRED. THE CONTRACTOR SHALL MAKE PROVISIONS FOR RESTORING THESE LINES BACK TO PRECONSTRUCTION CONDITIONS UPON COMPLETION OF EACH CULVERT REPLACEMENT. WHERE WATER SUPPLY LINES WERE OBSERVED THEY HAVE BEEN INDICATED ON THE DRAWINGS, HOWEVER ADDITIONAL WATER SUPPLY LINES MAY BE PRESENT THAT ARE WERE NOT OBSERVED AND THE CONTRACTOR SHOULD NOT RELY SOLELY ON THE DRAWINGS FOR THESE LOCATIONS.

Layout and Materials

1. PROPOSED BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A LICENSED LICENSED SURVEYOR (LLS).
2. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING GROUND ELEVATIONS AT THE INTERFACE WITH THE PROPOSED WORK, AND EXISTING GROUND ELEVATIONS ADJACENT TO DRAINAGE OUTLETS TO ASSURE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED FACILITIES.
3. GRAVEL ROADS SHALL BE REPLACED AND COMPACTED IN KIND TO MATCH EXISTING MATERIALS AND ELEVATIONS.

Demolition

1. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING MANMADE SURFACE FEATURES WITHIN THE LIMIT OF WORK INCLUDING BUILDINGS, STRUCTURES, PAVEMENTS, SLABS, CURBING, FENCES, UTILITY POLES, SIGNS, ETC. UNLESS INDICATED OTHERWISE ON THE DRAWINGS. REMOVE AND DISPOSE OF EXISTING UTILITIES, FOUNDATIONS AND UNSUITABLE MATERIAL WITHIN THE LIMIT OF WORK.
2. EXISTING UTILITIES SHALL BE TERMINATED, UNLESS OTHERWISE NOTED, IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES.
3. CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.

Winter Construction

1. ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED. STABILIZATION METHODS SHALL INCLUDE SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE TEMPORARILY STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL (NHDOT 304.3).

Construction Sequence

1. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT TO THE OWNER AND ENGINEER FOR REVIEW AND APPROVAL, A CONSTRUCTION SEQUENCING PLAN SHOWING THE INTENDED SEQUENCE OF WORK, BYPASS PROVISIONS AND TEMPORARY EROSION CONTROL MEASURES TO BE IMPLEMENTED.
2. FOR TIER 3 CULVERT IMPROVEMENTS, OR ANY CULVERT IMPROVEMENTS REQUIRING A FOUNDATION, A GEOTECHNICAL ENGINEER SHALL BE RETAINED TO PROVIDE DESIGN RECOMMENDATIONS FOR THE FOUNDATIONS. DESIGN OF THE FOUNDATIONS SHALL BE PREPARED BY A STRUCTURAL ENGINEER LICENSED IN NEW HAMPSHIRE AND SUBMITTED WITH THE SHOP DRAWINGS FOR REVIEW.
3. WORK WITHIN STREAM CHANNELS SHALL BE DONE DURING LOW FLOW PERIODS.
4. MATERIAL EXCAVATED FROM EXISTING STREAM BEDS FOR CULVERT REPLACEMENT SHOULD BE STOCKPILED FOR REUSE WITHIN PROPOSED STREAMBED DISTURBANCE AREAS.

Erosion Control

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWELVE HOURS AFTER EACH STORM EVENT (0.5" OF RAINFALL OR GREATER) AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM THE WORK AREA. COMPOST MULCH TUBES MAY BE LEFT IN PLACE.
6. WITHIN THREE DAYS OF FINAL GRADING , ALL EXPOSED UNSTABILIZED SOIL AREAS SHALL BE STABILIZED BY SEEDING AND MULCHING IF WITHIN THE GROWING SEASON OR IF NOT WITHIN THE GROWING SEASON BY MULCHING WITH TACKIFIER OR NETTING AND PINNING ON SLOPES STEEPER THAN 3:1. WHERE CONSTRUCTION ACTIVITIES HAVE BEEN TEMPORARILY SUSPENDED WITHIN THE GROWING SEASON, ALL EXPOSED SOIL AREAS SHALL BE STABILIZED WITHIN 14 DAYS BY SEEDING AND MULCHING. IF OUTSIDE THE GROWING SEASON, ALL EXPOSED AREAS SHALL BE STABILIZED WITHIN 14 DAYS BY MULCHING AND TACKIFIER. SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED WITH EROSION CONTROL BLANKETS.
7. PERMANENT SEEDING SHALL OCCUR BETWEEN APRIL 1 AND JUNE 1, AND/OR BETWEEN AUGUST 15 AND OCTOBER 15 (i.e. THE GROWING SEASON). ALL SEEDING FROM SEPTEMBER 15 SHALL BE HAY MULCHED.
8. DUST SHALL BE CONTROLLED THROUGH THE USE OF WATER.
9. SOILS TO BE STOCKPILED FOR A PERIOD OF MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED AND MULCHED. CONTRACTOR SHALL INSTALL SILT FENCING OR COMPOST MULCH TUBES ALONG DOWNHILL SIDE OF STOCKPILES.
10. CONTRACTOR SHALL PROVIDE NECESSARY EROSION CONTROL MEASURES TO INSURE THAT SURFACE WATER RUN-OFF FROM UNSTABILIZED AREAS DOES NOT CARRY SILT, SEDIMENT, AND OTHER DEBRIS OUTSIDE OF THE LIMITS OF WORK.
11. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN ACCESS ROADS;
    B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
    C. A MINIMUM OF 3-IN OF NON-EROSIVE MATERIAL, SUCH AS STONE OR RIPRAP, HAS BEEN INSTALLED;
    D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
12. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT AT NO TIME SHALL THE TOTAL UNSTABILIZED DISTURBED AREA ON-SITE BE GREATER THAN (5) FIVE ACRES.
13. ALL DITCHES, SWALES, AND DRAINAGE BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
14. ALL ACCESS ROADS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
15. ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
16. ALL PERMANENT AND TEMPORARY SEEDING SHALL BE AS FOLLOWS (UNLESS OTHERWISE NOTED) AND MAY BE APPLIED BY HYDRO-SEEDING, MECHANICAL SPREADER OR BROADCAST:

    PERMANENT SEEDING SHALL BE AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC., AMHERST, MA, AS FOLLOWS:

WETLAND AREAS NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR MOIST SITES	35 #/ACRE
UPLAND AREAS NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR DRY SITES	35#/ACRE

    TEMPORARY SEEDING SHALL BE IN CONFORMANCE WITH THE TEMPORARY VEGETATION REQUIREMENTS FOUND IN SECTION 4-1 OF THE CURRENT NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3 - EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION.

    * TEMPORARY SEED SHALL ONLY BE PLANTED WHEN PERMANENT GRASSES CANNOT BE PLANTED DUE TO THE GROWING SEASON.

17. EROSION CONTROL BLANKETS SHALL BE INSTALLED ON ALL SLOPES THAT ARE STEEPER THAN 3-FT HORIZONTAL AND 1-FT VERTICAL (3:1). EROSION CONTROL BLANKETS SHALL BE NORTH AMERICAN GREEN SC150BN, OR APPROVED EQUIVALENT.

Rock Removal

1. ANY ROCK REMOVAL REQUIRED SHALL BE DONE BY MECHANICAL REMOVAL METHODS. BLASTING SHALL NOT BE ALLOWED.

Existing Conditions Information

1. BASE PLAN: THE TOPOGRAPHY AND PHYSICAL FEATURES IN THE IMMEDIATE VICINITY OF THE CULVERT IMPROVEMENT AREAS ARE BASED ON AN ACTUAL FIELD SURVEY PERFORMED ON THE GROUND BY VANASSE HANGEN BRUSTLIN, IN THE FALL OF 2016.
   A. DELINEATION OF THE WETLANDS WAS PERFORMED BY NORMANDEAU ASSOCIATES.
   B. WETLANDS WERE LOCATED BY NORMANDEAU ASSOCIATES BY GPS AND FIELD MEASUREMENTS.
   C. LIMITS OF WETLANDS AND TOP OF BANK FOR CULVERTS BV-1 AND HK-11 WERE ESTIMATED FROM TOPOGRAPHY, SITE PHOTOS AND FIELD NOTES. FIELD DELINEATIONS OF THESE WERE NOT PERFORMED DUE TO ACCESS RESTRICTIONS CAUSED BY SNOW.
2. TOPOGRAPHY: ELEVATIONS ARE BASED ON NAVD 1988.

State Permits

1. IN THE EVENT THAT THE DRAWINGS CONFLICT WITH THE PROJECT PERMIT APPROVALS AND CONDITIONS, THE PERMIT APPROVALS AND CONDITIONS SHALL TAKE PRECEDENT.
2. STATE OF NEW HAMPSHIRE SITE EVALUATION COMMITTEE, DOCKET NO. 2015-06. CERTIFICATE OF SITE AND FACILITY IS PENDING.
3. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES WETLANDS BUREAU, NHDES FILE NO. SEC-2015-02817. PERMIT IS PENDING.
4. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES ALTERATION OF TERRAIN BUREAU, NHDES FILE NO. SEC-2015-02817. PERMIT IS PENDING.
5. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES SHORELAND PROGRAM, NHDES FILE NO. SEC-2015-02828 THROUGH 2015-02859. PERMITS ARE PENDING.

Document Use

1. THESE PLANS AND CORRESPONDING CADD DOCUMENTS ARE INSTRUMENTS OF PROFESSIONAL SERVICE, AND SHALL NOT BE USED, IN WHOLE OR IN PART, FOR ANY PURPOSE OTHER THAN FOR WHICH IT WAS CREATED WITHOUT THE EXPRESSED, WRITTEN CONSENT OF VHB. ANY UNAUTHORIZED USE, REUSE, MODIFICATION OR ALTERATION, INCLUDING AUTOMATED CONVERSION OF THIS DOCUMENT SHALL BE AT THE USER'S SOLE RISK WITHOUT LIABILITY OR LEGAL EXPOSURE TO VHB.
2. CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS, BUT SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH THE PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART OF THE CONTRACT DOCUMENTS.
3. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS. THE CONTRACTOR SHALL REFER TO THE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

NO.	REVISION	DATE	DRWN	CHKD	APPRV.

vhb

THE NORTHERN PASS®

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NPT Off-ROW Access Road
Culvert Improvements
LEGEND AND GENERAL NOTES

DATE: 12/15/2016

SCALE: NONE

DES: . CHK: .
DRW: . APR: .

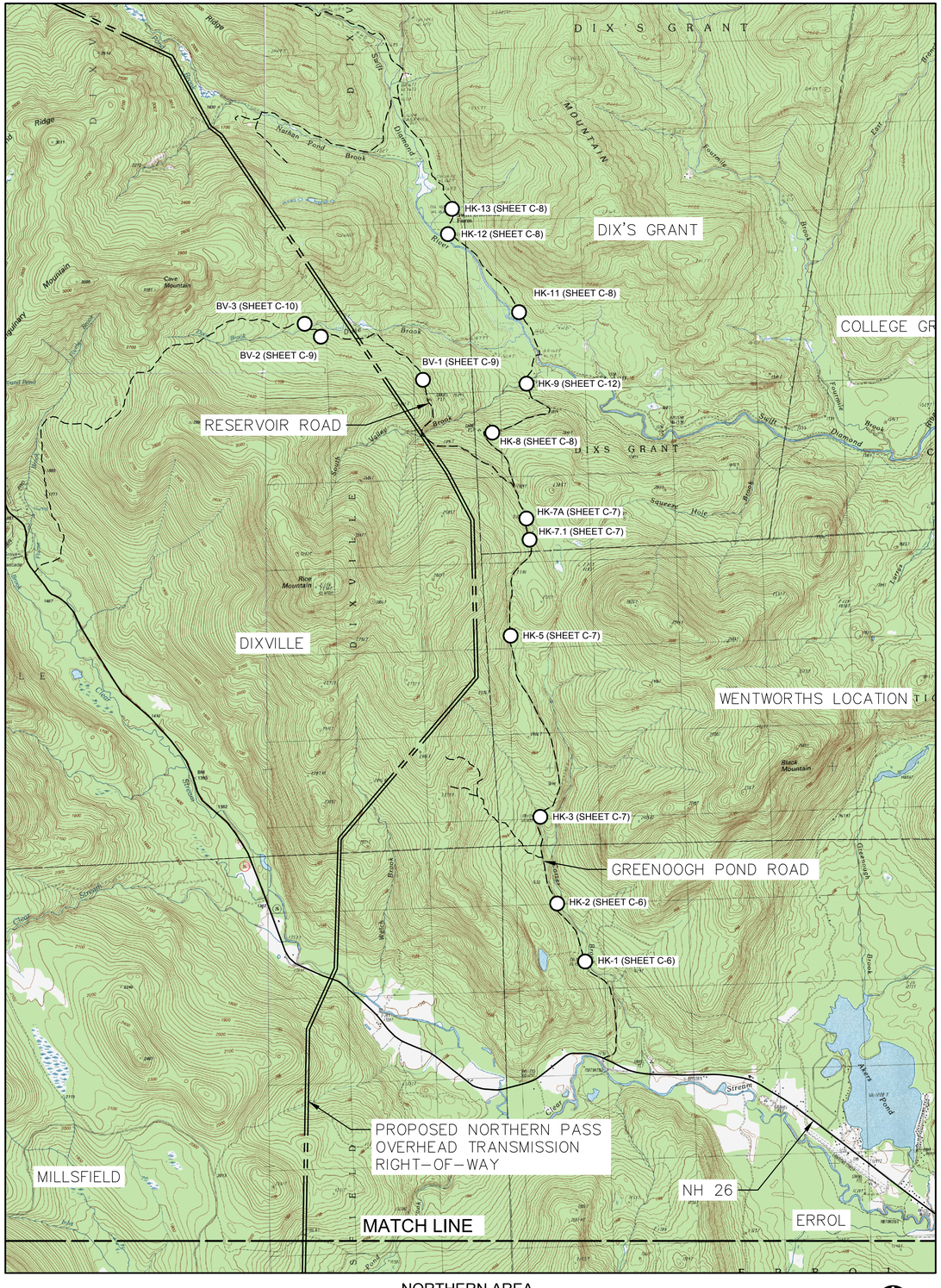
TOWN:

