STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-3655

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

June 2, 2015

Mr. Jim McAdoo, Permit Section
TN Department of Environment and Conservation
Division of Water Pollution Control
11th Floor William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue
Nashville, Tennessee 37243

RE: NOI and SWPPP Submittals for TDOT Construction Activities

Dear Mr. McAdoo:

We request coverage under the General NPDES Permit for Discharges of Storm Water Associated with Construction Activities for the subject project. Enclosed is the Notice of Intent (NOI) for Construction Activity – Storm Water Discharges and one hard copy and one electronic copy on CD of the site-specific Storm Water Pollution Prevention Plan (SWPPP).

PE No.: 65001-1256-14, PIN: 101411.05
SR 29 (US 27), from South of Whetstone Rd to North of SR 328
Morgan County

By copy of this letter, we are sending one CD and three hard copies of the Documentation Binder for the SWPPP to the Region Construction Office (one copy for the contractor). The SWPPP sheets have been incorporated into the final plans.

Please forward our office the Notice of Coverage (NOC) for this project as soon as it becomes available. Please contact me at (615) 532-4554 if I can be of any assistance.

Sincerely,

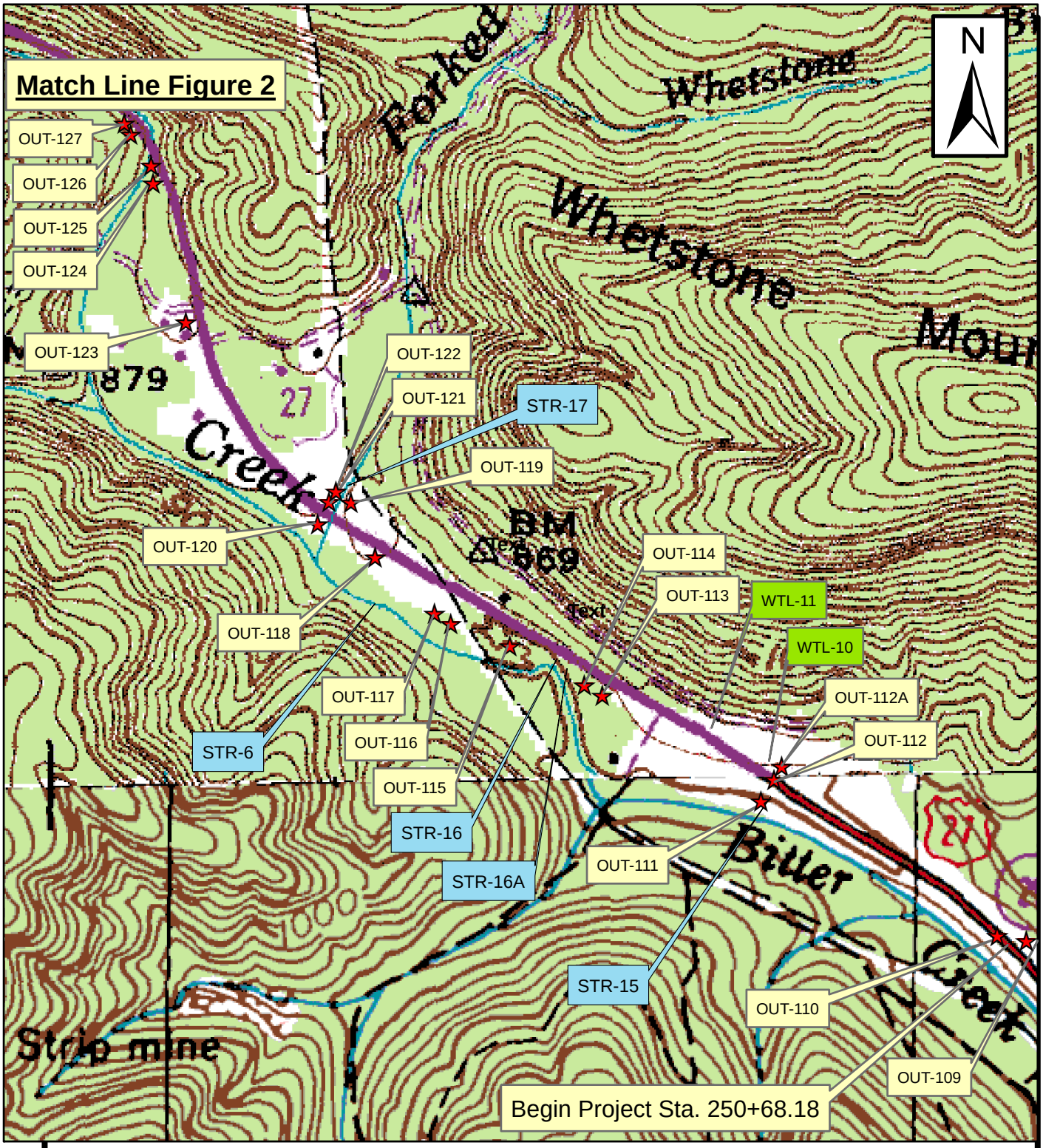
DJ Wiseman

DJ Wiseman, PE, CPESC
Civil Engineering Manager 1, Environmental Permits Section

Enclosures

JLH: DJW: RMS: pc

Enclosures for:
cc: Ms. Mary Howard, Region 1 Construction (CD)
Permit File



Approx. Outfall Location

USGS TOPOGRAPHIC MAP

Source:
USGS Topographic Maps
Camp Austin and Harriman, Tennessee Quadrangle Map (1985)

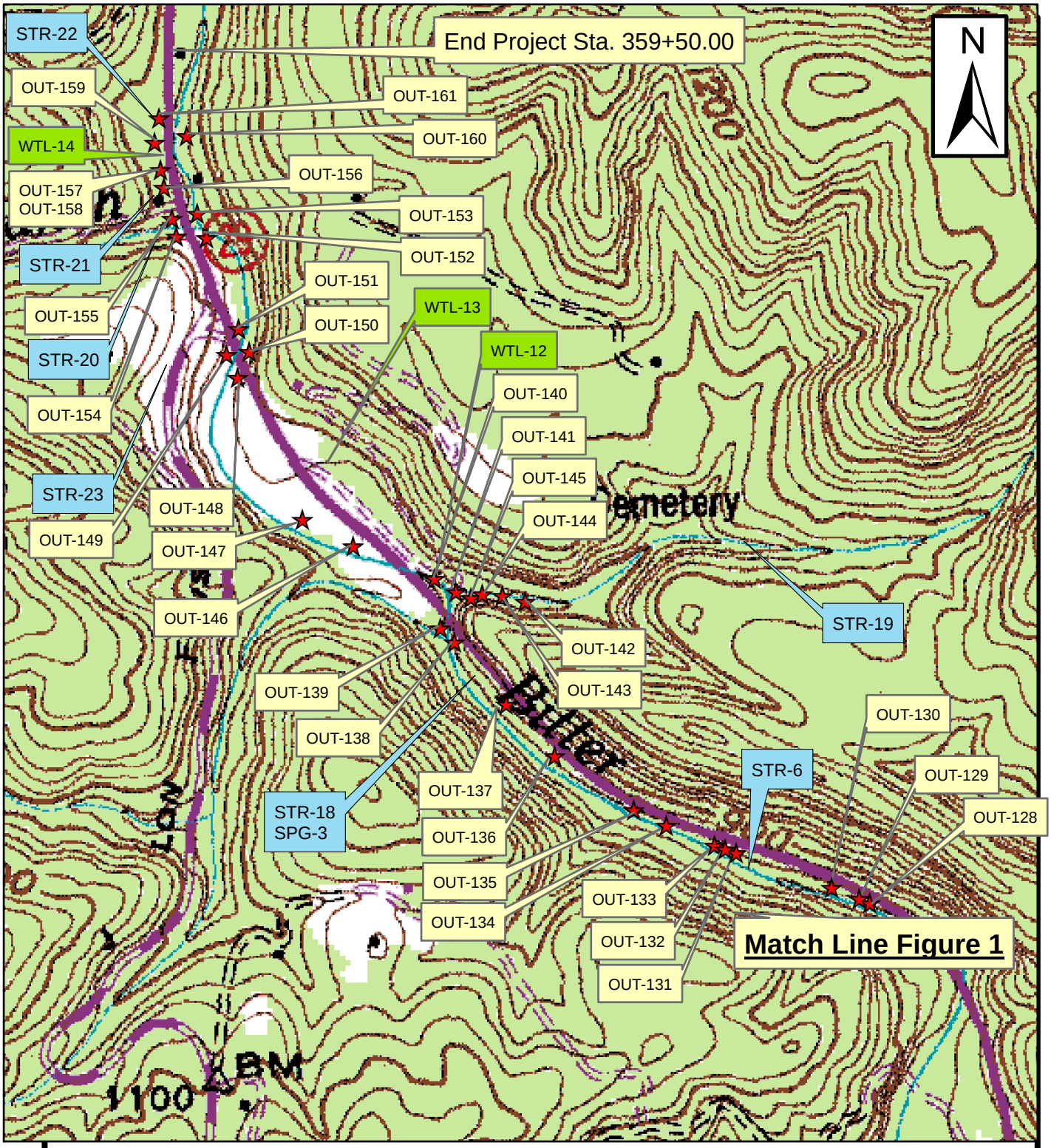
0 250 500 1,000 Feet

GRAPHIC SCALE

Stormwater Pollution Prevention Plan
SR-29(US-27): From South of Whetstone Rd
To North of SR-328
Morgan County, Tennessee

Proj. No. 65001-1256-14
PIN 101411.05

Figure 1



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Stormwater Pollution Prevention Plan
SR-29(US-27): From South of Whetstone Rd
To North of SR-328
Morgan County, Tennessee

Proj. No. 65001-1256-14
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Figure 2

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
SWPPP	2015	65001-1256-14	S1

SWPPP INDEX OF SHEETS

NOTE: CITATIONS IN PARENTHESIS INDICATE SECTIONS OF THE CURRENT CGP.

1. SWPPP REQUIREMENTS (3.0)

1.1. HAS THE SWPPP TEMPLATE BEEN PREPARED BY AN INDIVIDUAL THAT HAS THE FOLLOWING CERTIFICATIONS (3.1.1)?
YES ☒ NO ☐ (CHECK ALL THAT APPLY BELOW)
1.1.1. ☒ CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC); OR
1.1.2. ☒ TDEC LEVEL II

1.2. DOES THE EPSC PLANS INVOLVE STRUCTURAL DESIGN, HYDRAULIC, HYDROLOGIC OR OTHER ENGINEERING CALCULATIONS FOR EPSC STRUCTURAL MEASURES (SEDIMENT BASINS, ETC.)?(3.1.1)? YES ☐ NO ☒
IF YES, HAVE THE EPSC PLANS BEEN PREPARED, STAMPED AND CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER OR LANDSCAPE ARCHITECT?
☐YES ☐ NO

1.3. DOES THE PROJECT STORMWATER OUTFALLS DIRECTLY DISCHARGE INTO THE FOLLOWING (5.4.1)? YES ☐ NO ☒ (CHECK ALL THAT APPLY BELOW)
1.3.1. ☐ IMPAIRED WATERS (303d FOR SILTATION OR HABITAT ALTERATION)
1.3.2. ☐ KNOWN EXCEPTIONAL TENNESSEE WATERS
IF YES TO SECTION 1.3, HAVE THE EPSC PLANS BEEN PREPARED BY AN INDIVIDUAL WHO HAS COMPLETED TDEC LEVEL II? (5.4.1.b)
☐YES ☐ NO ☐ N/A (MAY 23, 2013 CGP EXEMPTION); AND
IF YES TO SECTION 1.3, HAS THE SWPPP TEMPLATE BEEN PREPARED BY AN INDIVIDUAL WHO HAS COMPLETED TDEC LEVEL II? (5.4.1.b)
☐YES ☐ NO ☐ N/A (MAY 23, 2013 CGP EXEMPTION)

2. SITE DESCRIPTION (3.5.1)

2.1. PROJECT LIMITS (3.5.1.g): REFER TO TITLE SHEET
2.2. PROJECT DESCRIPTION (3.5.1.a):
TITLE: SR 29, From South of Whetstone Rd. to North of SR 328
COUNTY: Morgan
PIN: 101411.05
2.3. SITE MAP(S) (3.5.1.g): REFER TO TITLE SHEET
2.4. DESCRIPTION OF EXISTING SITE TOPOGRAPHY (3.5.1.d): REFER TO EXISTING CONTOURS SHEET(S) 41 - 51, DRAINAGE MAP SHEET(S) 19, USGS QUAD MAP, AND THE OUTFALL TABLE IN SECTION 4.2.3 BELOW.
2.5. MAJOR SOIL DISTURBING ACTIVITIES (3.5.1.b) (CHECK ALL THAT APPLY):
2.5.1. ☒ CLEARING AND GRUBBING
2.5.2. ☒ EXCAVATION
2.5.3. ☒ CUTTING AND FILLING
2.5.4. ☒ FINAL GRADING AND SHAPING
2.5.5. ☒ UTILITIES
2.5.6. ☐ OTHER (DESCRIBE): ____
2.6. TOTAL PROJECT AREA (3.5.1.c): 87.9 ACRES
2.7. TOTAL AREA TO BE DISTURBED (3.5.1.c): 39.245 ACRES

IF GREATER THAN 50 ACRES, HAS CONSTRUCTION PROJECT PHASING BEEN SPECIFIED IN SECTION 3 BELOW AND IN THE PLANS (3.5.3.1.k)?
YES ☐ NO ☐ N/A ☒
2.8. ARE THERE ANY SEASONAL LIMITATIONS ON WORK? YES ☒ NO ☐
IF YES, DESCRIBE AND LIST THE CORRESPONDING PLAN SHEET: 1B: Seasonal tree clearing limitations between October 15 and March 31.
2.9. WAS ROW FINALIZED PRIOR TO FEBRUARY 1, 2010 (4.1.2.2)?
YES ☒ 1/20/2010 (DATE) NO ☐

IF ROW WAS FINALIZED PRIOR TO FEBRUARY 1, 2010, THIS PROJECT IS CONSIDERED A PRE-APPROVED SITE (4.1.2.2)

2.10. ARE UTILITIES INCLUDED IN THE CONTRACT? YES ☒ NO ☐
2.11. SOIL PROPERTIES (3.5.1.e)(4.1.1).
SOIL PROPERTIES FOR THE PRIMARY SOILS ARE LISTED IN THE TABLE BELOW.

SOIL PROPERTIES

PRIMARY SOIL NAME	HSG	% OF SITE	ERODIBILITY (k value)
Allegheny-Cotaco Complex	B	45.7%	.32
Gilpin-Petros Complex HSG-C	C	2.0%	.37
Gilpin-Bouldin-Petros Complex	C	41.6%	.37
Impervious areas		10.7%	

2.12. IS ACID PRODUCING ROCK (APR) (i.e. PYRITE) LOCATED WITHIN THE PROJECT LIMITS? YES ☒ NO ☐
2.12.1. IF YES TO SECTION 2.12, HAVE APR LOCATIONS BEEN IDENTIFIED WITHIN THE CONSTRUCTION PLANS AND/OR THE GEOTECHNICAL REPORT? ☒YES ☐ NO; AND
2.12.2. IF YES TO SECTION 2.12.1, HAS A SPECIAL HANDLING PLAN AND/OR ADAPTIVE MANAGEMENT PLAN (AMP) BEEN PREPARED FOR THE PROJECT? ☒YES ☐ NO ☐ N/A (TDOT SP107L WILL BE APPLIED.)

2.13. PROJECT RUNOFF COEFFICIENTS AND AREA PERCENTAGES (3.5.1.f).

RUNOFF COEFFICIENTS FOR EXISTING CONDITIONS

AREA TYPE	AREA(AC)	PERCENTAGE OF TOTAL AREA (%)	RUNOFF CN	C FACTOR
Allegheny-Cotaco Complex	40.19	45.7	55	
Glipin-Petros Complex HSG-C	1.73	2.0	70	
Glipin-Bouldin-Petros Complex	36.58	41.6	70	
Impervious areas	9.4	10.7	98	
WEIGHTED CURVE NUMBER OR C-FACTOR =			66	

RUNOFF COEFFICIENTS FOR POST-CONSTRUCTION CONDITIONS

AREA TYPE	AREA(AC)	PERCENTAGE OF TOTAL AREA (%)	RUNOFF CN	C FACTOR
Allegheny-Cotaco Complex	36.25	41.2	55	
Glipin-Petros Complex HSG-C	1.56	1.8	70	
Glipin-Bouldin-Petros Complex	33.00	37.6	70	
Impervious areas	17.09	19.4	98	
WEIGHTED CURVE NUMBER OR C-FACTOR =			69	

3. ORDER OF CONSTRUCTION ACTIVITIES (3.5.1.b, 3.5.2.a):

3.1. SPECIAL SEQUENCING REQUIREMENTS (SEE SHEETS N/A)
3.2. INSTALL STABILIZED CONSTRUCTION EXITS.
3.3. INSTALL PERIMETER PROTECTION WHERE RUNOFF SHEETS FROM THE SITE.
3.4. INSTALL INITIAL EPSC (EROSION PREVENTION AND SEDIMENT CONTROL) MEASURES.
3.5. PERFORM CLEARING AND GRUBBING (NOT MORE THAN 15 DAYS PRIOR TO GRADING OR EARTH-MOVING. REFER TO THE STABILIZATION PRACTICES BELOW.).
3.6. REMOVE AND STORE TOPSOIL.
3.7. STABILIZE DISTURBED AREAS WITHIN 14 DAYS OF COMPLETING ANY STAGE AND/OR PHASE OF ACTIVITY.
3.8. INSTALL UTILITIES, STORM SEWERS, CULVERTS AND BRIDGE STRUCTURES.
3.9. INSTALL INLET AND CULVERT PROTECTION ONCE STRUCTURES ARE IN PLACE AND CAPABLE OF INTERCEPTING FLOW.
3.10. PERFORM FINAL GRADING AND INSTALL BASE STONE.
3.11. COMPLETE FINAL PAVING AND SEALING OF CONCRETE.
3.12. INSTALL TRAFFIC CONTROL AND PROTECTION DEVICES.
3.13. COMPLETE FINAL STABILIZATION (TOPSOIL, SEEDING, MULCH, EROSION CONTROL BLANKET, SOD, ETC.)
3.14. REMOVE TEMPORARY EROSION CONTROLS AND ACCUMULATED SEDIMENT FROM AREAS THAT HAVE ESTABLISHED AT LEAST 70 PERCENT PERMANENT VEGETATIVE COVER.
3.15. RE-STABILIZE AREAS DISTURBED BY REMOVAL ACTIVITIES.

4. STREAM, OUTFALL, WETLAND, TMDL AND ECOLOGY INFORMATION

4.1. STREAM INFORMATION
4.1.1. WILL CONSTRUCTION AND/OR EROSION PREVENTION AND SEDIMENT CONTROLS IMPACT ANY STREAMS WITHIN THE PROJECT LIMITS?
YES ☒ NO ☐
4.1.2. IF NO TO SECTION 4.1.1, WILL THIS PROJECT DISCHARGE INTO STATE WATERS THAT ARE LESS THAN OR EQUAL TO 1 FLOW MILE DOWN GRADIENT OF THE PROJECT LIMITS? YES ☐ NO ☐
4.1.3. IF YES TO SECTION 4.1.2, HAVE ANY OF THE RECEIVING WATERS DOWN GRADIENT BEEN CLASSIFIED BY TDEC AS FOLLOWS (CHECK ALL THAT APPLY):
4.1.3.1. ☐ 303d IMPAIRED FOR SILTATION
4.1.3.2. ☐ 303d IMPAIRED FOR HABITAT ALTERATION
4.1.3.3. ☐ HIGH QUALITY WATERS OR KNOWN EXCEPTIONAL TENNESSEE WATERS (KETW)

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
SWPPP	2015	65001-1256-14	S2

4.1.4. RECEIVING STREAMS (3.5.1.j).

RECEIVING STREAM INFORMATION					
NATURAL RESOURCE LABEL	NAME OF RECEIVING NATURAL RESOURCE	303d IMPAIRED FOR SILTATION OR HABITAT ALTERATION (YES OR NO)	HIGH QUALITY OR KETW (YES OR NO)	LOCATED WITHIN PROJECT LIMITS (YES OR NO)	LOCATED WITHIN ≤ 1 FLOW MILE DOWN GRADIENT OF PROJECT LIMITS (YES OR NO)
STR-6	Bitter Creek	NO	NO	YES	YES
STR-15	Unnamed Tributary to Bitter Creek	NO	NO	YES	YES
STR-16	Unnamed Tributary to Bitter Creek	NO	NO	YES	YES
STR-16A	Unnamed Tributary to Bitter Creek	NO	NO	YES	YES
STR-17	Forked Creek	NO	NO	YES	YES
STR-18	Unnamed Tributary to Bitter Creek	NO	NO	YES	YES
STR-19	Unnamed Trib. to Bitter Creek	NO	NO	YES	YES
STR-20	Muddy Branch	NO	NO	YES	YES
STR-21	Unnamed Tributary to Muddy Branch	NO	NO	YES	YES
STR-22	Unnamed Tributary to Muddy Branch	NO	NO	YES	YES

4.1.5. ARE BUFFER ZONES REQUIRED (4.1.2, 5.4.2)? YES ☐ NO ☒

IF YES, THEY HAVE BEEN INCLUDED ON PLAN SHEET(S) _____

IF YES, CHECK THE APPROPRIATE BOX BELOW FOR SIZE OF BUFFER.

☐ 60-FEET FOR IMPAIRED AND KNOWN EXCEPTIONAL TENNESSEE WATERS (AVERAGE WIDTH PER SIDE WITH A MINIMUM OF 30-FEET)

☐ 30-FEET FOR ALL OTHER STREAMS (AVERAGE WIDTH PER SIDE WITH A MINIMUM OF 15-FEET)

IF NO, CHECK THE APPROPRIATE BOX BELOW.

☐ BUFFERS NOT REQUIRED (I.E. NO STREAM, WETLAND, ETC. IMPACTS)

☒ TDEC ARAP APPLIED FOR

BUFFER ZONE REQUIREMENTS ARE NOT REQUIRED FOR PRE-APPROVED SITES (4.1.2.2.)

4.1.6. ARE THERE BUFFER ZONE EXEMPTIONS (4.1.2.1)? YES ☐ NO ☒

IF YES, EXISTING CONDITIONS DESCRIPTION:_____

4.2. OUTFALL INFORMATION:

A SEDIMENT BASIN OR EQUIVALENT MEASURE(S) WILL BE PROVIDED FOR ANY OUTFALL IN A DRAINAGE AREA:

4.2.1. OF TEN ACRES OR MORE FOR AN OUTFALL(S) THAT DOES NOT DISCHARGE TO AN IMPAIRED STREAM OR KNOWN EXCEPTIONAL TENNESSEE WATERS (3.5.3.3) OR

4.2.2. OF FIVE ACRES OR MORE FOR AN OUTFALL(S) THAT DISCHARGES TO AN IMPAIRED STREAM OR KNOWN EXCEPTIONAL TENNESSEE WATERS (5.4.1.f).

4.2.3. OUTFALL TABLE (3.5.1.d, 5.4.1.f).

SEE SWPPP SHEET S6 FOR OUTFALL INFORMATION.

4.2.4. WHERE POSSIBLE, HAS NON-PROJECT RUN-ON BEEN DIVERTED THROUGH THE PROJECT SO THAT THE OFF-SITE RUN-ON WILL NOT FLOW OVER DISTURBED AREAS WITHIN THE ROW, THUS SEPARATING NON-PROJECT RUN-OFF FROM PROJECT RUN-OFF THEREBY REDUCING THE DRAINAGE AREA TO ANY ONE OUTFALL?

YES ☒ NO ☐ N/A ☐

4.2.5. ARE EQUIVALENT MEASURES BEING SUBSTITUTED FOR A SEDIMENT BASIN(S)? YES ☐ NO ☐ N/A ☒

4.2.6. HAVE ALL OUTFALLS BEEN LABELED ON THE EPSC PLAN SHEETS (3.5.1.g, 5.4.1.f)? YES ☒ NO ☐

4.2.7. HAVE ALL OUTFALLS BEEN LABELED ON A USGS TOPOGRAPHIC MAP INCLUDED IN THE "DOCUMENTATION AND PERMITS" BINDER (2.6.2)?

YES ☒ NO ☐

4.3. WETLAND INFORMATION

WILL CONSTRUCTION AND/OR EROSION AND SEDIMENT CONTROLS IMPACT ANY WETLANDS? YES ☒ NO ☐

IF YES, THE STRUCTURAL EPSC MEASURES HAVE BEEN INCLUDED IN THE TOTAL PROJECT WETLAND IMPACTS AND HAVE BEEN INCLUDED IN THE ARAP PERMIT, 401 OR 404 PERMITS.

WETLAND INFORMATION				
WETLAND LABEL	FROM STATION LT OR RT	TO STATION LT OR RT	TEMPORARY IMPACTS (AC)	PERMANENT IMPACTS (AC)
WTL-10	259+25 RT	260+15 RT	0.00	0.069
WTL-11	262+11 LT	266+57 LT	0.00	0.17
WTL-12	328+62 RT	330+33 RT	0.00	0.18
WTL-13	333+00 RT	335+14 RT	0.18	0.017
WTL-14	350+76 LT	357+16 LT	0.00	0.33

4.4. TOTAL MAXIMUM DAILY LOADS (TMDL) INFORMATION (3.5.10)

4.4.1. IS THIS PROJECT LOCATED IN A WATERSHED THAT MAINTAINS AN EPA APPROVED TMDL FOR SILTATION? YES ☐ NO ☒

4.4.2. IF YES, IS THIS PROJECT LOCATED WITHIN A SUBWATERSHED WITH A WASTE LOAD ALLOCATION (WLA)? YES ☐ NO ☐

4.4.3. IF YES, DOES THE PROJECT HAVE A DIRECT DISCHARGE TO A 303(d) LISTED STREAM FOR SILTATION OR HABITAT ALTERATION?

YES ☐ NO ☐

4.4.4. IF YES, HAS A SUMMARY OF THE CONSULTATION (LETTER) BEEN INCLUDED WITH THE SWPPP DOCUMENTATION? YES ☐ NO ☐

4.5. ECOLOGY INFORMATION (3.5.5.e)

IF SPECIAL NOTES ARE PRESENT IN THE TDOT ECOLOGY REPORT, HAVE THEY BEEN ADDED TO THE APPROPRIATE PLAN SHEETS?

YES ☒ NO ☐ NO NOTES REQUIRED ☐

IF YES, LIST ALL PLAN SHEETS WHERE SPECIAL NOTES HAVE BEEN ADDED. 1B

5. EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES (3.5.3)

5.1. EPSC MEASURES MUST BE DESIGNED, INSTALLED AND MAINTAINED TO CONTROL STORMWATER VOLUME AND VELOCITY WITHIN THE SITE TO MINIMIZE EROSION (4.1.1).

5.2. EPSC MEASURES MUST CONTROL STORMWATER DISCHARGES, INCLUDING BOTH PEAK FLOWS AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS, STREAM CHANNELS AND STREAM BANKS. (4.1.1)

5.3. HAVE THE CONTROL MEASURES BEEN DESIGNED ACCORDING TO THE SIZE AND SLOPE OF THE DISTURBED DRAINAGE AREA (3.5.3.3)? YES ☒ NO ☐

5.4. THE CONTROL MEASURES HAVE, AT A MINIMUM, BEEN DESIGNED FOR THE 2-YEAR, 24 HOUR STORM EVENT (3.5.3.3, 5.4.1.a).

5.5. ARE THE LIMITS OF DISTURBANCE CLEARLY MARKED ON THE EPSC PLANS (3.5.1.n)? YES ☒ NO ☐

5.6. HAVE STAGED EPSC PLANS BEEN PREPARED FOR THE PROJECT (3.5.2)?

YES ☒ NO ☐ (IF YES, CHECK ONE BELOW)

5.6.1.1. ☐ PROJECT DISTURBED AREA IS THAN LESS THAN 5 ACRES (MINIMUM OF TWO STAGES OF EPSC PLANS)

5.6.1.2. ☒ PROJECT DISTURBED AREA IS GREATER THAN 5 ACRES (MINIMUM OF THREE STAGES OF EPSC PLANS)

5.7. IS ADDITIONAL PHYSICAL OR CHEMICAL TREATMENT OF STORMWATER RUNOFF NECESSARY (5.4.1.a)? YES ☐ NO ☒

5.8. HAVE STEEP SLOPES (GREATER THAN 35%) BEEN MINIMALLY DISTURBED AND/OR PROTECTED BY CONVEYING RUNOFF NON-EROSIVELY AROUND OR OVER THE SLOPE (3.5.3.2) (10. "STEEP SLOPE")?

YES ☒ NO ☐ N/A ☐

5.9. ALL PHYSICAL AND/OR CHEMICAL TREATMENT WILL BE RESEARCHED, APPLIED IN ACCORDANCE WITH MANUFACTURE'S GUIDELINES AMD FULLY DESCRIBED ON THE EPSC PLANS (3.5.3.1.b).

5.10. ALL EPSC CONTROL MEASURES WILL BE INSTALLED ACCORDING TO TDOT STANDARDS (E.G. STANDARD DRAWINGS).

5.11. EPSC MEASURES WILL NOT BE INSTALLED IN A STREAM WITHOUT FIRST OBTAINING US COE SECTION 404, TDEC ARAP, AND TVA PERMITS.

5.12. DISCHARGES FROM DEWATERING ACTIVITIES ARE PROHIBITED UNLESS MANAGED BY CONTROLS PROVIDING EQUIVALENT LEVEL OF TREATMENT (FILTRATION) (4.14).

5.13. DISCHARGES FROM SEDIMENT BASINS AND IMPOUNDMENTS MUST USE OUTLET STRUCTURES THAT ONLY WITHDRAW WATER FROM NEAR THE SURFACE OF THE BASIN OR IMPOUNDMENT, UNLESS INFEASIBLE (4.1.7).

5.14. THE CONTROL MEASURES LISTED IN THE QUANTITIES TABLE ON SHEETS 2A AND 2A1 HAVE BEEN SELECTED IN ACCORDANCE WITH TDOT STANDARD DRAWINGS AND GOOD ENGINEERING PRACTICES (3.5.3.1.b).

5.15. THE QUANTITIES REQUIRED FOR STABILIZED CONSTRUCTION EXITS PER TDOT STANDARDS HAVE BEEN SPECIFIED ON SHEET 2A AND 2A1 (3.5.3.1.n).

5.16. STABILIZATION PRACTICES: PRE-CONSTRUCTION VEGETATIVE COVER WILL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN 15 DAYS PRIOR TO GRADING OR EARTH MOVING UNLESS THE AREA WILL BE SEEDED AND/OR MULCHED OR OTHER TEMPORARY COVER IS INSTALLED (3.5.3.1.h).

5.17. STABILIZATION MEASURES WILL BE INITIATED AS SOON AS POSSIBLE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. TEMPORARY OR PERMANENT STABILIZATION WILL BE COMPLETED WITHIN 14 DAYS AFTER ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED IN THAT AREA. PERMANENT STABILIZATION WILL REPLACE TEMPORARY MEASURES AS SOON AS PRACTICABLE (3.5.3.2).

5.18. STEEP SLOPES (3.5.3.2): STEEP SLOPES ARE DEFINED AS A NATURAL OR CREATED SLOPE OF 35% GRADE OR STEEPER REGARDLESS OF HEIGHT. STEEP SLOPES SHALL BE TEMPORARILY STABILIZED NOT LATER THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THE SLOPE HAS TEMPORARILY OR PERMANENTLY CEASED.

5.19. THE STRUCTURAL EPSC MEASURES HAVE BEEN INCLUDED IN THE TOTAL PROJECT IMPACTS AND HAVE BEEN INCLUDED IN THE AQUATIC RESOURCE ALTERATION (ARAP) PERMIT OR SECTION 401 CERTIFICATION (3.5.1.i). REFER TO THE LIST OF APPLICABLE ENVIRONMENTAL PERMITS LOCATED ON SWPPP SHEET S-5. ALL PERMITS WILL BE MAINTAINED ON SITE IN THE "DOCUMENTATION AND PERMITS" BINDER.

6. CONSTRUCTION SUPPORT ACTIVITIES – BORROW AND WASTE AREAS (1.2.2)(3.5.3.1.g)

IF OFFSITE BORROW AND WASTE AREAS BECOME NECESSARY DURING THE LIFE OF THE PROJECT, THIS SUPPORT ACTIVITY SHALL BE ADDRESSED PER THE TDOT *WASTE AND BORROW MANUAL* AS INDICATED IN THE *STATEWIDE STORMWATER MANAGEMENT PLAN (SSWMP).*

7. MAINTENANCE AND INSPECTION

7.1. INSPECTION PRACTICES (3.5.8)

7.1.1. INSPECTORS MUST HAVE SUCCESSFULLY COMPLETED THE TDEC FUNDAMENTALS OF EROSION AND SEDIMENT CONTROL COURSE (TDEC LEVEL I) AND MAINTAIN THE CERTIFICATION. A COPY OF THE INSPECTOR'S CERTIFICATION SHOULD BE KEPT ON SITE (3.5.8.1).

7.1.2. INSPECTIONS WILL BE CONDUCTED AT LEAST TWICE EVERY CALENDAR WEEK AND AT LEAST 72 HOURS A PART (3.5.8.2.a).

7.1.3. THE FREQUENCY OF EPSC INSPECTIONS MAY BE REDUCED TO ONCE A MONTH (I.E. EXTREME DROUGHT CONDITIONS, FROZEN GROUND, ETC.) WITH WRITTEN NOTIFICATION TO TDEC NASHVILLE CENTRAL OFFICE AND SUBSEQUENT TDEC APPROVAL. WRITTEN NOTIFICATION MUST INCLUDE THE INTENT TO CHANGE FREQUENCY AND JUSTIFICATION (3.5.8.2.a).

7.1.4. ALL DISTURBED AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR MATERIAL STORAGE THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, AND EACH OUTFALL WILL BE INSPECTED (3.5.8.2.b).

7.1.5. THE INSPECTOR WILL OVERSEE THE REQUIREMENTS OF OTHER CONSTRUCTION-RELATED WATER QUALITY PERMITS (I.E. TDEC ARAP, US COE AND TVA SECTION 26a PERMITS) FOR CONSTRUCTION ACTIVITIES AROUND WATERS OF THE STATE (10 "INSPECTOR").

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

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TENNESSEE D.O.T.	DESIGN DIVISION	FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
SWPPP	2015	65001-1256-14	S3

7.1.6. THE SWPPP WILL BE REVISED AS NECESSARY BASED ON THE RESULTS OF THE INSPECTION. REVISION(S) WILL BE RECORDED WITHIN 7 DAYS OF THE INSPECTION. REVISION(S) WILL BE IMPLEMENTED WITHIN 14 DAYS OF THE INSPECTION (3.8.5.2.e AND 3.8.5.2.f).

7.1.7. THE INSPECTOR SHALL CONDUCT PRE-CONSTRUCTION INSPECTIONS TO VERIFY AREAS THAT ARE NOT TO BE DISTURBED HAVE BEEN MARKED IN THE SWPPP AND IN THE FIELD BEFORE LAND DISTURBANCE ACTIVITIES BEGIN AND INITIAL MEASURES HAVE BEEN INSTALLED (10 "INSPECTOR") (3.5.1.n).

7.1.8. INSPECTIONS WILL BE DOCUMENTED ON THE TDOT EPSC INSPECTION REPORT (TDEC PRE-APPROVED) AND INCLUDE THE SCOPE OF THE INSPECTION, NAME(S), TITLE AND TN EPSC CERTIFICATION NUMBER OF PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, CURRENT APPROXIMATE DISTURBED ACREAGE AT TIME OF INSPECTION, CHECKLIST (NOC, SWPPP, RAIN GAUGE, SITE CONTACT INFORMATION, ETC.) AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWPPP (3.5.8.2.g).

7.1.9. DOCUMENTATION OF INSPECTIONS WILL BE MAINTAINED ON SITE IN THE "DOCUMENTATION AND PERMITS" BINDER. REPORTS WILL BE SUBMITTED TO THE TDOT PROJECT SUPERVISOR PER THE CONTRACT.

7.1.10. THESE INSPECTION REQUIREMENTS DO NOT APPLY TO DEFINABLE AREAS OF THE SITE THAT HAVE MET FINAL STABILIZATION REQUIREMENTS AND HAVE BEEN NOTED IN THE SWPPP.

7.1.11. TRAINED CERTIFIED INSPECTORS SHALL COMPLETE INSPECTION DOCUMENTATION TO THE BEST OF THEIR ABILITY. FALSIFYING INSPECTION RECORDS OR OTHER DOCUMENTATION OR FAILURE TO COMPLETE INSPECTION DOCUMENTATION SHALL RESULT IN A VIOLATION OF THIS PERMIT AND ANY OTHER APPLICABLE ACTS OR RULES (3.8.5.2.h).

7.2. DULY AUTHORIZED REPRESENTATIVE (7.7.3)

THE PROJECT SUPERVISOR MAY DELEGATE AN INDIVIDUAL AND/OR CONSULTANT TO SIGN EPSC INSPECTIONS REPORTS. FOR SATISFYING SIGNATORY REQUIREMENTS FOR EPSC INSPECTION REPORTS, THE PROJECT SUPERVISOR AND NEWLY AUTHORIZED INDIVIDUAL ACCEPTING RESPONSIBILITY MUST PERFORM THE FOLLOWING:

7.2.1. COMPLETE AND SIGN THE TDOT CONSTRUCTION DIVISION EPSC DELEGATION OF AUTHORITY.

7.2.2. SUBMIT THE EPSC DELEGATION OF AUTHORITY TO THE LOCAL TDEC EFO.

7.3. MAINTENANCE PRACTICES (3.5.3.1 AND 3.5.7)

7.3.1. ALL CONTROLS WILL BE MAINTAINED IN GOOD AND EFFECTIVE OPERATING ORDER. NECESSARY REPAIRS OR MAINTENANCE WILL BE ACCOMPLISHED BEFORE THE NEXT STORM EVENT AND IN NO CASE MORE THAN 24 HOURS AFTER THE NEED IS IDENTIFIED. IN A CASE WHERE THE ACTIVITY IS DEEMED IMPRACTICABLE, ANY SUCH CONDITIONS WILL BE DOCUMENTED (3.5.8.2.e).

7.3.2. ALL CONTROLS WILL BE MAINTAINED IN ACCORDANCE WITH TDOT STANDARD DRAWINGS AND GOOD ENGINEERING PRACTICES. (3.5.3.1.b)

7.3.3. SEDIMENT WILL BE REMOVED FROM SEDIMENT TRAPS, SILT FENCE, SEDIMENT BASINS, AND OTHER CONTROLS WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY 50% (3.5.3.1.e).

7.3.4. CHECK DAMS WILL BE INSPECTED FOR STABILITY. SEDIMENT WILL BE REMOVED WHEN DEPTH REACHES ONE-HALF (½) THE HEIGHT OF THE DAM.

7.3.5. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER WILL BE PICKED UP AND REMOVED FROM STORMWATER EXPOSURE PRIOR TO ANTICIPATED STORM EVENTS OR BEFORE BEING CARRIED OFF OF THE SITE BY WIND, OR OTHERWISE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORMWATER DISCHARGES. AFTER USE, MATERIALS USED FOR EROSION CONTROL WILL BE REMOVED (3.5.3.1.f).

7.3.6. ALL SEEDED AREAS WILL BE CHECKED FOR BARE SPOTS, EROSION WASHOUTS, AND VIGOROUS GROWTH FREE OF SIGNIFICANT WEED INFESTATIONS.

7.3.7. THE TDOT PROJECT SUPERVISOR OR THEIR DESIGNEE AND THE CONTRACTOR'S SITE SUPERINTENDENT ARE RESPONSIBLE FOR INSPECTIONS. MAINTENANCE AND REPAIR ACTIVITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE TDOT PROJECT SUPERVISOR OR THEIR DESIGNEE WILL COMPLETE THE INSPECTION REPORTS AND DISTRIBUTE COPIES PER THE CONTRACT.

8. SITE ASSESSMENTS (3.1.2)

QUALITY ASSURANCE SITE ASSESSMENTS OF EROSION PREVENTION AND SEDIMENT CONTROLS SHALL BE PERFORMED BY THE TDOT ENVIRONMENTAL DIVISION COMPREHENSIVE INSPECTIONS OFFICE GUIDELINES.

9. STORMWATER MANAGEMENT (3.5.4)

9.1. STORMWATER MANAGEMENT WILL BE HANDLED BY TEMPORARY CONTROLS OUTLINED IN THIS SWPPP AND ANY PERMANENT CONTROLS NEEDED TO MEET PERMANENT STORMWATER MANAGEMENT NEEDS IN THE POST CONSTRUCTION PERIOD. PERMANENT CONTROLS WILL BE SHOWN ON THE PLANS AND NOTED AS PERMANENT.

9.2. DESCRIBE ANY SPECIFIC POST-CONSTRUCTION MEASURES THAT WILL CONTROL VELOCITY, POLLUTANTS, AND/OR EROSION (3.5.1.F, 3.5.4): N/A

9.3. OTHER ITEMS NEEDING CONTROL (3.5.5)

9.3.1. CONSTRUCTION MATERIALS: THE FOLLOWING MATERIALS OR SUBSTANCES ARE EXPECTED TO BE PRESENT ON THE SITE DURING THE CONSTRUCTION PERIOD. (CHECK ALL THAT APPLY).