TRANSMISSION LINE:

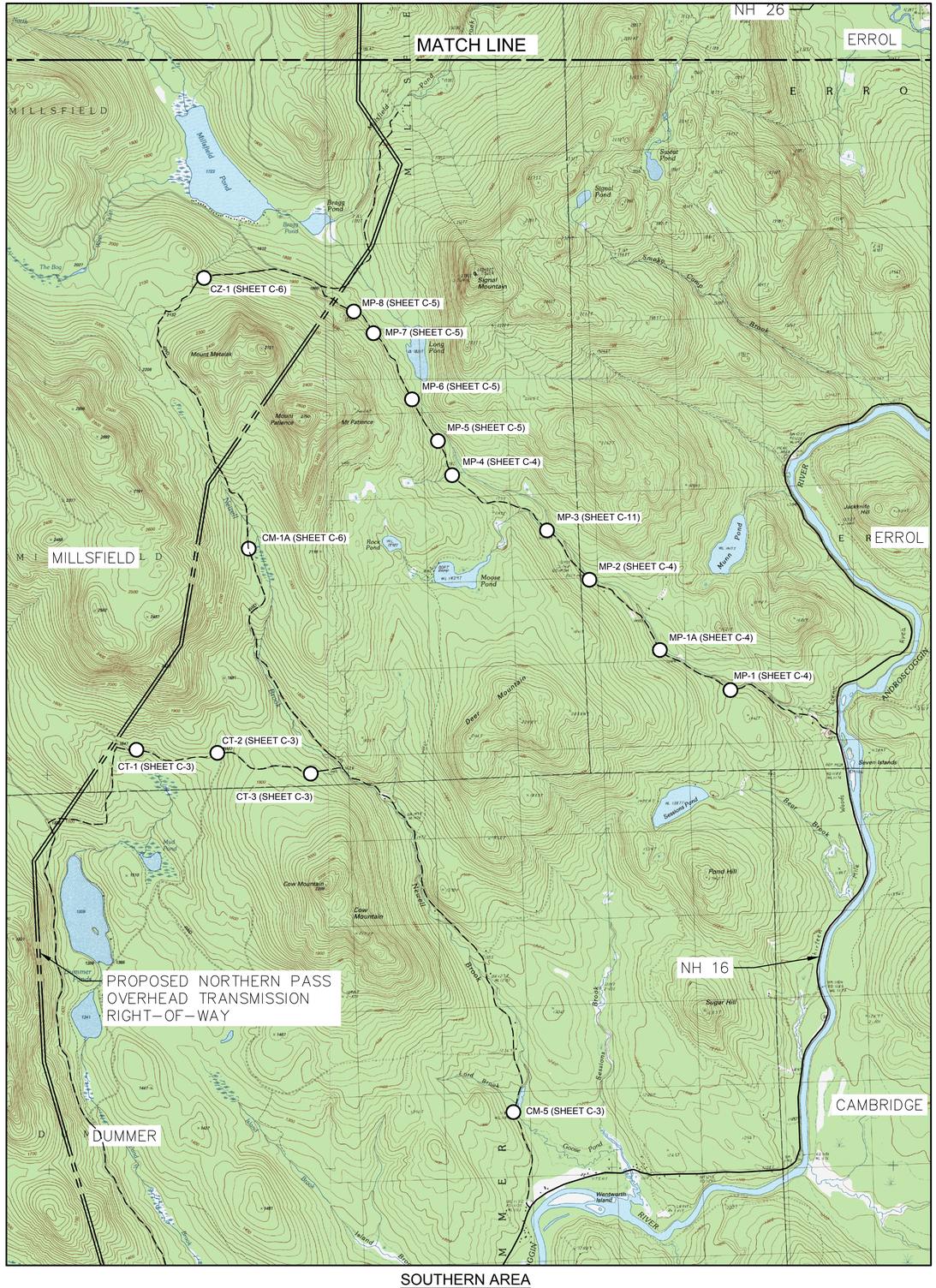
MILE NO:

DISCIPLINE/SHT NO.
C-1

SHEET 1 OF 14



NORTHERN AREA



SOUTHERN AREA

0 1250 2500 5000 Feet

NO.	REVISION	DATE	DRWN	CHKD	APPRV.

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Transmission Business

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NPT Off-ROW Access Road
Culvert Improvements
OVERALL SITE PLAN

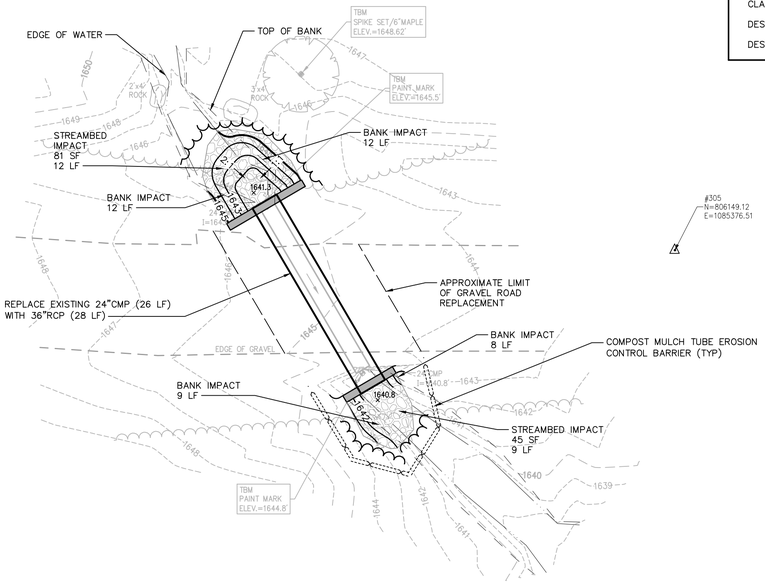
DATE: 12/15/2016

SCALE: 1"=2,500'

DES: -	CHK:
DRW: -	APP: -
TOWN:	
TRANSMISSION LINE:	
MILE NO:	
DISCIPLINE/SHT NO.	C-2
SHEET 2 OF 14	

DESIGN DATA

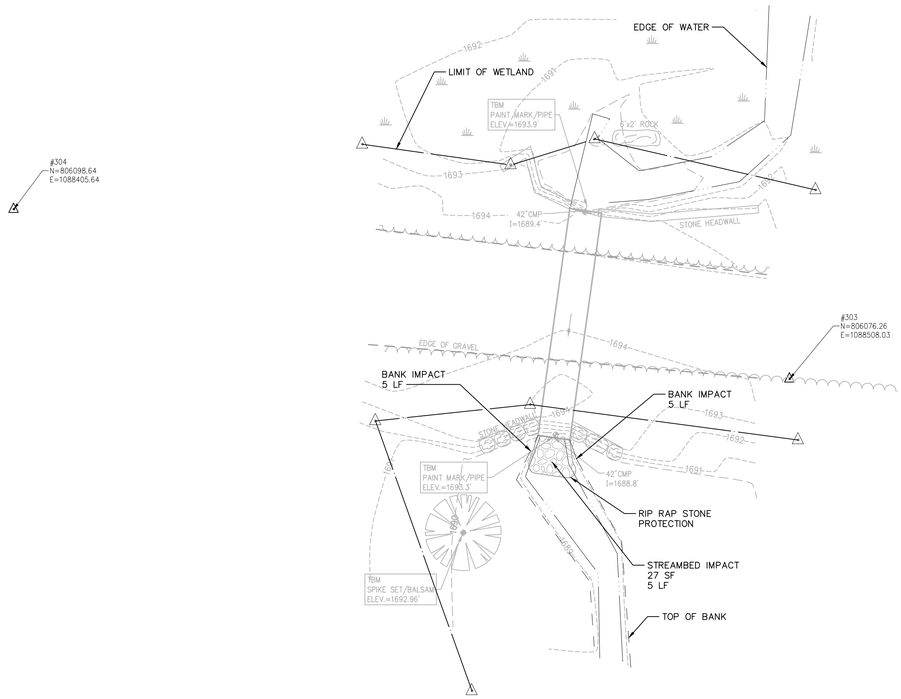
DRAINAGE AREA:	83 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	45.7 CFS



Culvert CT-1
SCALE: 1"=10'

DESIGN DATA

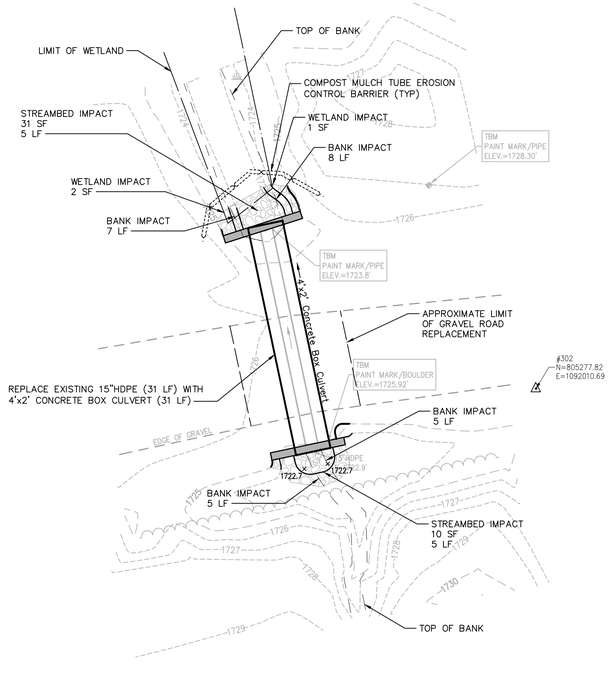
DRAINAGE AREA:	152 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	68.5 CFS



Culvert CT-2
SCALE: 1"=10'

DESIGN DATA

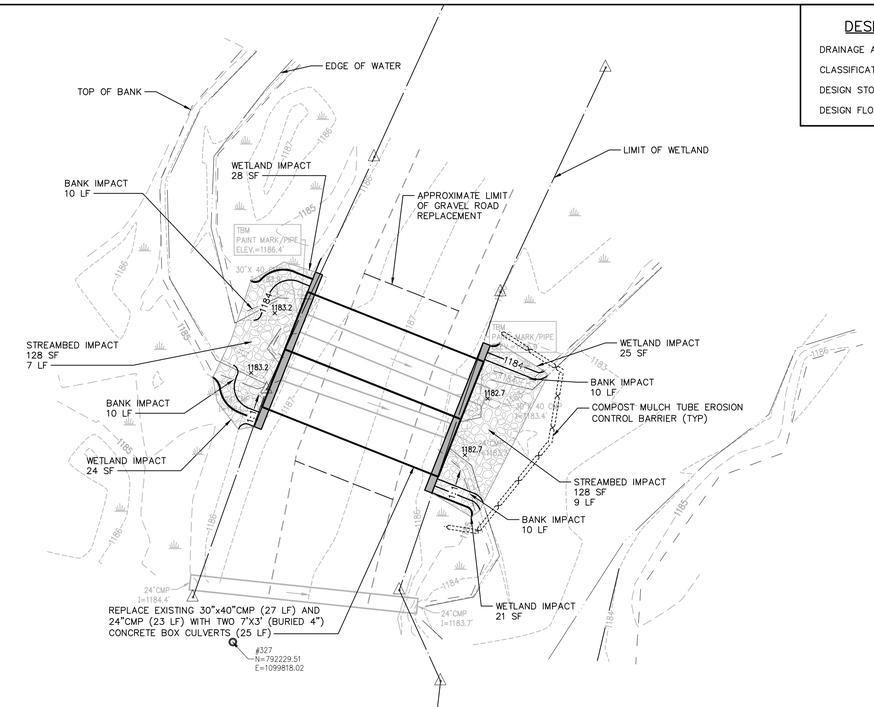
DRAINAGE AREA:	128 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	49.9 CFS



Culvert CT-3
SCALE: 1"=10'

DESIGN DATA

DRAINAGE AREA:	627 AC
CLASSIFICATION:	TIER 2
DESIGN STORM:	100 YR
DESIGN FLOW:	209.0 CFS



Culvert CM-5
SCALE: 1"=10'

0 5 10 20 Feet

NO.	REVISION	DATE	DRWN	CHKD	APPRV.