9.3.1.1. ☒ LUMBER, GUARDRAIL, TRAFFIC CONTROL DEVICES
9.3.1.2. ☒ CONCRETE WASHOUT
9.3.1.3. ☒ CONCRETE AND CORRUGATED METAL PIPES
9.3.1.4. ☒ MINERAL AGGREGATES, ASPHALT
9.3.1.5. ☒ EARTH
9.3.1.6. ☒ LIQUID TRAFFIC STRIPING MATERIALS, PAINT
9.3.1.7. ☒ ROCK
9.3.1.8. ☒ CURING COMPOUND
9.3.1.9. ☒ EXPLOSIVES
9.3.1.10. ☐ OTHER

THESE MATERIALS WILL BE HANDLED AS NOTED IN THIS SWPPP.

9.3.2. WASTE MATERIALS (3.5.5.b)

WASTE MATERIAL (EARTH, ROCK, ASPHALT, CONCRETE, ETC.) NOT REQUIRED FOR THE CONSTRUCTION OF THE PROJECT WILL BE DISPOSED OF BY THE CONTRACTOR. THE CONTRACTOR WILL OBTAIN ANY AND ALL NECESSARY PERMITS INCLUDING, BUT NOT LIMITED TO NPDES, AQUATIC RESOURCES ALTERATION PERMIT(S) CORPS OF ENGINEERS SECTION 404 PERMITS, AND TVA SECTION 26A PERMITS TO DISPOSE OF WASTE MATERIALS.

9.3.3. HAZARDOUS WASTE (3.5.5.c) (7.9)

ALL HAZARDOUS WASTE MATERIALS WILL BE DISPOSED OF IN A MANNER WHICH IS COMPLIANT WITH LOCAL OR STATE REGULATIONS. SITE PERSONNEL WILL BE INSTRUCTED IN THESE PRACTICES, AND THE INDIVIDUAL DESIGNATED AS THE CONTRACTOR'S ON-SITE REPRESENTATIVE WILL BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES ARE FOLLOWED. THE CONTRACTOR WILL OBTAIN ANY AND ALL NECESSARY PERMITS TO DISPOSE OF HAZARDOUS MATERIAL.

9.3.4. SANITARY WASTE (3.5.5.b)

PORTABLE SANITARY FACILITIES WILL BE PROVIDED ON ALL CONSTRUCTION SITES. SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS IN A TIMELY MANNER BY A LICENSED WASTE MANAGEMENT CONTRACTOR OR AS REQUIRED BY ANY LOCAL REGULATIONS. THE CONTRACTOR WILL OBTAIN ANY AND ALL NECESSARY PERMITS TO DISPOSE OF SANITARY WASTE.

9.3.5. OTHER MATERIALS

THE FOLLOWING MATERIALS OR SUBSTANCES ARE EXPECTED TO BE PRESENT ON THE SITE DURING THE CONSTRUCTION PERIOD. (CHECK ALL THAT APPLY).

9.3.5.1. ☒ FERTILIZERS AND LIME
9.3.5.2. ☒ PESTICIDES AND/OR HERBICIDES
9.3.5.3. ☒ DIESEL AND GASOLINE
9.3.5.4. ☒ MACHINERY LUBRICANTS (OIL AND GREASE)

THESE MATERIALS WILL BE HANDLED AS NOTED THIS SWPPP.

10. NON-STORMWATER DISCHARGES (3.5.9)

10.1. THE FOLLOWING NON-STORMWATER DISCHARGES ARE ANTICIPATED DURING THE COURSE OF THIS PROJECT (CHECK ALL THAT APPLY):

10.1.1. ☒ DEWATERING OF WORK AREAS OF COLLECTED STORMWATER AND GROUND WATER

10.1.2. ☒ WATERS USED TO WASH VEHICLES (OF DUST AND SOIL) WHERE DETERGENTS ARE NOT USED AND DETENTION AND/OR FILTERING IS PROVIDED BEFORE THE WATER LEAVES SITE

10.1.3. ☒ WATER USED TO CONTROL DUST (3.5.3.1.n)

10.1.4. ☒ POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS FROM WHICH CHLORINE HAS BEEN REMOVED TO THE MAXIMUM EXTENT PRACTICABLE

10.1.5. ☒ UNCONTAMINATED GROUNDWATER OR SPRING WATER

10.1.6. ☒ FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH POLLUTANTS

10.1.7. ☐ OTHER:

10.2. ALL ALLOWABLE NON-STORMWATER DISCHARGES WILL BE DIRECTED TO STABLE DISCHARGE STRUCTURES PRIOR TO LEAVING THE SITE. FILTERING OR CHEMICAL TREATMENT MAY BE NECESSARY PRIOR TO DISCHARGE.

10.3. THE DESIGN OF ALL IMPACTED EPSC MEASURES RECEIVING FLOW FROM ALLOWABLE NON-STORMWATER DISCHARGES MUST BE DESIGNED TO HANDLE THE VOLUME OF THE NON-STORMWATER COMPONENT.

10.4. WASH DOWN OR WASTE DISCHARGE OF CONCRETE TRUCKS WILL NOT BE PERMITTED ON-SITE UNLESS PROPER SETTLEMENT AREAS HAVE BEEN PROVIDED IN ACCORDANCE WITH BOTH STATE AND FEDERAL REGULATIONS.

10.5. ARE ANY DISCHARGES ASSOCIATED WITH INDUSTRIAL (NON-CONSTRUCTION STORMWATER) ACTIVITY EXPECTED (3.5.1.h)?

YES ☐ NO ☒ IF YES, SPECIFY THE LOCATION OF THE ACTIVITY AND ITS PERMIT NUMBER.

11. SPILL PREVENTION, MANAGEMENT AND NOTIFICATION (3.5.5.c, 5.1)

11.1. SPILL PREVENTION (3.5.5.c)

11.1.1. MATERIAL MANAGEMENT

11.1.1.1. HOUSEKEEPING

ONLY NEEDED PRODUCTS WILL BE STORED ON-SITE BY THE CONTRACTOR. EXCEPT FOR BULK MATERIALS THE CONTRACTOR WILL STORE ALL MATERIALS UNDER COVER AND IN APPROPRIATE CONTAINERS. PRODUCTS MUST BE STORED IN ORIGINAL CONTAINERS AND LABELED. MATERIAL MIXING WILL BE CONDUCTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHEN POSSIBLE, ALL PRODUCTS WILL BE USED COMPLETELY BEFORE PROPERLY DISPOSING OF THE CONTAINER OFF SITE. THE MANUFACTURER'S DIRECTIONS FOR DISPOSAL OF MATERIALS AND CONTAINERS WILL BE FOLLOWED. THE CONTRACTOR'S SITE SUPERINTENDENT WILL INSPECT MATERIALS STORAGE AREAS REGULARLY TO ENSURE PROPER USE AND DISPOSAL. DUST GENERATED WILL BE CONTROLLED IN AN ENVIRONMENTALLY SAFE MANNER. VEGETATION AREAS NOT ESSENTIAL TO THE CONSTRUCTION PROJECT WILL BE PRESERVED AND MAINTAINED AS NOTED ON THE PLANS.

11.1.1.2. HAZARDOUS MATERIALS

PRODUCTS WILL BE KEPT IN ORIGINAL CONTAINERS UNLESS THE CONTAINER IS NOT RESEALABLE. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHEETS WILL BE RETAINED IN A SAFE PLACE TO RELAY IMPORTANT PRODUCT INFORMATION. IF SURPLUS PRODUCT MUST BE DISPOSED OF, MANUFACTURER'S LABEL DIRECTIONS FOR DISPOSAL WILL BE FOLLOWED. MAINTENANCE AND REPAIR OF ALL EQUIPMENT AND VEHICLES INVOLVING OIL CHANGES, HYDRAULIC SYSTEM DRAIN DOWN, DE-GREASING OPERATIONS, FUEL TANK DRAIN DOWN AND REMOVAL, AND OTHER ACTIVITIES WHICH MAY RESULT IN THE ACCIDENTAL RELEASE OF CONTAMINANTS WILL BE CONDUCTED ON AN IMPERVIOUS SURFACE AND UNDER COVER DURING WET WEATHER TO PREVENT THE RELEASE OF CONTAMINANTS ONTO THE GROUND. WHEEL WASH WATER WILL BE COLLECTED AND ALLOWED TO SETTLE OUT SUSPENDED SOLIDS PRIOR TO DISCHARGE. WHEEL WASH WATER WILL NOT BE DISCHARGED DIRECTLY INTO ANY STORMWATER SYSTEM OR STORMWATER TREATMENT SYSTEM. POTENTIAL PH-MODIFYING MATERIALS SUCH AS: BULK CEMENT, CEMENT KILN DUST, FLY ASH, NEW CONCRETE WASHINGS AND CURING WATERS, CONCRETE PUMPING, AND MIXER WASHOUT WATERS WILL BE COLLECTED ON

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

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SITE AND MANAGED TO PREVENT CONTAMINATION OF STORMWATER RUNOFF.

11.1.1.3. PRODUCT SPECIFIC PRACTICES

11.1.1.3.1. PETROLEUM PRODUCTS: ALL ON-SITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED.

11.1.1.3.2. FERTILIZERS: FERTILIZERS WILL BE APPLIED ONLY IN THE AMOUNTS SPECIFIED BY TDOT. ONCE APPLIED, FERTILIZERS WILL BE WORKED INTO THE SOIL TO LIMIT THE EXPOSURE TO STORMWATER. FERTILIZERS WILL BE STORED IN AN ENCLOSED AREA UNDER COVER. THE CONTENTS OF PARTIALLY USED FERTILIZER BAGS WILL BE TRANSFERRED TO SEALABLE CONTAINERS TO AVOID SPILLS.

11.1.1.3.3. PAINTS: ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. THE EXCESS WILL BE DISPOSED OF ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AND APPLICABLE STATE AND LOCAL REGULATIONS.

11.1.1.3.4. CONCRETE TRUCKS: CONTRACTORS WILL PROVIDE DESIGNATED TRUCK WASHOUT AREAS ON THE SITE. THESE AREAS MUST BE SELF CONTAINED AND NOT CONNECTED TO ANY STORMWATER OUTLET OF THE SITE. UPON COMPLETION OF CONSTRUCTION WASHOUT AREAS WILL BE PROPERLY STABILIZED.

11.2. SPILL MANAGEMENT

11.2.1. IN ADDITION TO THE PREVIOUS HOUSEKEEPING AND MANAGEMENT PRACTICES, THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP IF NECESSARY.

11.2.2. FOR ALL HAZARDOUS MATERIALS STORED ON SITE, THE MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEAN UP WILL BE CLEARLY POSTED. SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATIONS OF THE INFORMATION AND CLEANUP SUPPLIES.

11.2.3. APPROPRIATE CLEANUP MATERIALS AND EQUIPMENT WILL BE MAINTAINED BY THE CONTRACTOR IN THE MATERIALS STORAGE AREA ON-SITE AND UNDER COVER. AS APPROPRIATE, EQUIPMENT AND MATERIALS MAY INCLUDE ITEMS SUCH AS BOOMS, DUST PANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC AND METAL TRASH CONTAINERS SPECIFICALLY FOR CLEAN UP PURPOSES.

11.2.4. ALL SPILLS WILL BE CLEANED IMMEDIATELY AFTER DISCOVERY AND THE MATERIALS DISPOSED OF PROPERLY. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.

11.2.5. THE CONTRACTOR'S SITE SUPERINTENDENT WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THE SITE SUPERINTENDENT HAS HAD APPROPRIATE TRAINING FOR HAZARDOUS MATERIALS HANDLING, SPILL MANAGEMENT, AND CLEANUP.

11.2.6. IF SPILLS REPRESENT AN IMMINENT THREAT OF ESCAPING THE SITE AND ENTERING RECEIVING WATERS, PERSONNEL WILL RESPOND IMMEDIATELY TO CONTAIN THE RELEASE AND NOTIFY THE SUPERINTENDENT AFTER THE SITUATION HAS BEEN STABILIZED.

11.2.7. IF OIL SHEEN IS OBSERVED ON SURFACE WATER (E.G. SETTLING PONDS, DETENTION PONDS, SWALES), ACTION WILL BE TAKEN IMMEDIATELY TO REMOVE THE MATERIAL CAUSING THE SHEEN. THE CONTRACTOR WILL USE APPROPRIATE MATERIALS TO CONTAIN AND ABSORB THE SPILL. THE SOURCE OF THE OIL SHEEN WILL ALSO BE IDENTIFIED AND REMOVED OR REPAIRED AS NECESSARY TO PREVENT FURTHER RELEASES.

11.2.8. IF A SPILL OCCURS THE SUPERINTENDENT OR THE SUPERINTENDENT'S DESIGNEE WILL BE RESPONSIBLE FOR COMPLETING THE SPILL REPORTING FORM AND FOR REPORTING THE SPILL TO THE TDOT PROJECT SUPERVISOR.

11.2.9. SPILL RESPONSE EQUIPMENT WILL BE INSPECTED AND MAINTAINED BY THE CONTRACTOR AS NECESSARY TO REPLACE ANY MATERIALS USED IN SPILL RESPONSE ACTIVITIES.

11.3. SPILL NOTIFICATION (5.1)

WHERE A RELEASE CONTAINING A HAZARDOUS SUBSTANCE IN AN AMOUNT EQUAL TO OR IN EXCESS OF A REPORTABLE QUANTITY ESTABLISHED UNDER EITHER 40 CFR 117 OR 40 CFR 302 OCCURS DURING A 24 HOUR PERIOD:

11.3.1. THE TDOT PROJECT SUPERVISOR IS RESPONSIBLE FOR NOTIFYING THE REGIONAL ENVIRONMENTAL COORDINATOR OR ASSISTANT REGIONAL ENVIRONMENTAL COORDINATOR AS SOON AS HE OR SHE HAS KNOWLEDGE OF THE DISCHARGE.

11.3.2. THE TDOT REGIONAL ENVIRONMENTAL COORDINATOR WILL NOTIFY THE LOCAL TDEC ENVIRONMENTAL FIELD OFFICE AND ANY OTHER APPLICABLE REGULATORY AGENCIES WITHIN 24 HOURS OF THE SPILL.

11.3.3. A WRITTEN DESCRIPTION OF THE RELEASE, DATE OF RELEASE AND CIRCUMSTANCES LEADING TO THE RELEASE, WHAT ACTIONS WERE TAKEN TO MITIGATE EFFECTS OF THE RELEASE, AND STEPS TAKEN TO MINIMIZE THE CHANCE OF FUTURE OCCURRENCES WILL BE SUBMITTED TO THE APPROPRIATE TDEC ENVIRONMENTAL FIELD OFFICE WITHIN 14 DAYS OF KNOWLEDGE OF THE RELEASE.

11.3.4. THE SWPPP MUST BE MODIFIED WITHIN 14 DAYS OF KNOWLEDGE OF THE RELEASE PROVIDING A DESCRIPTION OF THE RELEASE, CIRCUMSTANCES LEADING TO THE RELEASE, AND THE DATE OF RELEASE. THE SWPPP WILL BE REVIEWED AND MODIFIED AS NECESSARY TO IDENTIFY MEASURES TO PREVENT THE REOCCURRENCE OF SUCH RELEASES AND TO RESPOND TO SUCH RELEASES.

12. RECORD-KEEPING

12.1. REQUIRED RECORDS

TDOT OR THEIR DESIGNEE WILL MAINTAIN AT THE SITE THE FOLLOWING RECORDS OF CONSTRUCTION ACTIVITIES (3.5.3.1.m) (6.2.1):

12.1.1. THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR

12.1.2. THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE

12.1.3. THE DATES WHEN STABILIZATION MEASURES ARE INITIATED

12.1.4. RECORDS OF TWICE WEEKLY EPSC INSPECTION REPORTS AND CORRECTIVE MEASURES

12.1.5. RECORDS OF QUALITY ASSURANCE SITE ASSESSMENTS

12.1.6. COPY OF SITE EPSC INSPECTOR'S TDEC LEVEL 1 CERTIFICATION

12.1.7. RAINFALL MONITORING PLAN (3.5.3.1.o):

12.1.7.1. EQUIPMENT

AT A MINIMUM, THE CONTRACTOR WILL INSTALL A FENCE POST TYPE RAIN GAUGE TO MEASURE RAINFALL. THE STANDARD FENCE POST RAIN GAUGE WILL BE A WEDGE-SHAPED GAUGE THAT MEASURES UP TO 6 INCHES OF RAINFALL. AN ENGLISH SCALE WILL BE PROVIDED ON ONE FACE, WITH A METRIC SCALE ON THE OTHER FACE. GRADUATION WILL BE PERMANENTLY MOLDED IN DURABLE WEATHER-RESISTANT PLASTIC. THE MINIMUM GRADUATION WILL BE 0.01 INCH (OR 0.1MM). AN ALUMINUM BRACKET WITH SCREWS MAY BE USED TO MOUNT THE GAUGE ON A WOODEN SUPPORT.

12.1.7.2. LOCATION

THE RAIN GAUGE WILL BE LOCATED AT OR ALONG THE PROJECT SITE, AS DEFINED IN THE NOI OF THE NPDES PERMIT, IN AN OPEN AREA SUCH THAT THE MEASUREMENT WILL NOT BE INFLUENCED BY OUTSIDE FACTORS (I.E. OVERHANGS, GUTTER, TREES, ETC). AT LEAST ONE RAIN GAUGE PER LINEAR MILE IS REQUIRED ALONG (AS MEASURED ALONG THE CENTERLINE OF THE PRIMARY ALIGNMENT) THE PROJECT WHERE CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING IS ACTIVELY PERFORMED, OR EXPOSED SOIL HAS NOT YET BEEN PERMANENTLY STABILIZED.

12.1.7.3. METHODS

12.1.7.3.1. RAINFALL MONITORING WILL BE INITIATED PRIOR TO CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING, OR FILLING, EXCEPT AS SUCH MINIMAL CLEARING MAY BE NECESSARY TO INSTALL A RAIN GAUGE IN AN OPEN AREA. THE RAIN GAUGE WILL BE CHECKED FOR OPERATIONAL SOUNDNESS DAILY (DURING NORMAL BUSINESS HOURS) IN WET TIMES AND WEEKLY IN DRY TIMES. GAUGES WILL BE REPAIRED OR REPLACED ON THE SAME DAY IF FOUND TO BE NON-OPERATIONAL OR MISSING.

12.1.7.3.2. EACH RAIN GAUGE WILL BE READ (FOR DETAILED RECORDS OF RAINFALL) AND EMPTIED AFTER EVERY RAINFALL EVENT OCCURRING ON THE PROJECT SITE AT APPROXIMATELY THE SAME TIME OF THE DAY (DURING NORMAL BUSINESS HOURS). DURING PERIODS OF DRY CONDITIONS, IT WILL NOT BE NECESSARY TO READ THE RAIN GAUGE EVERY DAY. IN LIEU OF THIS REQUIREMENT ON WEEKENDS AND ON STATE HOLIDAYS, THE RAIN GAUGES CAN BE EMPTIED THE NEXT BUSINESS DAY AND A REFERENCE SITE USED FOR A RECORD OF DAILY AMOUNT OF PRECIPITATION FOR THOSE DAYS. A REFERENCE SITE IS THE DOCUMENTATION FROM THE CLOSEST GAUGE WITHIN PROXIMITY OF THE PROJECT FROM A RECOGNIZED SOURCE SUCH AS THE NOAA NATIONAL WEATHER SERVICE.

12.1.7.3.3. DETAILED RECORDS WILL BE RECORDED OF RAINFALL EVENTS INCLUDE DATES, AMOUNTS OF RAINFALL, AND THE APPROXIMATE DURATION (OR THE STARTING AND ENDING TIMES). THE RAINFALL RECORDS SHALL BE RECORDED ON THE TDOT RAINFALL RECORD SHEET AND SHALL BE MAINTAINED IN THE "DOCUMENTATION AND PERMITS" BINDER.

12.1.7.3.4. IF, IN THE EVENT THAT THE RAINFALL EVENT IS STILL IN PROGRESS AT THE DAILY RECORDING TIME, THE GAUGE WILL BE EMPTIED AND THE RECORD WILL INDICATE THAT THE STORM EVENT WAS STILL IN PROGRESS.

12.1.7.3.5. RAIN GAUGE INFORMATION (DETAILED RECORDS), INCLUDING THE LOCATION OF THE NEAREST OUTFALL, WILL BE RECORDED ON THE EPSC INSPECTION REPORT FORMS AT THE TIME OF MEASUREMENT.

12.2. KEEPING PLANS CURRENT (3.4)

TDOT OR THEIR DESIGNEE WILL MODIFY AND UPDATE THE SWPPP WHEN ANY OF THE FOLLOWING CONDITIONS APPLY:

12.2.1. WHENEVER THERE IS A CHANGE IN THE SCOPE OF THE PROJECT THAT WOULD BE EXPECTED TO HAVE A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO THE WATERS OF THE STATE AND WHICH HAS NOT OTHERWISE BEEN ADDRESSED IN THE SWPPP;

12.2.2. WHENEVER INSPECTIONS OR INVESTIGATIONS BY SITE OPERATORS, LOCAL, STATE, OR FEDERAL OFFICIALS INDICATE THE SWPPP IS PROVING INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANTS FROM CONSTRUCTION ACTIVITY SOURCES, OR IS OTHERWISE NOT ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS IN STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY; WHERE LOCAL, STATE, OR FEDERAL OFFICIALS DETERMINE THAT THE SWPPP IS INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANT SOURCES, A COPY OF ANY CORRESPONDENCE TO THAT EFFECT MUST BE RETAINED IN THE SWPPP;

12.2.3. WHEN ANY NEW OPERATOR AND/OR SUB-OPERATOR IS ASSIGNED OR RELIEVED OF THEIR RESPONSIBILITY TO IMPLEMENT A PORTION OF THE SWPPP;

12.2.4. TO PREVENT A NEGATIVE IMPACT TO LEGALLY PROTECTED STATE OR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED AQUATIC FAUNA;

12.2.5. WHEN THERE IS A CHANGE IN CHEMICAL TREATMENT METHODS INCLUDING: USE OF DIFFERENT TREATMENT CHEMICALS, DIFFERENT DOSAGE OR APPLICATION RATES OR A DIFFERENT AREA OF APPLICATION NOT SPECIFIED ON THE EPSC PLANS; OR

12.2.6. WHEN A TMDL IS DEVELOPED FOR THE RECEIVING WATERS FOR A POLLUTANT OF CONCERN (SILTATION AND/OR HABITAT ALTERATION)

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12.3. MAKING PLANS ACCESSIBLE

12.3.1. TDOT WILL RETAIN A COPY OF THIS SWPPP (INCLUDING A COPY OF THE "DOCUMENTATION AND PERMITS" BINDER AT THE CONSTRUCTION SITE (OR OTHER LOCATION ACCESSIBLE TO TDEC AND THE PUBLIC) FROM THE DATE CONSTRUCTION COMMENCES TO THE DATE OF FINAL STABILIZATION. TDOT WILL HAVE A COPY OF THE SWPPP AVAILABLE AT THE LOCATION WHERE WORK IS OCCURRING ON-SITE FOR THE USE OF OPERATORS AND THOSE IDENTIFIED AS HAVING RESPONSIBILITIES UNDER THE SWPPP WHENEVER THEY ARE ON THE CONSTRUCTION SITE (6.2).

12.3.2. PRIOR TO THE INITIATION OF LAND DISTURBING ACTIVITIES AND UNTIL THE SITE HAS MET THE FINAL STABILIZATION CRITERIA, TDOT OR THEIR DESIGNEE WILL POST A NOTICE NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE WITH THE FOLLOWING INFORMATION (3.3.3) (6.2.1):

12.3.2.1. A COPY OF THE NOTICE OF COVERAGE (NOC) WITH THE NPDES PERMIT NUMBER FOR THE PROJECT;

12.3.2.2. THE INDIVIDUAL NAME, COMPANY NAME, E-MAIL ADDRESS (IF APPLICABLE) AND TELEPHONE NUMBER OF THE LOCAL PROJECT SITE OWNER AND OPERATOR CONTACT;

12.3.2.3. A BRIEF DESCRIPTION OF THE PROJECT; AND

12.3.2.4. THE LOCATION OF THE SWPPP.

12.3.3. ALL INFORMATION DESCRIBED IN SECTION 10.3.2 MUST BE MANTAINED IN LEGIBLE CONDITION. IF POSTING THIS INFORMATION NEAR A MAIN ENTRANCE IS INFEASBLE DUE TO SAFETY CONCERNS, THE NOTICE SHALL BE POSTED IN A LOCAL BUILDING. THE NOTICE MUST BE PLACED IN A PUBLICLY ACCESSIBLE LOCATION WHERE CONSTRUCTION IS ACTIVELY UNDERWAY AND MOVED AS NECESSARY.

12.4. NOTICE OF TERMINATION (8.0)

12.4.1. WHEN ALL STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES THAT ARE AUTHORIZED BY THE PERMIT ARE ELIMINATED BY FINAL STABILIZATION, TDOT WILL SUBMIT A NOTICE OF TERMINATION (NOT) THAT IS SIGNED IN ACCORDANCE WITH THE PERMIT TO THE TDEC CENTRAL OFFICE IN NASHVILLE, TN.

12.4.2. FOR THE PURPOSES OF THE CERTIFICATION REQUIRED BY THE NOT, THE ELIMINATION OF STORMWATER DISCHARGES ASSOCIATED WITH THE CONSTRUCTION ACTIVITY MEANS THE FOLLOWING:

12.4.2.1. ALL EARTH-DISTURBING ACTIVITIES ON THE SITE ARE COMPLETED AND ALL DISTURBED SOILS AT THE PORTION OF THE CONSTRUCTION SITE WHERE THE OPERATOR HAD CONTROL HAVE BEEN FINALLY STABILIZED; AND

12.4.2.2. ALL CONSTRUCTION MATERIALS, WASTE AND WASTE HANDLING DEVICES, AND ALL EQUIPMENT, AND VEHICLES THAT WERE USED DURING CONSTRUCTION HAVE BEEN REMOVED AND PROPERLY DISPOSED; AND

12.4.2.3. ALL STORMWATER CONTROLS THAT WERE INSTALLED AND MAINTAINED DURING CONSTRUCTION, EXCEPT THOSE THAT ARE INTENDED FOR LONG-TERM USE FOLLOWING TERMINATION OF PERMIT COVERAGE, HAVE BEEN REMOVED; AND

12.4.2.4. ALL POTENTIAL POLLUTANTS AND POLLUTANT GENERATING ACTIVITIES ASSOCIATED WITH CONSTRUCTION HAVE BEEN REMOVED; AND

12.4.2.5. THE PERMITTEE HAS IDENTIFIED WHO IS RESPONSBLE FOR ONGOING MAINTENANCE OF ANY STORMWATER CONTROLS LEFT ON THE SITE FOR LONG-TERM USE FOLLOWING TERMINATION OF PERMIT COVERAGE; AND

12.4.2.6. TEMPORARY EPSC MEASURES HAVE BEEN OR WILL BE REMOVED AT AN APPROPRIATE TIME TO ENSURE FINAL STABILIZATION IS MAINTAINED; AND

12.4.2.7. ALL STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES FROM THE IDENTIFED SITE THAT ARE AUTHORIZED BY A NPDES GENERAL PERMIT HAVE OTHERWISE BEEN ELIMINATED FROM THE PORTION OF THE CONSTRUCTION SITE WHERE THE OPERATOR HAD CONTROL.

12.5. RETENTION OF RECORDS (6.2)

TDOT WILL RETAIN COPIES OF THE SWPPP, ALL REPORTS REQUIRED BY THE PERMIT, AND RECORDS OF ALL DATA USED TO COMPLETE THE NOTICE OF INTENT FOR THE PROJECT FOR A PERIOD OF AT LEAST THREE (3) YEARS FROM THE DATE THE NOT WAS FILED.

13. SITE WIDE/PRIMARY PERMITTEE CERTIFICATION (7.75)

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

AUTHORIZED TDOT PERSONNEL SIGNATURE (3.3.1)

JIM OZMENT
PRINTED NAME

ENVIRONMENTAL DIVISION DIRECTOR
TITLE

06-02-2015
DATE

14. SECONDARY PERMITTEE (OPERATOR) CERTIFICATION (7.7.6)

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE REVIEWED THIS DOCUMENT, ANY ATTACHMENTS, AND THE SWPPP REFERENCED ABOVE. BASED ON MY INQUIRY OF THE CONSTRUCTION SITE OWNER/DEVELOPER IDENTIFIED ABOVE AND/OR MY INQUIRY OF THE PERSON DIRECTLY RESPONSIBLE FOR ASSEMBLING THIS NOI AND SWPPP, I BELIEVE THE INFORMATION SUBMITTED IS ACCURATE. I AM AWARE THAT THIS NOI, IF APPROVED, MAKES THE ABOVE-DESCRIBED CONSTRUCTION ACTIVITY SUBJECT TO NPDES PERMIT NUMBER TNR100000, AND THAT CERTAIN OF MY ACTIVITIES ON-SITE ARE THEREBY REGULATED. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS, AND FOR FAILURE TO COMPLY WITH THESE PERMIT REQUIREMENTS.

AUTHORIZED OPERATOR (CONTRACTOR) SIGNATURE (3.3.1)

PRINTED NAME

TITLE

DATE

15. ENVIRONMENTAL PERMITS (9.1)

LIST ALL ENVIRONMENTAL PERMITS AND EXPIRATION DATES FOR PROJECT **(TO BE COMPLETED AT THE ENVIRONMENTAL PRECONSTRUCTION MEETING BY TDOT CONSTRUCTION OR THEIR DESIGNEE)**:

ENVIRONMENTAL PERMITS			
PERMIT	**YES OR NO**	**PERMIT OR TRACKING NO.**	**EXPIRATION DATE***
TDEC ARAP			
CORPS OF ENGINEERS (COE)			
TVA 26A			
TDEC CGP			
OTHER:			

*THE TDOT ENVIRONMENTAL DIVISION MUST BE NOTIFIED SIX MONTHS PRIOR TO PERMIT EXPIRATION DATE.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
SWPPP	2015	65001-1256-14	S6

4.2.3 OUTFALL TABLE (3.5.1.d, 5.4.1.f)

EPSC PHASE	OUTFALL LABEL	SUB-OUFALL	STATION CL, LT OR RT	SLOPE WITHIN ROW (%)	STAGE (S1) DRAINAGE AREA (AC)	STAGE 2 (S2) DRAINAGE AREA (AC)	STAGE 3 (S3) DRAINAGE AREA (AC)	SEDIMENT BASIN OR EQUIVALENT MEASURE(S) (YES, NO OR N/A)	RECEIVING NATURAL RESOURCE NAME OR LABEL	COMMENTS
1, 2, 3	109		251+00 RT	9%	2.33	1.18	1.18	N/A	WWC-21	DRAINS TO SR-29 PHASE 1 (PIN 101411.04)
1, 2, 3	110		251+30 CL	9%	0.52	0.52	0.52	N/A	MEDIAN DITCH	DRAINS TO SR-29 PHASE 1 (PIN 101411.04)
1, 2, 3	111		260+00 LT	19%	0.65	0.66	0.66	N/A	STR-15	
2, 3	112		260+00 CL	12%		1.48	1.48	N/A	STR-15	
2, 3		112A	260+00 RT	22%		0.14	4.45	N/A	STR-15	
1	113		266+10 LT	8%	0.20			N/A	STR-6	
1, 2, 3	114		266+70 LT	8%	1.14	1.00	1.00	N/A	WWC-22 / STR-6	
1, 2	115		270+30 LT	16%	1.07	0.27		N/A	STR-16A	
1, 2	116		271+80 LT	3%	2.29	1.39		N/A	STR-16	
3	116		270+80LT	3%			1.39		STR-16	
2, 3	117		272+70 LT	1%		1.63	12.80	N/A	STR-6	
1, 2, 3	118		276+50 LT	2%	1.76	1.27	8.50	N/A	WWC-26 / STR-6	
2, 3	119		280+35 RT	8%		0.21	0.60	N/A	STR-17	
1, 2	120		280+60 LT	8%	1.01	1.03		N/A	STR-17	
1	121		280+75 RT	4%	3.94			N/A	STR-17	
2, 3	122		281+00 RT	8%		3.85	14.45	N/A	STR-17	
1, 2	123		288+90 LT	5%	0.96	1.09		N/A	NATURAL SWALE	
1	124		297+30 LT	13%	0.32			N/A	STR-6	
2,3	124		297+00LT	13%		0.13	0.45		STR-6	
1	125		297+85 LT	13%	0.47			N/A	STR-6	
1	126		299+30 LT	4%	1.22			N/A	STR-6	
2, 3	127		300+00 LT	4%		1.13	18.54	N/A	STR-6	
1	128		304+85 LT	11%	0.43			N/A	STR-6	
2, 3	129		305+50 LT	4%		0.31	0.31	N/A	STR-6	
1, 2, 3	130		309+90 LT	11%	1.45	0.43	0.43	N/A	STR-6	
1	131		313+50 LT	11%	0.75			N/A	STR-6	
2, 3	132		314+00 LT	11%		1.15	7.97	N/A	STR-6	
1	133		314+00 LT	11%	1.54			N/A	STR-6	
2	133		314+50LT	11%		0.33		N/A	STR-6	
2, 3	134		317+00 LT	11%		0.40	0.40	N/A	STR-6	
1, 2, 3	135		319+30 LT	11%	1.74	0.46	1.04	N/A	STR-6	
2, 3	136		322+00 LT	6%		0.42	1.50	N/A	STR-6	
1, 2, 3	137		325+30 LT	6%	1.81	0.40	1.74	N/A	STR-6	
1, 2, 3	138		328+10 LT	6%	0.24	0.24	0.24	N/A	STR-19 / STR-6	CONFLUENCE OF STREAMS
1, 2, 3	139		328+45 LT	7%	0.46	0.46	0.46	N/A	STR-6	
1	140		328+80 RT	8%	1.26			N/A	STR-19	ROCK SEDIMENT DAM
2, 3	141		58+00 LT	10%		1.15	12.45	N/A	STR-19	HANGING ROCK RD.
2, 3	142		60+10 LT	22%		0.14	0.71	N/A	STR-19	HANGING ROCK RD.
2, 3	143		58+80 LT	3%		0.07	0.17	N/A	STR-19	HANGING ROCK RD.
2	144		58+60 LT	3%		0.05		N/A	STR-19	HANGING ROCK RD.
2	145		58+50 LT	3%		1.07		N/A	STR-19	HANGING ROCK RD.
1, 2	146		333+00 LT	10%	0.90	0.88		N/A	STR-6	
1, 2, 3	147		335+70 LT	2%	3.52	3.82	29.40	N/A	STR-6	
1, 2, 3	148		341+50 LT	3%		0.38	0.52	N/A	STR-6	
1, 2, 3	149		342+35 LT	5%	1.01	1.26	2.00	N/A	WWC-39 / STR-6	
1, 2, 3	150		343+20 RT	2%	0.51	0.40	1.00	N/A	STR-6	
1, 2	151		344+30 RT	2%	0.53	0.44		N/A	STR-6	
1, 2	152		349+00 RT	2%	0.63	0.57		N/A	STR-20 / STR-6	CONFLUENCE OF STREAMS
1, 2	153		349+40 RT	3%	1.48	1.48		N/A	STR-20 / STR-6	CONFLUENCE OF STREAMS
1, 2, 3	154		349+10 LT	2%	0.63	0.78	4.05	N/A	STR-20	
1, 2	155		349+50 LT	3%	0.29	0.17		N/A	STR-20	
2	156		349+50 LT	3%		0.70		N/A	STR-20 / STR-21	CONFLUENCE OF STREAMS
1, 2	157		350+90 LT	2%	0.27	0.27		N/A	STR-22 / WTL-14	
1, 2	158		350+95 LT	2%	0.03	0.03		N/A	STR-22 / WTL-14	
1	159		352+10 LT	2%	0.27			N/A	STR-21 / WTL-14	
1, 2, 3	160		356+10 RT	2%	1.00	1.00	1.00	N/A	STR-6	
1, 2, 3	161		356+90 LT	6%	21.91*	21.91*	21.91*	N/A	STR-22 / WTL-14	* OFFSITE DRAINGE FROM END OF PROJECT. RUNOFF WILL BE DIVERTED DURING NATURAL STREAM CONSTRUCITON FOR STR-21 AND STR-22.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
SWPPP	2015	65001-1256-14	S1

SWPPP INDEX OF SHEETS

NOTE: CITATIONS IN PARENTHESIS INDICATE SECTIONS OF THE CURRENT CGP.

1. SWPPP REQUIREMENTS (3.0)

1.1. HAS THE SWPPP TEMPLATE BEEN PREPARED BY AN INDIVIDUAL THAT HAS THE FOLLOWING CERTIFICATIONS (3.1.1)?
YES ☒ NO ☐ (CHECK ALL THAT APPLY BELOW)
1.1.1. ☒ CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC); OR
1.1.2. ☒ TDEC LEVEL II

1.2. DOES THE EPSC PLANS INVOLVE STRUCTURAL DESIGN, HYDRAULIC, HYDROLOGIC OR OTHER ENGINEERING CALCULATIONS FOR EPSC STRUCTURAL MEASURES (SEDIMENT BASINS, ETC.)?(3.1.1)? YES ☐ NO ☒
IF YES, HAVE THE EPSC PLANS BEEN PREPARED, STAMPED AND CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER OR LANDSCAPE ARCHITECT?
☐YES ☐ NO

1.3. DOES THE PROJECT STORMWATER OUTFALLS DIRECTLY DISCHARGE INTO THE FOLLOWING (5.4.1)? YES ☐ NO ☒ (CHECK ALL THAT APPLY BELOW)
1.3.1. ☐ IMPAIRED WATERS (303d FOR SILTATION OR HABITAT ALTERATION)
1.3.2. ☐ KNOWN EXCEPTIONAL TENNESSEE WATERS
IF YES TO SECTION 1.3, HAVE THE EPSC PLANS BEEN PREPARED BY AN INDIVIDUAL WHO HAS COMPLETED TDEC LEVEL II? (5.4.1.b)
☐YES ☐ NO ☐ N/A (MAY 23, 2013 CGP EXEMPTION); AND
IF YES TO SECTION 1.3, HAS THE SWPPP TEMPLATE BEEN PREPARED BY AN INDIVIDUAL WHO HAS COMPLETED TDEC LEVEL II? (5.4.1.b)
☐YES ☐ NO ☐ N/A (MAY 23, 2013 CGP EXEMPTION)

2. SITE DESCRIPTION (3.5.1)

2.1. PROJECT LIMITS (3.5.1.g): REFER TO TITLE SHEET
2.2. PROJECT DESCRIPTION (3.5.1.a):
TITLE: SR 29, From South of Whetstone Rd. to North of SR 328
COUNTY: Morgan
PIN: 101411.05
2.3. SITE MAP(S) (3.5.1.g): REFER TO TITLE SHEET
2.4. DESCRIPTION OF EXISTING SITE TOPOGRAPHY (3.5.1.d): REFER TO EXISTING CONTOURS SHEET(S) 41 - 51, DRAINAGE MAP SHEET(S) 19, USGS QUAD MAP, AND THE OUTFALL TABLE IN SECTION 4.2.3 BELOW.
2.5. MAJOR SOIL DISTURBING ACTIVITIES (3.5.1.b) (CHECK ALL THAT APPLY):
2.5.1. ☒ CLEARING AND GRUBBING
2.5.2. ☒ EXCAVATION
2.5.3. ☒ CUTTING AND FILLING
2.5.4. ☒ FINAL GRADING AND SHAPING
2.5.5. ☒ UTILITIES
2.5.6. ☐ OTHER (DESCRIBE): ____
2.6. TOTAL PROJECT AREA (3.5.1.c): 87.9 ACRES
2.7. TOTAL AREA TO BE DISTURBED (3.5.1.c): 39.245 ACRES
IF GREATER THAN 50 ACRES, HAS CONSTRUCTION PROJECT PHASING BEEN SPECIFIED IN SECTION 3 BELOW AND IN THE PLANS (3.5.3.1.k)?
YES ☐ NO ☐ N/A ☒
2.8. ARE THERE ANY SEASONAL LIMITATIONS ON WORK? YES ☒ NO ☐
IF YES, DESCRIBE AND LIST THE CORRESPONDING PLAN SHEET: 1B: Seasonal tree clearing limitations between October 15 and March 31.
2.9. WAS ROW FINALIZED PRIOR TO FEBRUARY 1, 2010 (4.1.2.2)?
YES ☒ 1/20/2010 (DATE) NO ☐

IF ROW WAS FINALIZED PRIOR TO FEBRUARY 1, 2010, THIS PROJECT IS CONSIDERED A PRE-APPROVED SITE (4.1.2.2)

2.10. ARE UTILITIES INCLUDED IN THE CONTRACT? YES ☒ NO ☐
2.11. SOIL PROPERTIES (3.5.1.e)(4.1.1).
SOIL PROPERTIES FOR THE PRIMARY SOILS ARE LISTED IN THE TABLE BELOW.

SOIL PROPERTIES			
PRIMARY SOIL NAME	HSG	% OF SITE	ERODIBILITY (k value)
Allegheny-Cotaco Complex	B	45.7%	.32
Gilpin-Petros Complex HSG-C	C	2.0%	.37
Gilpin-Bouldin-Petros Complex	C	41.6%	.37
Impervious areas		10.7%	

2.12. IS ACID PRODUCING ROCK (APR) (i.e. PYRITE) LOCATED WITHIN THE PROJECT LIMITS? YES ☒ NO ☐
2.12.1. IF YES TO SECTION 2.12, HAVE APR LOCATIONS BEEN IDENTIFIED WITHIN THE CONSTRUCTION PLANS AND/OR THE GEOTECHNICAL REPORT? ☒YES ☐ NO; AND
2.12.2. IF YES TO SECTION 2.12.1, HAS A SPECIAL HANDLING PLAN AND/OR ADAPTIVE MANAGEMENT PLAN (AMP) BEEN PREPARED FOR THE PROJECT? ☒YES ☐ NO ☐ N/A (TDOT SP107L WILL BE APPLIED.)