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THE NORTHERN PASS
Transmission Business

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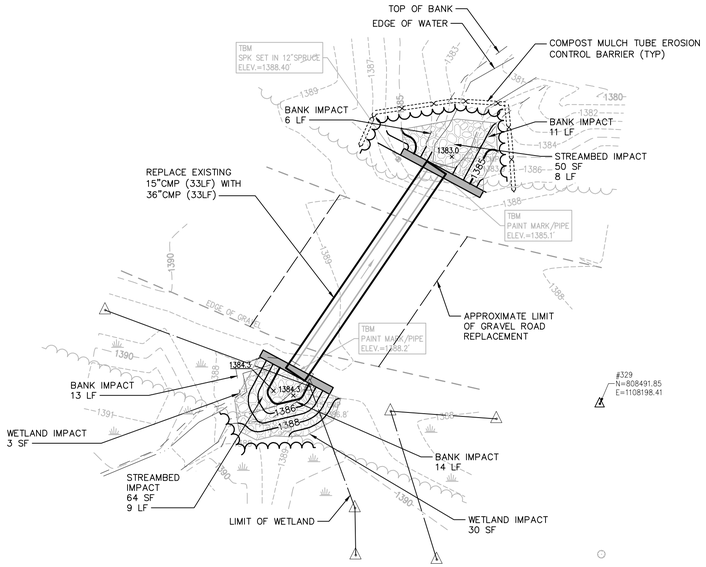
NPT Off-ROW Access Road
Culvert Improvements
GRADING AND DRAINAGE PLAN

DATE: 12/15/2016
SCALE: 1"=10'

DES: . CHK: .
DRW: . APR: .
TOWN:
TRANSMISSION LINE:
MILE NO:
DISCIPLINE/SHT NO. C-3
SHEET 3 OF 14

DESIGN DATA

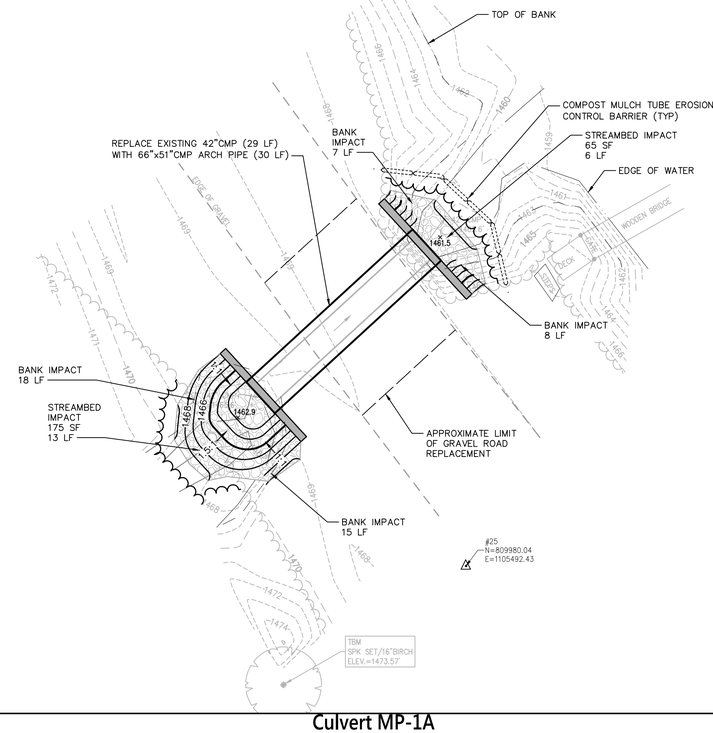
DRAINAGE AREA:	147 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	54.5 CFS



Culvert MP-1
SCALE: 1"=10'

DESIGN DATA

DRAINAGE AREA:	390 AC
CLASSIFICATION:	TIER 2
DESIGN STORM:	100 YR
DESIGN FLOW:	159.0 CFS



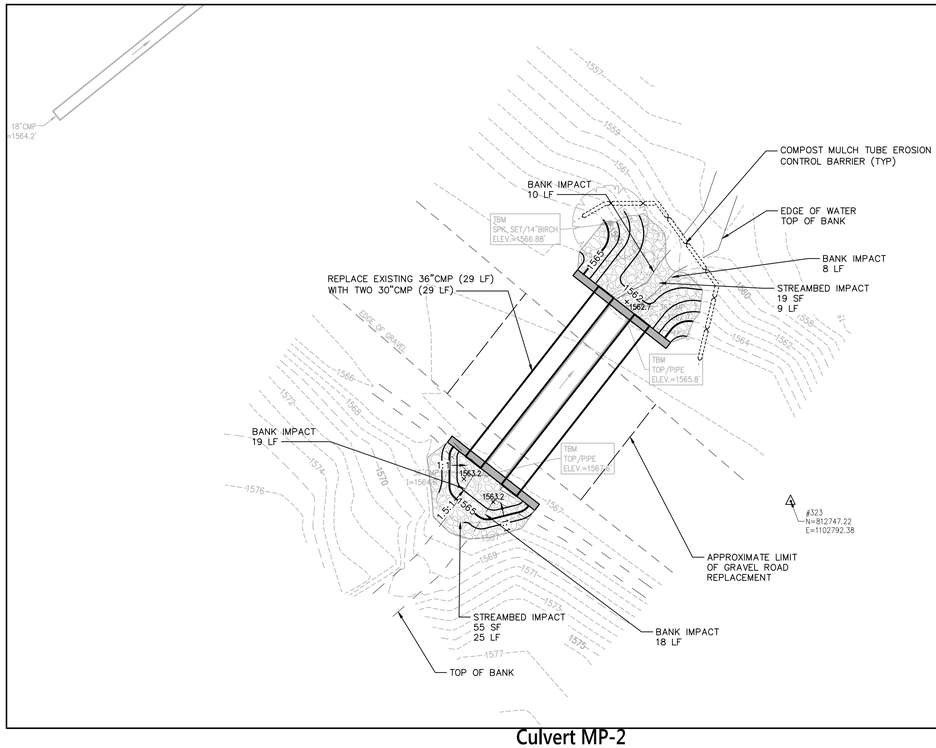
NOTE:

WATER SUPPLY LINE OBSERVED THROUGH EXISTING CULVERT.

Culvert MP-1A
SCALE: 1"=10'

DESIGN DATA

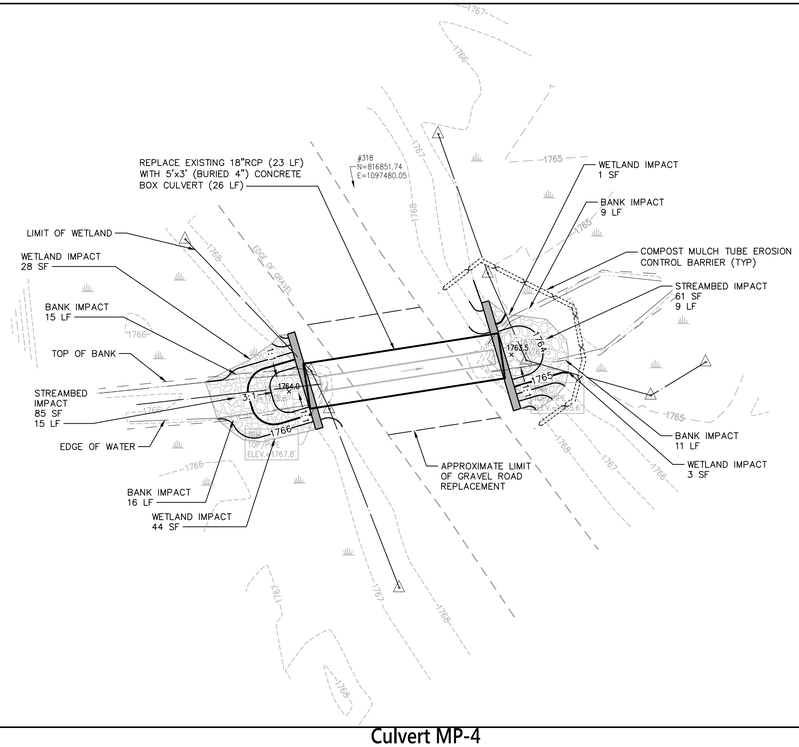
DRAINAGE AREA:	154 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	57.1 CFS



Culvert MP-2
SCALE: 1"=10'

DESIGN DATA

DRAINAGE AREA:	211 AC
CLASSIFICATION:	TIER 2
DESIGN STORM:	100 YR
DESIGN FLOW:	95.1 CFS



Culvert MP-4
SCALE: 1"=10'

0 5 10 20 Feet

NO.	REVISION	DATE	DRWN	CHKD	APPRV.

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Transmission Business

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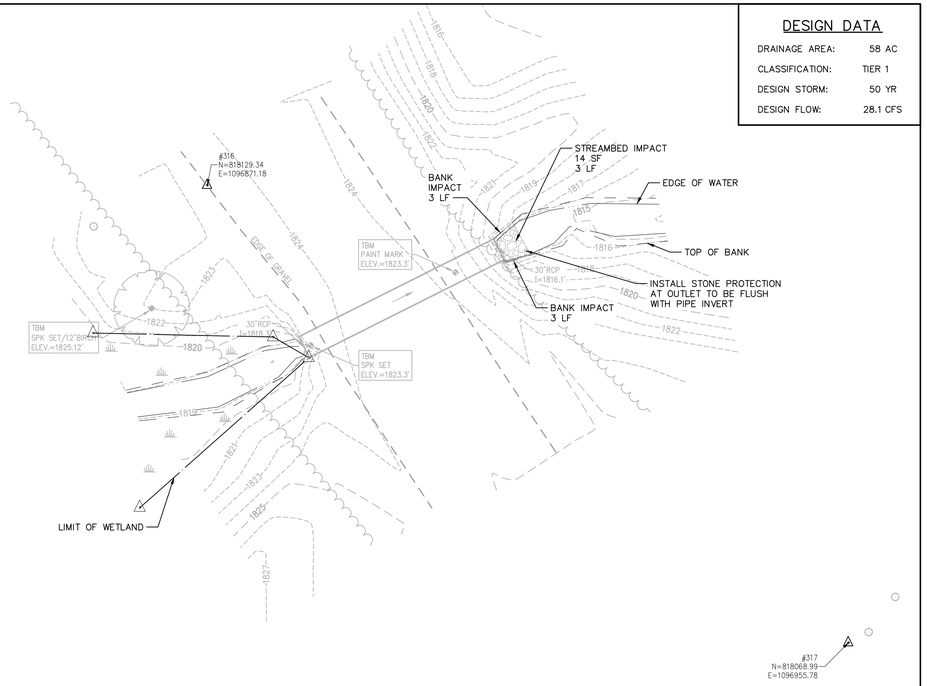
NPT Off-ROW Access Road
Culvert Improvements
GRADING AND DRAINAGE PLAN

DATE: 12/15/2016
SCALE: 1"=10'

DES: .	CHK: .
DRW: .	APR: .
TOWN:	
TRANSMISSION LINE:	
MILE NO:	
DISCIPLINE/SHT NO.	C-4
SHEET 4 OF 14	

DESIGN DATA

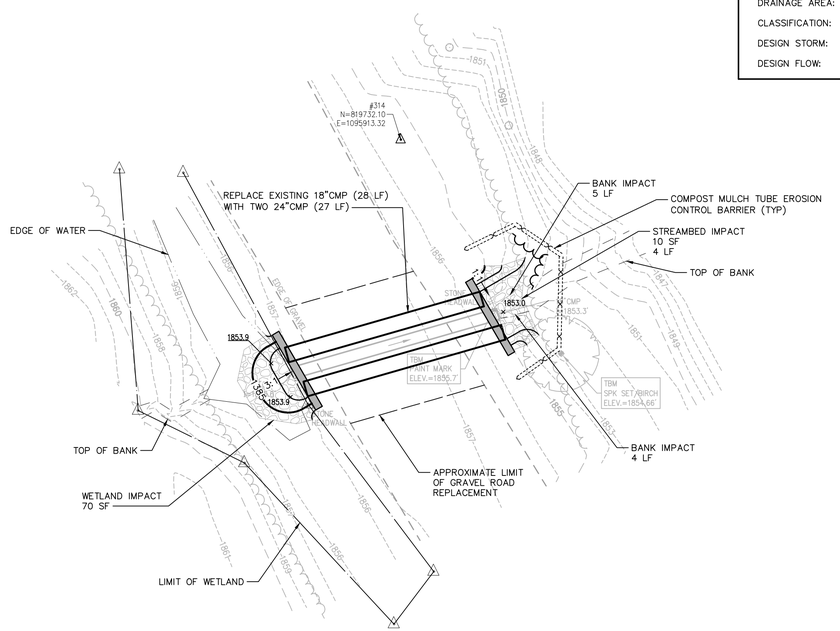
DRAINAGE AREA:	58 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	28.1 CFS



Culvert MP-5
SCALE: 1"=10'

DESIGN DATA

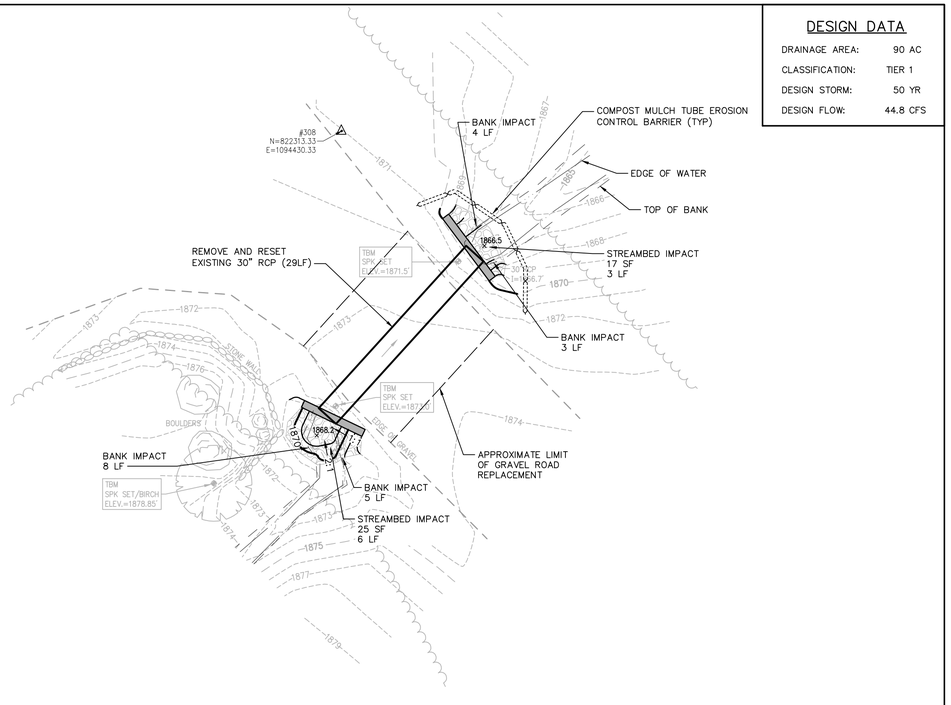
DRAINAGE AREA:	83 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	41.1 CFS



Culvert MP-6
SCALE: 1"=10'

DESIGN DATA

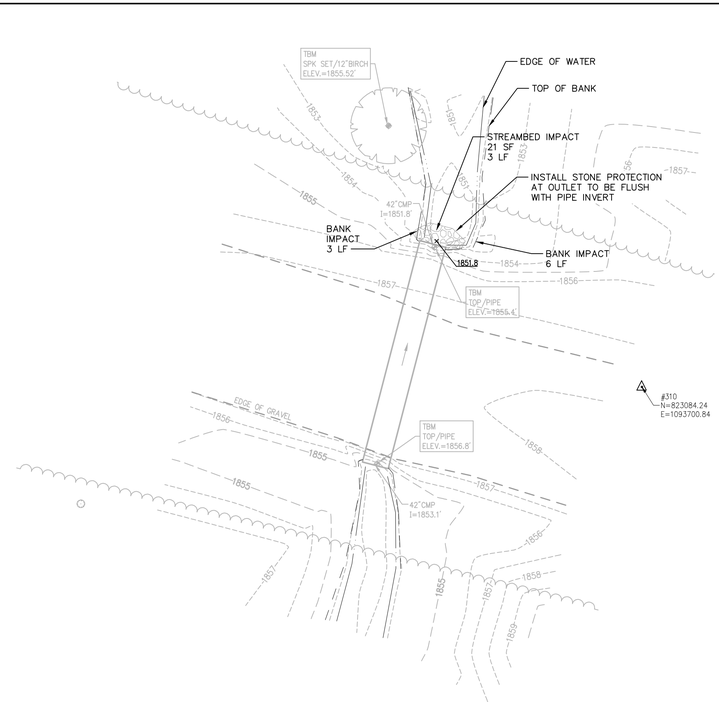
DRAINAGE AREA:	90 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	44.8 CFS



Culvert MP-7
SCALE: 1"=10'

DESIGN DATA

DRAINAGE AREA:	90 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	44.7 CFS



Culvert MP-8
SCALE: 1"=10'

0 5 10 20 Feet

NO.	REVISION	DATE	DRWN.	CHKD	APPRV.