2.13. PROJECT RUNOFF COEFFICIENTS AND AREA PERCENTAGES (3.5.1.f).

RUNOFF COEFFICIENTS FOR EXISTING CONDITIONS				
AREA TYPE	AREA(AC)	PERCENTAGE OF TOTAL AREA (%)	RUNOFF CN	C FACTOR
Allegheny-Cotaco Complex	40.19	45.7	55	
Glipin-Petros Complex HSG-C	1.73	2.0	70	
Glipin-Bouldin-Petros Complex	36.58	41.6	70	
Impervious areas	9.4	10.7	98	
WEIGHTED CURVE NUMBER OR C-FACTOR =			66	

RUNOFF COEFFICIENTS FOR POST-CONSTRUCTION CONDITIONS				
AREA TYPE	AREA(AC)	PERCENTAGE OF TOTAL AREA (%)	RUNOFF CN	C FACTOR
Allegheny-Cotaco Complex	36.25	41.2	55	
Glipin-Petros Complex HSG-C	1.56	1.8	70	
Glipin-Bouldin-Petros Complex	33.00	37.6	70	
Impervious areas	17.09	19.4	98	
WEIGHTED CURVE NUMBER OR C-FACTOR =			69	

3. ORDER OF CONSTRUCTION ACTIVITIES (3.5.1.b, 3.5.2.a):

3.1. SPECIAL SEQUENCING REQUIREMENTS (SEE SHEETS N/A)
3.2. INSTALL STABILIZED CONSTRUCTION EXITS.
3.3. INSTALL PERIMETER PROTECTION WHERE RUNOFF SHEETS FROM THE SITE.
3.4. INSTALL INITIAL EPSC (EROSION PREVENTION AND SEDIMENT CONTROL) MEASURES.
3.5. PERFORM CLEARING AND GRUBBING (NOT MORE THAN 15 DAYS PRIOR TO GRADING OR EARTH-MOVING. REFER TO THE STABILIZATION PRACTICES BELOW.).
3.6. REMOVE AND STORE TOPSOIL.
3.7. STABILIZE DISTURBED AREAS WITHIN 14 DAYS OF COMPLETING ANY STAGE AND/OR PHASE OF ACTIVITY.
3.8. INSTALL UTILITIES, STORM SEWERS, CULVERTS AND BRIDGE STRUCTURES.
3.9. INSTALL INLET AND CULVERT PROTECTION ONCE STRUCTURES ARE IN PLACE AND CAPABLE OF INTERCEPTING FLOW.
3.10. PERFORM FINAL GRADING AND INSTALL BASE STONE.
3.11. COMPLETE FINAL PAVING AND SEALING OF CONCRETE.
3.12. INSTALL TRAFFIC CONTROL AND PROTECTION DEVICES.
3.13. COMPLETE FINAL STABILIZATION (TOPSOIL, SEEDING, MULCH, EROSION CONTROL BLANKET, SOD, ETC.)
3.14. REMOVE TEMPORARY EROSION CONTROLS AND ACCUMULATED SEDIMENT FROM AREAS THAT HAVE ESTABLISHED AT LEAST 70 PERCENT PERMANENT VEGETATIVE COVER.
3.15. RE-STABILIZE AREAS DISTURBED BY REMOVAL ACTIVITIES.

4. STREAM, OUTFALL, WETLAND, TMDL AND ECOLOGY INFORMATION

4.1. STREAM INFORMATION
4.1.1. WILL CONSTRUCTION AND/OR EROSION PREVENTION AND SEDIMENT CONTROLS IMPACT ANY STREAMS WITHIN THE PROJECT LIMITS?
YES ☒ NO ☐
4.1.2. IF NO TO SECTION 4.1.1, WILL THIS PROJECT DISCHARGE INTO STATE WATERS THAT ARE LESS THAN OR EQUAL TO 1 FLOW MILE DOWN GRADIENT OF THE PROJECT LIMITS? YES ☐ NO ☐
4.1.3. IF YES TO SECTION 4.1.2, HAVE ANY OF THE RECEIVING WATERS DOWN GRADIENT BEEN CLASSIFIED BY TDEC AS FOLLOWS (CHECK ALL THAT APPLY):
4.1.3.1. ☐ 303d IMPAIRED FOR SILTATION
4.1.3.2. ☐ 303d IMPAIRED FOR HABITAT ALTERATION
4.1.3.3. ☐ HIGH QUALITY WATERS OR KNOWN EXCEPTIONAL TENNESSEE WATERS (KETW)

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
SWPPP	2015	65001-1256-14	S2

4.1.4. RECEIVING STREAMS (3.5.1.j).

RECEIVING STREAM INFORMATION					
NATURAL RESOURCE LABEL	NAME OF RECEIVING NATURAL RESOURCE	303d IMPAIRED FOR SILTATION OR HABITAT ALTERATION (YES OR NO)	HIGH QUALITY OR KETW (YES OR NO)	LOCATED WITHIN PROJECT LIMITS (YES OR NO)	LOCATED WITHIN ≤ 1 FLOW MILE DOWN GRADIENT OF PROJECT LIMITS (YES OR NO)
STR-6	Bitter Creek	NO	NO	YES	YES
STR-15	Unnamed Tributary to Bitter Creek	NO	NO	YES	YES
STR-16	Unnamed Tributary to Bitter Creek	NO	NO	YES	YES
STR-16A	Unnamed Tributary to Bitter Creek	NO	NO	YES	YES
STR-17	Forked Creek	NO	NO	YES	YES
STR-18	Unnamed Tributary to Bitter Creek	NO	NO	YES	YES
STR-19	Unnamed Trib. to Bitter Creek	NO	NO	YES	YES
STR-20	Muddy Branch	NO	NO	YES	YES
STR-21	Unnamed Tributary to Muddy Branch	NO	NO	YES	YES
STR-22	Unnamed Tributary to Muddy Branch	NO	NO	YES	YES

4.1.5. ARE BUFFER ZONES REQUIRED (4.1.2, 5.4.2)? YES ☐ NO ☒

IF YES, THEY HAVE BEEN INCLUDED ON PLAN SHEET(S) _____

IF YES, CHECK THE APPROPRIATE BOX BELOW FOR SIZE OF BUFFER.

☐ 60-FEET FOR IMPAIRED AND KNOWN EXCEPTIONAL TENNESSEE WATERS (AVERAGE WIDTH PER SIDE WITH A MINIMUM OF 30-FEET)

☐ 30-FEET FOR ALL OTHER STREAMS (AVERAGE WIDTH PER SIDE WITH A MINIMUM OF 15-FEET)

IF NO, CHECK THE APPROPRIATE BOX BELOW.

☐ BUFFERS NOT REQUIRED (I.E. NO STREAM, WETLAND, ETC. IMPACTS)

☒ TDEC ARAP APPLIED FOR

BUFFER ZONE REQUIREMENTS ARE NOT REQUIRED FOR PRE-APPROVED SITES (4.1.2.2.)

4.1.6. ARE THERE BUFFER ZONE EXEMPTIONS (4.1.2.1)? YES ☐ NO ☒

IF YES, EXISTING CONDITIONS DESCRIPTION:_____

4.2. OUTFALL INFORMATION:

A SEDIMENT BASIN OR EQUIVALENT MEASURE(S) WILL BE PROVIDED FOR ANY OUTFALL IN A DRAINAGE AREA:

4.2.1. OF TEN ACRES OR MORE FOR AN OUTFALL(S) THAT DOES NOT DISCHARGE TO AN IMPAIRED STREAM OR KNOWN EXCEPTIONAL TENNESSEE WATERS (3.5.3.3) OR

4.2.2. OF FIVE ACRES OR MORE FOR AN OUTFALL(S) THAT DISCHARGES TO AN IMPAIRED STREAM OR KNOWN EXCEPTIONAL TENNESSEE WATERS (5.4.1.f).

4.2.3. OUTFALL TABLE (3.5.1.d, 5.4.1.f).

SEE SWPPP SHEET S6 FOR OUTFALL INFORMATION.

4.2.4. WHERE POSSIBLE, HAS NON-PROJECT RUN-ON BEEN DIVERTED THROUGH THE PROJECT SO THAT THE OFF-SITE RUN-ON WILL NOT FLOW OVER DISTURBED AREAS WITHIN THE ROW, THUS SEPARATING NON-PROJECT RUN-OFF FROM PROJECT RUN-OFF THEREBY REDUCING THE DRAINAGE AREA TO ANY ONE OUTFALL?

YES ☒ NO ☐ N/A ☐

4.2.5. ARE EQUIVALENT MEASURES BEING SUBSTITUTED FOR A SEDIMENT BASIN(S)? YES ☐ NO ☐ N/A ☒

4.2.6. HAVE ALL OUTFALLS BEEN LABELED ON THE EPSC PLAN SHEETS (3.5.1.g, 5.4.1.f)? YES ☒ NO ☐

4.2.7. HAVE ALL OUTFALLS BEEN LABELED ON A USGS TOPOGRAPHIC MAP INCLUDED IN THE "DOCUMENTATION AND PERMITS" BINDER (2.6.2)?

YES ☒ NO ☐

4.3. WETLAND INFORMATION

WILL CONSTRUCTION AND/OR EROSION AND SEDIMENT CONTROLS IMPACT ANY WETLANDS? YES ☒ NO ☐

IF YES, THE STRUCTURAL EPSC MEASURES HAVE BEEN INCLUDED IN THE TOTAL PROJECT WETLAND IMPACTS AND HAVE BEEN INCLUDED IN THE ARAP PERMIT, 401 OR 404 PERMITS.

WETLAND INFORMATION				
WETLAND LABEL	FROM STATION LT OR RT	TO STATION LT OR RT	TEMPORARY IMPACTS (AC)	PERMANENT IMPACTS (AC)
WTL-10	259+25 RT	260+15 RT	0.00	0.069
WTL-11	262+11 LT	266+57 LT	0.00	0.17
WTL-12	328+62 RT	330+33 RT	0.00	0.18
WTL-13	333+00 RT	335+14 RT	0.18	0.017
WTL-14	350+76 LT	357+16 LT	0.00	0.33

4.4. TOTAL MAXIMUM DAILY LOADS (TMDL) INFORMATION (3.5.10)

4.4.1. IS THIS PROJECT LOCATED IN A WATERSHED THAT MAINTAINS AN EPA APPROVED TMDL FOR SILTATION? YES ☐ NO ☒

4.4.2. IF YES, IS THIS PROJECT LOCATED WITHIN A SUBWATERSHED WITH A WASTE LOAD ALLOCATION (WLA)? YES ☐ NO ☐

4.4.3. IF YES, DOES THE PROJECT HAVE A DIRECT DISCHARGE TO A 303(d) LISTED STREAM FOR SILTATION OR HABITAT ALTERATION?

YES ☐ NO ☐

4.4.4. IF YES, HAS A SUMMARY OF THE CONSULTATION (LETTER) BEEN INCLUDED WITH THE SWPPP DOCUMENTATION? YES ☐ NO ☐

4.5. ECOLOGY INFORMATION (3.5.5.e)

IF SPECIAL NOTES ARE PRESENT IN THE TDOT ECOLOGY REPORT, HAVE THEY BEEN ADDED TO THE APPROPRIATE PLAN SHEETS?

YES ☒ NO ☐ NO NOTES REQUIRED ☐

IF YES, LIST ALL PLAN SHEETS WHERE SPECIAL NOTES HAVE BEEN ADDED. 1B

5. EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES (3.5.3)

5.1. EPSC MEASURES MUST BE DESIGNED, INSTALLED AND MAINTAINED TO CONTROL STORMWATER VOLUME AND VELOCITY WITHIN THE SITE TO MINIMIZE EROSION (4.1.1).

5.2. EPSC MEASURES MUST CONTROL STORMWATER DISCHARGES, INCLUDING BOTH PEAK FLOWS AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS, STREAM CHANNELS AND STREAM BANKS. (4.1.1)

5.3. HAVE THE CONTROL MEASURES BEEN DESIGNED ACCORDING TO THE SIZE AND SLOPE OF THE DISTURBED DRAINAGE AREA (3.5.3.3)? YES ☒ NO ☐

5.4. THE CONTROL MEASURES HAVE, AT A MINIMUM, BEEN DESIGNED FOR THE 2-YEAR, 24 HOUR STORM EVENT (3.5.3.3, 5.4.1.a).

5.5. ARE THE LIMITS OF DISTURBANCE CLEARLY MARKED ON THE EPSC PLANS (3.5.1.n)? YES ☒ NO ☐

5.6. HAVE STAGED EPSC PLANS BEEN PREPARED FOR THE PROJECT (3.5.2)?

YES ☒ NO ☐ (IF YES, CHECK ONE BELOW)

5.6.1.1. ☐ PROJECT DISTURBED AREA IS THAN LESS THAN 5 ACRES (MINIMUM OF TWO STAGES OF EPSC PLANS)

5.6.1.2. ☒ PROJECT DISTURBED AREA IS GREATER THAN 5 ACRES (MINIMUM OF THREE STAGES OF EPSC PLANS)

5.7. IS ADDITIONAL PHYSICAL OR CHEMICAL TREATMENT OF STORMWATER RUNOFF NECESSARY (5.4.1.a)? YES ☐ NO ☒

5.8. HAVE STEEP SLOPES (GREATER THAN 35%) BEEN MINIMALLY DISTURBED AND/OR PROTECTED BY CONVEYING RUNOFF NON-EROSIVELY AROUND OR OVER THE SLOPE (3.5.3.2) (10. "STEEP SLOPE")?

YES ☒ NO ☐ N/A ☐

5.9. ALL PHYSICAL AND/OR CHEMICAL TREATMENT WILL BE RESEARCHED, APPLIED IN ACCORDANCE WITH MANUFACTURE'S GUIDELINES AMD FULLY DESCRIBED ON THE EPSC PLANS (3.5.3.1.b).

5.10. ALL EPSC CONTROL MEASURES WILL BE INSTALLED ACCORDING TO TDOT STANDARDS (E.G. STANDARD DRAWINGS).

5.11. EPSC MEASURES WILL NOT BE INSTALLED IN A STREAM WITHOUT FIRST OBTAINING US COE SECTION 404, TDEC ARAP, AND TVA PERMITS.

5.12. DISCHARGES FROM DEWATERING ACTIVITIES ARE PROHIBITED UNLESS MANAGED BY CONTROLS PROVIDING EQUIVALENT LEVEL OF TREATMENT (FILTRATION) (4.14).

5.13. DISCHARGES FROM SEDIMENT BASINS AND IMPOUNDMENTS MUST USE OUTLET STRUCTURES THAT ONLY WITHDRAW WATER FROM NEAR THE SURFACE OF THE BASIN OR IMPOUNDMENT, UNLESS INFEASIBLE (4.1.7).

5.14. THE CONTROL MEASURES LISTED IN THE QUANTITIES TABLE ON SHEETS 2A AND 2A1 HAVE BEEN SELECTED IN ACCORDANCE WITH TDOT STANDARD DRAWINGS AND GOOD ENGINEERING PRACTICES (3.5.3.1.b).

5.15. THE QUANTITIES REQUIRED FOR STABILIZED CONSTRUCTION EXITS PER TDOT STANDARDS HAVE BEEN SPECIFIED ON SHEET 2A AND 2A1 (3.5.3.1.n).

5.16. STABILIZATION PRACTICES: PRE-CONSTRUCTION VEGETATIVE COVER WILL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN 15 DAYS PRIOR TO GRADING OR EARTH MOVING UNLESS THE AREA WILL BE SEEDED AND/OR MULCHED OR OTHER TEMPORARY COVER IS INSTALLED (3.5.3.1.h).

5.17. STABILIZATION MEASURES WILL BE INITIATED AS SOON AS POSSIBLE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. TEMPORARY OR PERMANENT STABILIZATION WILL BE COMPLETED WITHIN 14 DAYS AFTER ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED IN THAT AREA. PERMANENT STABILIZATION WILL REPLACE TEMPORARY MEASURES AS SOON AS PRACTICABLE (3.5.3.2).

5.18. STEEP SLOPES (3.5.3.2): STEEP SLOPES ARE DEFINED AS A NATURAL OR CREATED SLOPE OF 35% GRADE OR STEEPER REGARDLESS OF HEIGHT. STEEP SLOPES SHALL BE TEMPORARILY STABILIZED NOT LATER THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THE SLOPE HAS TEMPORARILY OR PERMANENTLY CEASED.

5.19. THE STRUCTURAL EPSC MEASURES HAVE BEEN INCLUDED IN THE TOTAL PROJECT IMPACTS AND HAVE BEEN INCLUDED IN THE AQUATIC RESOURCE ALTERATION (ARAP) PERMIT OR SECTION 401 CERTIFICATION (3.5.1.i). REFER TO THE LIST OF APPLICABLE ENVIRONMENTAL PERMITS LOCATED ON SWPPP SHEET S-5. ALL PERMITS WILL BE MAINTAINED ON SITE IN THE "DOCUMENTATION AND PERMITS" BINDER.

6. CONSTRUCTION SUPPORT ACTIVITIES – BORROW AND WASTE AREAS (1.2.2)(3.5.3.1.g)

IF OFFSITE BORROW AND WASTE AREAS BECOME NECESSARY DURING THE LIFE OF THE PROJECT, THIS SUPPORT ACTIVITY SHALL BE ADDRESSED PER THE TDOT *WASTE AND BORROW MANUAL* AS INDICATED IN THE *STATEWIDE STORMWATER MANAGEMENT PLAN (SSWMP).*

7. MAINTENANCE AND INSPECTION

7.1. INSPECTION PRACTICES (3.5.8)

7.1.1. INSPECTORS MUST HAVE SUCCESSFULLY COMPLETED THE TDEC FUNDAMENTALS OF EROSION AND SEDIMENT CONTROL COURSE (TDEC LEVEL I) AND MAINTAIN THE CERTIFICATION. A COPY OF THE INSPECTOR'S CERTIFICATION SHOULD BE KEPT ON SITE (3.5.8.1).

7.1.2. INSPECTIONS WILL BE CONDUCTED AT LEAST TWICE EVERY CALENDAR WEEK AND AT LEAST 72 HOURS A PART (3.5.8.2.a).

7.1.3. THE FREQUENCY OF EPSC INSPECTIONS MAY BE REDUCED TO ONCE A MONTH (I.E. EXTREME DROUGHT CONDITIONS, FROZEN GROUND, ETC.) WITH WRITTEN NOTIFICATION TO TDEC NASHVILLE CENTRAL OFFICE AND SUBSEQUENT TDEC APPROVAL. WRITTEN NOTIFICATION MUST INCLUDE THE INTENT TO CHANGE FREQUENCY AND JUSTIFICATION (3.5.8.2.a).

7.1.4. ALL DISTURBED AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR MATERIAL STORAGE THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, AND EACH OUTFALL WILL BE INSPECTED (3.5.8.2.b).

7.1.5. THE INSPECTOR WILL OVERSEE THE REQUIREMENTS OF OTHER CONSTRUCTION-RELATED WATER QUALITY PERMITS (I.E. TDEC ARAP, US COE AND TVA SECTION 26a PERMITS) FOR CONSTRUCTION ACTIVITIES AROUND WATERS OF THE STATE (10 "INSPECTOR").

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

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7.1.6. THE SWPPP WILL BE REVISED AS NECESSARY BASED ON THE RESULTS OF THE INSPECTION. REVISION(S) WILL BE RECORDED WITHIN 7 DAYS OF THE INSPECTION. REVISION(S) WILL BE IMPLEMENTED WITHIN 14 DAYS OF THE INSPECTION (3.8.5.2.e AND 3.8.5.2.f).

7.1.7. THE INSPECTOR SHALL CONDUCT PRE-CONSTRUCTION INSPECTIONS TO VERIFY AREAS THAT ARE NOT TO BE DISTURBED HAVE BEEN MARKED IN THE SWPPP AND IN THE FIELD BEFORE LAND DISTURBANCE ACTIVITIES BEGIN AND INITIAL MEASURES HAVE BEEN INSTALLED (10 "INSPECTOR") (3.5.1.n).

7.1.8. INSPECTIONS WILL BE DOCUMENTED ON THE TDOT EPSC INSPECTION REPORT (TDEC PRE-APPROVED) AND INCLUDE THE SCOPE OF THE INSPECTION, NAME(S), TITLE AND TN EPSC CERTIFICATION NUMBER OF PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, CURRENT APPROXIMATE DISTURBED ACREAGE AT TIME OF INSPECTION, CHECKLIST (NOC, SWPPP, RAIN GAUGE, SITE CONTACT INFORMATION, ETC.) AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWPPP (3.5.8.2.g).

7.1.9. DOCUMENTATION OF INSPECTIONS WILL BE MAINTAINED ON SITE IN THE "DOCUMENTATION AND PERMITS" BINDER. REPORTS WILL BE SUBMITTED TO THE TDOT PROJECT SUPERVISOR PER THE CONTRACT.

7.1.10. THESE INSPECTION REQUIREMENTS DO NOT APPLY TO DEFINABLE AREAS OF THE SITE THAT HAVE MET FINAL STABILIZATION REQUIREMENTS AND HAVE BEEN NOTED IN THE SWPPP.

7.1.11. TRAINED CERTIFIED INSPECTORS SHALL COMPLETE INSPECTION DOCUMENTATION TO THE BEST OF THEIR ABILITY. FALSIFYING INSPECTION RECORDS OR OTHER DOCUMENTATION OR FAILURE TO COMPLETE INSPECTION DOCUMENTATION SHALL RESULT IN A VIOLATION OF THIS PERMIT AND ANY OTHER APPLICABLE ACTS OR RULES (3.8.5.2.h).

7.2. DULY AUTHORIZED REPRESENTATIVE (7.7.3)

THE PROJECT SUPERVISOR MAY DELEGATE AN INDIVIDUAL AND/OR CONSULTANT TO SIGN EPSC INSPECTIONS REPORTS. FOR SATISFYING SIGNATORY REQUIREMENTS FOR EPSC INSPECTION REPORTS, THE PROJECT SUPERVISOR AND NEWLY AUTHORIZED INDIVIDUAL ACCEPTING RESPONSIBILITY MUST PERFORM THE FOLLOWING:

7.2.1. COMPLETE AND SIGN THE TDOT CONSTRUCTION DIVISION EPSC DELEGATION OF AUTHORITY.

7.2.2. SUBMIT THE EPSC DELEGATION OF AUTHORITY TO THE LOCAL TDEC EFO.

7.3. MAINTENANCE PRACTICES (3.5.3.1 AND 3.5.7)

7.3.1. ALL CONTROLS WILL BE MAINTAINED IN GOOD AND EFFECTIVE OPERATING ORDER. NECESSARY REPAIRS OR MAINTENANCE WILL BE ACCOMPLISHED BEFORE THE NEXT STORM EVENT AND IN NO CASE MORE THAN 24 HOURS AFTER THE NEED IS IDENTIFIED. IN A CASE WHERE THE ACTIVITY IS DEEMED IMPRACTICABLE, ANY SUCH CONDITIONS WILL BE DOCUMENTED (3.5.8.2.e).

7.3.2. ALL CONTROLS WILL BE MAINTAINED IN ACCORDANCE WITH TDOT STANDARD DRAWINGS AND GOOD ENGINEERING PRACTICES. (3.5.3.1.b)

7.3.3. SEDIMENT WILL BE REMOVED FROM SEDIMENT TRAPS, SILT FENCE, SEDIMENT BASINS, AND OTHER CONTROLS WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY 50% (3.5.3.1.e).

7.3.4. CHECK DAMS WILL BE INSPECTED FOR STABILITY. SEDIMENT WILL BE REMOVED WHEN DEPTH REACHES ONE-HALF (½) THE HEIGHT OF THE DAM.

7.3.5. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER WILL BE PICKED UP AND REMOVED FROM STORMWATER EXPOSURE PRIOR TO ANTICIPATED STORM EVENTS OR BEFORE BEING CARRIED OFF OF THE SITE BY WIND, OR OTHERWISE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORMWATER DISCHARGES. AFTER USE, MATERIALS USED FOR EROSION CONTROL WILL BE REMOVED (3.5.3.1.f).

7.3.6. ALL SEEDED AREAS WILL BE CHECKED FOR BARE SPOTS, EROSION WASHOUTS, AND VIGOROUS GROWTH FREE OF SIGNIFICANT WEED INFESTATIONS.

7.3.7. THE TDOT PROJECT SUPERVISOR OR THEIR DESIGNEE AND THE CONTRACTOR'S SITE SUPERINTENDENT ARE RESPONSIBLE FOR INSPECTIONS. MAINTENANCE AND REPAIR ACTIVITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE TDOT PROJECT SUPERVISOR OR THEIR DESIGNEE WILL COMPLETE THE INSPECTION REPORTS AND DISTRIBUTE COPIES PER THE CONTRACT.

8. SITE ASSESSMENTS (3.1.2)

QUALITY ASSURANCE SITE ASSESSMENTS OF EROSION PREVENTION AND SEDIMENT CONTROLS SHALL BE PERFORMED BY THE TDOT ENVIRONMENTAL DIVISION COMPREHENSIVE INSPECTIONS OFFICE GUIDELINES.

9. STORMWATER MANAGEMENT (3.5.4)

9.1. STORMWATER MANAGEMENT WILL BE HANDLED BY TEMPORARY CONTROLS OUTLINED IN THIS SWPPP AND ANY PERMANENT CONTROLS NEEDED TO MEET PERMANENT STORMWATER MANAGEMENT NEEDS IN THE POST CONSTRUCTION PERIOD. PERMANENT CONTROLS WILL BE SHOWN ON THE PLANS AND NOTED AS PERMANENT.

9.2. DESCRIBE ANY SPECIFIC POST-CONSTRUCTION MEASURES THAT WILL CONTROL VELOCITY, POLLUTANTS, AND/OR EROSION (3.5.1.F, 3.5.4): N/A

9.3. OTHER ITEMS NEEDING CONTROL (3.5.5)

9.3.1. CONSTRUCTION MATERIALS: THE FOLLOWING MATERIALS OR SUBSTANCES ARE EXPECTED TO BE PRESENT ON THE SITE DURING THE CONSTRUCTION PERIOD. (CHECK ALL THAT APPLY).

9.3.1.1. ☒ LUMBER, GUARDRAIL, TRAFFIC CONTROL DEVICES
9.3.1.2. ☒ CONCRETE WASHOUT
9.3.1.3. ☒ CONCRETE AND CORRUGATED METAL PIPES
9.3.1.4. ☒ MINERAL AGGREGATES, ASPHALT
9.3.1.5. ☒ EARTH
9.3.1.6. ☒ LIQUID TRAFFIC STRIPING MATERIALS, PAINT
9.3.1.7. ☒ ROCK
9.3.1.8. ☒ CURING COMPOUND
9.3.1.9. ☒ EXPLOSIVES
9.3.1.10. ☐ OTHER

THESE MATERIALS WILL BE HANDLED AS NOTED IN THIS SWPPP.

9.3.2. WASTE MATERIALS (3.5.5.b)

WASTE MATERIAL (EARTH, ROCK, ASPHALT, CONCRETE, ETC.) NOT REQUIRED FOR THE CONSTRUCTION OF THE PROJECT WILL BE DISPOSED OF BY THE CONTRACTOR. THE CONTRACTOR WILL OBTAIN ANY AND ALL NECESSARY PERMITS INCLUDING, BUT NOT LIMITED TO NPDES, AQUATIC RESOURCES ALTERATION PERMIT(S) CORPS OF ENGINEERS SECTION 404 PERMITS, AND TVA SECTION 26A PERMITS TO DISPOSE OF WASTE MATERIALS.

9.3.3. HAZARDOUS WASTE (3.5.5.c) (7.9)

ALL HAZARDOUS WASTE MATERIALS WILL BE DISPOSED OF IN A MANNER WHICH IS COMPLIANT WITH LOCAL OR STATE REGULATIONS. SITE PERSONNEL WILL BE INSTRUCTED IN THESE PRACTICES, AND THE INDIVIDUAL DESIGNATED AS THE CONTRACTOR'S ON-SITE REPRESENTATIVE WILL BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES ARE FOLLOWED. THE CONTRACTOR WILL OBTAIN ANY AND ALL NECESSARY PERMITS TO DISPOSE OF HAZARDOUS MATERIAL.

9.3.4. SANITARY WASTE (3.5.5.b)

PORTABLE SANITARY FACILITIES WILL BE PROVIDED ON ALL CONSTRUCTION SITES. SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS IN A TIMELY MANNER BY A LICENSED WASTE MANAGEMENT CONTRACTOR OR AS REQUIRED BY ANY LOCAL REGULATIONS. THE CONTRACTOR WILL OBTAIN ANY AND ALL NECESSARY PERMITS TO DISPOSE OF SANITARY WASTE.

9.3.5. OTHER MATERIALS

THE FOLLOWING MATERIALS OR SUBSTANCES ARE EXPECTED TO BE PRESENT ON THE SITE DURING THE CONSTRUCTION PERIOD. (CHECK ALL THAT APPLY).

9.3.5.1. ☒ FERTILIZERS AND LIME
9.3.5.2. ☒ PESTICIDES AND/OR HERBICIDES
9.3.5.3. ☒ DIESEL AND GASOLINE
9.3.5.4. ☒ MACHINERY LUBRICANTS (OIL AND GREASE)

THESE MATERIALS WILL BE HANDLED AS NOTED THIS SWPPP.

10. NON-STORMWATER DISCHARGES (3.5.9)

10.1. THE FOLLOWING NON-STORMWATER DISCHARGES ARE ANTICIPATED DURING THE COURSE OF THIS PROJECT (CHECK ALL THAT APPLY):

10.1.1. ☒ DEWATERING OF WORK AREAS OF COLLECTED STORMWATER AND GROUND WATER

10.1.2. ☒ WATERS USED TO WASH VEHICLES (OF DUST AND SOIL) WHERE DETERGENTS ARE NOT USED AND DETENTION AND/OR FILTERING IS PROVIDED BEFORE THE WATER LEAVES SITE

10.1.3. ☒ WATER USED TO CONTROL DUST (3.5.3.1.n)

10.1.4. ☒ POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS FROM WHICH CHLORINE HAS BEEN REMOVED TO THE MAXIMUM EXTENT PRACTICABLE

10.1.5. ☒ UNCONTAMINATED GROUNDWATER OR SPRING WATER

10.1.6. ☒ FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH POLLUTANTS

10.1.7. ☐ OTHER:

10.2. ALL ALLOWABLE NON-STORMWATER DISCHARGES WILL BE DIRECTED TO STABLE DISCHARGE STRUCTURES PRIOR TO LEAVING THE SITE. FILTERING OR CHEMICAL TREATMENT MAY BE NECESSARY PRIOR TO DISCHARGE.

10.3. THE DESIGN OF ALL IMPACTED EPSC MEASURES RECEIVING FLOW FROM ALLOWABLE NON-STORMWATER DISCHARGES MUST BE DESIGNED TO HANDLE THE VOLUME OF THE NON-STORMWATER COMPONENT.

10.4. WASH DOWN OR WASTE DISCHARGE OF CONCRETE TRUCKS WILL NOT BE PERMITTED ON-SITE UNLESS PROPER SETTLEMENT AREAS HAVE BEEN PROVIDED IN ACCORDANCE WITH BOTH STATE AND FEDERAL REGULATIONS.

10.5. ARE ANY DISCHARGES ASSOCIATED WITH INDUSTRIAL (NON-CONSTRUCTION STORMWATER) ACTIVITY EXPECTED (3.5.1.h)?

YES ☐ NO ☒ IF YES, SPECIFY THE LOCATION OF THE ACTIVITY AND ITS PERMIT NUMBER.

11. SPILL PREVENTION, MANAGEMENT AND NOTIFICATION (3.5.5.c, 5.1)

11.1. SPILL PREVENTION (3.5.5.c)

11.1.1. MATERIAL MANAGEMENT

11.1.1.1. HOUSEKEEPING

ONLY NEEDED PRODUCTS WILL BE STORED ON-SITE BY THE CONTRACTOR. EXCEPT FOR BULK MATERIALS THE CONTRACTOR WILL STORE ALL MATERIALS UNDER COVER AND IN APPROPRIATE CONTAINERS. PRODUCTS MUST BE STORED IN ORIGINAL CONTAINERS AND LABELED. MATERIAL MIXING WILL BE CONDUCTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHEN POSSIBLE, ALL PRODUCTS WILL BE USED COMPLETELY BEFORE PROPERLY DISPOSING OF THE CONTAINER OFF SITE. THE MANUFACTURER'S DIRECTIONS FOR DISPOSAL OF MATERIALS AND CONTAINERS WILL BE FOLLOWED. THE CONTRACTOR'S SITE SUPERINTENDENT WILL INSPECT MATERIALS STORAGE AREAS REGULARLY TO ENSURE PROPER USE AND DISPOSAL. DUST GENERATED WILL BE CONTROLLED IN AN ENVIRONMENTALLY SAFE MANNER. VEGETATION AREAS NOT ESSENTIAL TO THE CONSTRUCTION PROJECT WILL BE PRESERVED AND MAINTAINED AS NOTED ON THE PLANS.

11.1.1.2. HAZARDOUS MATERIALS

PRODUCTS WILL BE KEPT IN ORIGINAL CONTAINERS UNLESS THE CONTAINER IS NOT RESEALABLE. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHEETS WILL BE RETAINED IN A SAFE PLACE TO RELAY IMPORTANT PRODUCT INFORMATION. IF SURPLUS PRODUCT MUST BE DISPOSED OF, MANUFACTURER'S LABEL DIRECTIONS FOR DISPOSAL WILL BE FOLLOWED. MAINTENANCE AND REPAIR OF ALL EQUIPMENT AND VEHICLES INVOLVING OIL CHANGES, HYDRAULIC SYSTEM DRAIN DOWN, DE-GREASING OPERATIONS, FUEL TANK DRAIN DOWN AND REMOVAL, AND OTHER ACTIVITIES WHICH MAY RESULT IN THE ACCIDENTAL RELEASE OF CONTAMINANTS WILL BE CONDUCTED ON AN IMPERVIOUS SURFACE AND UNDER COVER DURING WET WEATHER TO PREVENT THE RELEASE OF CONTAMINANTS ONTO THE GROUND. WHEEL WASH WATER WILL BE COLLECTED AND ALLOWED TO SETTLE OUT SUSPENDED SOLIDS PRIOR TO DISCHARGE. WHEEL WASH WATER WILL NOT BE DISCHARGED DIRECTLY INTO ANY STORMWATER SYSTEM OR STORMWATER TREATMENT SYSTEM. POTENTIAL PH-MODIFYING MATERIALS SUCH AS: BULK CEMENT, CEMENT KILN DUST, FLY ASH, NEW CONCRETE WASHINGS AND CURING WATERS, CONCRETE PUMPING, AND MIXER WASHOUT WATERS WILL BE COLLECTED ON

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

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SITE AND MANAGED TO PREVENT CONTAMINATION OF STORMWATER RUNOFF.

11.1.1.3. PRODUCT SPECIFIC PRACTICES

11.1.1.3.1. PETROLEUM PRODUCTS: ALL ON-SITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED.

11.1.1.3.2. FERTILIZERS: FERTILIZERS WILL BE APPLIED ONLY IN THE AMOUNTS SPECIFIED BY TDOT. ONCE APPLIED, FERTILIZERS WILL BE WORKED INTO THE SOIL TO LIMIT THE EXPOSURE TO STORMWATER. FERTILIZERS WILL BE STORED IN AN ENCLOSED AREA UNDER COVER. THE CONTENTS OF PARTIALLY USED FERTILIZER BAGS WILL BE TRANSFERRED TO SEALABLE CONTAINERS TO AVOID SPILLS.

11.1.1.3.3. PAINTS: ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. THE EXCESS WILL BE DISPOSED OF ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AND APPLICABLE STATE AND LOCAL REGULATIONS.

11.1.1.3.4. CONCRETE TRUCKS: CONTRACTORS WILL PROVIDE DESIGNATED TRUCK WASHOUT AREAS ON THE SITE. THESE AREAS MUST BE SELF CONTAINED AND NOT CONNECTED TO ANY STORMWATER OUTLET OF THE SITE. UPON COMPLETION OF CONSTRUCTION WASHOUT AREAS WILL BE PROPERLY STABILIZED.

11.2. SPILL MANAGEMENT

11.2.1. IN ADDITION TO THE PREVIOUS HOUSEKEEPING AND MANAGEMENT PRACTICES, THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP IF NECESSARY.

11.2.2. FOR ALL HAZARDOUS MATERIALS STORED ON SITE, THE MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEAN UP WILL BE CLEARLY POSTED. SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATIONS OF THE INFORMATION AND CLEANUP SUPPLIES.

11.2.3. APPROPRIATE CLEANUP MATERIALS AND EQUIPMENT WILL BE MAINTAINED BY THE CONTRACTOR IN THE MATERIALS STORAGE AREA ON-SITE AND UNDER COVER. AS APPROPRIATE, EQUIPMENT AND MATERIALS MAY INCLUDE ITEMS SUCH AS BOOMS, DUST PANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC AND METAL TRASH CONTAINERS SPECIFICALLY FOR CLEAN UP PURPOSES.

11.2.4. ALL SPILLS WILL BE CLEANED IMMEDIATELY AFTER DISCOVERY AND THE MATERIALS DISPOSED OF PROPERLY. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.

11.2.5. THE CONTRACTOR'S SITE SUPERINTENDENT WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THE SITE SUPERINTENDENT HAS HAD APPROPRIATE TRAINING FOR HAZARDOUS MATERIALS HANDLING, SPILL MANAGEMENT, AND CLEANUP.

11.2.6. IF SPILLS REPRESENT AN IMMINENT THREAT OF ESCAPING THE SITE AND ENTERING RECEIVING WATERS, PERSONNEL WILL RESPOND IMMEDIATELY TO CONTAIN THE RELEASE AND NOTIFY THE SUPERINTENDENT AFTER THE SITUATION HAS BEEN STABILIZED.

11.2.7. IF OIL SHEEN IS OBSERVED ON SURFACE WATER (E.G. SETTLING PONDS, DETENTION PONDS, SWALES), ACTION WILL BE TAKEN IMMEDIATELY TO REMOVE THE MATERIAL CAUSING THE SHEEN. THE CONTRACTOR WILL USE APPROPRIATE MATERIALS TO CONTAIN AND ABSORB THE SPILL. THE SOURCE OF THE OIL SHEEN WILL ALSO BE IDENTIFIED AND REMOVED OR REPAIRED AS NECESSARY TO PREVENT FURTHER RELEASES.

11.2.8. IF A SPILL OCCURS THE SUPERINTENDENT OR THE SUPERINTENDENT'S DESIGNEE WILL BE RESPONSIBLE FOR COMPLETING THE SPILL REPORTING FORM AND FOR REPORTING THE SPILL TO THE TDOT PROJECT SUPERVISOR.

11.2.9. SPILL RESPONSE EQUIPMENT WILL BE INSPECTED AND MAINTAINED BY THE CONTRACTOR AS NECESSARY TO REPLACE ANY MATERIALS USED IN SPILL RESPONSE ACTIVITIES.

11.3. SPILL NOTIFICATION (5.1)

WHERE A RELEASE CONTAINING A HAZARDOUS SUBSTANCE IN AN AMOUNT EQUAL TO OR IN EXCESS OF A REPORTABLE QUANTITY ESTABLISHED UNDER EITHER 40 CFR 117 OR 40 CFR 302 OCCURS DURING A 24 HOUR PERIOD:

11.3.1. THE TDOT PROJECT SUPERVISOR IS RESPONSIBLE FOR NOTIFYING THE REGIONAL ENVIRONMENTAL COORDINATOR OR ASSISTANT REGIONAL ENVIRONMENTAL COORDINATOR AS SOON AS HE OR SHE HAS KNOWLEDGE OF THE DISCHARGE.

11.3.2. THE TDOT REGIONAL ENVIRONMENTAL COORDINATOR WILL NOTIFY THE LOCAL TDEC ENVIRONMENTAL FIELD OFFICE AND ANY OTHER APPLICABLE REGULATORY AGENCIES WITHIN 24 HOURS OF THE SPILL.

11.3.3. A WRITTEN DESCRIPTION OF THE RELEASE, DATE OF RELEASE AND CIRCUMSTANCES LEADING TO THE RELEASE, WHAT ACTIONS WERE TAKEN TO MITIGATE EFFECTS OF THE RELEASE, AND STEPS TAKEN TO MINIMIZE THE CHANCE OF FUTURE OCCURRENCES WILL BE SUBMITTED TO THE APPROPRIATE TDEC ENVIRONMENTAL FIELD OFFICE WITHIN 14 DAYS OF KNOWLEDGE OF THE RELEASE.

11.3.4. THE SWPPP MUST BE MODIFIED WITHIN 14 DAYS OF KNOWLEDGE OF THE RELEASE PROVIDING A DESCRIPTION OF THE RELEASE, CIRCUMSTANCES LEADING TO THE RELEASE, AND THE DATE OF RELEASE. THE SWPPP WILL BE REVIEWED AND MODIFIED AS NECESSARY TO IDENTIFY MEASURES TO PREVENT THE REOCCURRENCE OF SUCH RELEASES AND TO RESPOND TO SUCH RELEASES.

12. RECORD-KEEPING

12.1. REQUIRED RECORDS

TDOT OR THEIR DESIGNEE WILL MAINTAIN AT THE SITE THE FOLLOWING RECORDS OF CONSTRUCTION ACTIVITIES (3.5.3.1.m) (6.2.1):

12.1.1. THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR

12.1.2. THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE

12.1.3. THE DATES WHEN STABILIZATION MEASURES ARE INITIATED

12.1.4. RECORDS OF TWICE WEEKLY EPSC INSPECTION REPORTS AND CORRECTIVE MEASURES

12.1.5. RECORDS OF QUALITY ASSURANCE SITE ASSESSMENTS

12.1.6. COPY OF SITE EPSC INSPECTOR'S TDEC LEVEL 1 CERTIFICATION

12.1.7. RAINFALL MONITORING PLAN (3.5.3.1.o):

12.1.7.1. EQUIPMENT

AT A MINIMUM, THE CONTRACTOR WILL INSTALL A FENCE POST TYPE RAIN GAUGE TO MEASURE RAINFALL. THE STANDARD FENCE POST RAIN GAUGE WILL BE A WEDGE-SHAPED GAUGE THAT MEASURES UP TO 6 INCHES OF RAINFALL. AN ENGLISH SCALE WILL BE PROVIDED ON ONE FACE, WITH A METRIC SCALE ON THE OTHER FACE. GRADUATION WILL BE PERMANENTLY MOLDED IN DURABLE WEATHER-RESISTANT PLASTIC. THE MINIMUM GRADUATION WILL BE 0.01 INCH (OR 0.1MM). AN ALUMINUM BRACKET WITH SCREWS MAY BE USED TO MOUNT THE GAUGE ON A WOODEN SUPPORT.

12.1.7.2. LOCATION

THE RAIN GAUGE WILL BE LOCATED AT OR ALONG THE PROJECT SITE, AS DEFINED IN THE NOI OF THE NPDES PERMIT, IN AN OPEN AREA SUCH THAT THE MEASUREMENT WILL NOT BE INFLUENCED BY OUTSIDE FACTORS (I.E. OVERHANGS, GUTTER, TREES, ETC). AT LEAST ONE RAIN GAUGE PER LINEAR MILE IS REQUIRED ALONG (AS MEASURED ALONG THE CENTERLINE OF THE PRIMARY ALIGNMENT) THE PROJECT WHERE CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING IS ACTIVELY PERFORMED, OR EXPOSED SOIL HAS NOT YET BEEN PERMANENTLY STABILIZED.

12.1.7.3. METHODS

12.1.7.3.1. RAINFALL MONITORING WILL BE INITIATED PRIOR TO CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING, OR FILLING, EXCEPT AS SUCH MINIMAL CLEARING MAY BE NECESSARY TO INSTALL A RAIN GAUGE IN AN OPEN AREA. THE RAIN GAUGE WILL BE CHECKED FOR OPERATIONAL SOUNDNESS DAILY (DURING NORMAL BUSINESS HOURS) IN WET TIMES AND WEEKLY IN DRY TIMES. GAUGES WILL BE REPAIRED OR REPLACED ON THE SAME DAY IF FOUND TO BE NON-OPERATIONAL OR MISSING.

12.1.7.3.2. EACH RAIN GAUGE WILL BE READ (FOR DETAILED RECORDS OF RAINFALL) AND EMPTIED AFTER EVERY RAINFALL EVENT OCCURRING ON THE PROJECT SITE AT APPROXIMATELY THE SAME TIME OF THE DAY (DURING NORMAL BUSINESS HOURS). DURING PERIODS OF DRY CONDITIONS, IT WILL NOT BE NECESSARY TO READ THE RAIN GAUGE EVERY DAY. IN LIEU OF THIS REQUIREMENT ON WEEKENDS AND ON STATE HOLIDAYS, THE RAIN GAUGES CAN BE EMPTIED THE NEXT BUSINESS DAY AND A REFERENCE SITE USED FOR A RECORD OF DAILY AMOUNT OF PRECIPITATION FOR THOSE DAYS. A REFERENCE SITE IS THE DOCUMENTATION FROM THE CLOSEST GAUGE WITHIN PROXIMITY OF THE PROJECT FROM A RECOGNIZED SOURCE SUCH AS THE NOAA NATIONAL WEATHER SERVICE.

12.1.7.3.3. DETAILED RECORDS WILL BE RECORDED OF RAINFALL EVENTS INCLUDE DATES, AMOUNTS OF RAINFALL, AND THE APPROXIMATE DURATION (OR THE STARTING AND ENDING TIMES). THE RAINFALL RECORDS SHALL BE RECORDED ON THE TDOT RAINFALL RECORD SHEET AND SHALL BE MAINTAINED IN THE "DOCUMENTATION AND PERMITS" BINDER.

12.1.7.3.4. IF, IN THE EVENT THAT THE RAINFALL EVENT IS STILL IN PROGRESS AT THE DAILY RECORDING TIME, THE GAUGE WILL BE EMPTIED AND THE RECORD WILL INDICATE THAT THE STORM EVENT WAS STILL IN PROGRESS.

12.1.7.3.5. RAIN GAUGE INFORMATION (DETAILED RECORDS), INCLUDING THE LOCATION OF THE NEAREST OUTFALL, WILL BE RECORDED ON THE EPSC INSPECTION REPORT FORMS AT THE TIME OF MEASUREMENT.

12.2. KEEPING PLANS CURRENT (3.4)

TDOT OR THEIR DESIGNEE WILL MODIFY AND UPDATE THE SWPPP WHEN ANY OF THE FOLLOWING CONDITIONS APPLY:

12.2.1. WHENEVER THERE IS A CHANGE IN THE SCOPE OF THE PROJECT THAT WOULD BE EXPECTED TO HAVE A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO THE WATERS OF THE STATE AND WHICH HAS NOT OTHERWISE BEEN ADDRESSED IN THE SWPPP;

12.2.2. WHENEVER INSPECTIONS OR INVESTIGATIONS BY SITE OPERATORS, LOCAL, STATE, OR FEDERAL OFFICIALS INDICATE THE SWPPP IS PROVING INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANTS FROM CONSTRUCTION ACTIVITY SOURCES, OR IS OTHERWISE NOT ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS IN STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY; WHERE LOCAL, STATE, OR FEDERAL OFFICIALS DETERMINE THAT THE SWPPP IS INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANT SOURCES, A COPY OF ANY CORRESPONDENCE TO THAT EFFECT MUST BE RETAINED IN THE SWPPP;

12.2.3. WHEN ANY NEW OPERATOR AND/OR SUB-OPERATOR IS ASSIGNED OR RELIEVED OF THEIR RESPONSIBILITY TO IMPLEMENT A PORTION OF THE SWPPP;

12.2.4. TO PREVENT A NEGATIVE IMPACT TO LEGALLY PROTECTED STATE OR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED AQUATIC FAUNA;

12.2.5. WHEN THERE IS A CHANGE IN CHEMICAL TREATMENT METHODS INCLUDING: USE OF DIFFERENT TREATMENT CHEMICALS, DIFFERENT DOSAGE OR APPLICATION RATES OR A DIFFERENT AREA OF APPLICATION NOT SPECIFIED ON THE EPSC PLANS; OR

12.2.6. WHEN A TMDL IS DEVELOPED FOR THE RECEIVING WATERS FOR A POLLUTANT OF CONCERN (SILTATION AND/OR HABITAT ALTERATION)

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

TENNESSEE D.O.T.
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SWPPP	2015	65001-1256-14	S5

12.3. MAKING PLANS ACCESSIBLE

12.3.1. TDOT WILL RETAIN A COPY OF THIS SWPPP (INCLUDING A COPY OF THE "DOCUMENTATION AND PERMITS" BINDER AT THE CONSTRUCTION SITE (OR OTHER LOCATION ACCESSIBLE TO TDEC AND THE PUBLIC) FROM THE DATE CONSTRUCTION COMMENCES TO THE DATE OF FINAL STABILIZATION. TDOT WILL HAVE A COPY OF THE SWPPP AVAILABLE AT THE LOCATION WHERE WORK IS OCCURRING ON-SITE FOR THE USE OF OPERATORS AND THOSE IDENTIFIED AS HAVING RESPONSIBILITIES UNDER THE SWPPP WHENEVER THEY ARE ON THE CONSTRUCTION SITE (6.2).

12.3.2. PRIOR TO THE INITIATION OF LAND DISTURBING ACTIVITIES AND UNTIL THE SITE HAS MET THE FINAL STABILIZATION CRITERIA, TDOT OR THEIR DESIGNEE WILL POST A NOTICE NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE WITH THE FOLLOWING INFORMATION (3.3.3) (6.2.1):

12.3.2.1. A COPY OF THE NOTICE OF COVERAGE (NOC) WITH THE NPDES PERMIT NUMBER FOR THE PROJECT;

12.3.2.2. THE INDIVIDUAL NAME, COMPANY NAME, E-MAIL ADDRESS (IF APPLICABLE) AND TELEPHONE NUMBER OF THE LOCAL PROJECT SITE OWNER AND OPERATOR CONTACT;

12.3.2.3. A BRIEF DESCRIPTION OF THE PROJECT; AND

12.3.2.4. THE LOCATION OF THE SWPPP.

12.3.3. ALL INFORMATION DESCRIBED IN SECTION 10.3.2 MUST BE MAINTAINED IN LEGIBLE CONDITION. IF POSTING THIS INFORMATION NEAR A MAIN ENTRANCE IS INFEASIBLE DUE TO SAFETY CONCERNS, THE NOTICE SHALL BE POSTED IN A LOCAL BUILDING. THE NOTICE MUST BE PLACED IN A PUBLICLY ACCESSIBLE LOCATION WHERE CONSTRUCTION IS ACTIVELY UNDERWAY AND MOVED AS NECESSARY.

12.4. NOTICE OF TERMINATION (8.0)

12.4.1. WHEN ALL STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES THAT ARE AUTHORIZED BY THE PERMIT ARE ELIMINATED BY FINAL STABILIZATION, TDOT WILL SUBMIT A NOTICE OF TERMINATION (NOT) THAT IS SIGNED IN ACCORDANCE WITH THE PERMIT TO THE TDEC CENTRAL OFFICE IN NASHVILLE, TN.

12.4.2. FOR THE PURPOSES OF THE CERTIFICATION REQUIRED BY THE NOT, THE ELIMINATION OF STORMWATER DISCHARGES ASSOCIATED WITH THE CONSTRUCTION ACTIVITY MEANS THE FOLLOWING:

12.4.2.1. ALL EARTH-DISTURBING ACTIVITIES ON THE SITE ARE COMPLETED AND ALL DISTURBED SOILS AT THE PORTION OF THE CONSTRUCTION SITE WHERE THE OPERATOR HAD CONTROL HAVE BEEN FINALLY STABILIZED; AND

12.4.2.2. ALL CONSTRUCTION MATERIALS, WASTE AND WASTE HANDLING DEVICES, AND ALL EQUIPMENT, AND VEHICLES THAT WERE USED DURING CONSTRUCTION HAVE BEEN REMOVED AND PROPERLY DISPOSED; AND

12.4.2.3. ALL STORMWATER CONTROLS THAT WERE INSTALLED AND MAINTAINED DURING CONSTRUCTION, EXCEPT THOSE THAT ARE INTENDED FOR LONG-TERM USE FOLLOWING TERMINATION OF PERMIT COVERAGE, HAVE BEEN REMOVED; AND

12.4.2.4. ALL POTENTIAL POLLUTANTS AND POLLUTANT GENERATING ACTIVITIES ASSOCIATED WITH CONSTRUCTION HAVE BEEN REMOVED; AND

12.4.2.5. THE PERMITTEE HAS IDENTIFIED WHO IS RESPONSBLE FOR ONGOING MAINTENANCE OF ANY STORMWATER CONTROLS LEFT ON THE SITE FOR LONG-TERM USE FOLLOWING TERMINATION OF PERMIT COVERAGE; AND

12.4.2.6. TEMPORARY EPSC MEASURES HAVE BEEN OR WILL BE REMOVED AT AN APPROPRIATE TIME TO ENSURE FINAL STABILIZATION IS MAINTAINED; AND

12.4.2.7. ALL STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES FROM THE IDENTIFED SITE THAT ARE AUTHORIZED BY A NPDES GENERAL PERMIT HAVE OTHERWISE BEEN ELIMINATED FROM THE PORTION OF THE CONSTRUCTION SITE WHERE THE OPERATOR HAD CONTROL.

12.5. RETENTION OF RECORDS (6.2)

TDOT WILL RETAIN COPIES OF THE SWPPP, ALL REPORTS REQUIRED BY THE PERMIT, AND RECORDS OF ALL DATA USED TO COMPLETE THE NOTICE OF INTENT FOR THE PROJECT FOR A PERIOD OF AT LEAST THREE (3) YEARS FROM THE DATE THE NOT WAS FILED.

13. SITE WIDE/PRIMARY PERMITTEE CERTIFICATION (7.7.5)

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

AUTHORIZED TDOT PERSONNEL SIGNATURE (3.3.1)

JIM OZMENT
PRINTED NAME

ENVIRONMENTAL DIVISION DIRECTOR
TITLE

06-02-2015
DATE

14. SECONDARY PERMITTEE (OPERATOR) CERTIFICATION (7.7.6)

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE REVIEWED THIS DOCUMENT, ANY ATTACHMENTS, AND THE SWPPP REFERENCED ABOVE. BASED ON MY INQUIRY OF THE CONSTRUCTION SITE OWNER/DEVELOPER IDENTIFIED ABOVE AND/OR MY INQUIRY OF THE PERSON DIRECTLY RESPONSIBLE FOR ASSEMBLING THIS NOI AND SWPPP, I BELIEVE THE INFORMATION SUBMITTED IS ACCURATE. I AM AWARE THAT THIS NOI, IF APPROVED, MAKES THE ABOVE-DESCRIBED CONSTRUCTION ACTIVITY SUBJECT TO NPDES PERMIT NUMBER TNR100000, AND THAT CERTAIN OF MY ACTIVITIES ON-SITE ARE THEREBY REGULATED. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS, AND FOR FAILURE TO COMPLY WITH THESE PERMIT REQUIREMENTS.

AUTHORIZED OPERATOR (CONTRACTOR) SIGNATURE (3.3.1)

PRINTED NAME

TITLE

DATE

15. ENVIRONMENTAL PERMITS (9.1)

LIST ALL ENVIRONMENTAL PERMITS AND EXPIRATION DATES FOR PROJECT **(TO BE COMPLETED AT THE ENVIRONMENTAL PRECONSTRUCTION MEETING BY TDOT CONSTRUCTION OR THEIR DESIGNEE)**:

ENVIRONMENTAL PERMITS			
PERMIT	**YES OR NO**	**PERMIT OR TRACKING NO.**	**EXPIRATION DATE***
TDEC ARAP			
CORPS OF ENGINEERS (COE)			
TVA 26A			
TDEC CGP			
OTHER:			

*THE TDOT ENVIRONMENTAL DIVISION MUST BE NOTIFIED SIX MONTHS PRIOR TO PERMIT EXPIRATION DATE.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
SWPPP	2015	65001-1256-14	S6

4.2.3 OUTFALL TABLE (3.5.1.d, 5.4.1.f)

EPSC PHASE	OUTFALL LABEL	SUB-OUFALL	STATION CL, LT OR RT	SLOPE WITHIN ROW (%)	STAGE (S1) DRAINAGE AREA (AC)	STAGE 2 (S2) DRAINAGE AREA (AC)	STAGE 3 (S3) DRAINAGE AREA (AC)	SEDIMENT BASIN OR EQUIVALENT MEASURE(S) (YES, NO OR N/A)	RECEIVING NATURAL RESOURCE NAME OR LABEL	COMMENTS
1, 2, 3	109		251+00 RT	9%	2.33	1.18	1.18	N/A	WWC-21	DRAINS TO SR-29 PHASE 1 (PIN 101411.04)
1, 2, 3	110		251+30 CL	9%	0.52	0.52	0.52	N/A	MEDIAN DITCH	DRAINS TO SR-29 PHASE 1 (PIN 101411.04)
1, 2, 3	111		260+00 LT	19%	0.65	0.66	0.66	N/A	STR-15	
2, 3	112		260+00 CL	12%		1.48	1.48	N/A	STR-15	
2, 3		112A	260+00 RT	22%		0.14	4.45	N/A	STR-15	
1	113		266+10 LT	8%	0.20			N/A	STR-6	
1, 2, 3	114		266+70 LT	8%	1.14	1.00	1.00	N/A	WWC-22 / STR-6	
1, 2	115		270+30 LT	16%	1.07	0.27		N/A	STR-16A	
1, 2	116		271+80 LT	3%	2.29	1.39		N/A	STR-16	
3	116		270+80LT	3%			1.39		STR-16	
2, 3	117		272+70 LT	1%		1.63	12.80	N/A	STR-6	
1, 2, 3	118		276+50 LT	2%	1.76	1.27	8.50	N/A	WWC-26 / STR-6	
2, 3	119		280+35 RT	8%		0.21	0.60	N/A	STR-17	
1, 2	120		280+60 LT	8%	1.01	1.03		N/A	STR-17	
1	121		280+75 RT	4%	3.94			N/A	STR-17	
2, 3	122		281+00 RT	8%		3.85	14.45	N/A	STR-17	
1, 2	123		288+90 LT	5%	0.96	1.09		N/A	NATURAL SWALE	
1	124		297+30 LT	13%	0.32			N/A	STR-6	
2,3	124		297+00LT	13%		0.13	0.45		STR-6	
1	125		297+85 LT	13%	0.47			N/A	STR-6	
1	126		299+30 LT	4%	1.22			N/A	STR-6	
2, 3	127		300+00 LT	4%		1.13	18.54	N/A	STR-6	
1	128		304+85 LT	11%	0.43			N/A	STR-6	
2, 3	129		305+50 LT	4%		0.31	0.31	N/A	STR-6	
1, 2, 3	130		309+90 LT	11%	1.45	0.43	0.43	N/A	STR-6	
1	131		313+50 LT	11%	0.75			N/A	STR-6	
2, 3	132		314+00 LT	11%		1.15	7.97	N/A	STR-6	
1	133		314+00 LT	11%	1.54			N/A	STR-6	
2	133		314+50LT	11%		0.33		N/A	STR-6	
2, 3	134		317+00 LT	11%		0.40	0.40	N/A	STR-6	
1, 2, 3	135		319+30 LT	11%	1.74	0.46	1.04	N/A	STR-6	
2, 3	136		322+00 LT	6%		0.42	1.50	N/A	STR-6	
1, 2, 3	137		325+30 LT	6%	1.81	0.40	1.74	N/A	STR-6	
1, 2, 3	138		328+10 LT	6%	0.24	0.24	0.24	N/A	STR-19 / STR-6	CONFLUENCE OF STREAMS
1, 2, 3	139		328+45 LT	7%	0.46	0.46	0.46	N/A	STR-6	
1	140		328+80 RT	8%	1.26			N/A	STR-19	ROCK SEDIMENT DAM
2, 3	141		58+00 LT	10%		1.15	12.45	N/A	STR-19	HANGING ROCK RD.
2, 3	142		60+10 LT	22%		0.14	0.71	N/A	STR-19	HANGING ROCK RD.
2, 3	143		58+80 LT	3%		0.07	0.17	N/A	STR-19	HANGING ROCK RD.
2	144		58+60 LT	3%		0.05		N/A	STR-19	HANGING ROCK RD.
2	145		58+50 LT	3%		1.07		N/A	STR-19	HANGING ROCK RD.
1, 2	146		333+00 LT	10%	0.90	0.88		N/A	STR-6	
1, 2, 3	147		335+70 LT	2%	3.52	3.82	29.40	N/A	STR-6	
1, 2, 3	148		341+50 LT	3%		0.38	0.52	N/A	STR-6	
1, 2, 3	149		342+35 LT	5%	1.01	1.26	2.00	N/A	WWC-39 / STR-6	
1, 2, 3	150		343+20 RT	2%	0.51	0.40	1.00	N/A	STR-6	
1, 2	151		344+30 RT	2%	0.53	0.44		N/A	STR-6	
1, 2	152		349+00 RT	2%	0.63	0.57		N/A	STR-20 / STR-6	CONFLUENCE OF STREAMS
1, 2	153		349+40 RT	3%	1.48	1.48		N/A	STR-20 / STR-6	CONFLUENCE OF STREAMS
1, 2, 3	154		349+10 LT	2%	0.63	0.78	4.05	N/A	STR-20	
1, 2	155		349+50 LT	3%	0.29	0.17		N/A	STR-20	
2	156		349+50 LT	3%		0.70		N/A	STR-20 / STR-21	CONFLUENCE OF STREAMS
1, 2	157		350+90 LT	2%	0.27	0.27		N/A	STR-22 / WTL-14	
1, 2	158		350+95 LT	2%	0.03	0.03		N/A	STR-22 / WTL-14	
1	159		352+10 LT	2%	0.27			N/A	STR-21 / WTL-14	
1, 2, 3	160		356+10 RT	2%	1.00	1.00	1.00	N/A	STR-6	
1, 2, 3	161		356+90 LT	6%	21.91*	21.91*	21.91*	N/A	STR-22 / WTL-14	* OFFSITE DRAINGE FROM END OF PROJECT. RUNOFF WILL BE DIVERTED DURING NATURAL STREAM CONSTRUCITON FOR STR-21 AND STR-22.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

FOR INDEX SEE SHEET IA

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING

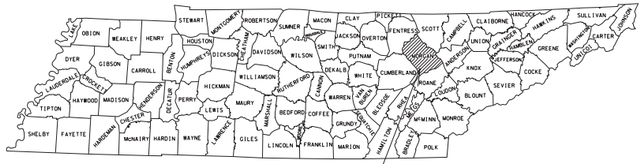
TENN.	YEAR	SHEET NO.
	2015	1
MORGAN COUNTY FED. AID PROJ. NO.	NH-29(86)	
MORGAN COUNTY STATE PROJ. NO.	65001-3268-14	

MORGAN COUNTY

STATE ROUTE 29 (US-27)
FROM SOUTH OF WHETSTONE ROAD TO
NORTH OF STATE ROUTE 328
MORGAN COUNTY

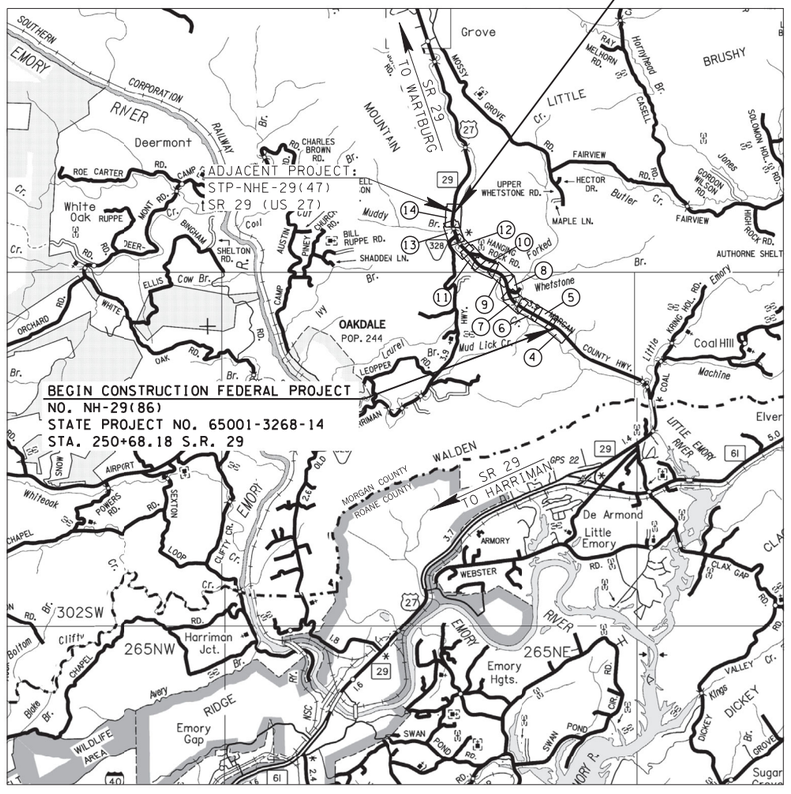
CONSTRUCTION

STATE HIGHWAY NO. 29 F.A.H.S. NO. 29



MORGAN COUNTY PROJECT NO. 65001-3268-14

END CONSTRUCTION FEDERAL PROJECT
NO. NH-29(86)
STATE PROJECT NO. 65001-3268-14
STA. 359+50.00 S.R. 29



SCALE: 1"= 1 MILE

EQUATION

DESCRIPTION	NET EFFECT ON ENUMERATION
STA. 359+17.69 BK. = STA. 359+20.43 AH.	-2.74
TOTAL	-2.74

NO EXCEPTION
NO EXCLUSION

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 101411
STATE OF TENNESSEE
04/27/2015

APPROVED: Paul D. Degges
PAUL D. DEGGES, CHIEF ENGINEER

DATE:

APPROVED:
JOHN SCHROER, COMMISSIONER

SPECIAL NOTES

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED JANUARY 1, 2015 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT

TDOT TRANSPORTATION MANAGER FREDERICK MILLER,P.E.

DESIGNED BY ARCADIS U.S.

DESIGNER CLINT BUTLER, P.E. CHECKED BY BRIAN WHITAKER, P.E.

P.E. NO. 65001-1256-14

PIN 101411.05

ARCADIS
Infrastructure · Water · Environment · Buildings

Survey & Design Division

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CONSTRUCTION PROJECT LENGTH

ROADWAY LENGTH	2.060 MILES
BRIDGE LENGTH	0.000 MILES
BOX BRIDGE LENGTH	0.000 MILES
PROJECT LENGTH	2.060 MILES

TRAFFIC DATA

ADT (2014)	4,270
ADT (2034)	5,130
DHV (2034)	564
D	65 - 35
T (ADT)	6 %
T (DHV)	4 %
V	(1) 60 mph
V	(2) 50 mph

(1) FROM BEGINNING OF CONSTRUCTION TO STA. 277+20.53
(2) FROM STA. 277+20.53 TO END OF CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	1A

INDEX

STANDARD BRIDGE DRAWINGS

DWG. NO.	REV.	DESCRIPTION
BRIDGE APPURTENANCES ENGLISH (BOX CULVERTS)		
STD-15-1	11-06-08	INDEX OF DRAWINGS AND TERMINOLOGY
STD-15-2	03-28-08	GENERAL NOTES
STD-15-3	02-28-03	DESIGN SECTION LIMITS
STD-15-4	12-07-01	TYPICAL SECTION AND DETAILS
STD-15-5	02-28-03	TYPICAL ELEVATION
STD-15-8	12-07-01	INTERIOR WALL END TREATMENTS
STD-15-9	02-28-03	TYPICAL WINGWALL DETAILS AND NOTES
STD-15-10	11-06-08	WINGWALL DIMENSIONS AND QUANTITIES
STD-15-11		WINGWALL DIMENSIONS AND QUANTITIES
STD-15-14	06-01-11	BACKFILL AND DRAINAGE DETAILS
STD-15-15		BACKFILL AND DRAINAGE DETAILS
STD-15-16A		LOW FLOW CHANNEL CONSTRUCTION DETAILS FOR CULVERT INLET AND OUTLET
STD-15-37	05-01-14	BOX BRIDGE, 1 BARREL AT 8', CLEAR HTS. 5'-8", 0 - 60' FILL
STD-15-38	9-19-06	BOX BRIDGE, 1 BARREL AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-80		BOX BRIDGE, 3 BARRELS AT 12', CLEAR HTS. 4' - 7', 0 TO 60' FILL
STD-15-125	02-28-03	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-141		SLAB BRIDGE, 3 BARRELS AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL

STANDARD ROADWAY DRAWINGS

DWG. NO	REV.	DESCRIPTION
ROADWAY DESIGN STANDARDS		
RD-A-1	12-18-99	STANDARD ABBREVIATIONS
RD-L-1	10-26-94	STANDARD LEGEND
RD-L-2	09-05-01	STANDARD LEGEND FOR UTILITY INSTALLATIONS
RD-L-5	05-01-08	STANDARD LEGEND FOR EROSION PREVENTION AND SEDIMENT CONTROL
RD-L-6	03-30-10	STANDARD LEGEND FOR EROSION PREVENTION AND SEDIMENT CONTROL
RD-L-7	05-24-12	STANDARD LEGEND FOR EROSION PREVENTION AND SEDIMENT CONTROL
RD-L-8		STANDARD LEGEND FOR NATURAL STREAM DESIGN
RD01-S-11	04-04-03	DESIGN AND CONSTRUCTION DETAILS FOR ROADSIDE SLOPE DEVELOPMENT
RD01-S-11A	10-15-02	ROADSIDE DITCH DETAILS FOR DESIGN AND CONSTRUCTION
RD01-SD-1		INTERSECTION SIGHT DISTANCE DESIGN AND GENERAL NOTES
RD01-SD-4		INTERSECTION SIGHT DISTANCE 5-LANE AND 4-LANE UNDIVIDED ROADWAYS
RD01-SD-5		INTERSECTION SIGHT DISTANCE 4-LANE DIVIDED HIGHWAYS
RD01-SE-3	10-15-02	RURAL SUPERELEVATION DETAILS
RD01-TS-1	10-15-02	DESIGN STANDARDS FOR LOCAL ROADS AND STREETS
RD01-TS-1A		DESIGN STANDARDS FOR LOW-VOLUME LOCAL ROADS (ADT<=400)
RD01-TS-2	10-15-02	DESIGN STANDARDS FOR COLLECTOR ROADS AND STREETS
RD01-TS-3	10-15-02	DESIGN STANDARD FOR 2-LANE ARTERIAL HIGHWAYS
RD01-TS-3A	10-15-02	DESIGN STANDARDS 4 AND 6 LANE ARTERIAL HIGHWAYS WITH DEPRESSED MEDIANS
RD01-TS-3C	10-15-02	DESIGN STANDARDS 4 AND 6 LANE ARTERIAL HIGHWAYS WITH FLUSH MEDIANS

DWG. NO	REV.	DESCRIPTION
DRAINAGE - CULVERTS AND ENDWALL		
D-PB-1	01-02-13	STANDARD DETAILS FOR CONCRETE PIPE INSTALLATION
D-PB-2	01-29-14	STANDARD DETAILS FOR FLEXIBLE PIPE INSTALLATION
D-PE-1	02-12-76	TYPE "A" CONCRETE ENDWALL (2:1 SLOPE, 36" TO 78")
D-PE-4	12-01-14	STRAIGHT TYPE CONCRETE ENDWALL
D-PE-18A	01-06-15	18" CONCRETE ENDWALL CROSS DRAIN
D-PE-18B		18" CONCRETE ENDWALL CROSS DRAIN
D-PE-24A	01-06-15	24" CONCRETE ENDWALL CROSS DRAIN
D-PE-24B		24" CONCRETE ENDWALL CROSS DRAIN
D-PE-30A	01-06-15	30" CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE
D-PE-30B		30" CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE
D-PE-36A	06-14-13	36" CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE
D-PE-36B		36" CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE
D-PE-48A	06-14-13	48" CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE
D-PE-48B		48" CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE
D-SEW-1A	06-14-13	SIDE DRAIN CONCRETE ENDWALL WITH STEEL PIPE GRATE
D-SEW-12D	06-14-13	CONCRETE ENDWALL TYPE "SD" WITH STEEL PIPE GRATE FOR 15" AND 18" PIPES - 12:1 SLOPE
DRAINAGE-CATCH BASINS AND MANHOLES		
D-CB-38S	08-01-12	STANDARD 32" X 32" SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-38SB	03-11-14	STANDARD 4' X 4' SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-39S	08-01-12	STANDARD 4' X 4' SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-40S	08-01-12	STANDARD 4' X 8' RECTANGULAR CONCRETE NO. 40 CATCH BASIN
D-CB-41SB	03-11-14	STANDARD 4' X 4' SQUARE CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-99	05-20-14	MISCELLANEOUS DETAILS FOR RECTANGULAR STRUCTURES
D-CBB-31	05-27-01	TYPE "B" CAST IRON FRAME, GRATE & INLET DETAILS FOR NOS. 31, 41, 45, 46, & 51 TYPE CATCH BASINS
D-JBS-2	08-01-12	STANDARD 4' X 4' SQUARE CONCRETE NO. 2 JUNCTION BOX
D-JBS-3	08-01-12	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 3
DRAINAGE - NATURAL STREAM DESIGN		
D-NSD-2		ROCK VANES
D-NSD-3		LOG DEFLECTORS
D-NSD-4		LOG DROPS AND STEP POOLS
D-NSD-6		CONSTRUCTED RIFFLES
D-NSD-7		COCONUT FIBER ROLLS AND LIVE SILTATION

CLINT T. BUTLER
REGISTERED
NO. 109965
STATE OF TENNESSEE
04/29/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

INDEX AND STANDARD DRAWINGS

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Survey & Data Division

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	1A1

ROADWAY AND PAVEMENT APPURTENANCES

RP-DH0-1	10-26-93	MEDIAN OPENINGS ON 4-LANE DIVIDED HIGHWAY
RP-H-6	01-30-15	MEDIAN CROSSING
RP-I-5	12-18-96	EXAMPLES OF STREET AND ALLEY INTERSECTIONS
RP-R-1	05-27-01	STANDARD RAMPS TO SIDE ROADS

SAFETY APPURTENANCES AND FENCE

S-F-1	05-24-12	HIGH VISIBILITY FENCE
S-F-10E	05-14-10	STANDARD RIGHT-OF-WAY CHAIN LINK FENCE
S-F-10C	05-14-10	RIGHT-OF-WAY FENCE AT BRIDGES AND BOX CULVERTS
S-RP-2	01-19-99	STANDARD CONCRETE RIGHT-OF-WAY MARKERS
S-CZ-1		CLEAR ZONE CRITERIA
S-PL-2		SAFETY PLAN AT SIDE ROADS OR PRIVATE DRIVES
S-PL-6	12-01-14	SAFETY PLAN SAFETY HARDWARE PLACEMENT
S-GR31-1	12-01-14	W-BEAM GUARDRAIL
S-GRT-1		TYPE 12 GUARDRAIL TERMINAL (BURIED-IN-BACKSLOPE)
S-GRT-2	11-03-14	TYPE 38 GUARDRAIL TERMINAL
S-GRT-2P		EARTH PAD FOR TYPE 38 TERMINAL
S-GRT-3		TYPE 21 GUARDRAIL TERMINAL
S-GRT-3D		TYPE 21 GUARDRAIL TERMINAL (DETAILS)
S-GRT-3P		EARTH PAD FOR TYPE 21 TERMINAL
S-GRT-4	11-06-14	TYPE 13 GUARDRAIL TERMINAL (TRAILING END)
S-GRA-1		GUARDRAIL ANCHOR FOR TYPE 12 TERMINAL
S-GRA-3		GUARDRAIL ANCHOR FOR TYPE 12, 13 AND IN-LINE TERMINALS
S-SSMB-3	07-16-13	51" HALF SIZE SINGLE SLOPE CONCRETE BARRIER WALL
S-SSMB-5		SINGLE SLOPE MEDIAN BARRIER WALL CATCH BASIN DETAIL
S-SSMB-6	10-24-13	GUARDRAIL ATTACHMENT TO SINGLE SLOPE CONCRETE BARRIER WALL

TRAFFIC CONTROL APPURTENANCES

T-FAB-1	05-27-97	FLASHING YELLOW ARROW BOARD
T-M-1	07-24-14	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS AND MARKING ABBREVIATIONS
T-M-2	07-24-14	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS
T-M-3	07-24-14	MARKING STANDARDS FOR TRAFFIC ISLANDS, MEDIANS & PAVED SHOULDERS ON CONVENTIONAL ROADS
T-M-4	07-24-14	STANDARD INTERSECTION PAVEMENT MARKINGS
T-M-9	11-01-11	MARKING DETAILS FOR RAMP INTERSECTIONS
T-M-15A	01-30-15	ASPHALT SHOULDER RUMBLE STRIP INSTALLATION DETAILS FOR NON-ACCESS CONTROLLED ROUTES
T-M-16	12-01-14	ASPHALT SHOULDER RUMBLE STRIPE INSTALLATION DETAILS FOR NON-ACCESS CONTROLLED ROUTES
T-PBR-1	06-30-09	INTERCONNECTED PORTABLE BARRIER RAIL
T-PBR-2	11-01-11	DETAIL FOR VERTICAL PANELS AND FLEXIBLE DELINEATORS
T-S-7	02-12-91	HIGHWAY SHIELDS USED ON INTERSTATE AND U.S. NUMBERED ROUTES
T-S-8	07-15-91	HIGHWAY SHIELDS USED ON STATE NUMBERED ROUTES AND ARROWS
T-S-9	06-10-14	STANDARD LAYOUT GROUND MOUNTED SIGNS
T-S-10	04-04-12	STANDARD MOUNTING DETAILS FLAT SHEET SIGNS ALUMINUM-STEEL DESIGN
T-S-11	06-06-11	DELINEATOR AND MILEPOST DETAILS
T-S-16	06-05-14	GROUND MOUNTED ROADSIDE SIGN AND DETAILS
T-S-17	07-19-13	STANDARD GROUND MOUNTED SIGN USING PERFORATED/KNOCKOUT SQUARE TUBE
T-S-19	07-19-13	STANDARD STEEL SIGN SUPPORTS
T-S-20	11-01-11	SIGN DETAILS
T-S-21	02-28-13	DETAILS FOR SIGNS MOUNTS ON CONCRETE MEDIAN BARRIERS
T-WZ-10	04-02-12	ADVANCE ROAD WORK SIGNING ON HIGHWAYS AND FREEWAYS
T-WZ-11	03-13-09	ONE LANE CLOSURE DETAIL ON DIVIDED HIGHWAYS
T-WZ-19	04-02-12	MEDIAN CROSS-OVER DETAIL ON DIVIDED HIGHWAYS
T-WZ-20	12-18-99	GEOMETRIC MEDIAN CROSS-OVER DETAIL ON DIVIDED HIGHWAYS
T-WZ-21	03-15-11	LANE CLOSURE WITH LEFT HAND MERGE AND LANE SHIFT
T-WZ-36	04-02-12	LANE CLOSURE ON LOW-VOLUME 2-LANE HIGHWAY

EROSION PREVENTION AND SEDIMENT CONTROL

EC-STR-2	08-01-12	SEDIMENT FILTER BAG
EC-STR-3B	08-01-12	SILT FENCE
EC-STR-3C	08-01-12	SILT FENCE WITH WIRE BACKING
EC-STR-3E	04-01-08	SILT FENCE FABRIC JOINING DETAILS
EC-STR-6	08-01-12	ROCK CHECK DAM
EC-STR-6A	08-01-12	ENHANCED ROCK CHECK DAM
EC-STR-7	08-01-12	SEDIMENT TRAP WITH CHECK DAM
EC-STR-11	08-01-12	CULVERT PROCTECTION TYPE 1
EC-STR-11A	08-01-12	CULVERT PROCTECTION TYPE 2
EC-STR-12	08-01-12	ROCK SEDIMENT DAM
EC-STR-19	04-01-08	CATCH BASIN PROTECTION
EC-STR-25	08-01-12	TEMPORARY CULVERT CROSSING, CONSTRUCTION EXIT, CONSTRUCTION FORD
EC-STR-27	08-01-12	TEMPORARY SLOPE DRAIN AND BERM
EC-STR-30		INSTREAM DIVERSION (WITHOUT TRAFFIC)
EC-STR-30A		INSTREAM DIVERSION (WITH TRAFFIC)
EC-STR-31	08-01-12	TEMPORARY DIVERSION CHANNEL
EC-STR-31A	04-01-08	TEMPORARY DIVERSION CHANNEL DESIGN
EC-STR-32	08-01-12	TEMPORARY DIVERSION CULVERTS
EC-STR-33	08-01-12	SUSPENDED PIPE DIVERSON (DOWNSTREAM)
EC-STR-33A	08-01-12	SUSPENDED PIPE DIVERSON (UPSTREAM)
EC-STR-34	08-01-12	EROSION CONTROL BLANKET FOR SLOPE INSTALLATION
EC-STR-35	08-01-12	FILTER BERMS
EC-STR-36	08-01-12	TURF REINFORCEMENT MAT FOR CHANNEL INSTALLATION
EC-STR-37	06-10-14	SEDIMENT TUBE
EC-STR-40		CATCH BASIN FILTER ASSEMBLY FOR CIRCULAR STRUCTURES
EC-STR-41		CATCH BASIN FILTER ASSEMBLY (TYPE 1)
EC-STR-41A		CATCH BASIN FILTER ASSEMBLY (TYPE 1) SLIPCOVER DETAILS
EC-STR-42		CATCH BASIN FILTER ASSEMBLY (TYPE 2)
EC-STR-42A		CATCH BASIN FILTER ASSEMBLY (TYPE 2) SLIPCOVER DETAILS
EC-STR-48		CATCH BASIN FILTER ASSEMBLY (TYPE 8)
EC-STR-48A		CATCH BASIN FILTER ASSEMBLY (TYPE 8) SLIPCOVER DETAILS