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Transmission Business
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NPT Off-ROW Access Road
Culvert Improvements
GRADING AND DRAINAGE PLAN

DATE: 12/15/2016
SCALE: 1"=10'

DES: . CHK: .
DRW: . APR: .

TOWN:

TRANSMISSION LINE:

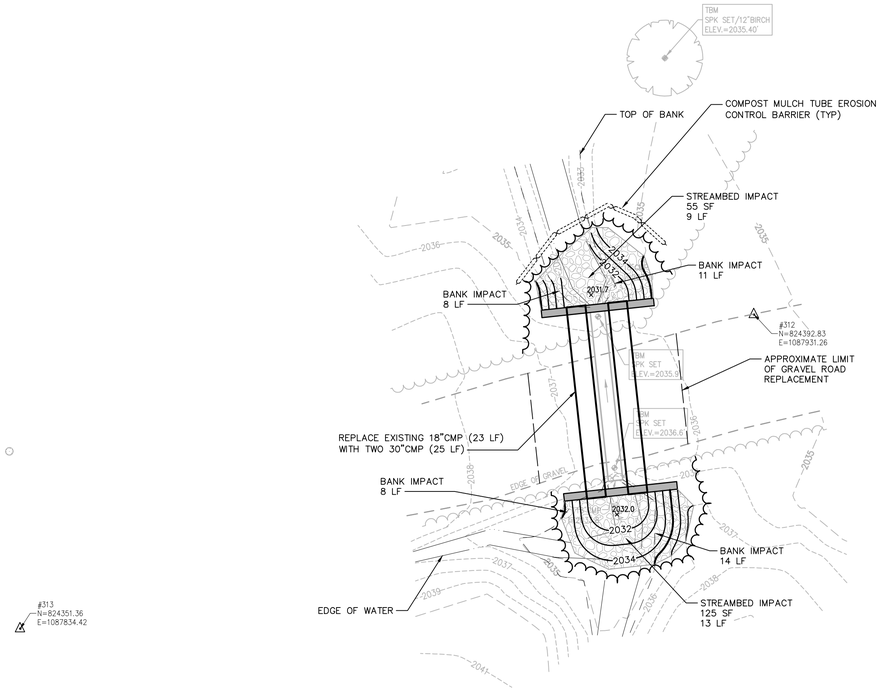
MILE NO:

DISCIPLINE/SHT NO.
C-5

SHEET 5 OF 14

DESIGN DATA

DRAINAGE AREA:	147 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	77.4 CFS

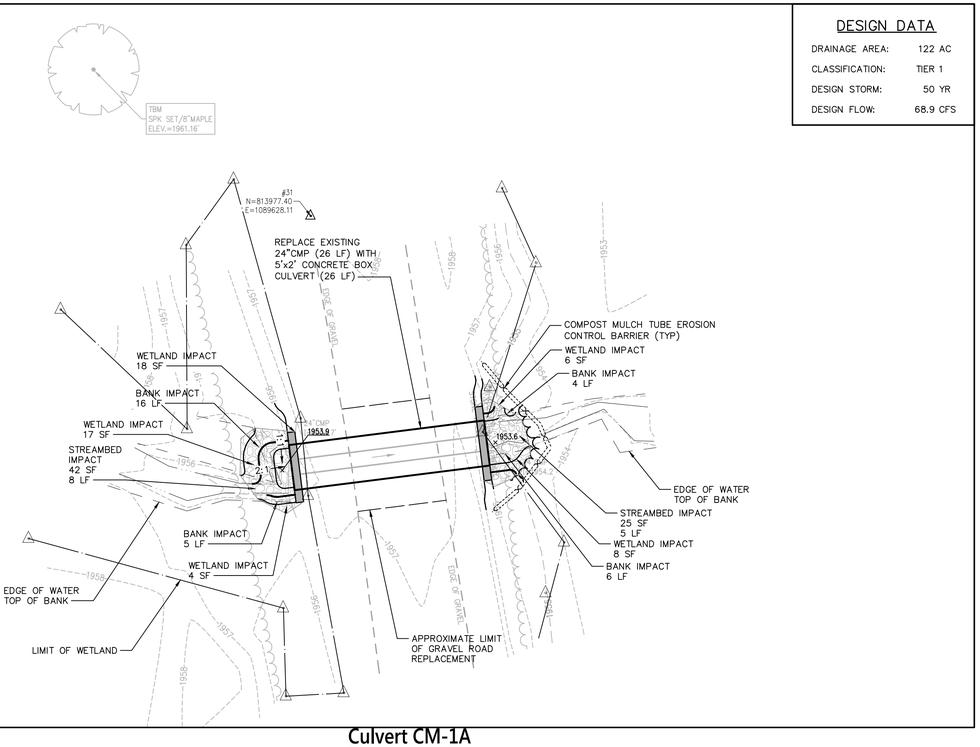


Culvert CZ-1

SCALE: 1"=10'

DESIGN DATA

DRAINAGE AREA:	122 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	68.9 CFS

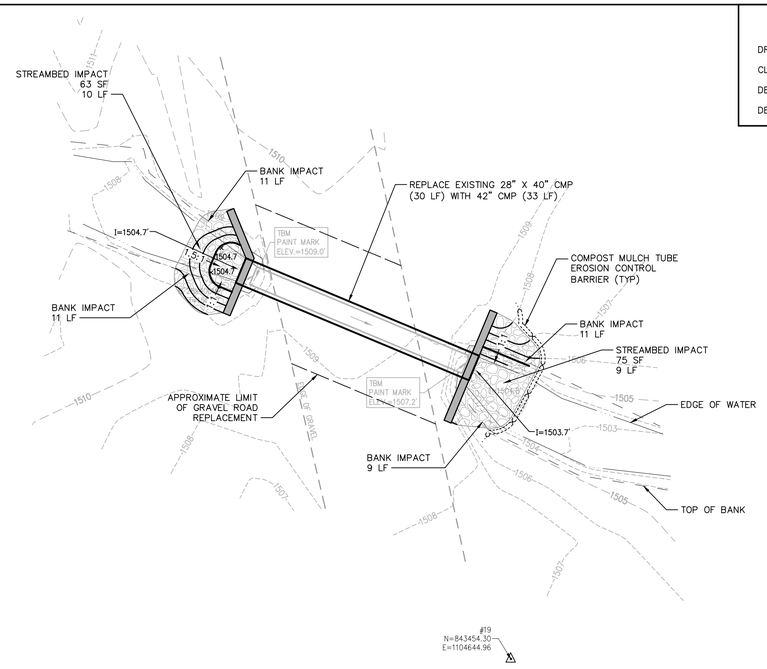


Culvert CM-1A

SCALE: 1"=10'

DESIGN DATA

DRAINAGE AREA:	186 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	61.8 CFS

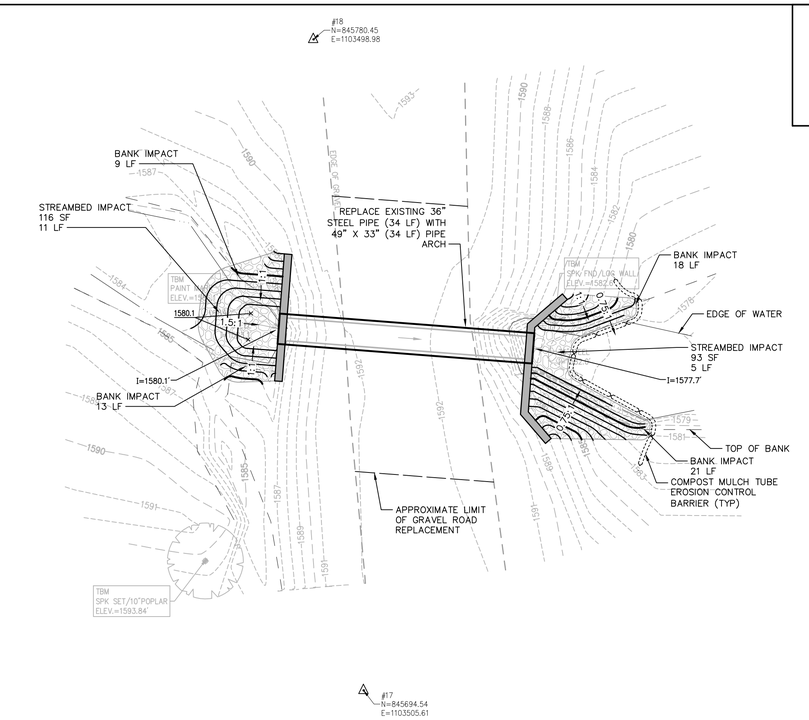


Culvert HK-1

SCALE: 1"=10'

DESIGN DATA

DRAINAGE AREA:	378 AC
CLASSIFICATION:	TIER 2
DESIGN STORM:	100 YR
DESIGN FLOW:	156.0 CFS



Culvert HK-2

SCALE: 1"=10'

0 5 10 20 Feet

NO.	REVISION	DATE	DRWN	CHKD	APPRV.

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THE NORTHERN PASS

Transmission Business

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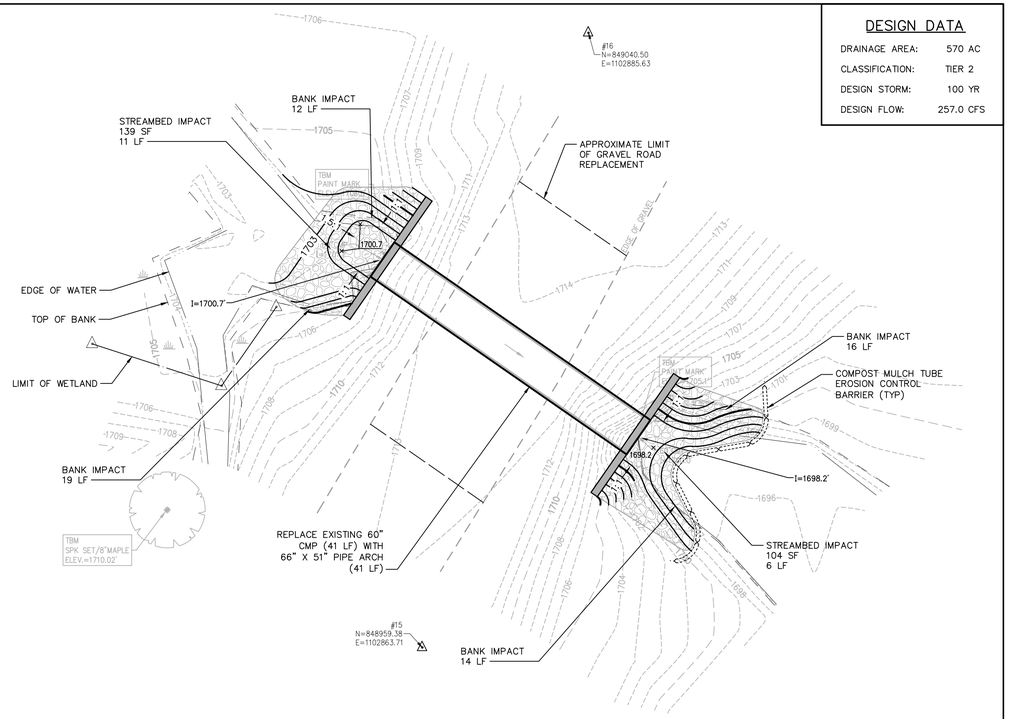
NPT Off-ROW Access Road Culvert Improvements GRADING AND DRAINAGE PLAN

DATE: 12/15/2016

SCALE: 1"=10'

DES: .	CHK: .
DRW: .	APR: .
TOWN:	
TRANSMISSION LINE:	
MILE NO:	
DISCIPLINE/SHT NO.	C-6
SHEET 6 OF 14	

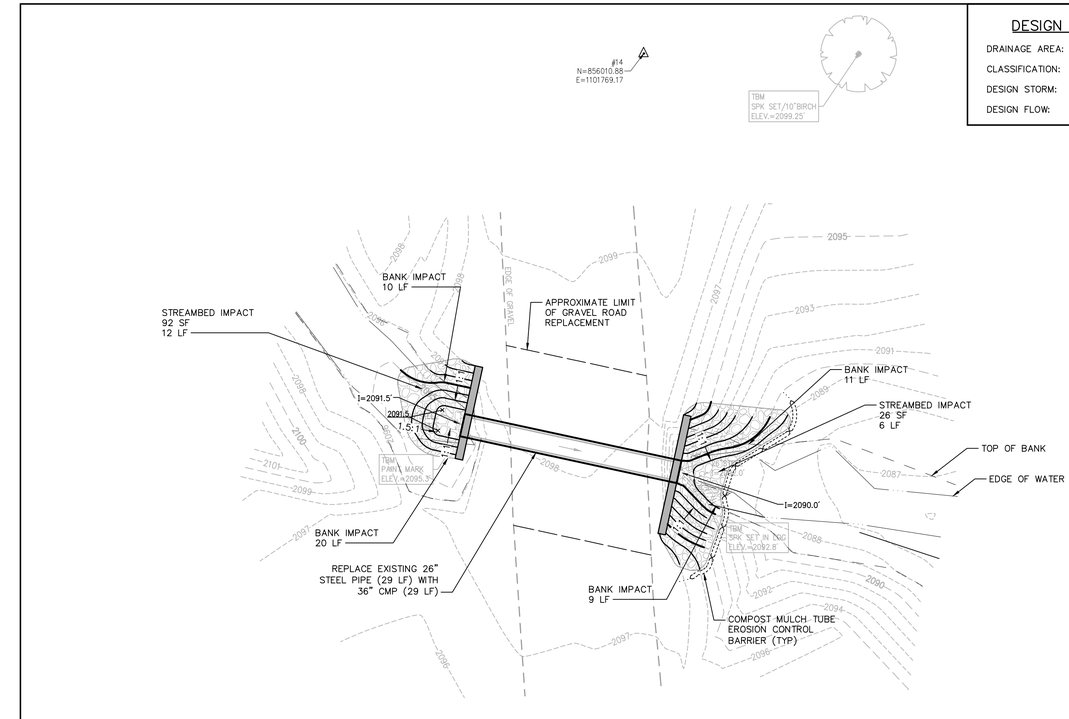


DESIGN DATA

DRAINAGE AREA:	570 AC
CLASSIFICATION:	TIER 2
DESIGN STORM:	100 YR
DESIGN FLOW:	257.0 CFS

Culvert HK-3

SCALE: 1"=10'

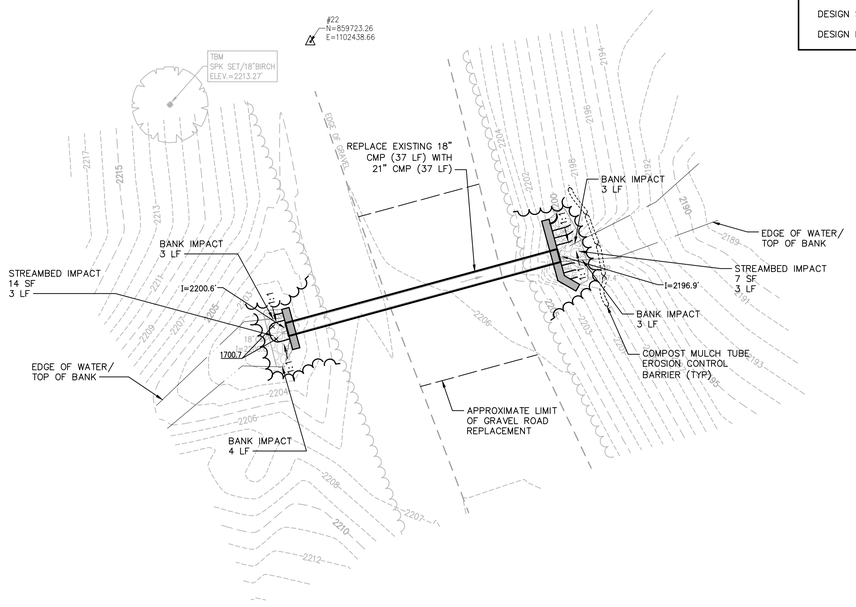


DESIGN DATA

DRAINAGE AREA:	115 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	60.6 CFS

Culvert HK-5

SCALE: 1"=10'

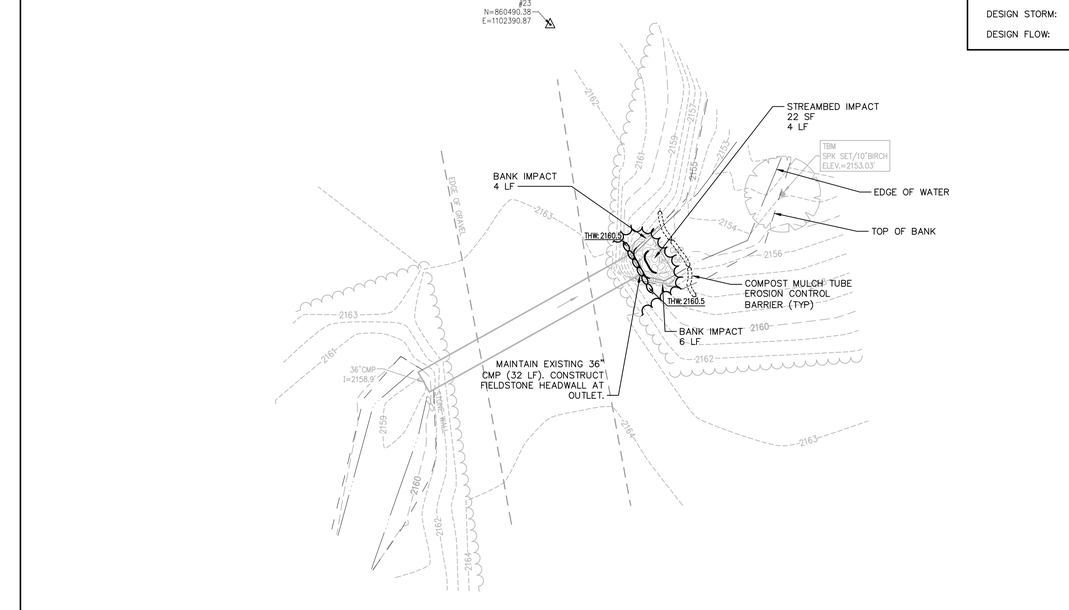


DESIGN DATA

DRAINAGE AREA:	45 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	25.7 CFS

Culvert HK-7.1

SCALE: 1"=10'



DESIGN DATA

DRAINAGE AREA:	32 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	19.0 CFS

Culvert HK-7A

SCALE: 1"=10'

0 5 10 20 Feet

NO.	REVISION	DATE	DRWN	CHKD	APPRV.

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Transmission Business

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NPT Off-ROW Access Road
Culvert Improvements
GRADING AND DRAINAGE PLAN

DATE: 12/15/2016

SCALE: 1"=10'

DES: . | CHK: .
DRW: . | APR: .

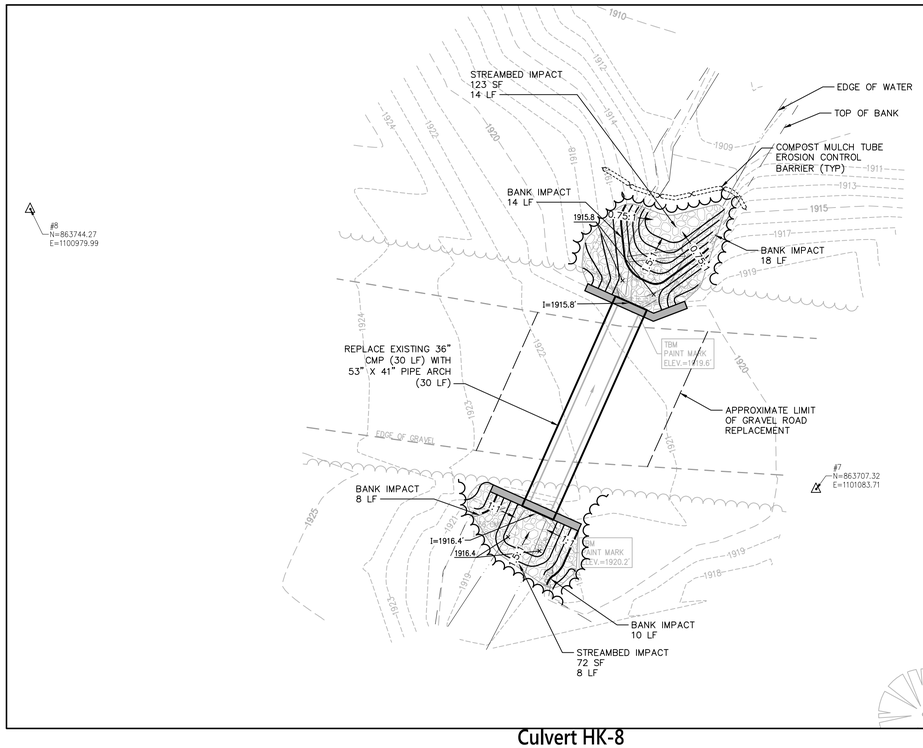
TOWN:

TRANSMISSION LINE:

MILE NO:

DISCIPLINE/SHT NO.
C-7

SHEET 7 OF 14

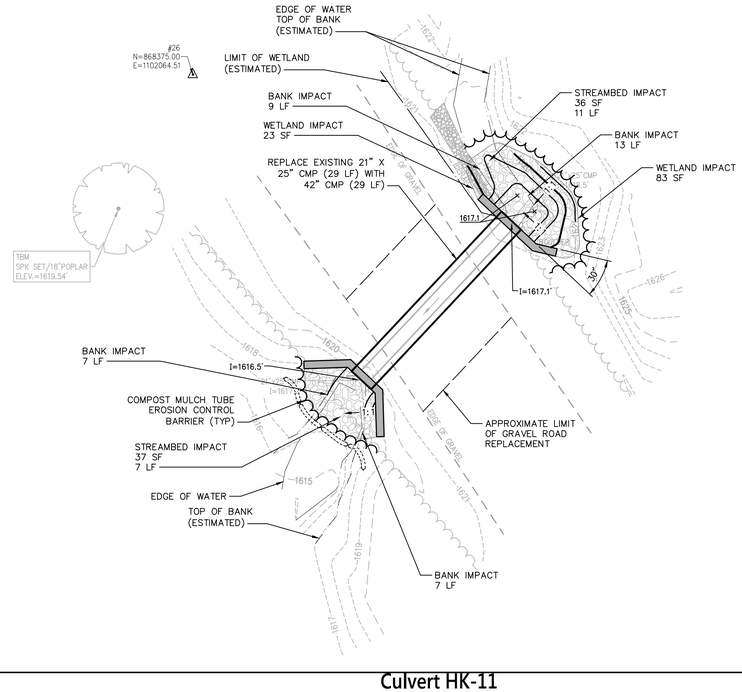


DESIGN DATA	
DRAINAGE AREA:	205 AC
CLASSIFICATION:	TIER 2
DESIGN STORM:	100 YR
DESIGN FLOW:	105.0 CFS

NOTE;

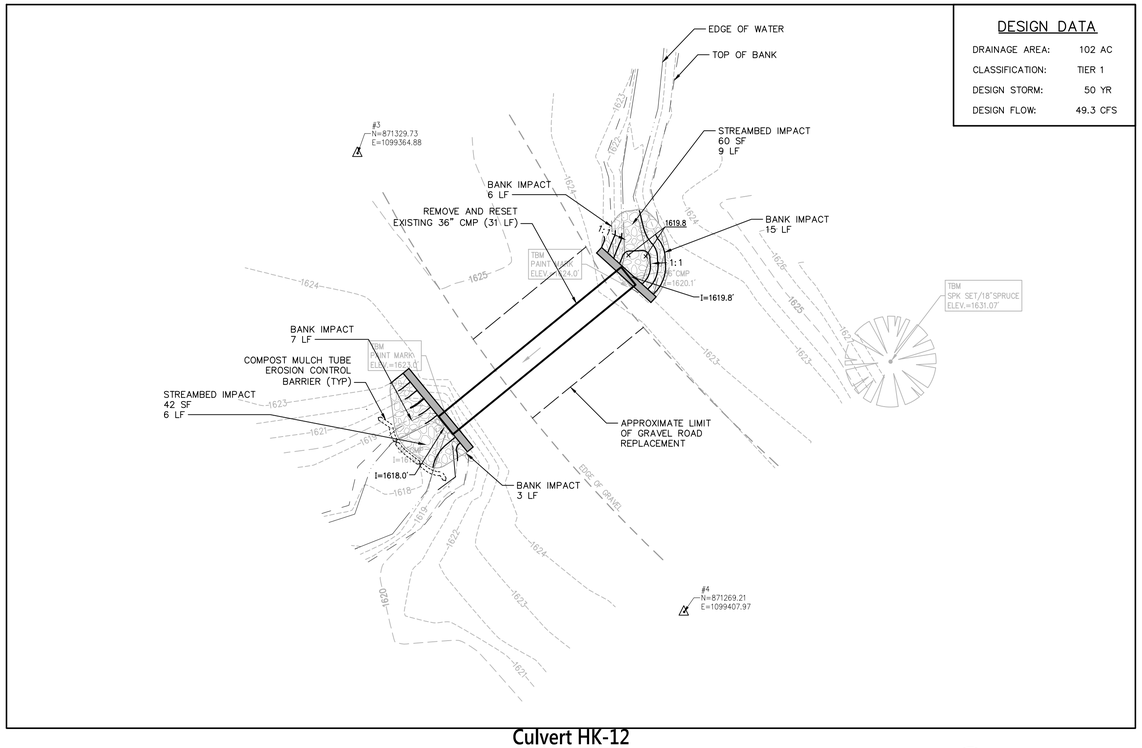
WATER SUPPLY LINE OBSERVED THROUGH EXISTING CULVERT.