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

INDEX AND STANDARD DRAWINGS

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	1B

PROJECT COMMITMENTS

COMMITMENT ID	SOURCE DIVISON	DESCRIPTION	STA. / LOCATION
1	ENVIRONMENTAL	PYRITE MONITORING PLAN MUST BE ADHERED TO, STARTING WITH PRE-CONSTRUCTION SAMPLING 3 MONTHS PRIOR TO START OF CONSTRUCTION AND CONTINUING DJRING- AND POST-CONSTRUCTION.	FROM BEGIN STA 250+68.18 S R. 29 IN MORGAN COUNTY TO END STA. 359+50.00 S.R. 29 IN MORGAN COUNTY
2	ENVIRONMENTAL	THE NORTHERN LONG-EARED BAT (MYOTIS SEPTENTRIONALIS) HAS BEEN DOCUMENTED IN THE PROJECT VICINITY. THIS SPECIES WAS PROPOSED FOR FEDERAL LISTING UNDER THE ESA ON OCTOBER 2, 2013 AND A DECISION IS SCHEDULED TO BE ANNOUNCED ON OR BEFORE ON APRIL 2, 2015. TO MINIMIZE THE POTENTIAL OF ADVERSELY AFFECTING (JEOPARDY) THE NORTHERN LONG-EARED BAT (MYOTIS SEPTENTRIONALIS), THE USFWS HAS REQUESTED THAT CONSIDERATION BE GIVEN TO THE CLEARING OF TREES WITH A DBH (DIAMETER AT BREAST HEIGHT) OF THREE (3) INCHES OR GREATER BETWEEN OCTOBER 15 AND MARCH 31 WHERE POSSIBLE. THIS WILL ALSO MINIMIZE POTENTIAL IMPACTS TO THE FEDERALLY LISTED ENDANGERED INDIANA BAT (MYOTIS SODALIS). THE REGION 1 BIOLOGIST SHALL BE CONTACTED FOR QUESTIONS OR GUIDANCE CONCERNING THIS ACTIVITY.	FROM BEGIN STA 250+68.18 S R. 29 IN MORGAN COUNTY TO END STA. 359+50.00 S.R. 29 IN MORGAN COUNTY

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CLINT T. BUTLER
REGISTERED ENGINEER
NO. 109680
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROJECT COMMITMENTS

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	2A

ESTIMATED ROADWAY QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
1	105-01	CONSTRUCTION STAKES, LINES AND GRADES	LS	1
40	106-04.01	SAMPLING AND TESTING OF POTENTIALLY ACIDIC MATERIAL	EA	4,000
2	201-01	CLEARING AND GRUBBING	LS	1
	202-02.01	REMOVAL OF PIPE (15" CMP,STA. 260+39)	L.F.	28
	202-02.02	REMOVAL OF PIPE (18" CMP,STA. 263+47)	L.F.	28
	202-02.03	REMOVAL OF PIPE (18" CMP,STA. 270+29)	L.F.	77
	202-02.04	REMOVAL OF PIPE (18" PL,STA. 270+71)	L.F.	41
	202-02.05	REMOVAL OF PIPE (18" CMP,STA. 281+01)	L.F.	37
	202-02.06	REMOVAL OF PIPE (18" CMP,STA. 288+01)	L.F.	29
	202-02.07	REMOVAL OF PIPE (18" CMP,STA. 290+59)	L.F.	48
	202-02.08	REMOVAL OF PIPE (30" RCP,STA. 297+81)	L.F.	76
	202-02.09	REMOVAL OF PIPE (30" CMP,STA. 299+30)	L.F.	79
	202-02.10	REMOVAL OF PIPE (18" CMP,STA. 304+87)	L.F.	98
	202-02.11	REMOVAL OF PIPE (18" CMP,STA. 313+53)	L.F.	105
	202-02.12	REMOVAL OF PIPE (24" RCP,STA. 314+43)	L.F.	78
	202-02.13	REMOVAL OF PIPE (18" RCP,STA. 325+24)	L.F.	73
	202-02.14	REMOVAL OF PIPE (86" CMP,STA. 58+40 HANGING ROCK RD.)	L.F.	25
	202-02.15	REMOVAL OF PIPE (24" CMP,STA. 332+30)	L.F.	13
	202-02.16	REMOVAL OF PIPE (18" CMP,STA. 338+18)	L.F.	30
	202-02.17	REMOVAL OF PIPE (24" RCP,STA. 80+85 S.R. 328)	L.F.	74
	202-02.18	REMOVAL OF PIPE (30" CMP,STA. 357+26)	L.F.	22
3	202-01.56	REMOVAL OF STRUCTURES & OBSTRUCTIONS (10'X4' RCBC)	LS	1
4	202-03.01	REMOVAL OF ASPHALT PAVEMENT	S.Y.	2,211
5	202-06.01	REMOVAL OF BUILDINGS (TRACT 33A)	LS	1
5	202-06.02	REMOVAL OF BUILDINGS (TRACT 35)	LS	1
5	202-06.03	REMOVAL OF BUILDINGS (TRACT 45)	LS	1
6, 7, 8	203-01	ROAD & DRAINAGE EXCAVATION (UNCLASSIFIED)	C.Y.	138,478
9	203-01.09	ACID PRODUCING MATERIAL HAUL & TIP FEE	TON	138,864
10	203-02.01	BORROW EXCAVATION (GRADED SOLID ROCK)	TON	3,420
	203-03	BORROW EXCAVATION (UNCLASSIFIED)	C.Y.	89,992
	203-04	PLACING AND SPREADING TOPSOIL	C.Y.	19,203
11	203-05	UNDERCUTTING	C.Y.	2,253
	203-06	WATER	M.G.	2,730
12	203-15.03	COMPACTED CLAY	C.Y.	319
	204-08	FOUNDATION FILL MATERIAL	C.Y.	44
13, 14	209-01.31	TEMPORARY MULCH FILTER BERM	C.Y.	288
13, 14	209-02.04	10" TEMPORARY SLOPE DRAIN	L.F.	924
13, 14	209-02.05	12" TEMPORARY SLOPE DRAIN	L.F.	381
13, 14	209-02.06	15" TEMPORARY SLOPE DRAIN	L.F.	518
13, 14	209-02.07	18" TEMPORARY SLOPE DRAIN	L.F.	1,321
2, 14	209-04	BRUSH BARRIERS	L.F.	1,130
14	209-05	SEDIMENT REMOVAL	C.Y.	3,625
13, 14	209-08.02	TEMPORARY SILT FENCE (WITH BACKING)	L.F.	49,664
13, 14	209-08.03	TEMPORARY SILT FENCE (WITHOUT BACKING)	L.F.	9,427
13, 14, 15	209-08.07	ROCK CHECK DAM PER	EACH	275
13, 14, 15	209-08.08	ENHANCED ROCK CHECK DAM	EACH	105
13, 14, 16	209-09.01	SANDBAGS	BAG	3,208
13, 14	209-09.03	SEDIMENT FILTER BAG (15' X 15')	EACH	30
13, 14, 17	209-09.21	POLYACHLAMIDE GEL LOGS	EACH	88
13, 14, 17	209-09.22	POLYACHLAMIDE POWDER	LB.	945
13, 14, 17	209-09.24	JUTE MESH FABRIC	S.Y.	1,000
13, 14	209-09.41	CURB INLET PROTECTION (TYPE 2)	EACH	16
13	209-10.20	TEMPORARY SEDIMENT TRAP	C.Y.	1,910
13, 14, 18	209-20.03	POLYETHYLENE SHEETING (6 MIL. MINIMUM)	S.Y.	4,838
13, 14	209-40.33	CATCH BASIN PROTECTION (TYPE D)	EACH	12
13, 14	209-40.41	CATCH BASIN FILTER ASSEMBLY(TYPE 1)	EACH	3

ESTIMATED ROADWAY QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
13, 14	209-40.48	CATCH BASIN FILTER ASSEMBLY(TYPE 8)	EACH	1
13	209-65.03	TEMPORARY DIVERSION CHANNEL	L.F.	1,117
	209-65.04	TEMPORARY IN STREAM DIVERSION (WITH TRAFFIC)	L.F.	1,056
	303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TON	67,675
	303-01.01	GRANULAR BACKFILL (ROADWAY)	TON	1,321
19	303-10.01	MINERAL AGGREGATE (SIZE 57)	TON	13,846
	307-01.01	ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING A	TON	7,662
	307-01.08	ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2	TON	7,196
	402-01	BITUMINOUS MATERIAL FOR PRIME COAT (PC)	TON	169
	402-02	AGGREGATE FOR COVER MATERIAL (PC)	TON	667
	403-01	BITUMINOUS MATERIAL FOR TACK COAT (TC)	TON	43
	411-01.07	ACS MIX (PG64-22) GRADING E SHOULDER	TON	2,367
	411-01.10	ACS MIX(PG64-22) GRADING D	TON	5,481
	411-12.02	SCORING SHOULDERS (NON-CONTINUOUS)(16IN WIDTH)	L.M.	4
	411-12.03	SCORING FOR RUMBLE STRIPE (NON-CONT) (8IN WIDTH)	L.M.	1
	415-01.01	COLD PLANING BITUMINOUS PAVEMENT	TON	4,238
	604-01.01	CLASS A CONCRETE (ROADWAY)	C.Y.	179
	604-01.02	STEEL BAR REINFORCEMENT (ROADWAY)	LB.	37,746
	607-03.02	18" CONCRETE PIPE CULVERT (CLASS III)	L.F.	2,305
	607-05.02	24" CONCRETE PIPE CULVERT (CLASS III)	L.F.	340
	607-06.02	30" CONCRETE PIPE CULVERT (CLASS III)	L.F.	138
	607-07.02	36" CONCRETE PIPE CULVERT (CLASS III)	L.F.	409
	607-09.02	48" CONCRETE PIPE CULVERT (CLASS III)	L.F.	359
	607-39.02	18" CONCRETE PIPE CULVERT (SIDE DRAIN)	L.F.	77
	607-39.03	24" CONCRETE PIPE CULVERT (SIDE DRAIN)	L.F.	33
	607-39.04	30" CONCRETE PIPE CULVERT (SIDE DRAIN)	L.F.	146
	607-39.05	36" CONCRETE PIPE CULVERT (SIDE DRAIN)	L.F.	104
	611-02.11	JUNCTION BOX, TYPE 2	EACH	5
	611-02.12	JUNCTION BOX, TYPE 3	EACH	2
	611-07.01	CLASS A CONCRETE (PIPE ENDWALLS)	C.Y.	52
	611-07.02	STEEL BAR REINFORCEMENT (PIPE ENDWALLS)	LB.	1,178
	611-07.31	18IN ENDWALL (SIDE DRAIN)	EACH	7
	611-07.32	24IN ENDWALL (SIDE DRAIN)	EACH	2
	611-07.33	30IN ENDWALL (SIDE DRAIN)	EACH	1
	611-07.34	36IN ENDWALL (SIDE DRAIN)	EACH	6
	611-07.58	24IN ENDWALL (CROSS DRAIN) 4:1	EACH	1
	611-07.59	24IN ENDWALL (CROSS DRAIN) 6:1	EACH	1
	611-07.61	30IN ENDWALL (CROSS DRAIN) 4:1	EACH	2
	611-07.63	36IN ENDWALL (CROSS DRAIN) 3:1	EACH	1
	611-07.64	36IN ENDWALL (CROSS DRAIN) 4:1	EACH	1
	611-07.70	48IN ENDWALL (CROSS DRAIN) 4:1	EACH	1
	611-07.73	18" ENDWALL (MEDIAN DRAIN)	EACH	2
	611-38.02	CATCH BASINS, TYPE 38, > 4' - 8' DEPTH	EACH	4
	611-38.03	CATCH BASINS, TYPE 38, > 8' - 12' DEPTH	EACH	1
	611-39.01	CATCH BASINS, TYPE 39, 0' - 4' DEPTH	EACH	2
	611-39.02	CATCH BASINS, TYPE 39, > 4' - 8' DEPTH	EACH	2
	611-39.05	CATCH BASINS, TYPE 39, > 16' - 20' DEPTH	EACH	2
	611-39.07	CATCH BASINS, TYPE 39, > 24' - 28' DEPTH	EACH	1
	611-40.05	CATCH BASINS, TYPE 40, > 16' - 20' DEPTH	EACH	1
	611-41.02	CATCH BASINS, TYPE 41, > 4' - 8' DEPTH	EACH	13
	611-41.03	CATCH BASINS, TYPE 41, > 8' - 12' DEPTH	EACH	4

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 109080
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

ESTIMATED ROADWAY QUANTITIES

Survey & Data Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	2A1

ESTIMATED ROADWAY QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
13, 14, 20	621-03.02	18" TEMPORARY DRAINAGE PIPE (DIVERSION)	L.F.	130
13, 14, 20	621-03.03	24" TEMPORARY DRAINAGE PIPE (DIVERSION)	L.F.	50
13, 14, 20	621-03.06	42" TEMPORARY DRAINAGE PIPE (DIVERSION)	L.F.	278
	701-03	CONCRETE MEDIAN PAVEMENT	C.Y.	58
	703-01	CEMENT CONCRETE DITCH PAVING	C.Y.	755
	705-01.01	GUARDRAIL AT BRIDGE ENDS	L.F.	189
	705-02.02	SINGLE GUARDRAIL (TYPE 2)	L.F.	6798
	705-04.02	GUARDRAIL TERMINAL (TYPE 12)	EACH	1
	705-04.03	GUARDRAIL TERMINAL (TYPE 13)	EACH	6
	705-04.04	GUARDRAIL TERMINAL (TYPE 21)	EACH	1
	705-04.05	GUARDRAIL TERMINAL (TYPE-IN-LINE)	EACH	6
	705-04.07	TAN ENERGY ABSORBING TERM (NCHRP 350, TL3)	EACH	15
21	705-08.51	PORTABLE IMPACT ATTENUATOR NCHRP350 TL-3	EACH	8
	706-01	GUARDRAIL REMOVED	L.F.	885
	707-01.50	CHAIN-LINK FENCE (8 FOOT)	L.F.	1,145
	707-01.51	END & CORNER POST ASSEMBLY (CHAIN-LINK FENCE 8')	EACH	11
22	707-01.52	GATE - CHAIN-LINK FENCE (8 FOOT - 4' WIDE)	EACH	1
13, 14	707-08.11	HIGH-VISIBILITY CONSTRUCTION FENCE	L.F.	7,724
	708-01.01	MONUMENTS (R.O.W.)	EACH	63
23	709-05.05	MACHINED RIP-RAP (CLASS A-3)	TON	683
	709-05.06	MACHINED RIP-RAP (CLASS A-1)	TON	4,273
24	709-05.08	MACHINED RIP-RAP (CLASS B)	TON	5,292
25	709-05.09	MACHINED RIP-RAP (CLASS C)	TON	3,296
	710-10.08	18" PERFORATED PLASTIC PIPE	L.F.	27
26	710-13.03	FILTER CLOTH	S.Y.	1,140
	711-05.72	SINGLE SLOPE HALF CONCRETE BARRIER WALL	L.F.	5,109
27	712-01	TRAFFIC CONTROL	LS	1
16	712-02.02	INTERCONNECTED PORTABLE BARRIER RAIL	L.F.	7,200
16	712-04.01	FLEXIBLE DRUMS (CHANNELIZING)	EACH	215
	712-05.01	WARNING LIGHTS (TYPE A)	EACH	50
	712-05.03	WARNING LIGHTS (TYPE C)	EACH	50
	712-06	SIGNS (CONSTRUCTION)	S.F.	928
16, 28	712-06.01	VERTICAL PANELS	S.F.	370
	712-07.03	TEMPORARY BARRICADES (TYPE III)	L.F.	1,000
	712-08.03	ARROW BOARD (TYPE C)	EACH	2
	712-09.01	REMOVABLE PAVEMENT MARKING LINE	L.F.	4,000
29	713-02.15	FLEXIBLE DELINEATOR (YELLOW)	EACH	2
30	713-11.01	"U" SECTION STEEL POSTS	L.B.	1,515
	713-11.02	PERFORATED/KNOCKOUT SQUARE TUBE POST	L.B.	1,536
30	713-13.02	FLAT SHEET ALUMINUM SIGNS (0.080" THICK)	S.F.	341
	713-13.03	FLAT SHEET ALUMINUM SIGNS (0.100" THICK)	S.F.	325
31	713-15	REMOVAL OF SIGNS, POSTS AND FOOTINGS	LS	1
	713-16.01	CHANGEABLE MESSAGE SIGN	EACH	2
	713-30.09	BARRIER MOUNTED SIGN SUPPORT (AT RETAINING WALL 1)	EACH	3
	716-01.21	SNWPLWBLE PVMT MRKRS (BI-DIR)(1 COLOR)	EACH	224
	716-01.22	SNWPLWBLE PVMT MRKRS (MONO-DIR)(1 COLOR)	EACH	231
	716-01.23	SNWPLWBLE PVMT MRKRS (BI-DIR)(2 COLOR)	EACH	73
32	716-02.04	PLASTIC PAVEMENT MARKING (CHANNELIZATION STRIPING)	S.Y.	66
32	716-02.05	PLASTIC PAVEMENT MARKING (STOP LINE)	L.F.	46

ESTIMATED ROADWAY QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
32	716-02.06	PLASTIC PAVEMENT MKG (TURN LANE ARROW)	EACH	3
32	716-04.02	PLASTIC PVMT MKG(DOUBLE TURNING ARROW)	EACH	8
	716-04.03	PLASTIC PAVEMENT MARKING (4" DOTTED LINE)	L.F.	480
33, 34	716-05.01	PAINTED PAVEMENT MARKING (4" LINE)	L.M.	12
33	716-05.02	PAINTED PAVEMENT MARKING (8" BARRIER LINE)	L.F.	17,000
33	716-05.05	PAINTED PAVEMENT MARKING (STOP LINE)	L.F.	90
	716-08.01	REMOVAL OF PAVEMENT MARKING (LINE)	L.F.	2,000
	716-12.02	ENHANCED FLATLINE THERMO PVMT MRKNG (6IN LINE)	L.M.	12
	717-01	MOBILIZATION	LS	1
35	740-06.01	GEOMEMBRANE (60 MIL)	S.Y.	1,042
13, 14	740-10.03	GEOTEXTILE (TYPE III)(EROSION CONTROL)	S.Y.	10,474
13, 14, 23	740-10.04	GEOTEXTILE (TYPE IV) (STABILIZATION)	S.Y.	854
13, 14	740-11.02	12" SEDIMENT TUBE	L.F.	9,529
13, 14	740-11.03	18" SEDIMENT TUBE	L.F.	1,165
13, 14	740-11.04	20" SEDIMENT TUBE	L.F.	27,014
14, 22	801-01	SEEDING (WITH MULCH)	UNIT	20
13, 14	801-01.07	TEMPORARY SEEDING (WITH MULCH)	UNIT	3,761
14, 22	801-01.13	BONDED FIBER MATRIX HYDROMULCH (WITHOUT SEED)	UNIT	100
13, 14	801-01.65	TEMPORARY MULCH	UNIT	1,241
36	801-02	SEEDING (WITHOUT MULCH)	UNIT	870
	801-03	WATER (SEEDING & SODDING)	M.G.	578
	801-08	FERTILIZER (SUPPLEMENTAL APPLICATION)	TON	45
37	801-09	AGRICULTURAL LIME	TON	54
	802-11.02	RED MAPLE (ACER RUBRUM)	EACH	33
	802-11.06	PAWPAW (ASIMINA TRILOBA)	EACH	33
	802-11.45	AMERICAN HORNBEAM (CARPINUS CAROLINIANA)	EACH	33
	802-12.18	SWEETGUM (LIQUIDAMBAR STYRACIFLUA)	EACH	33
	802-13.07	AMERICAN HOLLY (ILEX OPACA)	EACH	33
38	803-01	SODDING (NEW SOD)	S.Y.	13,636
36	805-12.01	EROSION CONTROL BLANKET (TYPE I)	S.Y.	79,312
14	805-12.02	EROSION CONTROL BLANKET (TYPE II)	S.Y.	12,929
39	806-02.03	PROJECT MOWING	CYCL	6

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
204-08	FOUNDATION FILL MATERIAL	C.Y.	101
303-01.01	GRANULAR BACKFILL (ROADWAY)	TON	2,483
604-02.01	CLASS A CONCRETE (BOX BRIDGES)	C.Y.	596
604-02.02	STEEL BAR REINFORCEMENT (BOX BRIDGES)	LB.	122,190

CLINTT. BUTLER
REGISTERED ENGINEER
NO. 109990
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

ESTIMATED ROADWAY QUANTITIES

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Survey & Design Division

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	2A2

FOOTNOTES

1. INCLUDES COST OF STAKING HIGH-VISIBILITY CONSTRUCTION FENCE. (BUFFER FENCE) ITEM NO. 707-08.11
2. SEE SPECIAL NOTES REGARDING CLEARING AND GRUBBING ON SHEET 2T.
3. BOX CULVERT LOCATED AT STA. 350+53.26.
4. AREA NEAR STA. 254+30 AND PARKING LOT/BUSINESS ENTRANCE NEAR 290+00.
5. BID PRICE INCLUDES ALL SALVAGE VALUE OF MATERIAL. SEE TABULATED QUANTITIES SHEET 2U FOR REMOVAL OF BUILDINGS.
6. INCLUDES 5,494 C.Y. FOR EROSION CONTROL.
7. REFER TO "SPECIAL NOTES" ON SHEET 2T.
8. INCLUDES PRESPLITTING OF ROCK EXCAVATION AS REQUIRED.
9. SEE TDOT SPECIAL PROVISION 107L AND SHEET 2O.
10. TO BE USED FOR ROCK FILL PADS FOR UNDERCUTTING AS DIRECTED BY THE ENGINEER. INCLUDES 590 TONS FOR FRENCH DRAIN (WTL-10, SEE SHEET 2N) AND 2830 TONS FOR ROCK FILL PADS IN WTL-11 & WTL-12 (SEE SHEET 2F).
11. TO BE USED FOR WETLANDS AS DIRECTED BY THE TDOT SUPERVISOR.
12. TO BE USED FOR CUT SLOPES BEHIND RETAINING WALLS.
13. SEE SUBSECTION 209-07 OF THE STANDARD SPECIFICATIONS FOR MAINTENANCE AND REPLACEMENT.
14. ALL QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER.
15. ROCK ONLY FOR CHECK DAMS AND ENHANCED ROCK CHECK DAMS. NO QPL EQUIVALENTS WILL BE ACCEPTED.
16. MAY BE INCREASED OR DECREASED BY THE T.D.O.T. SUPERVISOR.
17. TO BE USED WHEN DEEMED NECESSARY BASED ON FIELD CONDITIONS. TO STAY IN PERMIT COMPLIANCE.
18. INCLUDES 24 S.Y. FOR EROSION CONTROL. INCLUDES 4814 S.Y. TO BE USED FOR A.P.R. COVER AS DIRECTED BY THE ENGINEER. SEE SHT. 2O.
19. INCLUDES 1553 TONS FOR ROCK FILL PADS FOR UNDERCUTTING; 513 TONS FOR EROSION CONTROL; 11,780 TONS FOR FILL AT WALLS 1, 2, 3, 3A, 4 AND 4A.
20. QUANTITY IS BASED ON MINIMUM CALCULATED LENGTH. ACTUAL LENGTH WILL BE DETERMINED BASED ON FIELD CONDITIONS ENCOUNTERED. THE BIDDER IS RESPONSIBLE FOR VERIFYING ESTIMATED LENGTHS PRIOR TO SUBMITTING HIS BID. ADDITIONAL LENGTH, IF ANY, REQUIRED BY ACTUAL FIELD MEASUREMENTS WILL BE INSTALLED AT NO ADDITIONAL COST. ALL COSTS SHALL BE INCLUDED IN THE BID PRICE FOR THESE ITEMS.
21. THIS ITEM SHALL BE A PORTABLE ENERGY ABSORBING TERMINAL MEETING THE REQUIREMENTS OF NCHRP. 350 FOR TEST LEVEL 3. EXAMPLES WOULD BE A QUADGUARD, A REACT 350 OR A TRACC. THE PAY ITEM WILL INCLUDE FURNISHING AND INSTALLING ALL COMPONENTS AS SHOWN ON THE MANUFACTURER'S DRAWING.
22. TO BE USED AS REQUESTED BY THE TDOT SUPERVISOR.
23. FOR EROSION CONTROL.
24. INCLUDES 514 TONS FOR SLOPE STABILIZATION.
25. INCLUDES 250 TONS FOR SLOPE STABILIZATION.
26. TO BE USED FOR ROCK FILL PADS FOR UNDERCUTTING AS DIRECTED BY THE ENGINEER.
27. INCLUDES TRAFFIC CONTROL SUPERVISOR. SEE TDOT BUREAU OF HIGHWAYS "SPECIAL PROVISION REGARDING TRAFFIC CONTROL SUPERVISOR".
28. INCLUDES 200 S.F. OF RIGHT PANELS AND 170 S.F. OF LEFT PANELS.
29. TO BE USED AT ALL MEDIAN OPENINGS.
30. INCLUDES 39 S.F. OF ALUMINUM SIGNS AND 527 LBS. OF "U" POSTS FOR "DO NOT MOW OR SPRAY" SIGNS. SEE SHEETS NS-1 THROUGH NS-4 FOR LOCATIONS AND SIGN DETAILS.
31. REMOVE SIGN AND SUPPORTS (NO FOOTINGS ON THESE SIGNS) ON APPROXIMATELY 40 EXISING SIGNS WITHIN THE LIMITS OF CONSTRUCTION OR AS DIRECTED BY THE ENGINEER.
32. THE CONTRACTOR MAY ELECT TO SUBSTITUTE PREFORMED PLASTIC FOR THERMOPLASTIC. PREFORMED PLASTIC SHALL BE PAID FOR AT THE SAME UNIT PRICE AS BID FOR THERMOPLASTIC.
33. TO BE USED FOR TEMPORARY STRIPING.
34. INCLUDES 1 L.M. FOR PERMANENT MARKINGS ON WHETSTONE ROAD AND HANGING ROCK ROAD.
35. SEE SPECIAL PROVISION 740D REGARDING GEOMEMBRANE.
36. TO BE USED ON ALL SLOPES OF THE PROJECT OR AS DIRECTED BY THE T.D.O.T. SUPERVISOR EXCEPT WHERE RIP RAP AND SOD ARE USED.
37. TO BE USED AS A SOIL AMENDMENT. SEE SHT. 2O.
38. ITEM TO BE USED WITHIN THE MEDIAN OF SR-29 AND BEHIND THE RETAINING WALLS OR AS DIRECTED BY THE TDOT SUPERVISOR. QUANTITY INCLUDES 1205 SY FOR DITCHES.
39. ITEM INCLUDES LITTER AND TRASH REMOVAL. THIS WORK WILL NOT BE MEASURED AND PAID FOR DIRECTLY BUT WILL BE INCLUDED IN THE COST OF ITEM NO. 806-02.03, PROJECT MOWING, CYCL.
40. SEE SHT. 2O APR NOTES. INCLUDES THE COLLECTION, LABORATORY DELIVERY AND TESTING OF EACH SAMPLE. EACH SAMPLE TESTED INCLUDES ALL TESTING PARAMETERS AS LISTED ON SHT. 2O.

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Survey & Design Division

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 109990
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

ESTIMATED ROADWAY QUANTITIES

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	2C

NATURAL STREAM DESIGN QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
		ESTIMATED QUANTITIES - STR-21 & 22		
	209-03.31	STREAM MITIGATION - COCONUT FIBER ROLLS	L.F.	650
	209-03.34	STREAM MITIGATION - SINGLE LOG VANE DEFLECTOR	EACH	3
	209-03.35	STREAM MITIGATION - LOG DROP STRUCTURES	EACH	5
	209-03.44	STREAM MITIGATION - WILLOW POLES (ELDERBERRY & SILKY DOGWOOD)	EACH	300
	209-03.55	STREAM MITIGATION - BOULDER SILL	EACH	1
	209-08.02	TEMPORARY SILT FENCE (WITH BACKING) FOR OLD CHANNEL	L.F.	650
	209-65.01	TEMPORARY STREAM DIVERSION (PUMP AROUND)	L.S.	1
	209-65.02	TEMPORARY STREAM DIVERSION (PIPE AROUND)	L.S.	1
	209-65.14	TEMPORARY STREAM DIVERSION (IN CHANNEL)	L.S.	1
	709-05.81	STREAM MITIGATION - ROCK RIFFLE	EACH	4
1	801-01.30	COVER CROP SEED MIX (RIPZN/FLPL) W/MULCH	UNIT	31
1	801-01.34	GRASS SEED MIX (RPNZN/FLPL)	UNIT	72
	802-02.01	ALNUS SERRULATA (HAZEL ALDER), 18-24 INCH BARE ROOT SEEDLINGS	EACH	80
	802-02.02	ASIMINA TRILOBA (PAWPAW) 18-24 INCH BARE ROOT SEEDLINGS	EACH	80
	805-12.04	EROSION CONTROL BLANKET (TYPE IV)	S.Y.	533

FOOTNOTE:

1. PLANTING RATE FOR ITEM NO. 801-01.34 IS 40 LBS/AC.
   PLANTING. RATE FOR ITEM NO. 801-01.30 IS 100 LBS/AC.

NOTES:

NO SUBSTITUTION FOR ANY OF THESE SPECIES WILL BE ACCECPTED WITHOUT PERMISSION FROM TDOT ENVIRONMENTAL PLANNING AND PERMITS DIVISION. NO CLONES OR COLTIVARS WILL BE ACCEPTED. ANY TREES FOUND TO BE INCORRECT SPECIES, IMPROPERLY PLANTED, OR WHICH DO NOT SURVIVE, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT, SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENCE. STAKES AND WIRES WILL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION.

SPECIAL NOTES FOR WETLAND MITIGATION:

TOPSOIL IS TO BE REMOVED FROM ALL AREAS OF TEMPORARY WETLAND IMPACTS AND STOCKPILED PRIOR TO CONSTRUCTION. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, TEMPORARY HAUL ROADS ARE TO BE REMOVED. EXCAVATED MATERIAL FROM THE HAUL ROADS IS TO BE DISPOSED OF AS DIRECTED BY THE ENGINEER. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, ALL TEMPORARY WETLAND IMPACT AREAS ARE TO BE RESTORED TO PRE-CONSTRUCTION CONTOURS AND THE STOCKPILED WETLAND TOPSOIL SPREAD TO RESTORE THESE AREAS TO PRE-CONSTRUCTION ELEVATION.
THE AREA OF TEMPORARY WETLAND IMPACT SHALL BE RESTORED TO PRECONSTRUCTION ELEVATION AND RESEEDED AS SOON AS POSSIBLE FOLLOWING THE COMPLETION OF CONSTRUCTION ACTIVITIES.

NO SUBSTITUTION FOR ANY OF THESE SPECIES WILL BE ACCEPTED WITHOUT PERMISSION FROM TDOT ENVIRONMENTAL PLANNING AND PERMITS DIVISION. NO CLONES OR COLTIVARS WILL BE ACCEPTED. ANY TREES FOUND TO BE INCORRECT SPECIES, IMPROPERLY PLANTED, OR WHICH DO NOT SURVIVE, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT, SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE. STAKES AND WIRES WILL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

NATURAL STREAM DESIGN QUANTITIES

Survey & Design Division

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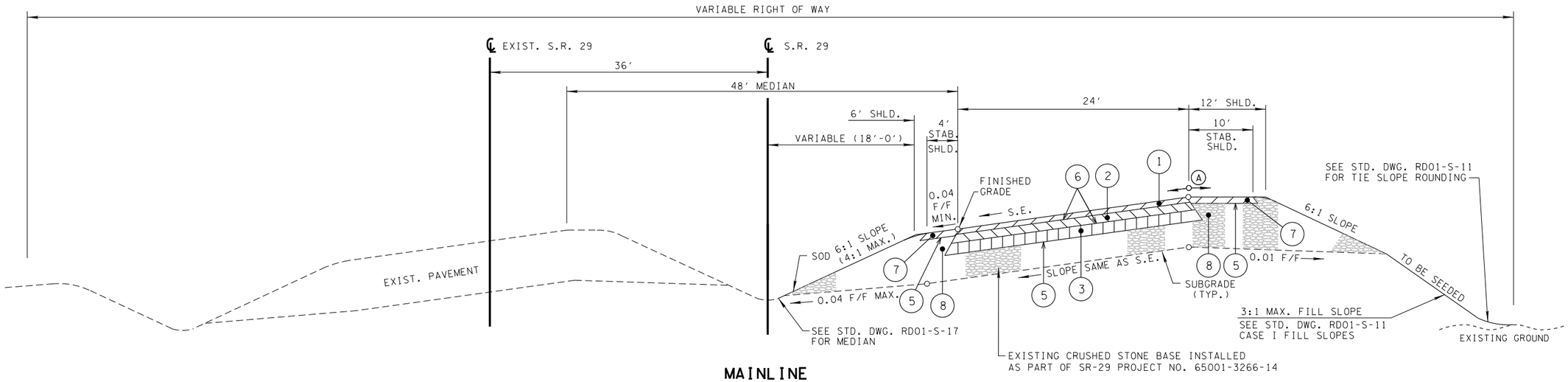
TENNESSEE D.O.T. | DESIGN DIVISION | FILE NO.

◊ IF SUBSURFACE PAVEMENT FAILURE IS EXPOSED AFTER MILLING, REMOVE AREA OF FAILURE TO SOUND PAVEMENT AND REPLACE WITH "B-M2" MIX ALSO USE AS NEEDED FOR LEVELING TO ACHIEVE PROPOSED CROSS SLOPES AND ELEVATIONS.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	2C
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	2D



MAINLINE SUPERELEVATED SECTION

(SEE STD. DWG. RD01-TS-3A FOR DETAILS NOT SHOWN)

STA. 250+68.18 TO STA. 253+18.72

Ⓐ THE SLOPE OF SHOULDER AND ROADWAY PAVEMENT SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 7.0%.

NOTE

1. ALL CUT AND FILL SLOPES 2:1 OR STEEPER (EXCLUDING ROCK CUT AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 2 EROSION CONTROL BLANKET.
2. ALL CUT AND FILL SLOPES 3:1 OR FLATTER (EXCLUDING SOD AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 1 EROSION CONTROL BLANKET.

PROPOSED PAVEMENT SCHEDULE - MAINLINE

① SURFACE AT 1.25" THICK (132.5 LBS/SQ. YD.) ITEM NUMBER 411-01.10 ACS MIX (PG64-22) GRADING D	⑥ TACK COAT ITEM NUMBER 403-01 BITUMINOUS MATERIAL FOR TACK COAT (0.07 GAL/SQ. YD.) GENERAL USE (0.10 GAL/SQ. YD.) MILLING-COLD PLANING
② BINDER AT 2" THICK (226 LBS./SQ. YD) ITEM NUMBER 307-01.08 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2	⑦ SURFACE(SHOULDERS)AT 1.5" THICK(154.5 LBS/SQ.YD.) ITEM NUMBER 411-01.07 ACS MIX (PG64-22) GRADING E SHOULDER
③ BLACK BASE AT 3" THICK (345 LBS./SQ. YD.) ITEM NUMBER 307-01.01 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING A	⑧ CRUSHED STONE BASE AT 14.75" THICK (SHOULDERS) ITEM NUMBER 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D
④ CRUSHED STONE BASE AT 10" THICK (ROADWAY) ITEM NUMBER 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D	⑨ LEVELING, THICKNESS AND RATE VARIES ITEM NUMBER 307-01.08 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2
⑤ PRIME COAT ITEM NUMBER 402-01 - BITUMINOUS MATERIAL FOR PRIME COAT(0.35 GAL/SQ.YD.) ITEM NUMBER 402-02 - AGGREGATE FOR COVER MATERIAL PRIME COAT (12 LBS/SQ.YD.)	⑩ PLANING, THICKNESS VARIES 1.25" (TRAVEL LANE) TO 1.50" (SHOULDER) ITEM NUMBER 415-01.01 COLD PLANING BITUMINOUS PAVEMENT (TON)

OUTSIDE SHOULDER GUARDRAIL PLACEMENT

SEE TYPICAL SR-29 GUARDRAIL LOCATION DETAIL SHEET 2M

STA. 258+54.09 TO STA. 259+50.00 (RT)
STA. 270+67.67 TO STA. 271+50.32 (LT)
STA. 277+75.90 TO STA. 279+67.13 (RT)
STA. 279+86.67 TO STA. 280+52.14 (RT)
STA. 279+94.51 TO STA. 283+26.00 (LT)
STA. 281+66.15 TO STA. 282+97.62 (RT)
STA. 291+41.04 TO STA. 292+56.55 (RT)
STA. 297+24.58 TO STA. 321+75.00 (LT)
STA. 299+06.97 TO STA. 302+50.00 (RT)
STA. 324+59.00 TO STA. 336+39.24 (LT)
STA. 341+26.39 TO STA. 343+45.61 (LT)
STA. 341+33.85 TO STA. 352+12.52 (RT)
STA. 348+02.77 TO STA. 350+44.27 (LT)
STA. 350+64.14 TO STA. 351+94.37 (LT)

CLINT T. BUTLER REGISTERED ENGINEER NO. 120604 STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TYPICAL SECTIONS

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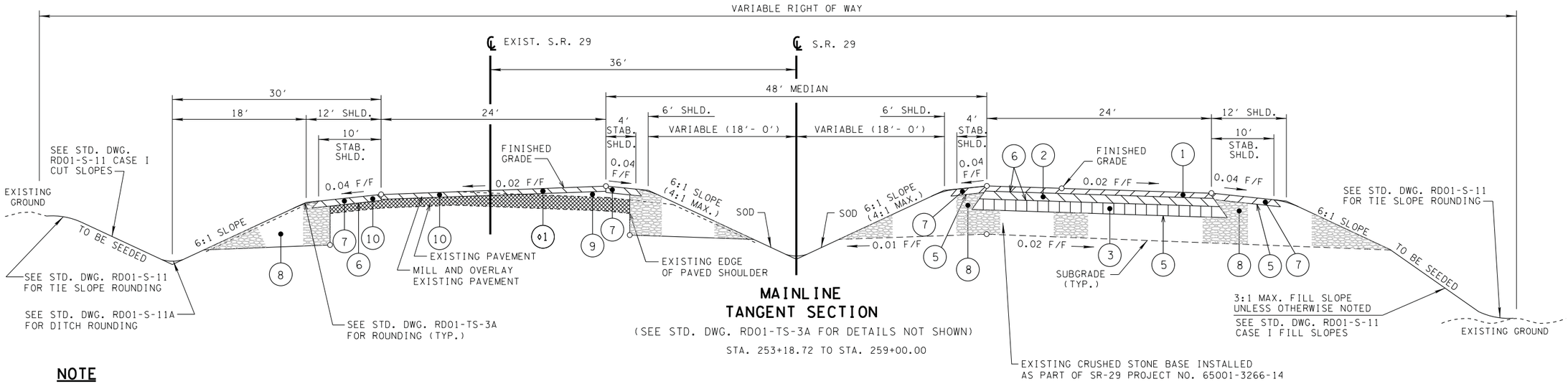
Survey & Design Division

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

◊ IF SUBSURFACE PAVEMENT FAILURE IS EXPOSED AFTER MILLING, REMOVE AREA OF FAILURE TO SOUND PAVEMENT AND REPLACE WITH "B-M2" MIX AS NEEDED FOR LEVELING TO ACHIEVE PROPOSED CROSS SLOPES AND ELEVATIONS.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	2E



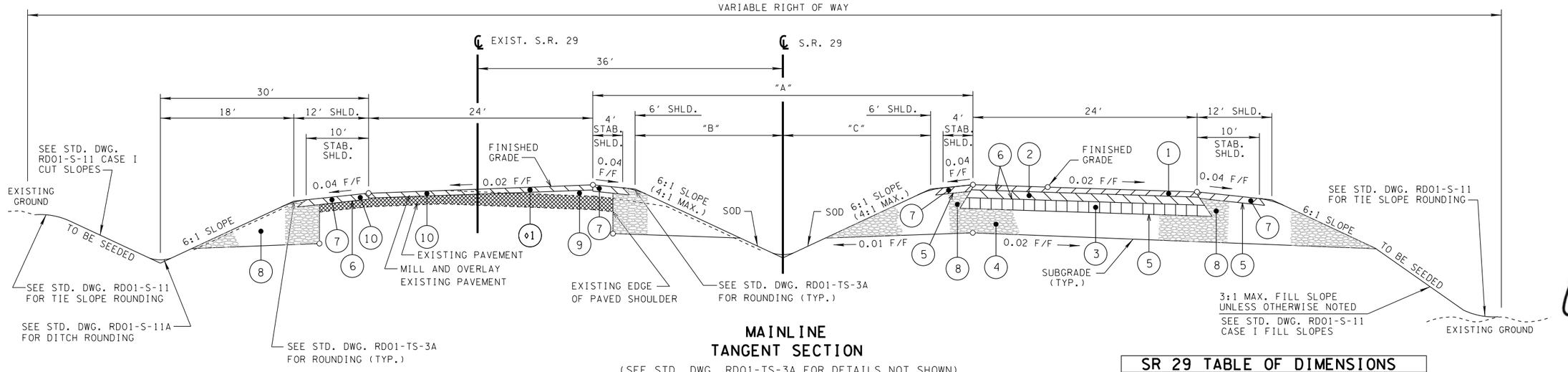
MAINLINE TANGENT SECTION

(SEE STD. DWG. RD01-TS-3A FOR DETAILS NOT SHOWN)

STA. 253+18.72 TO STA. 259+00.00

NOTE

1. SEE SHEET 2F FOR REQUIRED RETAINING WALLS AND DETAILS.
2. ALL CUT AND FILL SLOPES 2:1 OR STEEPER (EXCLUDING ROCK CUT AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 2 EROSION CONTROL BLANKET.
3. ALL CUT AND FILL SLOPES 3:1 OR FLATTER (EXCLUDING SOD AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 1 EROSION CONTROL BLANKET.