Culvert HK-8
SCALE: 1"=10'



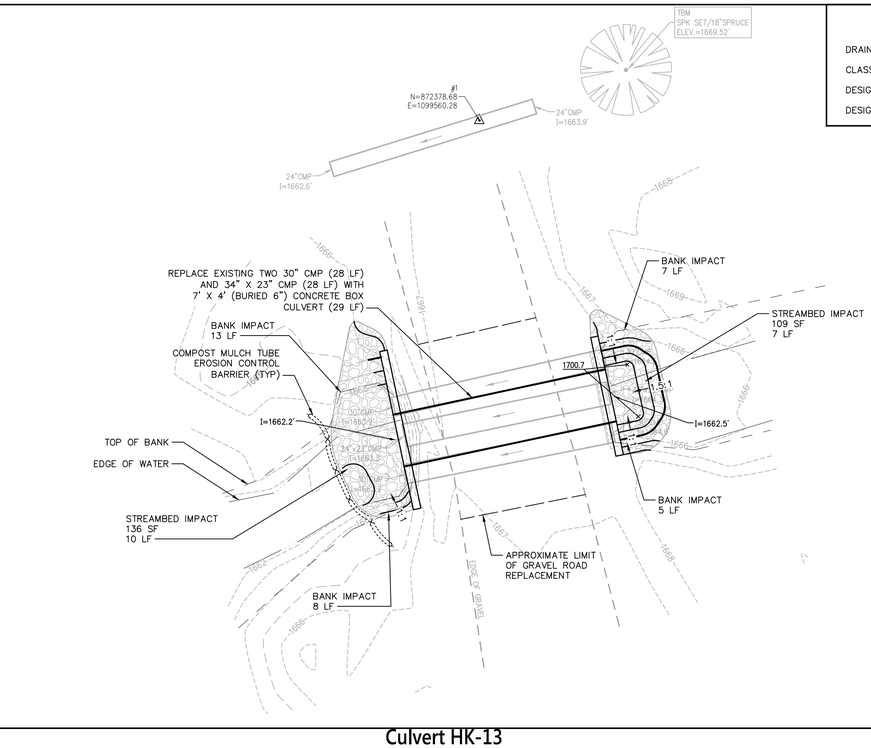
DESIGN DATA	
DRAINAGE AREA:	109 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	55.5 CFS

Culvert HK-11
SCALE: 1"=10'



DESIGN DATA	
DRAINAGE AREA:	102 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	49.3 CFS

Culvert HK-12
SCALE: 1"=10'



DESIGN DATA	
DRAINAGE AREA:	333 AC
CLASSIFICATION:	TIER 2
DESIGN STORM:	100 YR
DESIGN FLOW:	164.0 CFS

Culvert HK-13
SCALE: 1"=10'

0 5 10 20 Feet

NO.	REVISION	DATE	DRWN	CHKD	APPRV.

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Transmission Business

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NPT Off-ROW Access Road
Culvert Improvements
GRADING AND DRAINAGE PLAN

DATE: 12/15/2016
SCALE: 1"=10'

DES: .	CHK: .
DRW: .	APR: .

TOWN:

TRANSMISSION LINE:

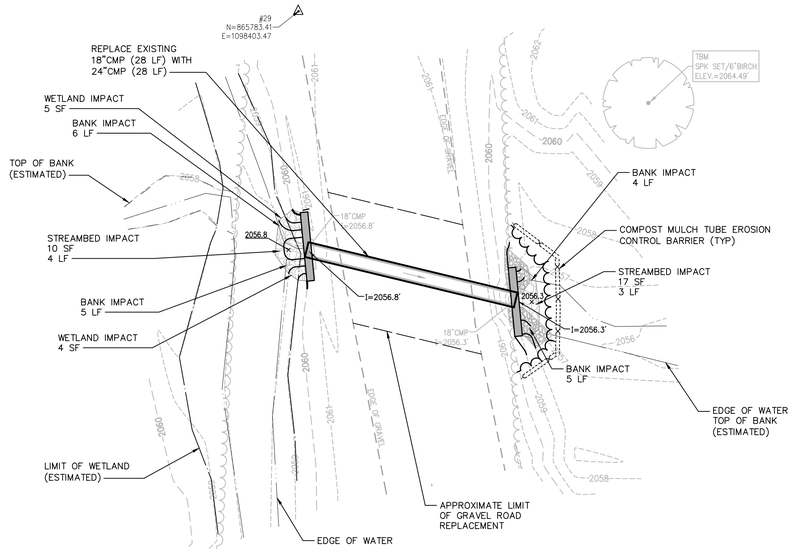
MILE NO:

DISCIPLINE/SHT NO.
C-8

SHEET 8 OF 14

DESIGN DATA

DRAINAGE AREA:	38 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	19.9 CFS

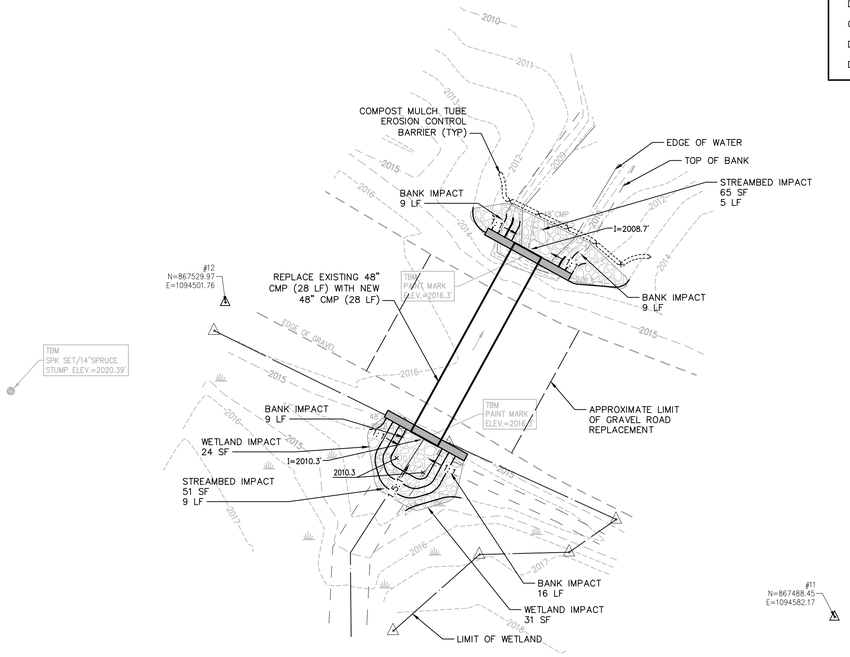


Culvert BV-1

SCALE: 1"=10'

DESIGN DATA

DRAINAGE AREA:	128 AC
CLASSIFICATION:	TIER 1
DESIGN STORM:	50 YR
DESIGN FLOW:	80.5 CFS



Culvert BV-2

SCALE: 1"=10'

0 5 10 20 Feet

NO.	REVISION	DATE	DRWN.	CHKD	APPRV.

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NPT Off-ROW Access Road
Culvert Improvements
GRADING AND DRAINAGE PLAN

DATE: 12/15/2016

SCALE: 1"=10'

DES: . | CHK: .
DRW: . | APR: .

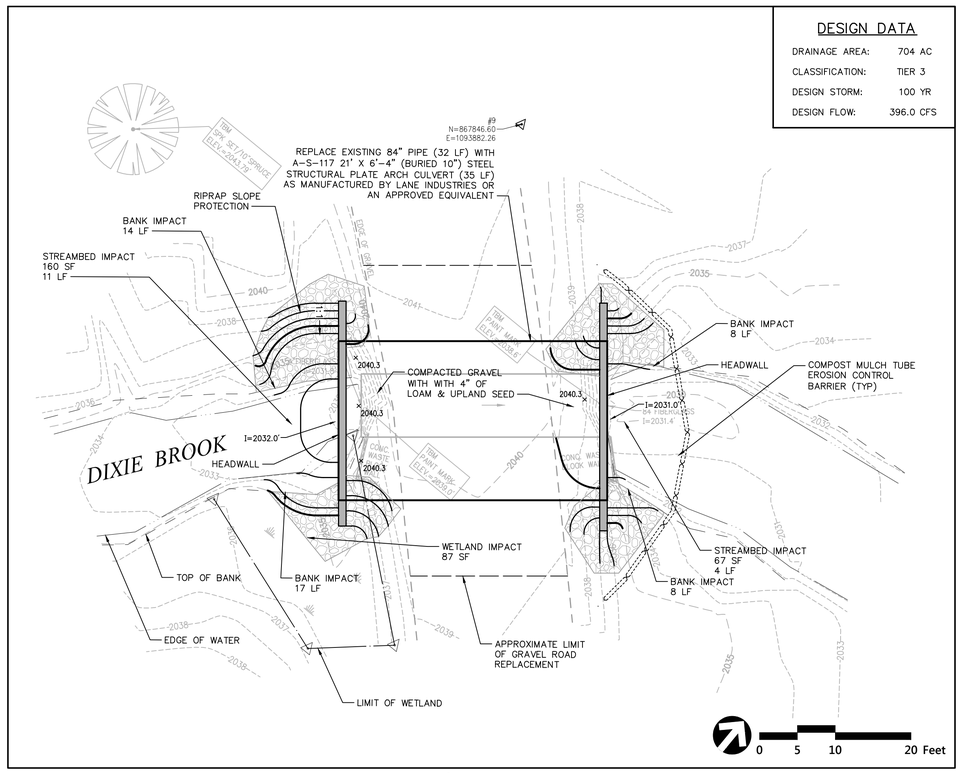
TOWN:

TRANSMISSION LINE:

MILE NO:

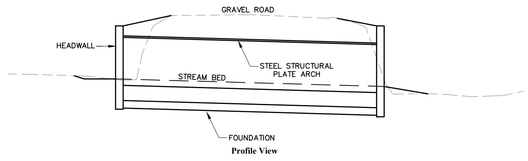
DISCIPLINE/SHT NO.
C-9

SHEET 9 OF 14



Culvert BV-3

SCALE: 1"=10'



Profile View

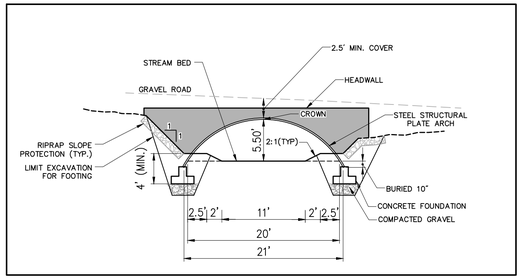
Notes:

1. CULVERT TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. CULVERT TO BE OPEN BOTTOM STEEL STRUCTURAL PLATE ARCH DESIGNED FOR HS-20 LOADING.
3. CULVERT HEADWALLS SHALL INCLUDE WING-WALLS AS MAY BE REQUIRED AND/OR AS INDICATED ON SITE PLANS.
4. A GEOTECHNCAL ENGINEER SHALL BE RETAINED TO PROVIDE RECOMMENDATIONS FOR CULVERTS WITH FOUNDATIONS. FOUNDATIONS SHALL BE DESIGNED BY A STRUCTURAL ENGINEER LICENSED IN NEW HAMPSHIRE. CONTRACTOR SHALL SUBMIT STAMPED STRUCTURAL SHOP DRAWING DESIGNS FOR TIER 3 (SPAN) CULVERT FOUNDATIONS PRIOR TO CONSTRUCTION OR ORDERING MATERIALS.
5. ALL STONE USED IN TIER 3 STREAM BEDS SHALL BE NATURAL RIVER STONE, SIMILAR IN SIZE STONES FOUND IN THE UP AND DOWNSTREAM REACHES; NOT ANGULAR RIP-RAP

Steel Structural Plate Arch Culvert

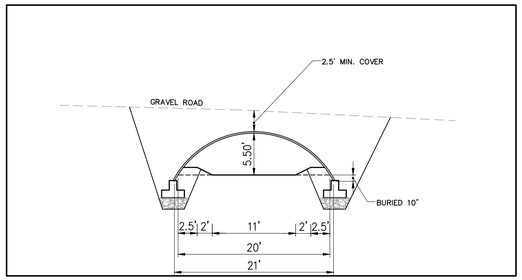
12/16

N.T.S. Source: VHB



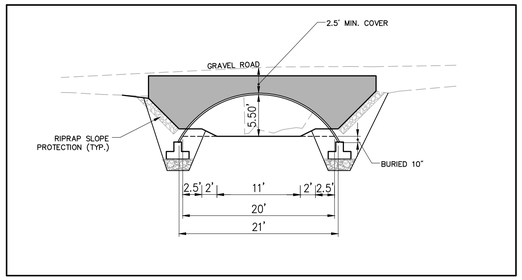
Inlet End Cross-Section

SCALE: 1"=10'



Internal Cross-Section

SCALE: 1"=10'



Outlet End Cross-Section

SCALE: 1"=10'

BV-3 STREAMBED MATERIAL

THE STREAMBED MATERIAL IS INTENDED TO SIMULATE THE NATURAL STREAMBED CONDITIONS UPSTREAM AND DOWNSTREAM OF THE CULVERT CROSSING AND IS BASED ON FIELD DATA PROVIDED BY NORMANDEAU ASSOCIATES. STREAMBED MATERIAL (COBBLE-GRAVEL-SAND FILL) SHALL CONSIST OF NATURAL FIELD STONE OR NATURAL RIVER ROCK IN AN 18-INCHES DEEP LAYER. CRUSHED STONE FROM A QUARRY OR OTHER SOURCES WILL NOT BE PERMITTED. STONE PARTICLES SHALL BE SOUND, TOUGH, DENSE, AND RESISTANT TO THE ACTION OF AIR AND WATER. COBBLE-GRAVEL-SAND FILL MAY CONTAIN SMALL AMOUNTS OF FINE AGGREGATE BUT SHALL CONTAIN NO AMOUNTS OF SOIL MATERIAL. COBBLE-GRAVEL-SAND MIX WILL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT.

COBBLE-GRAVEL-SAND FILL SHALL CONFORM TO THE FOLLOWING GRADATION:

Particle Size (In)	% Passing (By Weight)
14	100
10	20-25
2.50	0-0.7
0.07	0

NO. | REVISION | DATE | DRWN | CHKD | APPRV.

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Transmission Business

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NPT Off-ROW Access Road
Culvert Improvements
GRADING AND DRAINAGE PLAN

DATE: 12/15/2016

SCALE: 1"=10'

DES: , CHK: ,
DRW: , APR: ,

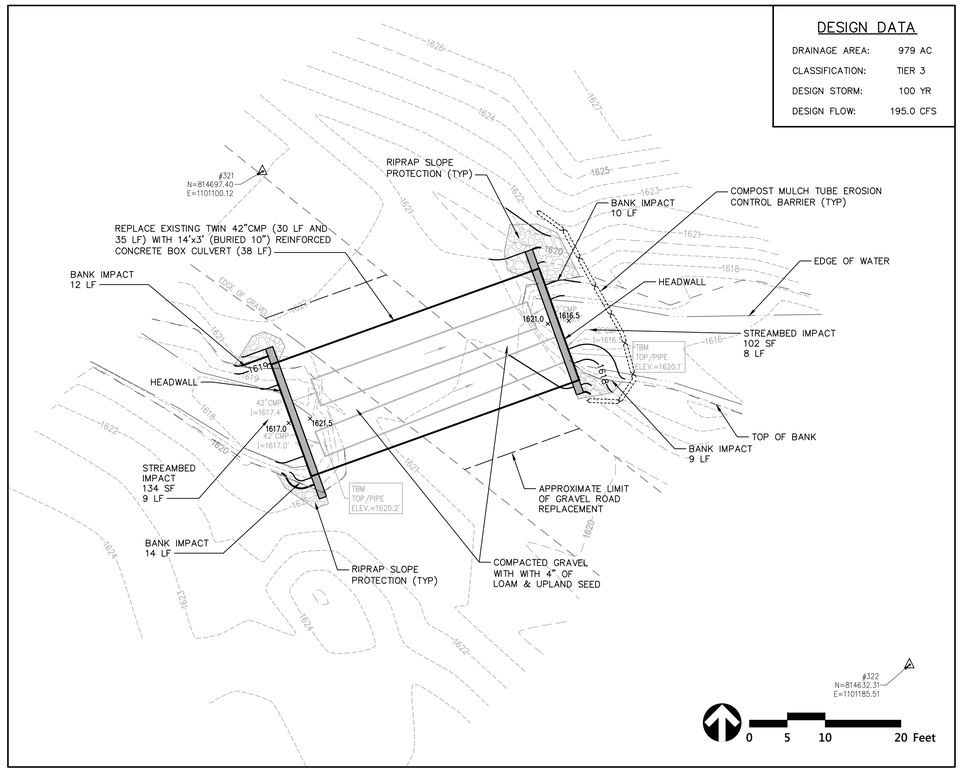
TOWN:

TRANSMISSION LINE:

MILE NO:

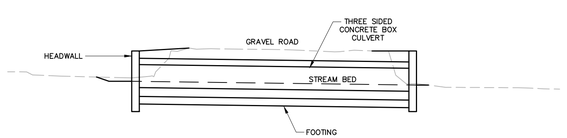
DISCIPLINE/SHT NO.
C-10

SHEET 10 OF 14



Culvert MP-3

SCALE: 1"=10'



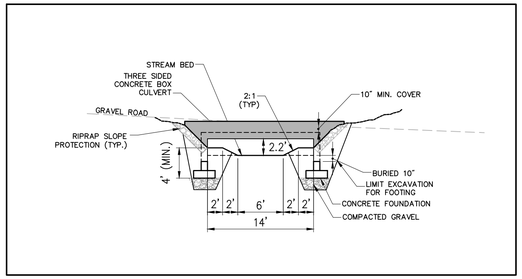
Profile View

Notes:

1. CULVERT TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. CULVERT TO BE OPEN BOTTOM, REINFORCED CONCRETE BOX CULVERT DESIGNED FOR HS-20 LOADING.
3. CULVERT HEADWALLS SHALL INCLUDE WING-WALLS AS MAY BE REQUIRED AND/OR AS INDICATED ON SITE PLANS.
4. A GEOTECHNICAL ENGINEER SHALL BE RETAINED TO PROVIDE RECOMMENDATIONS FOR CULVERTS WITH FOUNDATIONS. FOUNDATIONS SHALL BE DESIGNED BY A STRUCTURAL ENGINEER LICENSED IN NEW HAMPSHIRE. CONTRACTOR SHALL SUBMIT STAMPED STRUCTURAL SHOP DRAWING DESIGNS FOR TIER 3 (SPAN) CULVERT FOUNDATIONS PRIOR TO CONSTRUCTION OR ORDERING MATERIALS.
5. ALL STONE USED IN TIER 3 STREAM BEDS SHALL BE NATURAL RIVER STONE, SIMILAR IN SIZE STONES FOUND IN THE UP AND DOWNSTREAM REACHES; NOT ANGULAR RIP-RAP

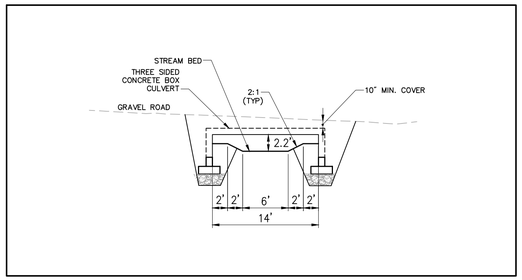
Concrete Box Culvert 11/16

1"=10' Source: VHB



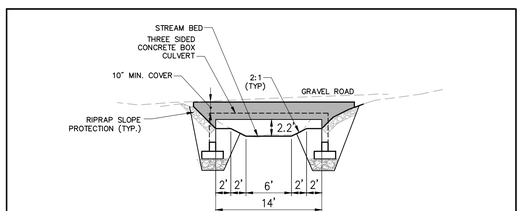
Inlet End Cross-Section

SCALE: 1"=10'



Internal Cross-Section

SCALE: 1"=10'



Outlet End Cross-Section

SCALE: 1"=10'

MP-3 STREAMBED MATERIAL

THE STREAMBED MATERIAL IS INTENDED TO SIMULATE THE NATURAL STREAMBED CONDITIONS UPSTREAM AND DOWNSTREAM OF THE CULVERT CROSSING AND IS BASED ON FIELD DATA PROVIDED BY NORMANDEAU ASSOCIATES. STREAMBED MATERIAL (COBBLE-GRAVEL-SAND FILL) SHALL CONSIST OF NATURAL FIELD STONE OR NATURAL RIVER ROCK IN AN 18-INCHES DEEP LAYER. CRUSHED STONE FROM A QUARRY OR OTHER SOURCES WILL NOT BE PERMITTED. STONE PARTICLES SHALL BE SOUND, TOUGH, DENSE, AND RESISTANT TO THE ACTION OF AIR AND WATER. COBBLE-GRAVEL-SAND FILL MAY CONTAIN SMALL AMOUNTS OF FINE AGGREGATE BUT SHALL CONTAIN NO AMOUNTS OF SOIL MATERIAL. COBBLE-GRAVEL-SAND MIX WILL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT.

COBBLE-GRAVEL-SAND FILL SHALL CONFORM TO THE FOLLOWING GRADATION:

Particle Size (In)	% Passing (By Weight)
14	100
10	18-23
2.50	0-0.6
0.07	0

NO.	REVISION	DATE	DRWN	CHKD	APPRV.

vhb

THE NORTHERN PASS™

Transmission Business

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NPT Off-ROW Access Road
Culvert Improvements
GRADING AND DRAINAGE PLAN

DATE: 12/15/2016

SCALE: 1"=10'

DES: . CHK: .
DRW: . APR: .

TOWN:

TRANSMISSION LINE:

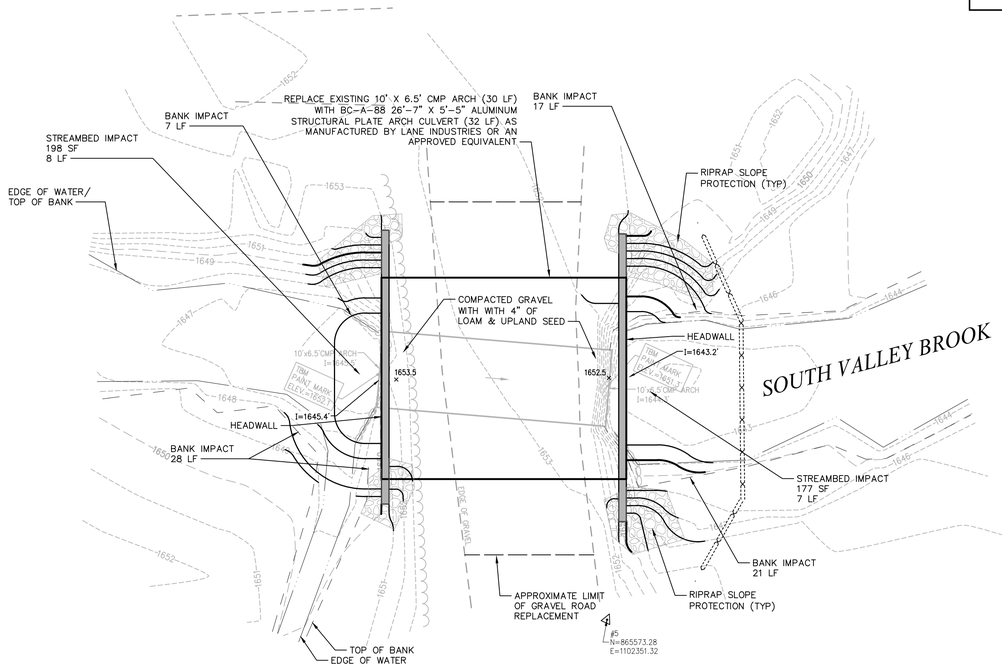
MILE NO:

DISCIPLINE/SHT NO.
C-11

SHEET 11 OF 14

DESIGN DATA

DRAINAGE AREA:	1,510 AC
CLASSIFICATION:	TIER 3
DESIGN STORM:	100 YR
DESIGN FLOW:	646.0 CFS

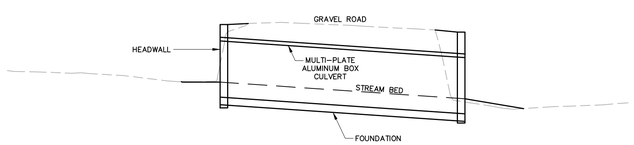


NOTE:

WATER SUPPLY LINE OBSERVED THROUGH EXISTING CULVERT.

Culvert HK-9

SCALE: 1"=10'



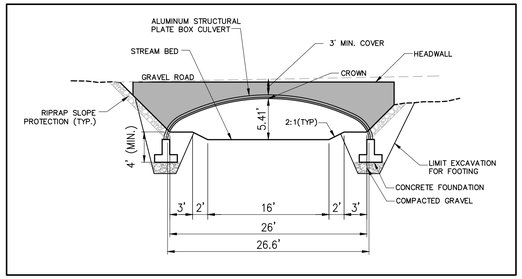
Profile View

Notes:

1. CULVERT TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. CULVERT TO BE OPEN BOTTOM, ALUMINUM STRUCTURAL PLATE BOX CULVERT DESIGNED FOR HS-20 LOADING.
3. CULVERT HEADWALLS SHALL INCLUDE WING-WALLS AS MAY BE REQUIRED AND/OR AS INDICATED ON SITE PLANS.
4. A GEOTECHNICAL ENGINEER SHALL BE RETAINED TO PROVIDE RECOMMENDATIONS FOR CULVERTS WITH FOUNDATIONS. FOUNDATIONS SHALL BE DESIGNED BY A STRUCTURAL ENGINEER LICENSED IN NEW HAMPSHIRE. CONTRACTOR SHALL SUBMIT STAMPED STRUCTURAL SHOP DRAWING DESIGNS FOR TIER 3 (SPAN) CULVERT FOUNDATIONS PRIOR TO CONSTRUCTION OR ORDERING MATERIALS.
5. ALL STONE USED IN TIER 3 STREAM BEDS SHALL BE NATURAL RIVER STONE, SIMILAR IN SIZE STONES FOUND IN THE UP AND DOWNSTREAM REACHES; NOT ANGULAR RIP-RAP

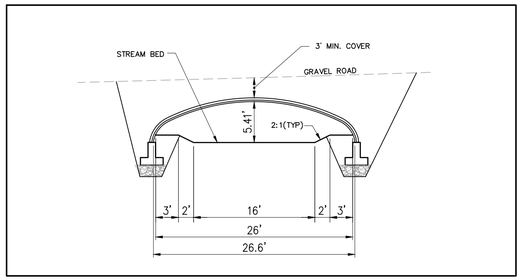
ALUMINUM STRUCTURAL PLATE BOX CULVERT

N.T.S. Source: VHB



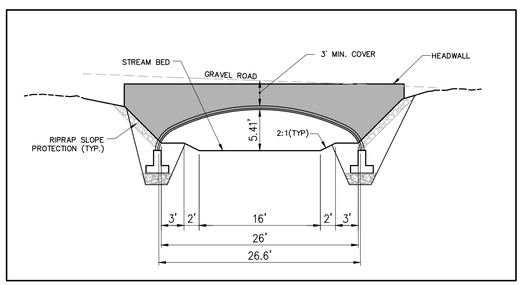
Inlet End Cross-Section

SCALE: 1"=10'



Internal Cross-Section

SCALE: 1"=10'



Outlet End Cross-Section

SCALE: 1"=10'

HK-9 STREAMBED MATERIAL

THE STREAMBED MATERIAL IS INTENDED TO SIMULATE THE NATURAL STREAMBED CONDITIONS UPSTREAM AND DOWNSTREAM OF THE CULVERT CROSSING AND IS BASED ON FIELD DATA PROVIDED BY NORMANDEAU ASSOCIATES. STREAMBED MATERIAL (COBBLE-GRAVEL-SAND FILL) SHALL CONSIST OF NATURAL FIELD STONE OR NATURAL RIVER ROCK IN AN 18-INCHES DEEP LAYER. CRUSHED STONE FROM A QUARRY OR OTHER SOURCES WILL NOT BE PERMITTED. STONE PARTICLES SHALL BE SOUND, TOUGH, DENSE, AND RESISTANT TO THE ACTION OF AIR AND WATER. COBBLE-GRAVEL-SAND FILL MAY CONTAIN SMALL AMOUNTS OF FINE AGGREGATE BUT SHALL CONTAIN NO AMOUNTS OF SOIL MATERIAL. COBBLE-GRAVEL-SAND MIX WILL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT.