MAINLINE TANGENT SECTION

(SEE STD. DWG. RD01-TS-3A FOR DETAILS NOT SHOWN)

STA. 259+00.00 TO STA. 259+39.15
STA. 270+67.67 TO STA. 277+28.54

NOTE: SEE SHEET 2D FOR MAINLINE PAVEMENT SCHEDULE

SR 29 TABLE OF DIMENSIONS

"A"	259+00.00	48′	259+39.15	48′	
"B"	259+00.00	18′	259+39.15	18′	
"C"	259+00.00	18′	259+39.15	18′	
"A"	270+67.67	27.76′	277+20.53	12′	TRANS.
"B"	270+67.67	15.30′	277+20.53	6′	TRANS.
"C"	270+67.67	12.46′	277+20.53	6′	TRANS.
"A"	277+20.53	12′	277+28.54	12′	
"B"	277+20.53	6′	277+28.54	6′	
"C"	277+20.53	6′	277+28.54	6′	

CLINT T. BUTLER REGISTERED ENGINEER NO. 109671 STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
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TYPICAL SECTIONS

Survey & Design Division

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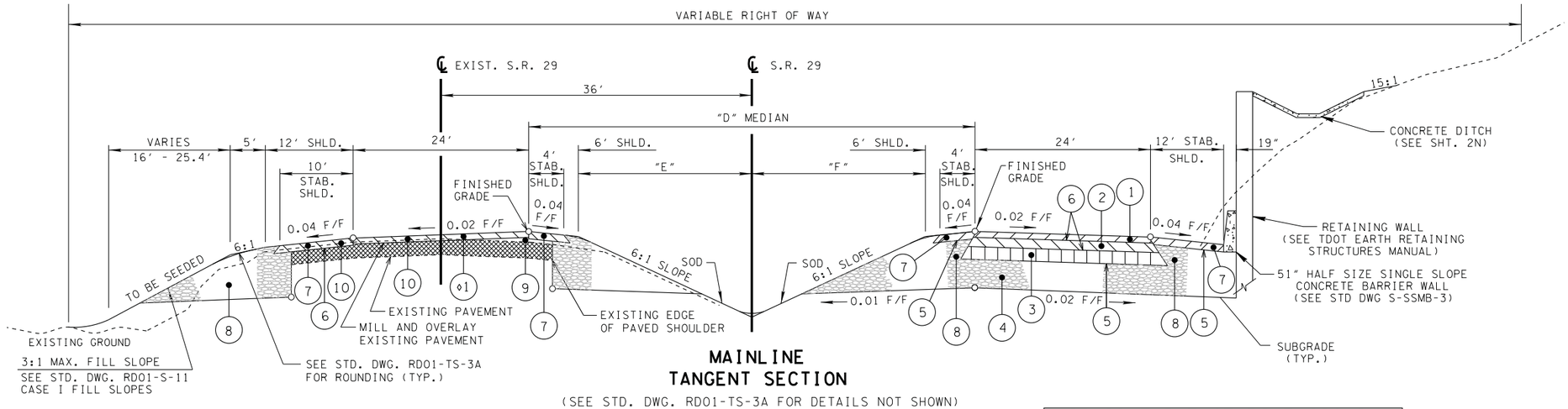
TENNESSEE D.O.T. | DESIGN DIVISION | FILE NO.

◊ IF SUBSURFACE PAVEMENT FAILURE IS EXPOSED AFTER MILLING, REMOVE AREA OF FAILURE TO SOUND PAVEMENT AND REPLACE WITH "B-M2" MIX AS NEEDED FOR LEVELING TO ACHIEVE PROPOSED CROSS SLOPES AND ELEVATIONS.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	2E
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	2F



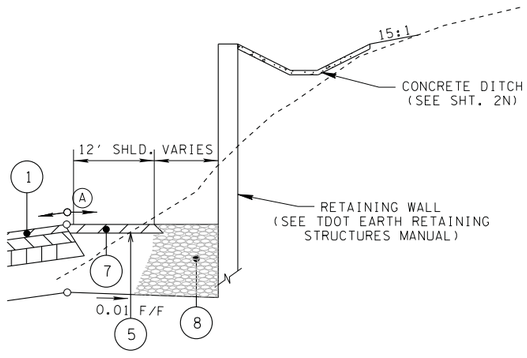
MAINLINE TANGENT SECTION

(SEE STD. DWG. RD01-TS-3A FOR DETAILS NOT SHOWN)

STA. 259+39.15 TO STA. 270+67.67

SR 29 TABLE OF DIMENSIONS

"D"	259+39.15	48'	263+18.26	48'	
"E"	259+39.15	24'	264+36.11	24'	
"D"	259+39.15	24'	263+18.26	24'	
"D"	263+18.26	48'	270+67.67	27.76'	TRANS.
"E"	264+36.11	24'	270+67.67	15.30'	TRANS.
"F"	263+18.26	24'	270+67.67	12.46'	TRANS.

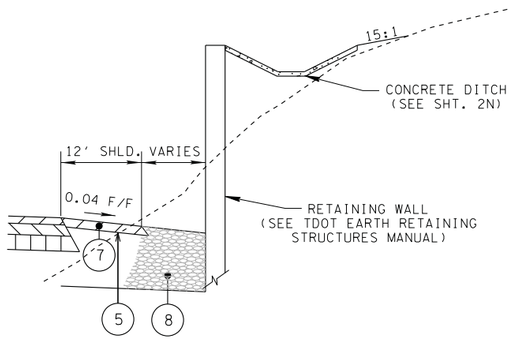


RETAINING WALL TAPERED END SECTIONS SUPERELEVATED SECTION

(SEE STD. DWG. RD01-TS-3A FOR DETAILS NOT SHOWN)

STA. 291+70.20 TO STA. 292+50.00

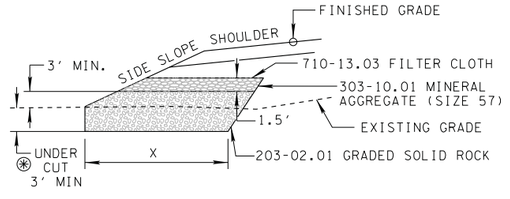
STA. 80+37.06 TO STA. 80+47.00 (STATE ROUTE 328)



RETAINING WALL TAPERED END SECTIONS TANGENT SECTION

(SEE STD. DWG. RD01-TS-3A FOR DETAILS NOT SHOWN)

STA. 259+39.15 TO STA. 259+50.00



TYPICAL SECTION - ROCK FILL PAD⊛ (UNDERCUT AREAS)

STA. 259+24 - 260+14 RT, X= 0'- 40'

FOR USE UNDER PAVED AREAS AT WETLANDS WTL-10, WTL-11, WTL-12 AND OTHER AREAS AS DIRECTED BY THE TDOT SUPERVISOR.

NOTE: SEE SHEET 2D FOR MAINLINE PAVEMENT SCHEDULE

NOTE

1. ALL CUT AND FILL SLOPES 2:1 OR STEEPER (EXCLUDING ROCK CUT AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 2 EROSION CONTROL BLANKET.
2. ALL CUT AND FILL SLOPES 3:1 OR FLATTER (EXCLUDING SOD AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 1 EROSION CONTROL BLANKET.

CLINT T. BUTLER — REGISTERED ENGINEER — NO. 120270 — STATE OF TENNESSEE — 04/27/2015

STATE OF TENNESSEE
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TYPICAL SECTIONS

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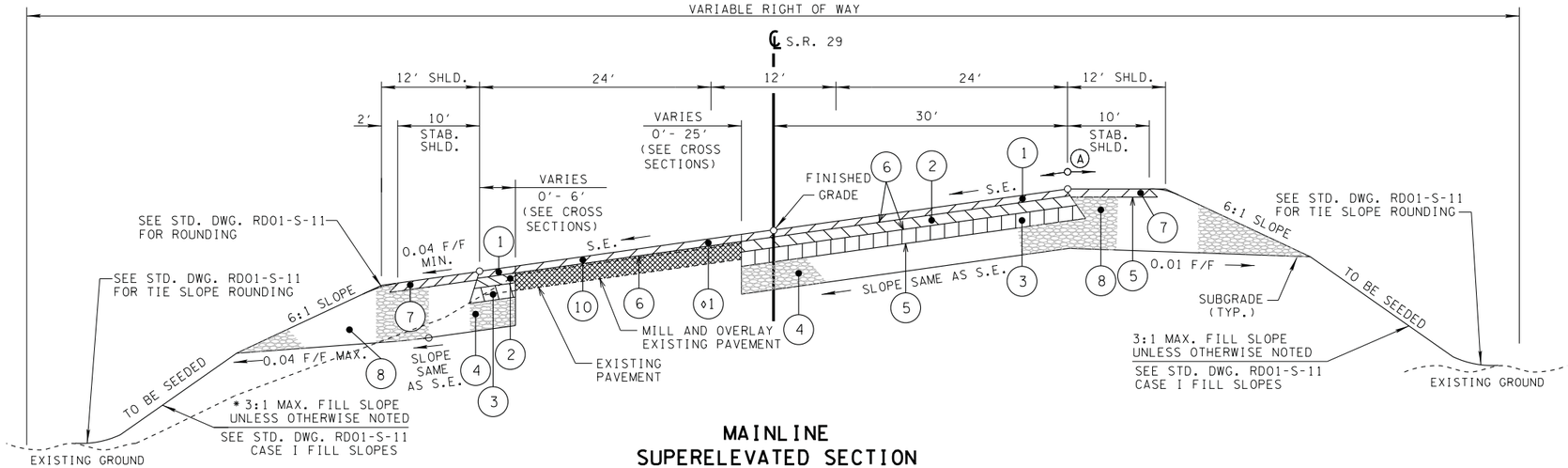
TENNESSEE D.O.T. | DESIGN DIVISION | FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	2G

◊ IF SUBSURFACE PAVEMENT FAILURE IS EXPOSED AFTER MILLING, REMOVE AREA OF FAILURE TO SOUND PAVEMENT AND REPLACE WITH "B-M2" MIX AS NEEDED FOR LEVELING TO ACHIEVE PROPOSED CROSS SLOPES AND ELEVATIONS.



MAINLINE
SUPERELEVATED SECTION

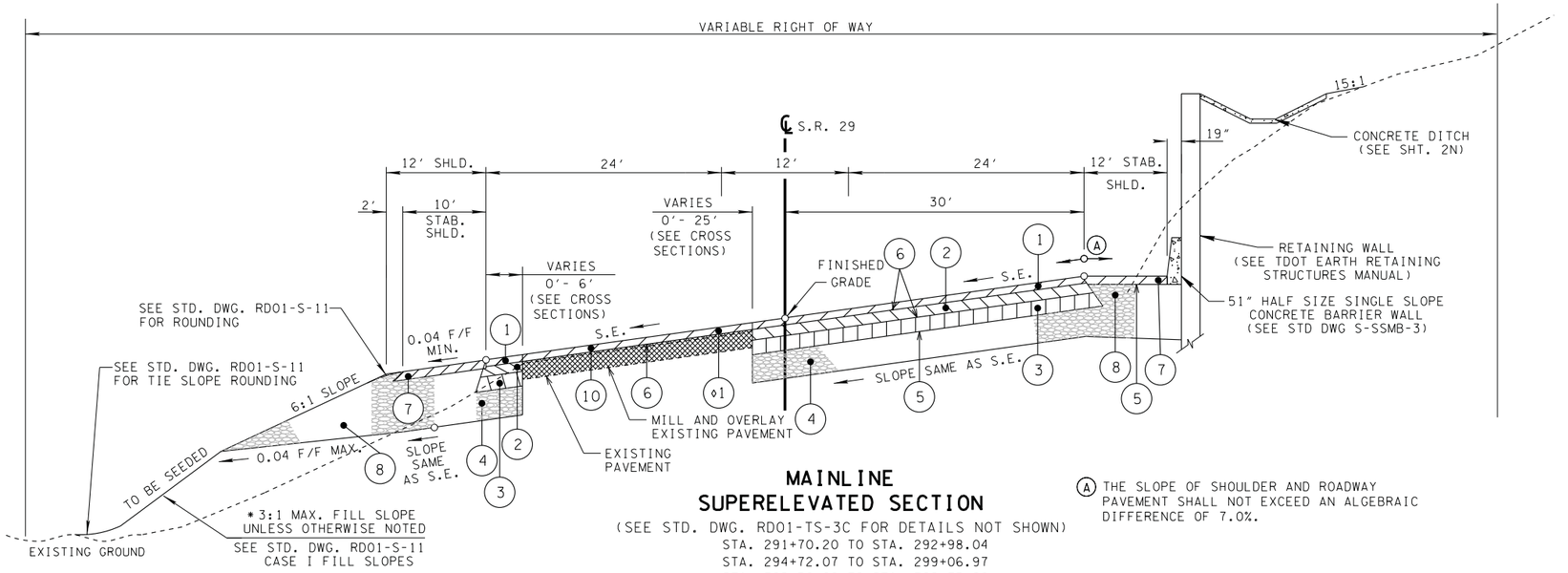
(SEE STD. DWG. RD01-TS-3C FOR DETAILS NOT SHOWN)

STA. 277+28.54 TO STA. 291+70.20
STA. 299+06.97 TO STA. 302+50.00

*USE 2:1 FILL SLOPE FROM:
STA. 326+25 TO STA. 328+00, LT.

USE 2:1 TO 1.65:1 FILL SLOPES FROM:
STA. 297+50 TO STA. 307+00, LT.

USE 4:1 TO 6:1 FILL SLOPES FROM:
STA. 299+50 TO STA. 301+50, RT.



MAINLINE
SUPERELEVATED SECTION

(SEE STD. DWG. RD01-TS-3C FOR DETAILS NOT SHOWN)

STA. 291+70.20 TO STA. 292+98.04
STA. 294+72.07 TO STA. 299+06.97
STA. 302+50.00 TO STA. 309+75.80
STA. 312+74.46 TO STA. 324+42.88
STA. 324+56.73 TO STA. 327+72.15

Ⓐ THE SLOPE OF SHOULDER AND ROADWAY PAVEMENT SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 7.0%.

NOTE: SEE SHEET 2D FOR MAINLINE PAVEMENT SCHEDULE

NOTE

1. ALL CUT AND FILL SLOPES 2:1 OR STEEPER (EXCLUDING ROCK CUT AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 2 EROSION CONTROL BLANKET.
2. ALL CUT AND FILL SLOPES 3:1 OR FLATTER (EXCLUDING SOD AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 1 EROSION CONTROL BLANKET.

CLINT T. BUTLER — REGISTERED — NO. 109611 — STATE OF TENNESSEE — 04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TYPICAL SECTIONS

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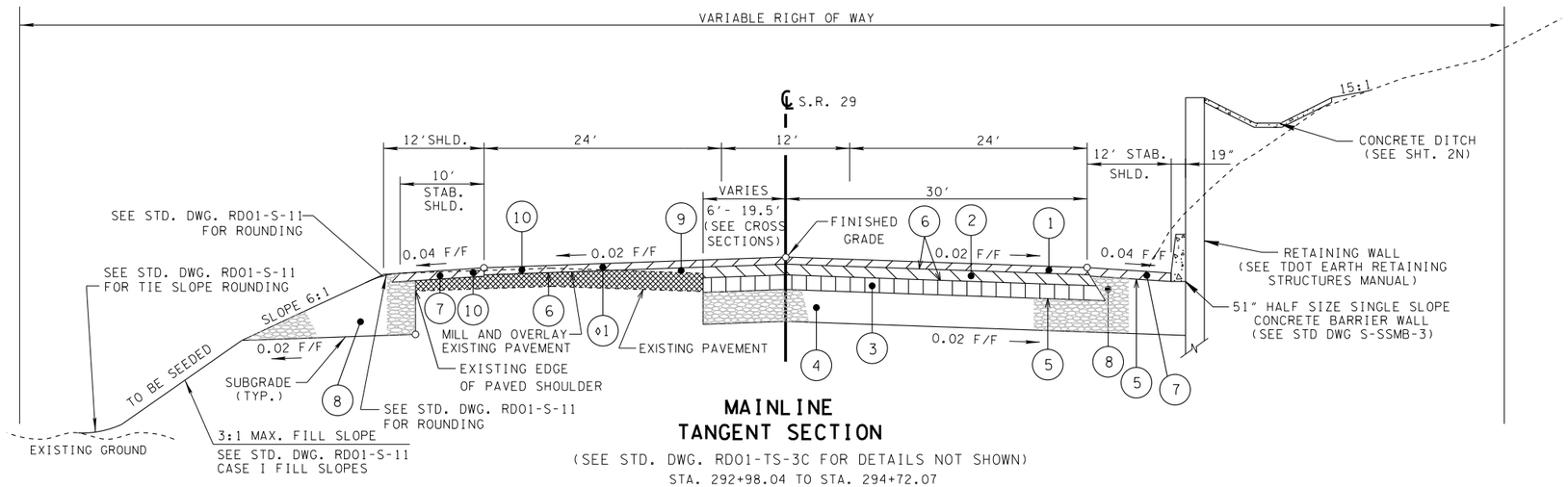
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

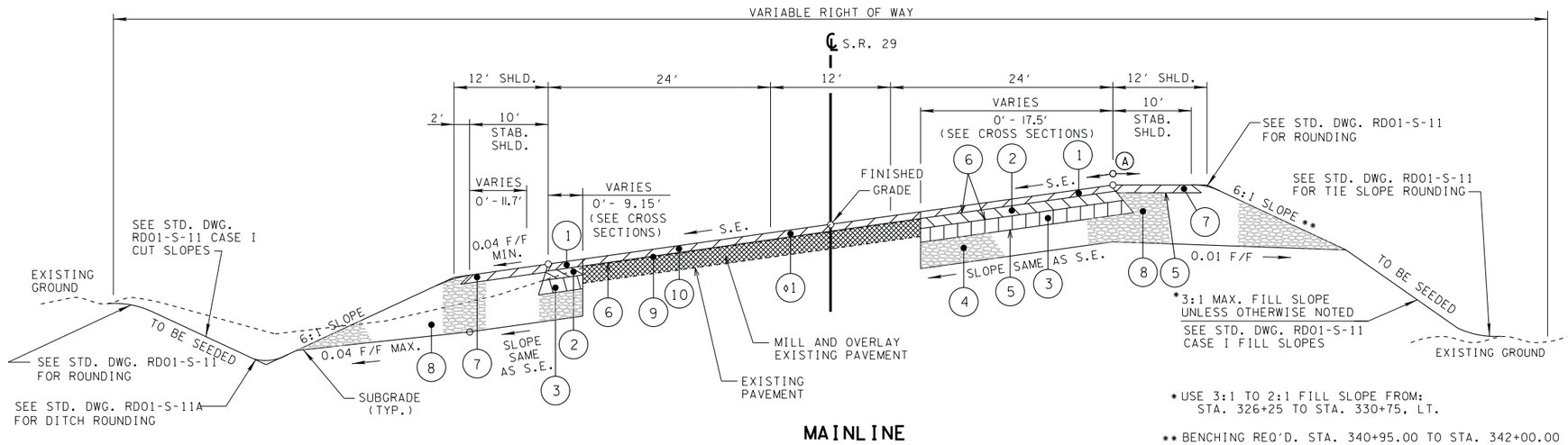
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	2H
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	2H

◊ IF SUBSURFACE PAVEMENT FAILURE IS EXPOSED AFTER MILLING, REMOVE AREA OF FAILURE TO SOUND PAVEMENT AND REPLACE WITH "B-M2" MIX AS NEEDED FOR LEVELING TO ACHIEVE PROPOSED CROSS SLOPES AND ELEVATIONS.



MAINLINE
TANGENT SECTION

(SEE STD. DWG. RD01-TS-3C FOR DETAILS NOT SHOWN)
STA. 292+98.04 TO STA. 294+72.07
STA. 309+75.80 TO STA. 312+74.46
STA. 324+42.88 TO STA. 324+56.73



MAINLINE
SUPERELEVATED SECTION

(SEE STD. DWG. RD01-TS-3C FOR DETAILS NOT SHOWN)
STA. 327+72.15 TO STA. 332+80.14
STA. 334+63.83 TO STA. 345+64.50

* USE 3:1 TO 2:1 FILL SLOPE FROM: STA. 326+25 TO STA. 330+75, LT.

** BENCHING REQ'D. STA. 340+95.00 TO STA. 342+00.00
SEE SHEET 2M FOR DETAILS

Ⓐ THE SLOPE OF SHOULDER AND ROADWAY PAVEMENT SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 7.0%.

NOTE: SEE SHEET 2D FOR MAINLINE PAVEMENT SCHEDULE

NOTE

1. ALL CUT AND FILL SLOPES 2:1 OR STEEPER (EXCLUDING ROCK CUT AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 2 EROSION CONTROL BLANKET.
2. ALL CUT AND FILL SLOPES 3:1 OR FLATTER (EXCLUDING SOD AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 1 EROSION CONTROL BLANKET.

CLINT T. BUTLER REGISTERED No. 120670 STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TYPICAL SECTIONS

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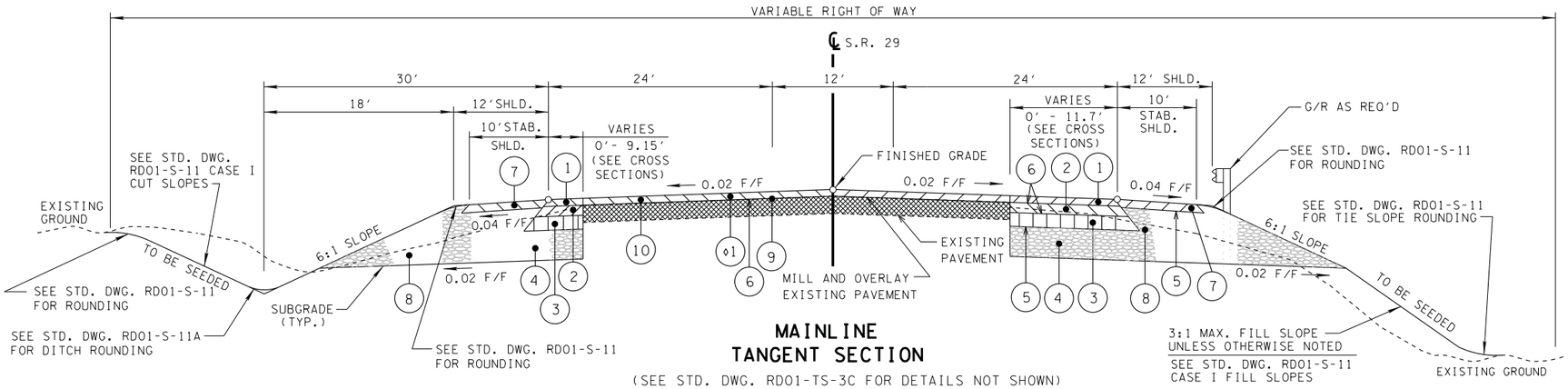
TENNESSEE D.O.T. | DESIGN DIVISION | FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	2J
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	2I

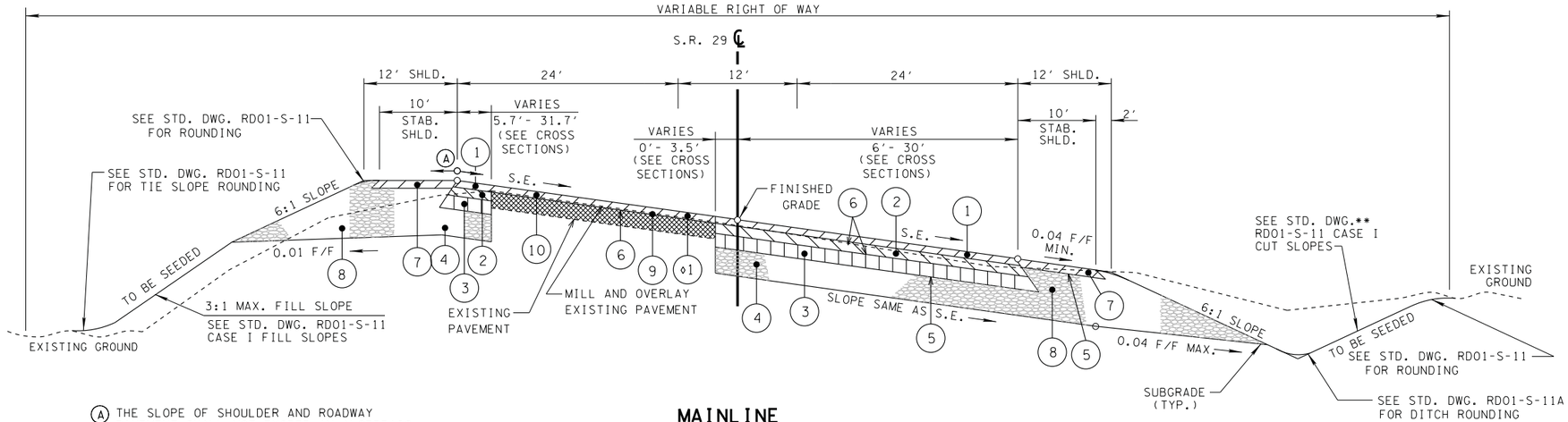
◊ IF SUBSURFACE PAVEMENT FAILURE IS EXPOSED AFTER MILLING, REMOVE AREA OF FAILURE TO SOUND PAVEMENT AND REPLACE WITH "B-M2" MIX AS NEEDED FOR LEVELING TO ACHIEVE PROPOSED CROSS SLOPES AND ELEVATIONS.



MAINLINE TANGENT SECTION

(SEE STD. DWG. RDO1-TS-3C FOR DETAILS NOT SHOWN)

STA. 332+80.14 TO STA. 334+63.83
STA. 348+02.77 TO STA. 348+88.20



Ⓐ THE SLOPE OF SHOULDER AND ROADWAY PAVEMENT SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 7.0%.

MAINLINE SUPERELEVATED SECTION

(SEE STD. DWG. RDO1-TS-3C FOR DETAILS NOT SHOWN)

STA. 348+88.20 TO STA. 357+48.09

NOTE: SEE SHEET 2D FOR MAINLINE PAVEMENT SCHEDULE

NOTE

1. ALL CUT AND FILL SLOPES 2:1 OR STEEPER (EXCLUDING ROCK CUT AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 2 EROSION CONTROL BLANKET.
2. ALL CUT AND FILL SLOPES 3:1 OR FLATTER (EXCLUDING SOD AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 1 EROSION CONTROL BLANKET.

CLINT T. BUTLER — REGISTERED ENGINEER — NO. 109990 — STATE OF TENNESSEE — 04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TYPICAL SECTIONS

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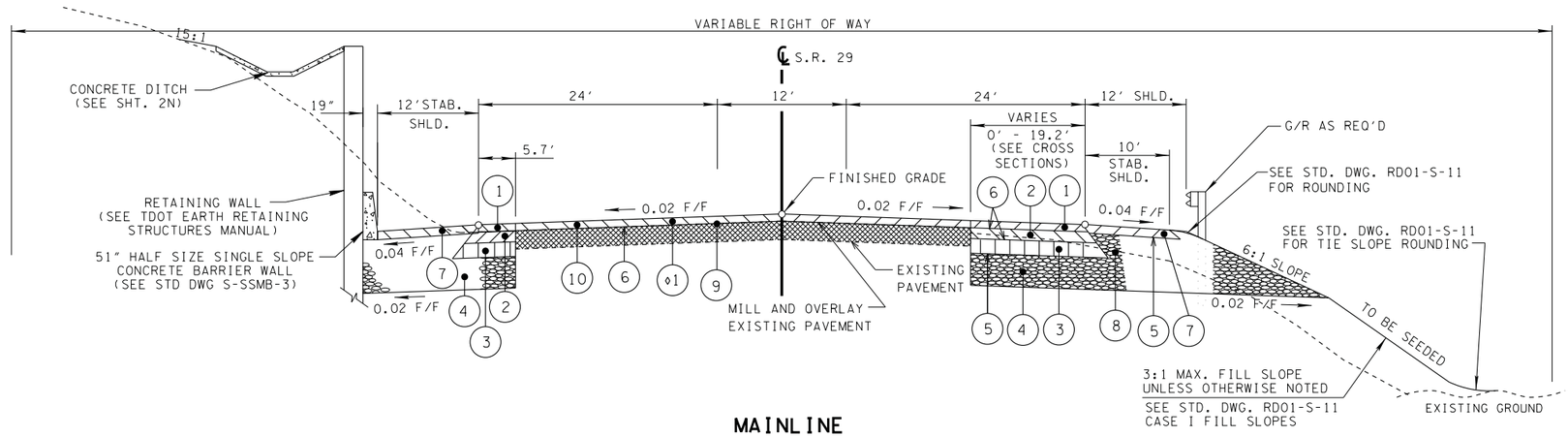
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	2K
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	2J

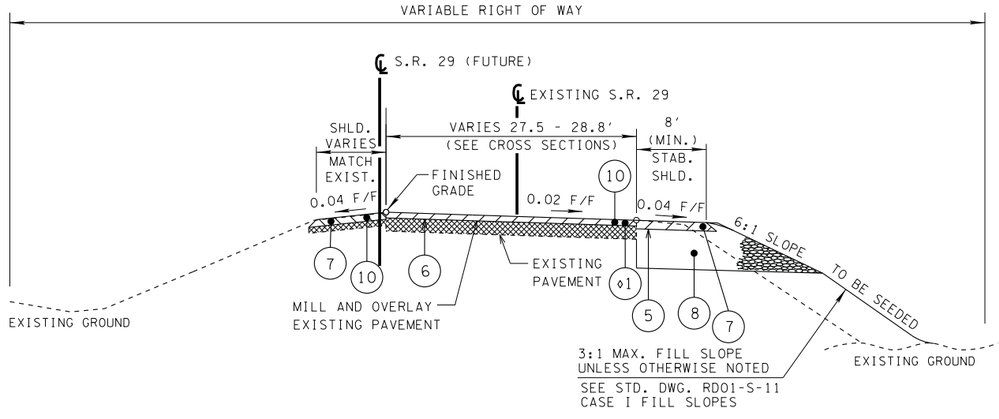


MAINLINE
TANGENT SECTION

(SEE STD. DWG. RD01-TS-3C FOR DETAILS NOT SHOWN)

STA. 346+49.60 TO STA. 348+02.77

◊ IF SUBSURFACE PAVEMENT FAILURE IS EXPOSED AFTER MILLING, REMOVE AREA OF FAILURE TO SOUND PAVEMENT AND REPLACE WITH "B-M2" MIX AS NEEDED FOR LEVELING TO ACHIEVE PROPOSED CROSS SLOPES AND ELEVATIONS.



MAINLINE
SUPERELEVATED SECTION

(SEE STD. DWG. RD01-TS-3 FOR DETAILS NOT SHOWN)

STA. 357+48.09 TO STA. 359+50.00

NOTE: SEE SHEET 2D FOR MAINLINE PAVEMENT SCHEDULE

NOTE

1. ALL CUT AND FILL SLOPES 2:1 OR STEEPER (EXCLUDING ROCK CUT AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 2 EROSION CONTROL BLANKET.
2. ALL CUT AND FILL SLOPES 3:1 OR FLATTER (EXCLUDING SOD AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 1 EROSION CONTROL BLANKET.

LIMIT T. BUTLER
REGISTERED ENGINEER
NO. 120291
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
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TYPICAL SECTIONS

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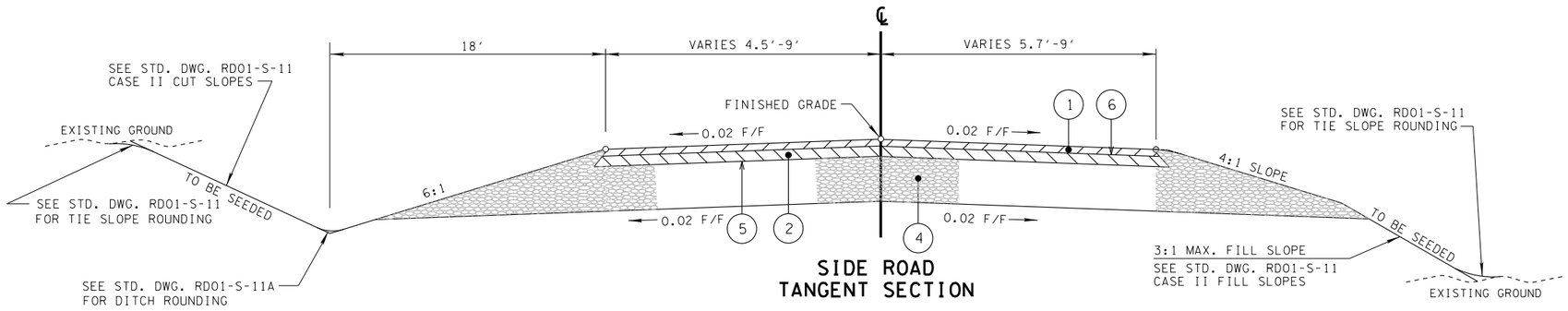
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	2L
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	2K

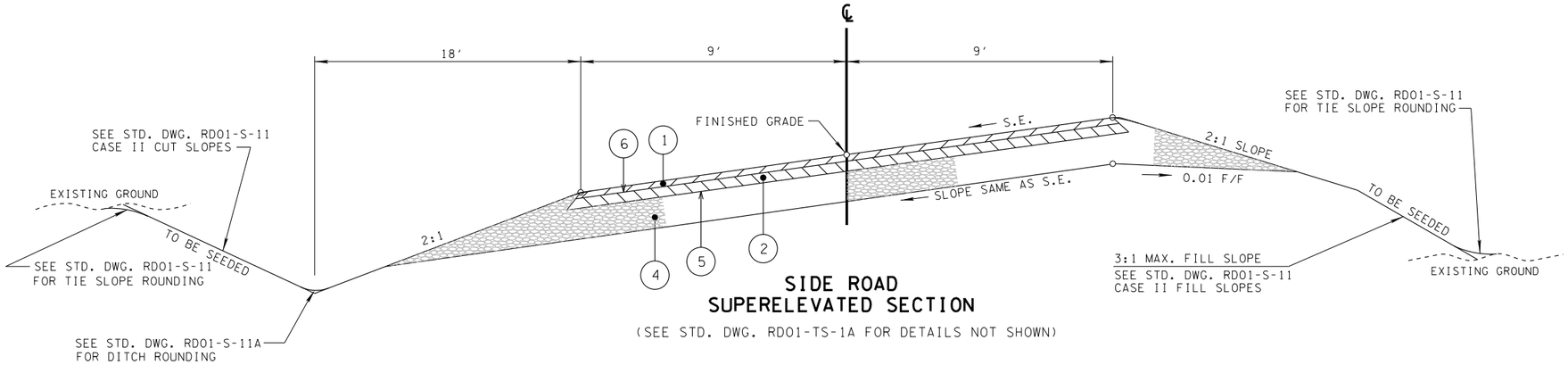


SIDE ROAD TANGENT SECTION

(SEE STD. DWG. RDO1-TS-1A FOR DETAILS NOT SHOWN)

(A) THE SLOPE OF SHOULDER AND ROADWAY PAVEMENT SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 7.0%.

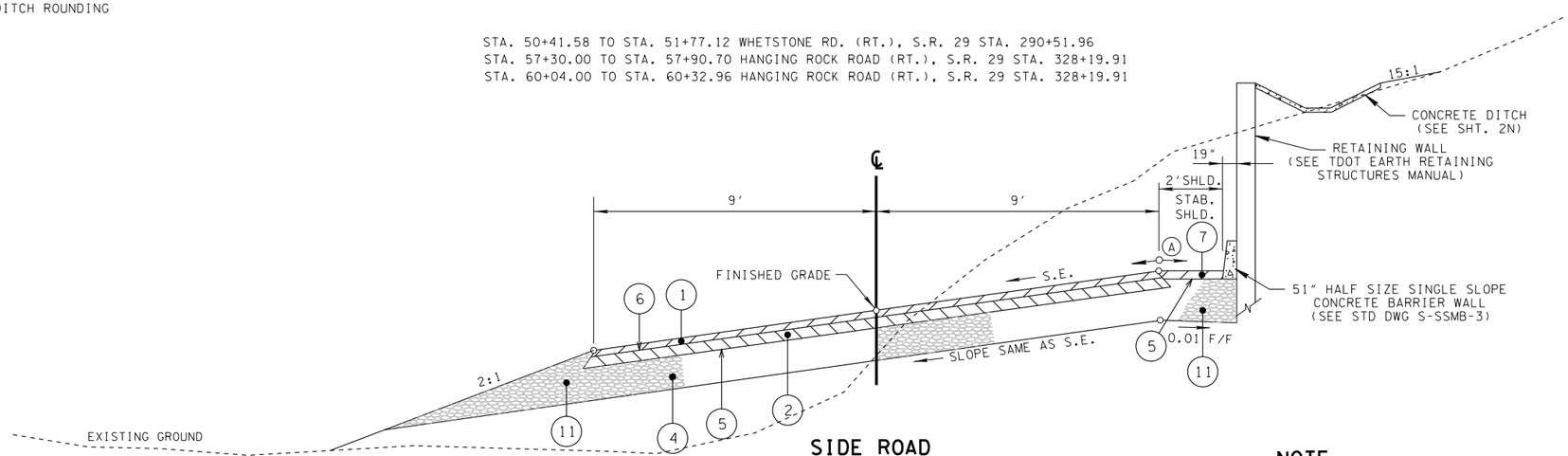
STA. 50+30.00 TO STA. 50+41.58 WHETSTONE RD. (RT.), S.R. 29 STA. 290+51.96
STA. 51+77.12 TO STA. 52+53.55 WHETSTONE RD. (RT.), S.R. 29 STA. 290+51.96
STA. 60+32.96 TO STA. 60+40.00 HANGING ROCK ROAD (RT.), S.R. 29 STA. 328+19.91



SIDE ROAD SUPERELEVATED SECTION

(SEE STD. DWG. RDO1-TS-1A FOR DETAILS NOT SHOWN)

STA. 50+41.58 TO STA. 51+77.12 WHETSTONE RD. (RT.), S.R. 29 STA. 290+51.96
STA. 57+30.00 TO STA. 57+90.70 HANGING ROCK ROAD (RT.), S.R. 29 STA. 328+19.91
STA. 60+04.00 TO STA. 60+32.96 HANGING ROCK ROAD (RT.), S.R. 29 STA. 328+19.91



SIDE ROAD SUPERELEVATED SECTION

(SEE STD. DWG. RDO1-TS-1 FOR DETAILS NOT SHOWN)

STA. 57+90.70 TO STA. 60+04.00 HANGING ROCK ROAD (RT.), S.R. 29 STA. 328+19.91

NOTE: SEE SHEET 2L FOR SIDE ROAD PAVEMENT SCHEDULE

NOTE

1. ALL CUT AND FILL SLOPES 2:1 OR STEEPER (EXCLUDING ROCK CUT AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 2 EROSION CONTROL BLANKET.
2. ALL CUT AND FILL SLOPES 3:1 OR FLATTER (EXCLUDING SOD AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 1 EROSION CONTROL BLANKET.

CLINT T. BUTLER
REGISTERED
NO. 109600
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TYPICAL SECTIONS

Survey & Design Division

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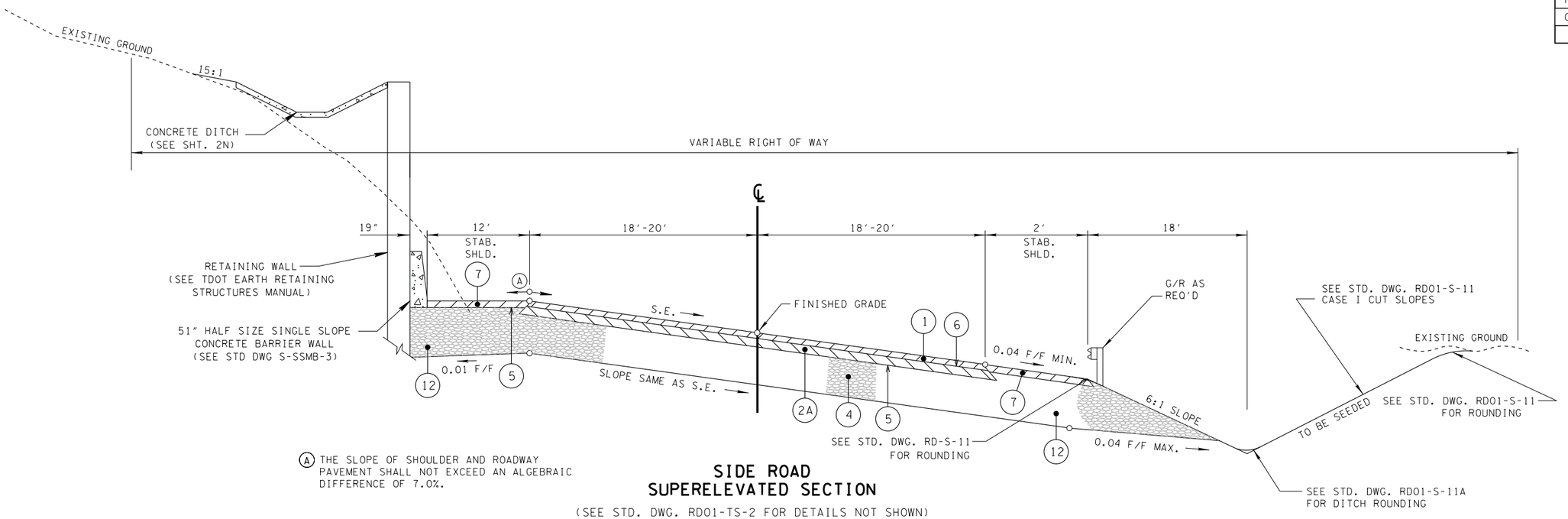
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	2N
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	2L



(A) THE SLOPE OF SHOULDER AND ROADWAY PAVEMENT SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 7.0%.