COBBLE-GRAVEL-SAND FILL SHALL CONFORM TO THE FOLLOWING GRADATION:

Particle Size (In)	% Passing (By Weight)
14	100
10	22-27
2.50	0-0.5
0.07	0

NO.	REVISION	DATE	DRWN.	CHKD	APPRV.

vhb

THE NORTHERN PASS

Transmission Business

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NPT Off-ROW Access Road
Culvert Improvements
GRADING AND DRAINAGE PLAN

DATE: 12/15/2016

SCALE: 1"=10'

DES: . CHK: .
DRW: . APR: .

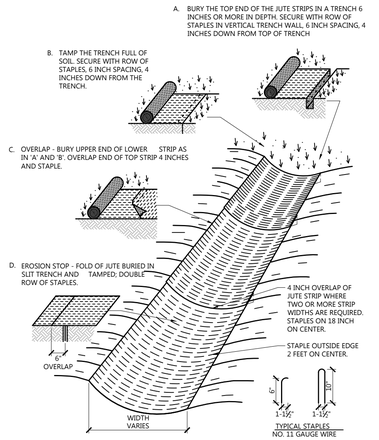
TOWN:

TRANSMISSION LINE:

MILE NO:

DISCIPLINE/SHT NO. C-12

SHEET 12 OF 14

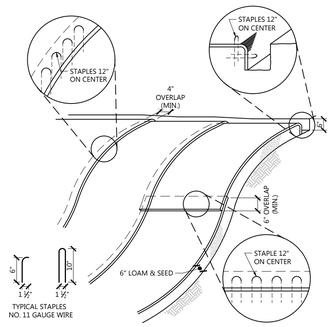


* INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS

Erosion Control Blanket Swale Installation

1/16

N.T.S. Source: VHB LD_681



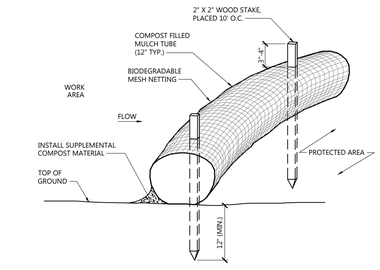
NOTES

1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH 6 INCH (MIN.) OVERLAP AND STAPLE BOTH TOGETHER.
5. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
6. EROSION CONTROL BLANKETS SHALL BE USED IN ALL AREAS WHERE SLOPES EXCEED 3:1.

Erosion Control Blanket Slope Installation

1/16

N.T.S. Source: VHB LD_680



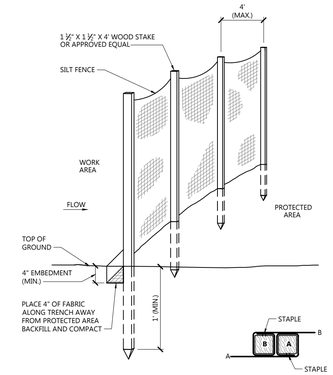
NOTES

1. COMPOST MULCH TUBES SHALL BE FILTREXX SILTSOXX, OR APPROVED EQUAL.
2. STRAW WATTLES ARE NOT AN ACCEPTABLE SUBSTITUTE.
3. COMPOST MULCH TUBES SHALL OVERLAP A MINIMUM OF 12 INCHES.
4. COMPOST MULCH TUBES SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
5. COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
6. IF NON BIODEGRADABLE NETTING IS USED THE NETTING SHALL BE COLLECTED AND DISPOSED OF OFFSITE.

Compost Mulch Tube - Erosion Control Barrier

1/16

N.T.S. Source: VHB REV LD_658



WOOD STAKE JOINT DETAIL

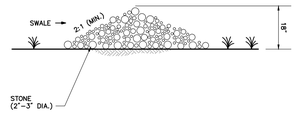
Silt Fence - Erosion Control Barrier

1/16

N.T.S. Source: VHB REV LD_650

ELEVATION

CHECK DAM SPACING



SECTION A-A

Notes:

1. THE CHECK DAMS ARE TO BE TEMPORARY UNLESS OTHERWISE NOTED ON THE PLANS.
2. THE MAXIMUM SPACING OF THE TEMPORARY CHECK DAMS SHOULD BE SUCH THAT THE TOE OF THE UPSTREAM CHECK DAM IS AT THE SAME ELEVATION AS THE OVERFLOW ELEVATION OF THE DOWNSTREAM CHECK DAM.
3. STONE CHECK DAMS SHOULD BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED STORMS AND ANY NECESSARY REPAIRS SHOULD BE MADE IMMEDIATELY.
4. SEDIMENT SHOULD BE REMOVED FROM BEHIND THE CHECK DAMS WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE CHECK DAM.
5. TEMPORARY CHECK DAMS SHOULD BE REMOVED AFTER VEGETATION HAS BEEN ESTABLISHED.
6. WHEN CHECK DAMS ARE REMOVED, THE DISTURBED AREA SHOULD BE BROUGHT TO THE EXISTING CHANNEL GRADE, SEEDED AND MULCHED WITH STRAW.

Stone Check Dam

11/16

N.T.S. Source: VHB REV 616

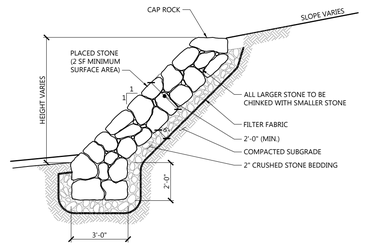
Notes:

1. CONSTRUCTION ACTIVITIES IN STREAMS SHALL BE SCHEDULED FOR PERIODS WHEN FLOWS ARE ANTICIPATED TO BE AT A MINIMUM. IF THERE IS FLOWING WATER DURING CONSTRUCTION THE FLOW SHALL BE DIVERTED AROUND THE WORK SITE IN A STABLE MANNER USING METHODS APPROVED BY THE ENGINEER. SUCH METHODS MAY INCLUDE USE OF A TEMPORARY COFFERDAM IN LARGER STREAMS SUCH AS DIXIE BROOK AND SOUTH VALLEY BROOK OR A DAM AND FLUME OR DAM AND PUMP METHOD IN SMALLER STREAMS.
2. ONCE SANDBAGS ARE IN PLACE, EITHER A TEMPORARY FLUME OR A PUMP AROUND SYSTEM WILL BE PLACED TO CONVEY ANY FLOW AROUND THE WORK SITE, AS NEEDED.
3. COFFERDAMS AND FLUME (OR PUMP AROUND) WILL BE REMOVED AFTER CULVERT/BRIDGE IS INSTALLED. COMPLETE REMOVAL IMMEDIATELY AFTER CULVERT/BRIDGE INSTALLATION, WITHIN ONE DAY WHENEVER POSSIBLE.
4. PUMP AROUND USED ONLY DURING ACTIVE CONSTRUCTION. PUMP AROUND SYSTEM SHALL NOT BE LEFT UNATTENDED. PIPE FLUME TO BE USED OVERNIGHT AND WHEN UNATTENDED.
5. TREES SHALL BE SELECTIVELY TRIMMED ALONG BANKS (IF APPLICABLE) OR CLEARED TO ALLOW EQUIPMENT TO OPERATE. GRUBBING OF ROOTS SHALL BE KEPT TO A MINIMUM.
6. DETAIL PROVIDED FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL MODIFY AS NECESSARY TO ACHIEVE REQUIRED DEWATERING OF WORK AREA.

Dam and Flume/Pump For Culvert Construction

11/16

N.T.S. Source: VHB



NOTES

1. SLOPE TO BE FOUNDED ON UNDISTURBED MATERIAL OR GRAVEL AND COMPACTED CONSISTENT WITH GEOTECHNICAL ENGINEERS RECOMMENDATIONS.
2. ONLY FOR USE OUTSIDE OF WETLAND AND STREAM RESOURCE AREAS.

Rip Rap Slope Protection

1/16

N.T.S. Source: VHB REV LD_760

NO.	REVISION	DATE	DRWN	CHKD	APPRV.

THE NORTHERN PASS
Transmission Business

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NPT Off-ROW Access Road
Culvert Improvements
SITE DETAILS 1

DATE: 12/15/2016
SCALE: NONE

DES: .	CHK: .
DRW: .	APR: .

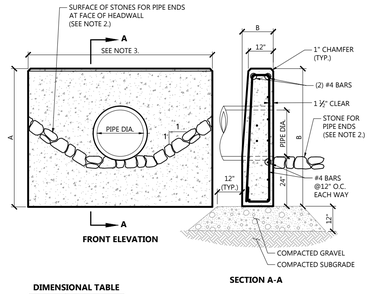
TOWN:

TRANSMISSION LINE:

MILE NO:

DISCIPLINE/SHT NO. C-13

SHEET 13 OF 14



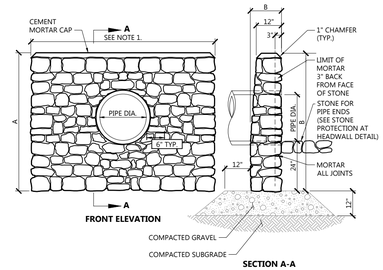
DIMENSIONAL TABLE		
PIPE DIA.	A	B
12"	4'-2"	4'-2"
15"	4'-5"	4'-5"
18"	4'-9"	4'-9"
24"	5'-3"	5'-3"
30"	5'-10"	5'-10"
36"	6'-4"	6'-4"
42"	6'-11"	6'-11"
48"	7'-5"	7'-5"
60"	8'-6"	8'-6"
72"	9'-7"	9'-7"

NOTES

1. CONCRETE SHALL BE AIR ENTRAINED TYPE II CEMENT WITH MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI
2. SEE STONE PROTECTION AT HEADWALL DETAIL.
3. SEE PLANS FOR LENGTH. CONTRACTOR SHALL FIELD VERIFY REQUIRED LENGTH AND PROVIDE SHOP DRAWING FOR REVIEW AND APPROVAL.

Concrete Headwall (HW) 1/16

N.T.S. Source: VHB REV LD_130



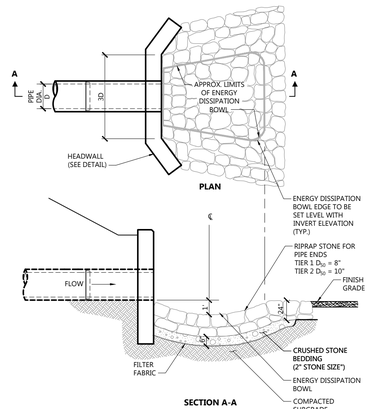
DIMENSIONAL TABLE		
PIPE DIA.	A	B
12"	4'-2"	1'-6"
15"	4'-5"	1'-6"
18"	4'-9"	1'-6"
24"	5'-3"	1'-6"
30"	5'-10"	1'-6"
36"	6'-4"	1'-9"
42"	6'-11"	1'-9"
48"	7'-5"	2'-0"
60"	8'-6"	2'-6"
72"	9'-7"	3'-0"

NOTES

1. SEE PLANS FOR LENGTH. CONTRACTOR SHALL FIELD VERIFY REQUIRED LENGTH AND PROVIDE SHOP DRAWING FOR REVIEW AND APPROVAL.

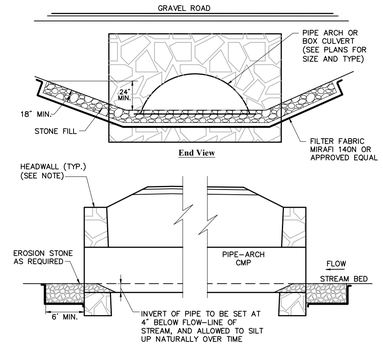
Field Stone Masonry Headwall (HW) 1/16

N.T.S. Source: VHB REV LD_131



Stone Protection at Headwall (Tier 1 and 2) 1/16

N.T.S. Source: VHB REV LD_133



Notes:

1. HEADWALL MAY BE ELIMINATED IF PIPE END IS MITERED TO CONFORM TO ROAD EMBANKMENT SLOPE AND SLOPE IS STABILIZED WITH RIPRAP OR PERMANENT VEGETATION.
2. CMP PIPE-ARCH SHALL BE MANUFACTURED BY LANE ENTERPRISES, INC. OR APPROVED EQUAL.
3. ALL STONE USED IN STREAM BEDS SHALL BE NATURAL RIVER STONE, SIMILAR IN SIZE TO STONES FOUND IN THE UP AND DOWNSTREAM REACHES; NOT ANGULAR RIPRAP.
4. REFER TO CULVERT TRENCH DETAIL FOR BEDDING AND BACKFILL REQUIREMENTS.

Tier 2 Culvert Crossing 11/16

N.T.S. Source: VHB

Culvert Trench 1/16

N.T.S. Source: VHB REV LD_300

NO.	REVISION	DATE	DRWN.	CHKD	APPRV.

THE NORTHERN PASS
Transmission Business
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NPT Off-ROW Access Road Culvert Improvements
SITE DETAILS
DATE: 12/15/2016
SCALE: NONE

DES: . CHK: .
DRW: . APR: .
TOWN:
TRANSMISSION LINE:
MILE NO:
DISCIPLINE/SHT NO. C-14
SHEET 14 OF 14