SIDE ROAD SUPERELEVATED SECTION

(SEE STD. DWG. RD01-TS-2 FOR DETAILS NOT SHOWN)

STA. 80+48.00 TO STA. 82+17.01 STATE ROUTE 328 (LT.), S.R. 29 STA. 344+41.25

PROPOSED PAVEMENT SCHEDULE - SIDE ROADS AND SR-328

(1) SURFACE AT 1.25" THICK (132.5 LBS/SQ. YD.)
ITEM NUMBER 411-01.10
ACS MIX (PG64-22) GRADING D

(2) BINDER AT 2" THICK (226 LBS./SQ. YD)
ITEM NUMBER 307-01.08
ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM)
GRADING B-M2

(2A) BINDER AT 2.5" THICK (287.5 LBS./SQ. YD)(SR-328)
ITEM NUMBER 307-01.08
ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM)
GRADING B-M2

(4) CRUSHED STONE BASE AT 10" THICK
ITEM NUMBER 303-01
MINERAL AGGREGATE, TYPE A BASE, GRADING D

(5) PRIME COAT
ITEM NUMBER 402-01 - BITUMINOUS MATERIAL FOR PRIME COAT(0.35 GAL/SQ.YD.)
ITEM NUMBER 402-02 - AGGREGATE FOR COVER MATERIAL PRIME COAT (12 LBS/SQ.YD.)

(6) TACK COAT
ITEM NUMBER 403-01
BITUMINOUS MATERIAL FOR TACK COAT
(0.07 GAL/SQ. YD.) GENERAL USE
(0.10 GAL/SQ. YD.) MILLING-COLD PLANING

(7) SURFACE(SHOULDERS)AT 1.5" THICK(154.5 LBS/SQ.YD.)
ITEM NUMBER 411-01.07
ACS MIX (PG64-22) GRADING E SHOULDER

(11) CRUSHED STONE BASE AT 11.75" THICK (SHOULDERS)
ITEM NUMBER 303-01
MINERAL AGGREGATE, TYPE A BASE, GRADING D

(12) CRUSHED STONE BASE AT 12.25" THICK (SHOULDERS)
ITEM NUMBER 303-01
MINERAL AGGREGATE, TYPE A BASE, GRADING D

NOTE

1. ALL CUT AND FILL SLOPES 2:1 OR STEEPER (EXCLUDING ROCK CUT AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 2 EROSION CONTROL BLANKET.
2. ALL CUT AND FILL SLOPES 3:1 OR FLATTER (EXCLUDING SOD AND RIP-RAP AREAS) SHALL BE SEEDED WITH TYPE 1 EROSION CONTROL BLANKET.

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 109041
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TYPICAL SECTIONS

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	20

APR NOTES:

1. THIS PROJECT CONTAINS POTENTIALLY ACID PRODUCING MATERIALS (PYRITIC MATERIALS) CONSISTING OF ROCK, ROCK-LIKE MATERIALS, AND SOIL THAT CONTAIN SUFFICIENT AMOUNTS OF CERTAIN MINERALS THAT COULD PRODUCE DRAINAGE AT pH LEVELS SUFFICIENTLY LESS THAN BACKGROUND pH WHEN EXPOSED TO ATMOSPHERIC CONDITIONS AND WEATHERING PROCESSES.

2. TDOT SPECIAL PROVISION 107L, REGARDING POTENTIALLY ACID PRODUCING MATERIALS, AND SUPPLEMENTAL NOTES HEREIN SHALL BE FOLLOWED FOR THE SAMPLING, TESTING AND DISPOSAL OF ACID PRODUCING MATERIALS.

3. TESTING OF ACID PRODUCING MATERIALS SHALL BE PERFORMED BY A TDOT APPROVED LABORATORY. THE CONTRACTOR SHALL COLLECT THE ACID PRODUCING MATERIAL SAMPLES FOR TESTING AND THE ACID PRODUCING MATERIAL SAMPLES WILL BE DELIVERED BY THE CONTRACTOR TO THE LABORATORY.

4. SAMPLES OF THE ACID PRODUCING MATERIAL TESTED BY THE LABORATORY SHALL BE PAID AS EACH UNDER PAY ITEM 106-04.01, SAMPLING AND TESTING OF POTENTIAL ACIDIC MATERIAL. EACH SAMPLE WILL INCLUDE THE FOLLOWING SUITE OF TESTING PARAMETERS:

   A. ACID POTENTIAL EPA 600/2-78-054
   B. NEUTRALIZATION POTENTIAL EPA 600/2-78-054 OR MODIFIED SKOUSEN 1997, IF REQUESTED.
   C. NET NEUTRALIZATION POTENTIAL - EPA 600/2-78-054 (ALSO KNOWN AS CALCIUM CARBONATE DEFICIENCY/SURPLUS)
   D. pH - EPA 600/2-78-054 OR ASTM D4239
   E. TOTAL SULFUR (%) EPA600/2-78-054 OR ASTM D4239
   F. % 7#32PYRITIC9#32SULFUR ASTM D2492-02
   G. FIZZ - EPA 600/2-78-054

5. TEST RESULTS OF SAMPLES TAKEN FROM THE CONSTRUCTION PROJECT FOR THE PURPOSE OF MONITORING ACID PRODUCING MATERIAL DURING CONSTRUCTION SHALL BE PROVIDED WITHIN 36 HOURS OF THEIR DELIVERY TO THE LABORATORY. IF THE 36 HOUR TIME FRAME ENDS BETWEEN THE HOURS OF 5:00 PM EASTERN TIME AND 8:00 AM EASTERN TIME, THE TEST RESULTS SHALL BE PROVIDED BY 8:30 AM EASTERN TIME FOLLOWING THE END OF THE 36 HOUR PERIOD. IF MORE THAN 30 SAMPLES ARE DELIVERED TO THE LABORATORY AT ONE TIME, THE TIME FRAME WILL BE SHIFTED (ADVANCED LATER) 24 HOURS FOR EACH SUBSEQUENT GROUP OF 30 SAMPLES.

6. ALL ANALYTICAL LABORATORY TESTING RESULTS SHALL BE PROVIDED TO TDOT AND/OR THEIR REPRESENTATIVE.

7. ALL ACID PRODUCING MATERIALS THAT REQUIRE ENCAPSULATION OR BLENDING SHALL BE PLACED IN A CLASS 1 APPROVED LANDFILL. THE FOLLOWING LANDFILL HAS AIRSPACE AVAILABLE TO ACCEPT ACID PRODUCING MATERIAL: RHEA COUNTY, TN LANDFILL. CONTACT INFORMATION:

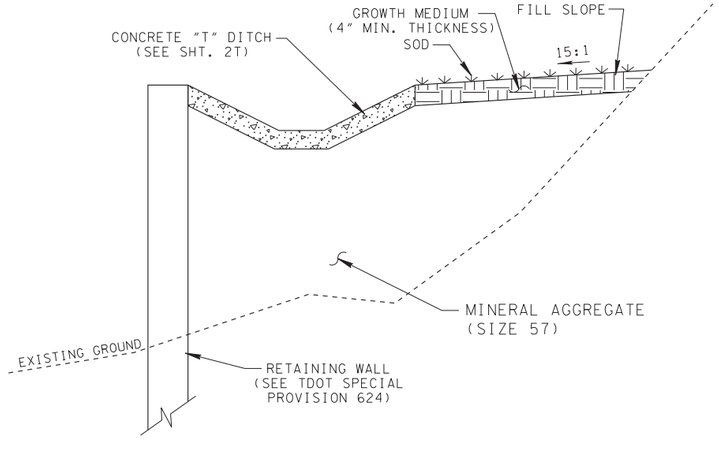
   SANTEK WASTE SERVICES
   ATTN: AARON ELLEDGE
   650 25TH STREET, N.W., SUITE 100
   CLEVELAND, TN 37311
   PHONE: 423-303-7101
   TOLL FREE: 800-467-9160

8. THE CONTRACTOR SHALL COORDINATE WITH THE LANDFILL REGARDING THE AMOUNT OF ACID PRODUCING MATERIALS THAT CAN BE RECEIVED ON A PER DAY BASIS IN ORDER TO PREVENT EXCESS STOCKPILING OF ACID PRODUCING MATERIALS ON-SITE.

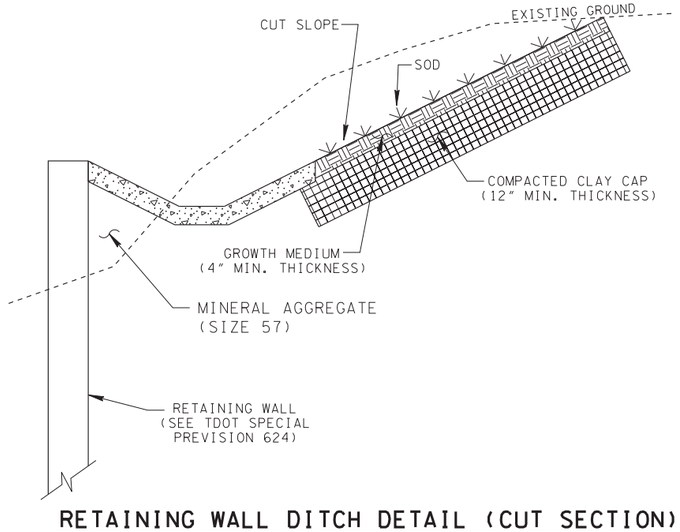
9. IN ADDITION TO SPECIAL PROVISION 107L, THE CONTRACTOR SHALL COVER AND PROTECT ALL PYRITIC SLOPES AND MATERIAL BY THE USE OF POLYETHYLENE SHEETING AND SANDBAGS AT ANY TIME THE PROJECT ENGINEER DETERMINES THAT APPROACHING INCLEMENT WEATHER WILL POSE A CONCERN WITH POTENTIAL ACIDIC RUNOFF. THE COST FOR COVERING PYRITIC SLOPES AND MATERIALS SHALL BE INCLUDED IN PAY ITEM NO. 209-20.03.

10. DUE TO THE POTENTIAL OF ACIDIC SOILS THROUGHOUT THE PROJECT SITE, SOILS ON OR TOPSOIL PLACED ON CUT AND FILL SLOPES SHALL BE TESTED FOR pH PRIOR TO APPLYING PERMANENT STABILIZATION (SEED AND EROSION CONTROL BLANKETS, SOD, ETC.). THE COST FOR pH TESTS WILL BE INCLUDED IN THE COST OF OTHER ITEMS. AGRICULTURAL LIME (801-09) SHALL BE APPLIED TO THE SLOPES TO NEUTRALIZE THE SOIL ACIDITY AT THE RECOMMENDED RATES TO PROVIDE A pH RANGE OF 6-9.

11. SOILS INFORMATION DEPICTED WITHIN THE CONSTRUCTION PLANS IS BASED UPON THE "GEOTECHNICAL INVESTIGATION STATE ROUTE 29 (U.S. 27) STA. 100+00 TO STA. 345+00" REPORT PREPARED BY ARCADIS U.S., INC. DATED FEBRUARY 12, 2002. FOR ADDITIONAL GEOTECHNICAL BORINGS AND SOILS INFORMATION REFER TO THE "REPORT OF ACID PRODUCING ROCK EVALUATION STATE ROUTE 29 (U.S. HIGHWAY 27) IMPROVEMENTS" DATED JANUARY 4, 2013 AND THE REPORT "RETAINING WALL AND ACID PRODUCING ROCK EVALUATION REPORT STATE ROUTE 29 WIDENING FROM SOUTH OF WHETSTONE ROAD TO NORTH OF STATE ROUTE 328" DECEMBER 11, 2013, PREPARED BY S&ME, INC..



RETAINING WALL DITCH DETAIL (FILL SECTION)
N.T.S.



RETAINING WALL DITCH DETAIL (CUT SECTION)
N.T.S.

SPECIAL GEOTECHNICAL NOTES:

1. THE GEOTECHNICAL REPORT WHICH INCLUDES DETAILED BORING RECORDS, SOIL AND ROCK TESTING DATA IS AVAILABLE UPON REQUEST. ON SOME PROJECTS SOIL AND ROCK CORE SAMPLES ARE AVAILABLE FOR INSPECTION BY THE CONTRACTOR.

2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE PLANS, GEOTECHNICAL REPORT, AND BORING LOGS TO BECOME FAMILIAR WITH THE SUBSURFACE CONDITIONS PERTINENT TO THE ASSOCIATED WORK TO BE CONDUCTED BY THE CONTRACTOR. THE CONTRACTOR SHOULD ALSO CONSIDER THEIR EXPERIENCE IN THE PROJECT'S GEOLOGIC AND SUBSURFACE SETTING AND THEIR EXPERIENCE IN DEALING WITH VARIABLE SUBSURFACE CONDITIONS ACROSS A PROJECT SITE TO BASE THEIR BID UPON AND DECISIONS REGARDING APPROPRIATE EQUIPMENT TO BE UTILIZED.

3. DUE TO THE SITE GEOLOGY AND THE POTENTIAL CORROSIVE ENVIRONMENT AT THE ANCHOR AREA, IT IS REQUIRED THAT THE TENDON BOND LENGTH BE ENCAPSULATED TO PROVIDE ADDITIONAL CORROSION PROTECTION (DOUBLE CORROSION PROTECTION). THE ENCAPSULATION SHALL BE FABRICATED FROM ONE OF THE FOLLOWING:

   I. HIGH DENSITY CORRUGATED POLYETHYLENE TUBING CONFORMING TO THE REQUIREMENTS OF AASHTO M 252 AND HAVING A MINIMUM WALL THICKNESS OF 0.06 INCH EXCEPT PRE-GROUTED TENDONS, WHICH MAY HAVE A MINIMUM WALL THICKNESS OF 0.04 INCH.

   II. CORRUGATED POLYVINYL CHLORIDE TUBES MANUFACTURED FROM RIGID PVC COMPOUNDS CONFORMING TO ASTM D 1784, CLASS 13646-B.

NOTE:
1. THE COMPACTED CLAY CAP SHALL CONSIST OF 12 INCHES OF LOW TO MODERATELY PLASTIC CLAY OR SILT WITH A PLASTICITY INDEX OF LESS THAN THIRTY FIVE(PI<35) AND A STANDARD PROCTOR MAXIMUM DRY DENSITY GREATER THAN 90 POUNDS PER CUBIC FOOT. THE CAP SHALL CONTAIN NO ROCK FRAGMENTS LARGER THAN 1 INCH IN ANY DIMENSION, AND NO ORGANIC MATTER.

2. THE COMPACTED CLAY CAP SHALL BE PLACED IN THIN LIFTS WITH A MAXIMUM LOOSE THICKNESS OF 8 INCHES, THEN COMPACTED TO 90 PERCENT OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY, WITH A MOISTURE CONTENT WITHIN 3 PERCENT OF THE OPTIMUM MOISTURE CONTENT, DEPENDING ON THE SHAPE OF THE PROCTOR CURVE. WETTING OR DRYING OF THESE SOILS MAY BE REQUIRED, DEPENDING ON THE TIME OF YEAR SITE GRADING IS PERFORMED.

3. THE DENSITY AND MOISTURE CONTENT OF EACH LIFT SHALL BE TESTED BY A SOILS TECHNICIAN BEFORE PLACING ADDITIONAL LIFTS TO EVALUATE THAT THE SPECIFIED DEGREE OF COMPACTION IS BEING ACHIEVED.

4. THE ACTUAL TESTING FREQUENCY SHALL BE DETERMINED BY THE GEOTECHNICAL OR PROJECT ENGINEER BASED ON THE TYPE OF SOIL BEING PLACED, THE EQUIPMENT BEING USED, AND THE TIME OF YEAR THE FILL IS BEING PLACED. ANY AREAS THAT DO NOT MEET THE COMPACTION SPECIFICATION SHALL BE RE-COMPACTED TO ACHIEVE COMPLIANCE.

5. THE GROWTH MEDIUM SHALL CONSIST OF 4 INCHES OF TOPSOIL PLACED OVER THE CLAY CAP WITH SOD FOR PERMANENT STABILIZATION.

6. THE BACK SLOPE OF THE CONCRETE "T" DITCH SHALL TIE INTO EXISTING GROUND OR BE PLACED IN FILL. EXCAVATION OF THE EXISTING SLOPE UP GRADIENT OF THE CONCRETE "T" DITCH WILL BE ALLOWED ONLY IN THE APPROXIMATE LOCATIONS LISTED BELOW.

   STA. 313+00.00 - 315+00.00 SR 29
   STA. 324+70.00 - 325+30.00 SR 29
   STA. 60+00.00 - 60+40.00 HANGING ROCK ROAD

7. DENSIFIED ASTM D448 NO. 57 STONE SHALL BE PLACED BENEATH THE CONCRETE "T" DITCH SECTIONS LOCATED IN FILL AREAS.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

APR
NOTES &
DETAILS

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Survey & Design Division

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	20

GENERAL NOTES

GRADING

(1) ANY AREA THAT IS DISTURBED OUTSIDE LIMITS OF CONSTRUCTION DURING THE LIFE 0F THIS PROJECT SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.

(2) CERTIFICATION FOR ALL BORROW PITS MUST BE OBTAINED IN ACCORDANCE WITH SUBSECTION 107.06 OF THE STANDARD SPECIFICATIONS.

(3) THE CONTRACTOR SHALL NOT DISPOSE OF ANY MATERIAL EITHER ON OR OFF STATE-OWNED R.O.W. IN A REGULATORY FLOOD WAY AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY WITHOUT APPROVAL BY SAME. ALL MATERIAL SHALL BE DISPOSED OF IN UPLAND (NON-WETLAND) AREAS AND ABOVE ORDINARY HIGH WATER OF ANY ADJACENT WATERCOURSE. THIS DOES NOT ELIMINATE THE NEED TO OBTAIN ANY OTHER LICENSES OR PERMITS THAT MAY BE REQUIRED BY ANY OTHER FEDERAL, STATE OR LOCAL AGENCY.

SEEDING AND SODDING

(1) ALL EXISTING ROADS WITHIN THE RIGHT-OF-WAY AND NOT IN THE GRADED AREA THAT ARE TO BE ABANDONED SHALL BE SCARIFIED, OBLITERATED, TOPSOILED AND SEEDED. SCARIFYING AND OBLITERATING THE PAVEMENT WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS. TOPSOIL, IN ACCORDANCE WITH SECTION 203 OF THE STANDARD SPECIFICATIONS, WILL BE MEASURED AND PAID FOR UNDER ITEMS 203-04 AND/OR 203-07. SEEDING, IN ACCORDANCE WITH SECTION 801 OF THE STANDARD SPECIFICATIONS, WILL BE MEASURED AND PAID FOR UNDER ITEM 801-01.

(2) SOD SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLANS TO PREVENT DAMAGE TO ADJACENT FACILITIES AND PROPERTY DUE TO EROSION ON

(3) ITEM NO. 801-02, SEEDING (WITHOUT MULCH) AND EROSION CONTROL BLANKET , SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLANS AS WELL AS LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL

(1) THE CONTRACTOR SHALL NOT REMOVE ANY SECTIONS OF EXISTING GUARDRAIL TO REWORK SHOULDERS OR FLATTEN SLOPES UNTIL THE ENGINEER CONCURS IN THE NECESSITY OF REMOVAL DUE TO CONSTRUCTION REQUIREMENTS AND THE APPROPRIATE WARNING DEVICES ARE INSTALLED. THE PROPOSED GUARDRAIL, INCLUDING ANY ANCHOR SYSTEM, SHALL BE INSTALLED QUICKLY TO MINIMIZE TRAFFIC EXPOSURE TO ANY HAZARD. NO PAYMENT WILL BE MADE FOR A SECTION OF PROPOSED GUARDRAIL, INCLUDING ANCHORS, UNTIL IT IS COMPLETE IN PLACE.

(2) IF ANY APPROACH END OF A SECTION OF GUARDRAIL OR BRIDGE RAIL MUST TEMPORARILY BE LEFT INCOMPLETE AND EXPOSED TO TRAFFIC, THE CONTRACTOR SHALL USE TWO (2) TEMPORARY BARRICADES OR DRUMS WITH TYPE A LIGHTS AND ROUNDED END ELEMENTS AS MINIMUM MEASURES TO PROTECT TRAFFIC FROM THE HAZARD OF AN EXPOSED END. ALL COST OF FURNISHING AND INSTALLING A TEMPORARY ROUNDED END ELEMENT SHALL BE INCLUDED IN THE COST OF THE PROPOSED GUARDRAIL.

(3) GUARDRAIL IS TO BE COMPLETE IN PLACE BEFORE THE MAINLINE ROADWAY IS OPENED TO TRAFFIC.

DRAINAGE

(1) THE CONTRACTOR SHALL SHAPE DITCHES TO THE SPECIFIED DESIGN. THIS WORK WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS.

(2) EXCAVATION FOR DRAINAGE PIPES AND CULVERTS WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT WILL BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PIPE (PIPE CULVERTS, STORM SEWERS, CONDUITS, ALL OTHER CULVERTS AND MINOR STRUCTURES).

(3) CULVERT EXCAVATION FOR CONCRETE BOX OR SLAB TYPE CULVERTS OR BRIDGES WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS.

(4) THE CUTTING OF INLET AND OUTLET DITCHES WHERE SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER WILL BE MEASURED AND PAID FOR AS ITEM NO. 203-01 ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED).

(5) WHERE A CULVERT (PIPE, SLAB OR BOX) IS MOVED TO A NEW LOCATION OTHER THAN THAT SHOWN ON THE PLANS, INCREASING OR DECREASING THE AMOUNT OF CULVERT EXCAVATION, NO INCREASE OR DECREASE IN THE AMOUNT OF PAYMENT WILL BE MADE DUE TO SUCH CHANGE.

(6) DURING CONSTRUCTION OF DRAINAGE STRUCTURES ALL COST ASSOCIATED WITH MAINTAINING THE FLOW OF WATER AND TRAFFIC, AT THESE STRUCTURES, DURING THE PHASED CONSTRUCTION OF THIS PROJECT ARE TO BE INCLUDED IN THE UNIT PRICE OF THE DRAINAGE STRUCTURES AND TRAFFIC CONTROL ITEMS.

UTILITIES

(1) THE LOCATIONS OF UTILITIES SHOWN WITHIN THESE PLANS ARE APPROXIMATE ONLY. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD BY CONTACTING THE UTILITY COMPANIES INVOLVED. NOTIFICATION BY CALLING THE TENNESSEE ONE CALL SYSTEM, INC., AT 1-800-351-1111 AS REQUIRED BY TCA 65-31-106 WILL BE REQUIRED.

(2) UNLESS OTHERWISE NOTED, ALL UTILITY ADJUSTMENTS WILL BE PERFORMED BY THE UTILITY OR IT'S REPRESENTATIVE. THE CONTRACTOR AND UTILITY OWNERS WILL BE REQUIRED TO COOPERATE WITH EACH OTHER IN ORDER TO EXPEDITE THE WORK REQUIRED BY THIS CONTRACT. ON CONTRACTS WHERE CONSTRUCTION STAKES, LINES, AND GRADES ARE CONTRACT ITEMS, THE CONTRACTOR WILL BE REQUIRED TO PROVIDE RIGHT-OF-WAY OR SLOPE STAKES, DITCH OR STREAM BED GRADES, OR OTHER ESSENTIAL SURVEY STAKING TO PREVENT CONFLICTS WITH THE HIGHWAY CONSTRUCTION. FREQUENTLY, THIS WILL BE REQUIRED AS THE FIRST ITEM OF WORK AND AT ANY LOCATION ON THE PROJECT DIRECTED BY THE ENGINEER.

(3) THE CONTRACTOR WILL PROVIDE ALL NECESSARY PROTECTIVE MEASURES TO SAFEGUARD EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION OF THIS PROJECT. IN THE EVENT THAT SPECIAL EQUIPMENT IS REQUIRED TO WORK OVER AND AROUND THE UTILITIES, THE CONTRACTOR WILL BE REQUIRED TO FURNISH SUCH EQUIPMENT. THE COST OF PROTECTING UTILITIES FROM DAMAGE AND FURNISHING SPECIAL EQUIPMENT WILL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF CONSTRUCTION

(4) PRIOR TO SUBMITTING HIS BID, THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR CONTACTING OWNERS OF ALL AFFECTED UTILITIES IN ORDER TO DETERMINE THE EXTENT TO WHICH UTILITY RELOCATIONS AND/OR ADJUSTMENTS WILL HAVE UPON THE SCHEDULE OF WORK FOR THE PROJECT. WHILE SOME WORK MAY BE REQUIRED 'AROUND' UTILITY FACILITIES THAT WILL REMAIN IN PLACE, OTHER UTILITY FACILITIES MAY NEED TO BE ADJUSTED CONCURRENTLY WITH THE CONTRACTOR'S OPERATIONS. ADVANCE CLEAR CUTTING MAY BE REQUIRED BY THE ENGINEER AT ANY LOCATION WHERE CLEARING IS CALLED FOR IN THE SPECIFICATIONS AND CLEAR CUTTING IS NECESSARY FOR A UTILITY RELOCATION. ANY ADDITIONAL COST WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE CLEARING ITEM SPECIFIED IN THE PLANS.

(5) THE CONTRACTOR SHALL NOTIFY EACH INDIVIDUAL UTILITY OWNER OF HIS PLAN OF OPERATION IN THE AREA OF THE UTILITIES. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL CONTACT THE UTILITY OWNERS AND REQUEST THEM TO PROPERLY LOCATE THEIR RESPECTIVE UTILITY ON THE GROUND. THIS NOTIFICATION SHALL BE GIVEN AT LEAST THREE (3) BUSINESS DAYS PRIOR TO COMMENCEMENT OF OPERATIONS AROUND THE UTILITY IN ACCORDANCE WITH TCA 65-31-106.

FENCING

(1) LOCATION OF THE FENCE SHALL BE ONE FOOT INSIDE THE RIGHT-OF-WAY EXCEPT WHERE SHOWN ON THE PLANS.

(2) FENCES SHALL BE TURNED IN AT DRAINAGE STRUCTURES, STOCK PASSES AND BRIDGES WHERE DIRECTED BY THE ENGINEER SO AS TO ABUT WINGWALLS AND/OR ABUTMENTS

(3) THE CONTRACTOR SHALL GIVE THE AFFECTED PROPERTY OWNERS TWO WEEKS NOTICE PRIOR TO CUTTING FENCES.

(4) THE CONTRACTOR SHALL BE REQUIRED TO INSTALL ACCESS CONTROL FENCES PRIOR TO CUTTING EXISTING STOCK FENCES IN AREAS UTILIZED BY DOMESTIC LIVESTOCK OR OTHER AREAS AS DIRECTED BY THE ENGINEER.

MISCELLANEOUS

(1) ALL DETOUR, ACCESS, SERVICE AND FRONTAGE ROADS SHALL BE CONSTRUCTED WITH A MINIMUM OF ONE (1) COURSE OF BASE MATERIAL BEFORE TRAFFIC IS INTERRUPTED ON EXISTING ROADS.

(2) THE CONTRACTOR SHALL BE REQUIRED TO REMOVE AND RESET MAILBOXES WHERE AND AS DIRECTED BY THE ENGINEER.

(3) NOTHING IN THE GENERAL NOTES OR SPECIAL PROVISIONS SHALL RELIEVE THE CONTRACTOR FROM HIS RESPONSIBILITIES TOWARD THE SAFETY AND CONVENIENCE OF THE GENERAL PUBLIC AND THE RESIDENTS ALONG THE PROPOSED CONSTRUCTION AREA

RIGHT - OF – WAY

(1) IT IS INTENDED THAT ALL BUILDINGS AND/OR PORTIONS OF BUILDINGS THAT ARE WITHIN THE PROPOSED RIGHT-OF-WAY AND/OR EASEMENT LINES FOR THE PROJECT BE REMOVED THERE FROM IN THE PROCESS OF RIGHT-OF-WAY ACQUISITION. IF ANY SUCH BUILDINGS OR IMPROVEMENTS ARE NOT REMOVED IN THE COURSE OF RIGHT-OF-WAY ACQUISITION, THE CIVIL ENGINEERING MANAGER 2, ROADWAY DESIGN DIVISION IS TO BE NOTIFIED IN SUFFICIENT TIME TO PERMIT HAVING SUCH REMOVALS DESIGNATED AS A PART OF THE CONSTRUCTION CONTRACT.

(2) ALL RAMPS MUST CONFORM TO THE DEPARTMENT'S "POLICY ON FINANCING CONSTRUCTION OF PUBLIC ROAD INTERSECTIONS AND DRIVEWAYS ON HIGHWAY RESURFACING, RECONSTRUCTION AND CONSTRUCTION PROJECTS ON NEW LOCATIONS", THE MANUAL ON RULES AND REGULATIONS FOR CONSTRUCTING DRIVEWAYS ON STATE HIGHWAY RIGHT-OF-WAY, STANDARD DRAWING RP-R-1, AND OTHER ACCEPTED DESIGN AND SAFETY STANDARDS.

(3) EXISTING PAVED DRIVEWAY PER TRACT REMAINDER WILL BE REPLACED IN KIND TO A TOUCHDOWN POINT.

(4) WHERE THE EXISTING DRIVEWAY IS UNPAVED AND THE PROPOSED DRIVEWAY EXCEEDS 7 PERCENT IN GRADE, EACH DRIVEWAY WILL BE PAVED TO A TOUCHDOWN POINT OR UNTIL THE GRADE IS LESS THAN 7 PERCENT.

(5) WHERE THE EXISTING DRIVEWAY IS UNPAVED AND THE PROPOSED DRIVEWAY IS LESS THAN 7 PERCENT IN GRADE, EACH DRIVEWAY WILL BE PAVED A SHOULDER WIDTH FROM THE EDGE OF PAVEMENT AND THE REMAINDER OF THAT DRIVEWAY REPLACED IN KIND TO A TOUCHDOWN POINT.

(6) ANY NECESSARY PAVING OF DRIVEWAYS WILL BE DONE DURING PAVING OPERATIONS ON THE MAIN ROADWAY.

(7) NEW DRIVEWAYS PROVIDED IN THE PLANS WILL BE PAVED BASED ON THE 7 PERCENT CRITERIA. THOSE 7 PERCENT OR STEEPER IN GRADE WILL BE PAVED AND THOSE FLATTER THAN 7 PERCENT WILL BE COVERED WITH BASE STONE.

(8) ON PROJECTS WITHOUT CURB AND GUTTER THAT ARE ON STATE ROUTES, IT WILL BE THE RESPONSIBILITY OF THE OWNER TO SECURE A PERMIT AND TO CONSTRUCT ADDITIONAL DRIVEWAYS AND FIELD ENTRANCES OTHER THAN THOSE PROVIDED IN THE PLANS.

PAVEMENT MARKINGS

TEMPORARY PAVEMENT MARKING ON INTERMEDIATE LAYERS

(1) TEMPORARY PAVEMENT LINE MARKINGS ON INTERMEDIATE LAYERS OF PAVEMENT SHALL BE REFLECTIVE TAPE OR REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAYS WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.01, PAINTED PAVEMENT MARKING (4" LINE) L.M.

(2) WIDE (8 INCH) TEMPORARY PAVEMENT MARKING LINE WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.02 PAINTED PAVEMENT MARKING (8" BARRIER LINE), LIN. FT.

FINAL PAVEMENT MARKING IF 6" ENHANCED FLATLINE THERMOPLASTIC IS USED

(4) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 6" ENHANCED FLATLINE THERMOPLASTIC INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-12.02, ENHANCED FLATLINE THERMO PVMT MRKNG (6IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF REFLECTORIZED PAINT IS USED

(5) PERMANENT PAVEMENT LINE MARKINGS SHALL BE REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 109930
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

GENERAL NOTES

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Survey & Design Division

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	2R

GENERAL NOTES (CONT.)

MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.01 PAINTED PAVEMENT MARKING (4IN LINE), L.M.

DETOURS, LANE SHIFTS AND MEDIAN CROSS-OVERS

(6) THE PAVEMENT MARKING ON THE LANE SHIFTS CENTERLINE, EDGE LINE AND LANE LINES WILL BE INSTALLED AND MAINTAINED TO THE SAME STANDARDS AS FOR PERMANENT MARKINGS ON THE MAIN ROADWAY. THESE MARKINGS SHALL BE IN PLACE PRIOR TO ALLOWING TRAFFIC ONTO THE PAVEMENT. THESE PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.01, LIN. MI.

(7) BEFORE OPENING THE DIVERSION TO TRAFFIC, THE TRANSITIONAL MARKINGS ON THE EXISTING ROADWAY MUST BE IN PLACE. ALL EXISTING MARKINGS IN THE AREA OF THESE TRANSITIONAL MARKINGS SHALL BE OBLITERATED AND ALL EXISTING RAISED PAVEMENT MARKERS SHALL BE REMOVED TO ELIMINATE CONFLICTING MARKINGS. REMOVAL OF THE EXISTING CONFLICTING MARKINGS AND RAISED PAVEMENT MARKERS WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN ITEM NO. 712-01 TRAFFIC CONTROL, LUMP SUM.

PAVEMENT

PAVING

(1) THE CONTRACTOR SHALL BE REQUIRED TO PAVE IN THE DIRECTION OF TRAFFIC.

(2) THE CONTRACTOR SHALL BE REQUIRED TO COLD PLANE AND PAVE IN THE DIRECTION OF TRAFFIC.

RESURFACING

(3) WHERE DIRECTED BY THE TDOT ENGINEER, THE CONTRACTOR SHALL BE REQUIRED TO SHAPE PUBLIC SIDE ROADS, BUSINESS ENTRANCES, AND PRIVATE DRIVES, AS WELL AS CLEANING OF EXISTING DRAINS BEFORE PLACING MATERIALS. ALL COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF CONSTRUCTION.

(4) ALL PUBLIC SIDE ROADS SHALL BE PAVED ONE PAVER WIDTH THROUGH THE INTERSECTION AS A MINIMUM. A SATISFACTORY TRANSITION FROM THE NEW PAVEMENT TO THE EXISTING GRADE OF THE INTERSECTING PUBLIC ROAD OR BUSINESS ENTRANCE SHALL BE PROVIDED. SHOULD THE PAVEMENT OF THE INTERSECTING PUBLIC ROAD BE DISTRESSED, THE RESURFACING WIDTH MAY BE INCREASED TO THE NORMAL RIGHT OF WAY LINE.

(5) PRIVATE DRIVEWAYS, FIELD ENTRANCES, AND BUSINESS ENTRANCES WILL BE RESURFACED A PAVER WIDTH (LANE WIDTH) AS A MINIMUM. A PAVEMENT TAPER TO TRANSITION THE NEW PAVEMENT SHALL BE REQUIRED, IT SHALL BE BASED ON AN ADDITIONAL ONE FOOT OF WIDTH PER ONE INCH DEPTH OF PAVEMENT. IF THE SHOULDER IS NARROW ENOUGH THAT THE SUM OF THE SHOULDER AND THE TRANSITION ARE LESS THAN A PAVER WIDTH, THE TRANSITION SHALL OCCUR WITHIN THE PAVER WIDTH. IF THE SUM OF THE SHOULDER AND THE TRANSITION IS GREATER THAN A PAVER WIDTH (LANE WIDTH), THE TRANSITION SHALL OCCUR OUTSIDE OF THE PAVER WIDTH.

(6) IN ALL CASES, THE LENGTH OF THE PAVEMENT TRANSITION, THE THICKNESS AND WIDTH OF THE RESURFACING AND ANY ADDITIONAL PAVEMENT MATERIALS SHALL BE AS DIRECTED BY THE TDOT ENGINEER.

GRADED SOLID ROCK

(1) THE ROCK FILL (GRADED SOLID ROCK) MATERIAL SHALL CONSIST OF SOUND, NON-DEGRADABLE LIMESTONE OR SANDSTONE WITH A MAXIMUM SIZE OF 3'-0". AT LEAST 50% (BY WEIGHT) OF THE ROCK SHALL BE UNIFORMLY DISTRIBUTED BETWEEN 1'-0" AND 3'-0" IN DIAMETER, AND NO GREATER THAN 10% (BY WEIGHT) SHALL BE LESS THAN 2" IN DIAMETER. THE MATERIAL SHALL BE ROUGHLY EQUIDIMENSIONAL; THIN, SLABBY MATERIALS WILL NOT BE ACCEPTED. THE CONTRACTOR SHALL BE REQUIRED TO PROCESS THE MATERIAL WITH AN ACCEPTABLE MECHANICAL MEANS (A SCREENING PROCESS CAPABLE OF PRODUCING THE REQUIRED GRADATION). THE ROCK SHALL BE APPROVED BY A REPRESENTATIVE OF THE DIVISION OF MATERIALS AND TESTS BEFORE USE.

(2) THIS GRADED SOLID ROCK MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING FIVE FEET IN DEPTH.

SIGNING

(1) THE TOP OF THE SIGN FOOTINGS SHALL BE PLACED LEVEL WITH THE GROUND LINE.

(2) AFTER THE SIGN LOCATIONS HAVE BEEN STAKED, BUT PRIOR TO ORDERING ANY MATERIAL FOR THE SUPPORTS, THERE SHALL BE A FIELD INSPECTION AND APPROVAL BY THE REGIONAL CONSTRUCTION OFFICE.

(3) ALL SIGNS MARKED "TO BE REMOVED" ARE TO BE REMOVED BY THE CONTRACTOR AND PAID FOR UNDER ITEM 713-15 AND BECOME THE PROPERTY OF THE CONTRACTOR.

(4) THE EXISTING FOOTINGS ARE TO BE REMOVED 6 INCHES BELOW GROUND LINE.

(5) THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL FLAT SHEET SIGNS SHALL BE APPLIED BY SILK SCREENING PROCESS, EXCEPT THAT CUT-OUT DIRECT APPLIED COPY SHALL BE USED ON ALL FLAT SHEET SIGNS WITH A GREEN BACKGROUND, OR BROWN BACKGROUND.

(6) THE LENGTHS OF ALL SIGN SUPPORTS SHOWN ON THE SIGN SCHEDULE ARE APPROXIMATE AND ARE FOR ESTIMATING PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ALL SUPPORT LENGTHS AT THE SITE PRIOR TO ERECTION.

(7) THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL FLAT SHEET SIGNS SHALL BE APPLIED BY SILK SCREENING PROCESS.

CONSTRUCTION WORK ZONE & TRAFFIC CONTROL

(1) ADVANCED WARNING SIGNS SHALL NOT BE DISPLAYED MORE THAN FORTY-EIGHT (48) HOURS BEFORE PHYSICAL CONSTRUCTION BEGINS. SIGNS MAY BE ERECTED UP TO ONE WEEK BEFORE NEEDED, IF THE SIGN FACE IS FULLY COVERED.

(2) IF THE CONTRACTOR MOVES OFF THE PROJECT, HE SHALL COVER OR REMOVE ALL UNNEEDED SIGNS AS DIRECTED BY THE ENGINEER. COSTS OF REMOVAL, COVERING, AND REINSTALLING SIGNS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT ALL COSTS SHALL BE INCLUDED IN THE ORIGINAL UNIT PRICE BID FOR ITEM NO 712-06, SIGNS (CONSTRUCTION) PER SQUARE FOOT.

(3) A LONG TERM BUT SPORADIC USE WARNING SIGN, SUCH AS A FLAGGER SIGN, MAY REMAIN IN PLACE WHEN NOT REQUIRED PROVIDED THE SIGN FACE IS FULLY COVERED.

(4) TRAFFIC CONTROL DEVICES SHALL NOT BE DISPLAYED OR ERECTED UNLESS RELATED CONDITIONS ARE PRESENT NECESSITATING WARNING.

(5) USE OF BARRICADES, PORTABLE BARRIER RAILS, VERTICAL PANELS, AND DRUMS SHALL BE LIMITED TO THE IMMEDIATE AREAS OF CONSTRUCTION WHERE A HAZARD IS PRESENT. THESE DEVICES SHALL NOT BE STORED ALONG THE ROADWAY WITHIN THIRTY (30) FEET OF THE EDGE OF THE TRAVELED WAY BEFORE OR AFTER USE UNLESS PROTECTED BY GUARDRAIL, BRIDGE RAIL, AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL INCREASE TO FORTY-FIVE (45) FEET FOR ROADWAYS WITH CURRENT ADT'S OF 1500 OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. THESE DEVICES SHALL BE REMOVED FROM THE CONSTRUCTION WORK ZONE WHEN THE ENGINEER DETERMINES THEY ARE NO LONGER NEEDED. WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK, THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.

(6) THE CONTRACTOR SHALL NOT BE PERMITTED TO PARK ANY VEHICLES OR CONSTRUCTION EQUIPMENT DURING PERIODS OF INACTIVITY, WITHIN THIRTY (30) FEET OF THE EDGE OF PAVEMENT WHEN THE LANE IS OPEN TO TRAFFIC UNLESS PROTECTED BY GUARDRAIL, BRIDGE RAIL, AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL BE INCREASED TO FORTY-FIVE (45) FEET FOR ROADWAYS WITH CURRENT ADT'S OF 1500 OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. PRIVATELY OWNED VEHICLES SHALL NOT BE ALLOWED TO PARK WITHIN THIRTY (30) FEET OF A OPEN TRAFFIC LANE AT ANY TIME UNLESS PROTECTED AS DESCRIBED ABOVE FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL BE INCREASED TO FORTY-FIVE (45) FEET FOR ROADWAYS WITH CURRENT ADT'S OF 1500 OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE.. WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK, THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.

(7) ALL DETOUR AND CONSTRUCTION SIGNING SHALL BE IN STRICT ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

(8) ALL DETOURS SHALL BE PAVED, STRIPED, SIGNED AND THE VERTICAL PANELS ARE TO BE IN PLACE BEFORE IT IS OPENED TO TRAFFIC.

EROSION PREVENTION AND SEDIMENT CONTROL

DISTURBED AREA

(1) AREAS TO BE UNDISTURBED SHALL BE CLEARLY MARKED IN THE FIELD BEFORE CONSTRUCTION ACTIVITIES BEGIN.

(2) PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED (I.E. CLEARING AND GRUBBING INITIATED) MORE THAN 15 CALENDAR DAYS PRIOR TO GRADING OR EARTH MOVING ACTIVITIES UNLESS THE AREA IS MULCHED, SEEDED WITH MULCH, OR OTHER TEMPORARY COVER IS INSTALLED.

(3) CLEARING, GRUBBING, AND OTHER DISTURBANCE TO RIPARIAN VEGETATION SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR SLOPE CONSTRUCTION AND EQUIPMENT OPERATIONS. EXISTING VEGETATION SHOULD BE PRESERVED TO THE MAXIMUM EXTENT POSSIBLE. UNNECESSARY VEGETATION REMOVAL IS PROHIBITED.

(4) ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE. PRIORITY SHALL BE GIVEN TO FINISHING OPERATIONS AND PERMANENT EPSC MEASURES OVER TEMPORARY EPSC MEASURES ON ALL PROJECTS.

(5) CONSTRUCTION SHALL BE SEQUENCED AND STAGED TO MINIMIZE THE EXPOSURE TIME OF GRADED OR DENUDED SOIL AREAS, PRESERVE TOPSOIL, AND MINIMIZE SOIL COMPACTION.

(6) NO MORE THAN 50 ACRES OF ACTIVE SOIL DISTURBANCE IS ALLOWED AT ANY TIME DURING THE CONSTRUCTION OF THE PROJECT. OFF-SITE BORROW OR WASTE AREAS ARE TO BE INCLUDED IN THE TOTAL DISTURBED AREA IF THE BORROW OR WASTE AREA IS EXCLUSIVE TO THE PROJECT PER TDOT'S WASTE AND BORROW MANUAL.

SEDIMENT CONTROL

(7) EPSC MEASURES SHALL BE INSTALLED AND FUNCTIONAL PRIOR TO ANY EARTH MOVING OPERATIONS, AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.

(8) THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A PROACTIVE METHOD TO PREVENT THE OFF-SITE MIGRATION OR DEPOSIT OF SEDIMENT ON ROADWAYS USED BY THE GENERAL PUBLIC. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT THAT HAVE NOT REACHED A STREAM MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS (E.G., FUGITIVE SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN A STREET MUST BE REMOVED SO THAT IT IS NOT SUBSEQUENTLY WASHED INTO STORM SEWERS AND STREAMS BY THE NEXT RAIN AND/OR SO THAT IT DOES NOT POSE A SAFETY HAZARD TO USERS OF PUBLIC STREETS). ARRANGEMENTS CONCERNING REMOVAL OF SEDIMENT ON ADJOINING PROPERTY MUST BE SETTLED WITH THE ADJOINING PROPERTY OWNER BEFORE REMOVAL OF SEDIMENT.

(9) WATER PUMPED FROM WORK AREAS AND EXCAVATION MUST BE HELD IN SETTLING BASINS OR TREATED BY FILTRATION OR CHEMICAL TREATMENT PRIOR TO ITS DISCHARGE INTO SURFACE WATERS. ALL PHYSICAL AND/OR CHEMICAL TREATMENT WILL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES AND FULLY DESCRIBED IN THE EPSC PLANS. WATER MUST BE HELD IN SETTLING BASINS UNTIL AT LEAST AS CLEAR AS THE RECEIVING WATERS. SETTLING BASINS SHALL NOT BE LOCATED CLOSER THAN 20 FEET FROM THE TOP BANK OF A STREAM. SETTLING BASINS AND SEDIMENT TRAPS SHALL BE PROPERLY DESIGNED ACCORDING TO THE SIZE OF THE DRAINAGE AREAS OR VOLUME OF WATER TO BE TREATED. TREATED WATER MUST BE DISCHARGED THROUGH A PIPE OR WELL- VEGETATED OR LINED CHANNEL, SO THAT THE DISCHARGE DOES NOT CAUSE EROSION OR SEDIMENT TRANSPORT. DISCHARGES FROM BASINS AND IMPOUNDMENTS SHALL UTILIZE OUTLET STRUCTURES THAT ONLY WITHDRAW WATER FROM NEAR THE SURFACE OF THE BASIN OR IMPOUNDMENT. DISCHARGES MUST NOT CAUSE AN OBJECTIONABLE COLOR CONTRAST WITH THE RECEIVING STREAM.

(10) CHECK DAMS SHALL BE USED WHERE RUNOFF IS CONCENTRATED. CLEAN ROCK, BRUSH, GABION, OR SANDBAG CHECK DAMS SHALL BE PROPERLY CONSTRUCTED TO REDUCE VELOCITY AND CONTROL EROSION.

CLINT T. BUTLER — REGISTERED — NO. 109080 — STATE OF TENNESSEE — 04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

GENERAL NOTES

Survey & Design Division

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

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GENERAL NOTES (CONT.)

(11) FOR AN OUTFALL IN A DRAINAGE AREA OF 10 ACRES OR MORE, A TEMPORARY (OR PERMANENT) SEDIMENT BASIN OR EQUIVALENT CONTROL MEASURES THAT PROVIDES STORAGE FOR A CALCULATED VOLUME OF RUNOFF FROM A MINIMUM 2-YEAR/ 24-HOUR STORM EVENT, SHALL BE PROVIDED UNTIL FINAL STABILIZATION OF THE SITE. THE ENVIRONMENTAL AND ROADWAY DESIGN DIVISIONS MAY BE CONTACTED TO REVIEW AND CONCUR WITH ANY REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE OUTFALL PROCEEDS.

(12) IF PERMANENT OR TEMPORARY VEGETATION IS TO BE USED AS AN EPSC MEASURE, THEN THE TIMING OF PLANTING OF VEGETATION SHALL BE SHOWN IN THE SWPPP. DELAYING PLANTING OF COVER VEGETATION UNTIL WINTER MONTHS OR DRY MONTHS SHOULD BE AVOIDED, IF POSSIBLE.

(13) OFFSITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST SHALL BE MINIMIZED. A STABILIZED CONSTRUCTION ACCESS (A PO NT OF ENTRANCE/EXIT TO THE CONSTRUCTION PROJECT) SHALL BE PROVIDED, AS NEEDED, TO REDUCE THE TRACKING OF MUD AND DIRT ONTO PUBLIC ROADS BY CONSTRUCTION VEHICLES.

(14) TEMPORARY EPSC MEASURES MAY BE REMOVED AT THE BEGINNING OF THE WORKDAY, BUT MUST BE REPLACED AT THE END OF THE WORKDAY.

STREAM/WETLAND

(15) SOIL MATERIALS MUST BE PREVENTED FROM ENTERING WATERS OF THE STATE/U.S. EPSC MEASURES TO PROTECT WATER QUALITY MUST BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. APPROPRIATE EPSC MEASURES MUST BE INSTALLED ALONG THE BASE OF ALL FILLS AND CUTS, ON THE DOWNHILL SIDE OF STOCKPILED SOIL, AND ALONG STREAM BANKS IN CLEARED AREAS TO PREVENT SEDIMENT MIGRATION INTO STREAMS IN ACCORDANCE WITH TDOT STANDARDS. THEY MUST BE INSTALLED ON THE CONTOUR, ENTRENCHED AND STAKED, AND EXTEND THE WIDTH OF THE AREA TO BE CLEARED.

(16) NEW CHANNEL CONSTRUCTION SHALL BE COMPLETED IN THE DRY AND STABILIZED FOR AT LEAST 72 HOURS PRIOR TO DIVERTING WATER FROM THE EXISTING AND/OR TEMPORARY CHANNEL.

(17) INSTREAM EPSC DEVICES REQUIRE THE ENVIRONMENTAL DIVISION'S PERMITS SECTION REVIEW AND MUST BE PROCESSED BY THE PERMITS SECTION TO OBTAIN TDEC, USACE, AND TVA PERMITS.

(18) THE OPERATION OF EQUIPMENT IN WATERS OF THE STATE/U.S., INCLUDING WETLANDS, SHALL BE ONLY AS SHOWN ON THE PROJECT PLANS AND/OR AS SO SPECIFIED IN THE ARAP/401, SECTION 404 PERMIT(S) AND/OR TVA26(A), IF APPLICABLE. ANY ADDITIONAL PERMITS REQUIRED BY THE CONTRACTOR'S METHOD OF OPERATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN, AFTER RECEIVING THE APPROVAL OF TDOT ENVIRONMENTAL DIVISION.

(19) THE WIDTH OF THE FILL ASSOCIATED WITH TEMPORARY CROSSINGS SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR THE ACTUAL CROSSING.

(20) STREAM BEDS SHALL NOT BE USED AS TRANSPORTATION ROUTES FOR CONSTRUCTION EQUIPMENT. TEMPORARY CROSSINGS MUST BE LIMITED TO ONE POINT PER STREAM AND EPSC MEASURES MUST BE USED WHERE THE STREAM BANKS ARE DISTURBED. WHERE THE STREAMBED IS NOT COMPOSED OF BEDROCK, A PAD OF CLEAN ROCK MUST BE USED AT THE CROSSING POINT AND CULVERTED TO PREVENT THE IMPOUNDMENT OF WATER FLOW. CLEAN ROCK IS ROCK OF VARIOUS TYPE AND SIZE, DEPENDING UPON APPLICATION, WHICH CONTAINS NO FINES, SOILS, OR OTHER WASTES OR CONTAMINANTS. OTHER MATERIALS USED FOR ALL TEMPORARY FILLS MUST BE COMPLETELY REMOVED IN THEIR ENTIRETY AFTER THE WORK IS COMPLETED AND THE AFFECTED AREAS RETURNED TO THEIR PREEXISTING ELEVATION. ALL TEMPORARY CROSSINGS MUST BE CONSTRUCTED IN ACCORDANCE WITH STD. DWG. EC-STR-25 UNLESS SPECIFICALLY ADDRESSED IN THE EPSC PLANS. ALTERNATIVELY, PLACING A TEMPORARY BRIDGE (BAILEY BRIDGE OR EQUIVALENT, TIMBERS, ETC.) FROM TOP OF BANK TO TOP OF BANK OR THE APPROPRIATE USE OF BARGES AT THE CROSSING TO AVOID DISTURBANCE OF THE STREAMBED IS AN ACCEPTABLE OPTION.

(21) HEAVY EQUIPMENT WORKING IN WETLANDS MUST BE PLACED ON MATS, OR OTHER MEASURES MUST BE TAKEN TO MINIMIZE SOIL DISTURBANCE UNLESS SPECIFICALLY ADDRESSED IN THE EPSC PLANS. ANY MATS AND OTHER MEASURES USED FOR HEAVY EQUIPMENT MUST BE REMOVED IN THEIR ENTIRETY AFTER THE WORK IS COMPLETED.

(22) WETLANDS SHALL NOT BE USED AS EQUIPMENT STORAGE, STAGING, OR TRANSPORTATION AREAS, UNLESS PROVIDED FOR IN THE PLANS.

SPECIES

(23) NO ACTIVITY MAY SUBSTANTIALLY DISRUPT THE MOVEMENT OF THOSE SPECIES OF AQUATIC LIFE INDIGENOUS TO THE WATER BODY, INCLUDING THOSE SPECIES THAT NORMALLY MIGRATE THROUGH THE AREA. THE SWPPP SHALL BE MODIFIED TO INCLUDE EPSC MEASURES TO PREVENT NEGATIVE IMPACTS TO LEGALLY PROTECTED STATE OR FEDERAL FAUNA OR FLORA OR AS INDICATED IN THE ECOLOGICAL STUDIES OR ON THE PERMIT(S).

INSPECTION, MAINTENANCE, REPAIR

(24) EPSC CONTROLS WILL BE MAINTAINED IN ACCORDANCE WITH TDOT STANDARD DRAWINGS AND GOOD ENGINEERING PRACTICES.

(25) INSPECTION, REPAIR, AND MAINTENANCE OF EPSC MEASURES/STRUCTURES IS TO BE PERFORMED ON A REGULAR BASIS. SEDIMENT SHALL BE REMOVED FROM SEDIMENT CONTROL STRUCTURES WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT (50%). DURING SEDIMENT REMOVAL, THE CONTRACTOR SHALL TAKE CARE TO ENSURE THAT STRUCTURAL COMPONENTS OF EPSC MEASURES ARE NOT DAMAGED AND THUS MADE INEFFECTIVE. IF DAMAGE DOES OCCUR, THE CONTRACTOR SHALL REPAIR THE STRUCTURES AT THE CONTRACTOR'S OWN EXPENSE.

(26) SEDIMENT REMOVED FROM SEDIMENT CONTROL STRUCTURES SHALL BE PLACED AND BE TREATED IN A MANNER SO THAT THE SEDIMENT IS CONTAINED WITHIN THE PROJECT LIMITS AND DOES NOT MIGRATE INTO WATERS OF THE STATE/U.S. COST FOR THIS TREATMENT IS TO BE INCLUDED IN PRICE BID FOR ITEM NO. 209-05 SEDIMENT REMOVAL, C.Y.

(27) THE CONTRACTOR SHALL INSTALL A RAIN GAUGE EVERY LINEAR MILE AT ALL SITES WHERE CLEARING, GRUBBING, EXCAVATION, GRADING CUTTING OR FILLING IS BEING ACTIVELY PERFORMED, OR EXPOSED SOIL HAS NOT YET BEEN PERMANENTLY STABILIZED. IF THE PROJECT LENGTH IS LESS THAN ONE LINEAR MILE, ONE RAIN GAUGE SHALL BE INSTALLED AT THE CENTER OF THE PROJECT OR AS INDICATED BY THE TDOT EPSC INSPECTOR. THE CONTRACTOR SHALL ENSURE THAT EACH GAUGE IS MAINTAINED IN GOOD WORKING CONDITION. TDOT AND/OR THE CONTRACTOR SHALL RECORD DAILY PRECIPITATION AND FORECASTED PERCENTAGE OF PRECIPITATION IN DETAILED RECORDS OF RAINFALL EVENTS INCLUDING DATES, AMOUNTS OF RAINFALL PER GAUGE, THE ESTIMATED DURATION (OR STARTING AND ENDING TIMES), AND FORECASTED PERCENTAGE OF PRECIPITATION FOR THE PROJECT. THIS INFORMATION SHALL BE PROVIDED TO THE ENGINEER ON A MONTHLY BASIS. THE COST FOR THE RAIN GAUGES IS TO BE INCLUDED IN THE UNIT BID PRICES FOR OTHER ITEMS. RAIN GAUGES SHALL BE AS SPECIFIED IN THE APPROVED TDOT RAINFALL MONITORING PLAN.

(28) INSPECTION OF EPSC MEASURES SHALL BE DONE AT LEAST TWICE PER CALENDAR WEEK AT LEAST 72 HOURS APART. A CALENDAR WEEK IS DEFINED AS SUNDAY THROUGH SATURDAY. QUALITY ASSURANCE/QUALITY CONTROL SITE ASSESSMENT OF EPSC SHALL BE PERFORMED PER THE TDOT ENVIRONMENTAL DIVISION'S COMPREHENSIVE INSPECTION OFFICE GUIDELINES.

(29) OUTFALL POINTS SHALL BE INSPECTED TO ASCERTAIN WHETHER EPSC MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO SURROUNDING WATERS. WHERE DISCHARGE LOCATIONS ARE INACCESSIBLE, NEARBY DOWNSTREAM LOCATIONS SHALL BE INSPECTED. LOCATIONS WHERE VEHICLES ENTER AND EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE ROADWAY SEDIMENT TRACKING.

(30) UPON CONCLUSION OF THE INSPECTIONS, EPSC MEASURES FOUND TO BE INEFFECTIVE SHALL BE REPAIRED, REPLACED, OR MODIFIED BEFORE THE NEXT RAIN EVENT, IF POSSIBLE, BUT IN NO CASE MORE THAN 24 HOURS AFTER THE INSPECTION OR WHEN THE CONDITION IS IDENTIFIED. IF THE REPAIR, REPLACEMENT OR MODIFICATION IS NOT PRACTICAL WITHIN THE TIMEFRAME, WRITTEN DOCUMENTATION MUST BE PROVIDED IN THE FIELD BOOK AND AN ESTIMATED REPAIR, REPLACEMENT OR MODIFICATION SCHEDULE SHALL BE DOCUMENTED WITHIN 24 HOURS AFTER IDENTIFICATION.

(31) THE TDOT PROJECT SUPERVISOR (OR THEIR DESIGNEE) AND THE CONTRACTOR'S SITE SUPERINTENDENT ARE RESPONSIBLE FOR INSPECTIONS. MAINTENANCE AND REPAIR ACTIVITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE TDOT PROJECT SUPERVISOR OR THEIR DESIGNEE WILL COMPLETE THE INSPECTION REPORTS AND DISTRIBUTE COPIES PER THE CONTRACT.

MATERIALS

(32) WASTE AND BORROW AREAS SHALL BE LOCATED IN NON-WETLAND AREAS AND ABOVE THE 100-YEAR, FEDERAL EMERGENCY MANAGEMENT AGENCY FLOODPLAIN. BORROW AND WASTE DISPOSAL AREAS SHALL NOT AFFECT ANY WATERS OF THE STATE/U.S. UNLESS THESE AREAS ARE SPECIFICALLY COVERED BY AN ARAP, 404, OR NPDES PERMIT, OBTAINED SOLELY BY THE CONTRACTOR.

SWPPP, PERMITS, PLANS, RECORDS

(33) THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND OBTAIN ANY NECESSARY ENVIRONMENTAL PERMITS OR APPROVALS, INCLUDING BUT NOT LIMITED TO TDEC ARAP/401, USACE SECTION 404, TVA SECTION 26A, AND TDEC NPDES PERMITS, FROM FEDERAL, STATE AND/OR LOCAL AGENCIES REGARDING THE OPERATION OF ANY PROJECT DEDICATED ASPHALT AND/OR CONCRETE PLANTS.

(34) ANY DISAGREEMENT BETWEEN THE PROJECT PLANS, THE PROJECT AS CONSTRUCTED, AND THE PERMIT(S) ISSUED FOR THE PROJECT, SHALL BE BROUGHT TO THE ATTENTION OF THE TDOT PROJECT ENGINEER. THE ENVIRONMENTAL DIVISION, ROADWAY DESIGN DIVISION, AND HEADQUARTERS CONSTRUCTION OFFICE SHALL BE CONTACTED IN THESE INSTANCES AND DECIDE WHICH HAS PRECEDENCE AND WHETHER PERMIT OR PLANS REVISIONS ARE NEEDED. IN GENERAL, PERMIT CONDITIONS WILL PREVAIL.

(35) THE FOLLOWING INFORMATION SHALL BE MAINTAINED ON OR NEAR THE SITE: DATES THAT MAJOR GRADING ACTIVITIES OCCUR, DATES WHERE CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE, DATES WHEN STABILIZATION MEASURES ARE INITIATED, EPSC INSPECTION RECORDS, QUALITY ASSURANCE SITE ASSESSMENT RECORDS, PRECIPITATION RECORDS, SWPPP, PROJECT ENVIRONMENTAL PERMITS, AND A COPY OF THE PROJECT EPSC INSPECTOR'S TDEC LEVEL 1 CERTIFICATION.

(36) ALL WATER QUALITY AND STORM WATER PERMITS, INCLUDING A COPY OF THE NOC WITH NPDES PERMIT TRACKING NUMBER AND THE LOCATION OF THE SWPPP, SHALL BE POSTED NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE ACCESSIBLE TO THE PUBLIC. THE NAME, COMPANY NAME, EMAIL ADDRESS, TELEPHONE NUMBER AND ADDRESS OF THE PROJECT SITE OWNER, OPERATOR, OR A LOCAL CONTACT PERSON WITH A BREIF DESCRIPTION OF THE PROJECT SHALL ALSO BE POSTED. IF POSTING THIS INFORMATION NEAR A MAIN ENTRANCE IS INFEASIBLE, THE INFORMATION SHALL BE PLACED IN A PUBLICLY ACCESSIBLE LOCATION NEAR WHERE THE CONSTRUCTION IS ACTIVELY UNDERWAY AND MOVED AS NECESSARY. THIS LOCATION SHALL BE POSTED AT THE CONSTRUCTION SITE. ALL POSTINGS SHALL BE MAINTAINED IN LEGIBLE CONDITION.

(37) IF A CHANGE IN PROJECT SCOPE OCCURS DURING CONSTRUCTION, INCLUDING VALUE ENGINEERING, THE ENVIRONMENTAL DIVISION SHALL BE CONTACTED TO DETERMINE WHETHER PERMIT REVISIONS OR MODIFICATIONS OF THE SWPPP ARE NEEDED. THE ROADWAY DESIGN DIVISION SHALL BE CONTACTED TO DETERMINE IF ANY PLAN REVISIONS ARE NEEDED.

(38) THE SWPPP SHALL BE UPDATED BY CONSTRUCTION WHENEVER EPSC INSPECTIONS INDICATE, OR WHERE STATE OR FEDERAL OFFICIALS DETERMINE EPSC MEASURES ARE PROVING INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANT SOURCES OR ARE OTHERWISE NOT ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS IN STORM WATER DISCHARGES ASSOCIATED WITH THE CONSTRUCTION ACTIVITY. THE ENVIRONMENTAL DIVISION SHALL BE CONTACTED WHEN MAJOR DESIGN REVISIONS ARE REQUESTED BY CONSTRUCTION. THE ENVIRONMENTAL DIVISION MAY BE CONTACTED FOR GUIDANCE ON SPECIFIC SWPPP NEEDS. A COPY OF ANY CORRESPONDENCE REGARDING THE EFFECTIVENESS OF THE SWPPP OR EPSC CONTROLS SHALL BE RETAINED IN THE SWPPP.

(39) THE SWPPP SHALL BE UPDATED BY CONSTRUCTION WHENEVER A CHANGE IN CHEMICAL TREATMENT METHODS IS MADE INCLUDING USE OF A DIFFERENT CHEMICAL, DIFFERENT DOSAGE OR APPLICATION RATE, OR A DIFFERENT AREA OF APPLICATION.

(40) IF A TMDL IS DEVELOPED FOR THE RECEIVING WATERS FOR A POLLUTANT OF CONCERN (SILTATION AND/OR HABITAT ALTERATION) THE SWPPP SHALL BE MODIFIED OR UPDATED.

(41) PROJECT INSPECTORS AND SUPERVISORS (INCLUDING TDOT STAFF, CONSULTANTS AND CONTRACTOR STAFF) RESPONSIBLE FOR THE IMPLEMENTATION AND MAINTENANCE OF EPSC PLANS SHALL SUCCESSFULLY COMPLETE THE TDEC "LEVEL 1 - FUNDAMENTALS OF EROSION PREVENTION AND SEDIMENT CONTROL FOR CONSTRUCTION

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04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

GENERAL NOTES

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

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GENERAL NOTES (CONT.)

SITES" COURSE AND ANY REFRESHER COURSES AS REQUIRED TO MAINTAIN CERTIFICATION. A COPY OF CERTIFICATION RECORDS FOR THE COURSES SHALL BE KEPT ON SITE AND AVAILABLE UPON REQUEST.

LITTER, DEBRIS, WASTE, PETROLEUM

(42) THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A PROACTIVE METHOD TO PREVENT LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION WASTES FROM ENTERING WATERS OF THE STATE/U.S. THESE MATERIALS WILL BE PICKED UP AND REMOVED FROM STORMWATER EXPOSURE PRIOR TO ANTICIPATED STORM EVENTS. AFTER USE, MATERIALS USED FOR EPSC WILL BE REMOVED FROM THE SITE.

(43) THE CONTRACTOR SHALL TAKE APPROPRIATE STEPS TO ENSURE THAT PETROLEUM PRODUCTS OR OTHER CHEMICAL POLLUTANTS ARE PREVENTED FROM ENTERING WATERS OF THE STATE/U.S. ALL EQUIPMENT REFUELING, SERVICING, AND STAGING AREAS SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS, RULES, REGULATIONS, AND ORDINANCES, INCLUDING THOSE OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA). APPROPRIATE CONTAINMENT MEASURES FOR THESE AREAS SHALL BE USED. ALL SPILLS MUST BE REPORTED TO THE APPROPRIATE AGENCY, AND MEASURES SHALL BE TAKEN IMMEDIATELY TO PREVENT THE POLLUTION OF WATERS OF THE STATE/U.S., INCLUDING GROUNDWATER, SHOULD A SPILL OCCUR.

SPECIAL NOTES

GRADING

(1) THE GRADING TABULATIONS AND RESULTING EARTHWORK ASSOCIATED BID QUANTITIES WERE PREPARED UTILIZING AVAILABLE GEOTECHNICAL INFORMATION AND/OR REPORTS PREPARED FOR THIS PROJECT. THIS INFORMATION IS PROVIDED FOR GENERAL INFORMATION AND ESTIMATION GUIDANCE ONLY.

(2) BORING DEPICTIONS SHOWN ON THE FOUNDATION DATA SHEETS, SOILS SHEETS, PLANS, AND CROSS-SECTIONS INDICATE SOIL AND ROCK CONDITIONS AT THE SPECIFIC BORING LOCATIONS. ANY SOIL PROFILE AND/OR ROCK LINE IS INTERPRETIVE BASED ON THE JUDGMENT OF THE GEOTECHNICAL ENGINEER/GEOLOGIST. THE TRANSITION BETWEEN BORINGS AND LAYERS MAY VARY SIGNIFICANTLY DEPENDING ON THE GEOLOGIC FORMATIONS ENCOUNTERED.

(3) TO ASSIST IN BID PREPARATION FOR EARTHWORK AND FOUNDATION CONSTRUCTION, DETAIL ROCK AND SOIL DESCRIPTION AND ON SOME PROJECTS, ROCK CORE SAMPLES ARE AVAILABLE FOR INSPECTION AT THE MATERIALS AND TESTS HEADQUARTERS AT 6601 CENTENNIAL BOULEVARD, NASHVILLE, TN OR AT THE TDOT REGION 1 BUILDING IN KNOXVILLE, TN.

(4) THE CONTRACTOR SHALL UTILIZE ALL INFORMATION PROVIDED IN THE PLANS, CROSS-SECTIONS AND CONTRACT DOCUMENTS INCLUDING ANY SPECIAL PROVISIONS AS WELL AS UTILIZING HIS PAST EXPERIENCE WITH PROJECTS OF SIMILAR NATURE, SCOPE AND LOCATION IN PREPARATION OF HIS BID FOR EARTHWORK ITEMS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE AND PROVIDE EQUIPMENT AND MEANS NECESSARY TO CONDUCT THE EXCAVATION ACTIVITIES IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.

(5) EARTHWORK IS PAID FOR UNDER ITEM 203-01, ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED). NO ADDITIONAL PAYMENT WILL BE MADE FOR EARTHWORK QUANTITIES BASED SOLELY ON A CLAIM THAT THE QUANTITIES SHOWN IN THE GRADING TABULATION OR ELSEWHERE IN THE PLANS ARE INACCURATE WITH RESPECT TO THE TYPE OF MATERIALS ENCOUNTERED DURING CONSTRUCTION EXCEPT AS PROVIDED FOR BY SECTION 104.02 IN THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OR AS AMENDED IN SUPPLEMENTAL SPECIFICATIONS.

MISCELLANEOUS

(1) ALL EXISTING DRAINAGE PIPES AND STRUCTURES THAT WILL NO LONGER BE OPERATIONAL SHALL BE REMOVED. PIPES AND STRUCTURES LISTED ON THE ESTIMATED ROADWAY QUANTITIES SHEET WILL BE PAID FOR DIRECTLY. ALL OTHER REMOVAL OF EXISTING PIIPES AND CATCH BASINS WILL NOT BE MEASURED DIERECTLY BUT WILL BE INCLUDED IN THE COST OF OTHER ITEMS.

EROSION PREVENTION AND SEDIMENT CONTROL

NPDES

(1) REFER TO THE EROSION PREVENTION AND SEDIMENT CONTROL PLAN, SHEET 40, FOR NOTES REGARDING SEASONAL WORK LIMITATION OR LIMITATION ON THE TOTAL AREA OF EXPOSED SOIL.

ENVIRONMENTAL

ECOLOGY

(2) STAFF FROM THE TDOT ENVIRONMENTAL DIVISION OR A DESIGNEE WILL ADVISE THE CONTRACTOR DURING THE PRE-CONSTRUCTION MEETING CONCERNING WHEN ENVIRONMENTAL DIVISION PERSONNEL OR DESIGNATED CONSULTANT WILL NEED TO BE ON-SITE FOR WORK BEING DONE WHICH CCULD AFFECT THE STREAM OR SPECIES.

(3) STAFF FROM THE TDOT ENVIRONMENTAL DIVISION OR A DESIGNEE WILL ATTEND THE PRE-CONSTRUCTION MEETING FOR ALL PROJECTS WHICH HAVE THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT PROXIMAL TO SCHEDULED BRIDGE WORK. THIS WILL PROVIDE THE OPPORTUNITY TO ENSURE THAT PERSONNEL INCLUDING THE CONTRACTOR'S PERSONNEL AND SUBCONTRACTORS ARE MADE AWARE OF THE NECESSARY PRECAUTIONS WHICH MUST BE FOLLOWED.

(4) ALL BRIDGE PROJECTS WITH THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT IDENTIFIED MUST HAVE MEASURES IN PLACE TO CONTAIN CONCRETE DUST, CEMENT DUST AND ALL OTHER MATERIALS. THESE MATERIALS ARE NOT ALLOWED TO ENTER THE STREAM.

STREAM RELOCATION

(5) ONCE WATER IS DIVERTED INTO A NEWLY CONSTRUCTED AND STABILIZED RELOCATED STREAM / CHANNEL THE ECOLOGY SECTION MUST BE NOTIFIED. THE STREAM NAME, STREAM NUMBER, AND DATE THE WATER WAS DIVERTED INTO THE STREAM / CHANNEL IS TO BE SUPPLIED WITH THE NOTIFICATION.

CLEARING AND GRUBBING

(6) CLEARING OPERATIONS FOR THE ENTIRE PROJECT SHALL INCLUDE THE CHIPPING/MULCHING OF TREES AND VEGETATION (EXCLUDING TREES AND VEGETATION USED TO CONSTRUCT BRUSH BARRIERS) AND THE SPREADING/BLOWING OF WOOD MULCH OVER THE CLEARED AREA(S) AT A DEPTH OF 3-INCHES (MIN.) FOR TEMPORARY STABILIZATION. THE COST FOR REMOBILIZATION, CHIPPING/MULCHING AND SPREADING/BLOWING OF WOOD MULCH IS TO BE INCLUDED IN THE COST OF PAY ITEM 201-01.

(7) IN AREAS OF THE PROJECT SITE THAT CONTAIN BENCH CUTS AND ASSOCIATED SLOPES, THE CONTRACTOR SHALL NOT CLEAR THE ENTIRE BENCH CUT SLOPE AREA AT ONE TIME. CLEARING SHALL BE STAGED AND LIMITED TO THE CONSTRUCTION OF ACCESS AND HAUL ROADS AND THE ARE REQUIRED TO CONSTRUCT THREE (3) BENCH CUTS AT A TIME. ONCE A BENCH CUT AND ASSOCIATED SLOPE ARE STABILIZED ADDITIONAL AREA MAY BE CLEARED FOR THE NEXT BENCH CUT. BRUSH BARRIERS SHALL BE CONSTRUCTED BELOW EACH CLEARED BENCH CONSTRUCTION AREA AND IN LOCATIONS DEPICTED ON THE EPSC PLANS. BRUSH BARRIERS AND/OR OTHER SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED PER DETAIL "F" LOCATED ON SHEET 40A AND SUPPLEMENTED AS NEEDED WITH ADDITIONAL BRUSH BARRIERS OR OTHER EPSC MEASURES. ONCE A BENCH CUT AND ASSOCIATED SLOPE IS CONSTRUCTED AND STABILIZED THEN ADDITIONAL AREA(S) CAN BE CLEARED.

DEMOLITION OF BUILDINGS

(1) IF THE ASBESTOS SURVEY AND ABATEMENT IS NOT PART OF THE CONTRACT, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE TDOT HAZARDOUS MATERIALS OFFICE TO VERIFY THAT AN ASBESTOS SURVEY HAS BEEN COMPLETED FOR ANY BUILDING TO BE REMOVED. IN THE CASE THAT NO SURVEY HAS BEEN COMPLETED, THE CONTRACTOR SHALL COORDINATE WITH THE HAZARDOUS MATERIAL OFFICE IN SCHEDULING A SURVEY.

(2) ASBESTOS-CONTAINING MATERIAL (ACM) ABATEMENT SHALL BE COMPLETED PRIOR TO ANY DEMOLITION ACTIVITIES FOR BUILDINGS INCLUDED IN THE PROJECT. ABATEMENT SHOULD BE ACCOMPLISHED PER SP202ACM SPECIAL PROVISION REGARDING REMOVAL OF ASBESTOS-CONTAINING MATERIALS. STAT OF TENNESSEE ACCREDITATION REQUIREMENTS (TCA 1200-01-20) MANDATE THAT ACM ABATEMENT WORK BE PERFORMED BY AN ACCREDITED FIRM (CONTRACTOR) USING ACCREDITED ABATEMENT WORKERS AND SUPERVISORS.

(3) THE CONTRACTOR SHALL BE RESPONSIBE FOR SUBMITTING A NOTICE TO THE TDEC, DIVISION OF AIR POLLUTION CONTROL TEN (10) DAYS IN ADVANCE OF ANY ACM ABATEMENT OR DEMOLTION.

PROJECT COMMITMENTS

(1) SEE PROJECT COMMITMENTS, SHEET 1B, FOR DETAILS RELATING TO SPECIAL ENVIRONMENTAL COMMITMENTS REQUIRIED BY THIS PROJECT.

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Survey & Design Division

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 109241
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

GENERAL NOTES
AND
SPECIAL NOTES

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	2U

GUARDRAIL REMOVAL

SHEET NO.	LOCATION	SIDE		STATION		LENGTH (FT)	REMARKS
		LT	RT	FROM	TO		
13	SR-29		X	341+90.98	350+81.66	885	
TOTALS						885	

REMOVAL OF BUILDINGS AND OBSTRUCTIONS DESCRIPTION BLOCK

PAY ITEM	TRACT NO.	DESCRIPTION
202-06.01	33A	BUILDING
202-06.02	35	SHED, BUILDING
202-06.03	45	SINGLE FAMILY RESIDENCE

NO ADDITIONAL COMPENSATION WILL BE MADE FOR THESE REMOVALS.

R.O.W. MARKERS

SHEET NO.	QUANTITIES			
	"A"	"B"	"C"	TOTALS
4				0
5	4	1	1	6
6	2	2		4
6C		3	1	4
7	4			4
8	1	2	5	8
9	4	1	1	6
10				
11	4	2	4	10
12	4		1	5
13	7	3	3	13
14	2	1		3
TOTALS	32	15	16	63

PAVEMENT QUANTITIES

LOCATION	303-01 (TON)	307-01.01 (TON)	307-01.08 (TON)	402-01 (TON)	402-02 (TON)	403-01 (TON)	411-01.10 (TON)	411-01.07 (TON)
SR-29	57284.0	7456.0	6679.0	162.0	642.0	41.0	4984.0	2335.0
WHETSTONE ROAD	384.0		55.0	0.8	2.9	0.2	32.0	
HANGING ROCK ROAD	603.0		78.0	1.7	6.7	0.2	45.0	10.2
SR 328	1521.0		249.0	3.8	15.0	0.7	146.0	21.8
PRIVATE DRIVES	979.0						274.0	
TEMP. TRAFFIC CONTROL	404.0	206.0	135.0					
DRIVES DURING CONST.	6500.0							
TOTALS	67675.0	7662.0	7196.0	168.3	666.6	42.1	5481.0	2367.0

EPSC QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
203-01	ROAD & DRAINAGE EXCAVATION (UNCLASSIFIED)	C.Y.	5,494
209-01.31	TEMPORARY MULCH FILTER BERM	C.Y.	288
209-02.04	10" TEMPORARY SLOPE DRAIN	L.F.	924
209-02.05	12" TEMPORARY SLOPE DRAIN	L.F.	381
209-02.06	15" TEMPORARY SLOPE DRAIN	L.F.	518
209-02.07	18" TEMPORARY SLOPE DRAIN	L.F.	1,321
209-04	BRUSH BARRIERS	L.F.	1,130
209-05	SEDIMENT REMOVAL	C.Y.	3,625
209-08.02	TEMPORARY SILT FENCE (WITH BACKING)	L.F.	49,664
209-08.03	TEMPORARY SILT FENCE (WITHOUT BACKING)	L.F.	9,427
209-08.07	ROCK CHECK DAM PER	EACH	275
209-08.08	ENHANCED ROCK CHECK DAM	EACH	105
209-09.01	SANDBAGS	BAG	3,208
209-09.03	SEDIMENT FILTER BAG (15' X 15')	EACH	30
209-09.21	POLYACHLAMIDE GEL LOGS	EACH	88
209-09.22	POLYACHLAMIDE POWDER	LB.	945
209-09.24	JUTE MESH FABRIC	S.Y.	1,000
209-09.41	CURB INLET PROTECTION (TYPE 2)	EACH	16
209-10.20	TEMPORARY SEDIMENT TRAP	C.Y.	1,910
209-20.03	POLYETHYLENE SHEETING (6 MIL. MINIMUM)	S.Y.	24
209-40.33	CATCH BASIN PROTECTION (TYPE D)	EACH	12
209-40.41	CATCH BASIN FILTER ASSEMBLY(TYPE 1)	EACH	3
209-40.42	CATCH BASIN FILTER ASSEMBLY(TYPE 2)	EACH	25
209-40.48	CATCH BASIN FILTER ASSEMBLY(TYPE 8)	EACH	1
209-65.03	TEMPORARY DIVERSION CHANNEL	L.F.	1,117
209-65.04	IN STREAM DIVERSION (WITH TRAFFIC)	L.F.	1,056
303-10.01	MINERAL AGGREGATE (SIZE 57)	TON	513
621-03.02	18" TEMPORARY DRAINAGE PIPE (DIVERSION)	L.F.	130
621-03.03	24" TEMPORARY DRAINAGE PIPE (DIVERSION)	L.F.	50
621-03.06	42" TEMPORARY DRAINAGE PIPE (DIVERSION)	L.F.	278
707-08.11	HIGH-VISIBILITY CONSTRUCTION FENCE	L.F.	7,724
709-05.05	MACHINED RIP-RAP (CLASS A-3)	TON	683
709-05.06	MACHINED RIP-RAP (CLASS A-1)	TON	2,972
709-05.08	MACHINED RIP-RAP (CLASS B)	TON	956
740-10.03	GEOTEXTILE (TYPE III)(EROSION CONTROL)	S.Y.	10,474
740-10.04	GEOTEXTILE (TYPE IV) (STABILIZATION)	S.Y.	854
740-11.02	12" SEDIMENT TUBE	L.F.	9,529
740-11.03	18" SEDIMENT TUBE	L.F.	1,165
740-11.04	20" SEDIMENT TUBE	L.F.	27,014
801-01.07	TEMPORARY SEEDING (WITH MULCH)	UNT	3,761
801-01.65	TEMPORARY MULCH	UNT	1,241
801-02	SEEDING (WITHOUT MULCH)	UNT	870
801-03	WATER (SEEDING & SODDING)	M.G.	578
801-08	FERTILIZER (SUPPLEMENTAL APPLICATION)	TON	45
801-09	AGRICULTURAL LIME	TON	54
805-12.01	EROSION CONTROL BLANKET (TYPE I)	S.Y.	79,312
805-12.02	EROSION CONTROL BLANKET (TYPE II)	S.Y.	12,929

CLINT T. BUTLER
REGISTERED
NO. 109961
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TABULATED QUANTITIES

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Survey & Design Division

TENNESSEE D.O.T. | DESIGN DIVISION | FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	3F
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	3F

12/16/2011: ADDED SHEET TO PLAN SET AND TRACTS 8054B AND 8054C.

07/20/2012: ADDED TRACT 8057

R.O.W. ACQUISITION TABLE

TRACT NO.	PROPERTY OWNERS	COUNTY RECORDS				TOTAL AREA ACRES			AREA TO BE ACQUIRED ACRES			AREA REMAINING ACRES		EASEMENT (SQUARE FEET)		
		TAX MAP NO.	PARCEL NO.	DEED DOCUMENT REFERENCE BK.	PAGE	LEFT	RIGHT	TOTAL	LEFT	RIGHT	TOTAL	LEFT	RIGHT	PERM. DRAINAGE	SLOPE	CONST.
44	PEGGY WALLS	140-O	17-18	Z7	626-627		5.941	5.941	0.000	0.272	0.272	0.000	5.669			
45	JUDY SAFFALL TANNER(1/2), DANNY HONEYCUTT(1/4), AND GLENDA CCMPTON(1/4)	'40	26	X8 Z6 Y7	707, 557, 817	0.444	50.466	50.910	0.000	1.923	1.923	0.444	48.543			
~~46~~	~~DAVID TECUMSEH LEE~~	~~'40~~	~~25.02~~	~~U6~~	~~654~~	~~1.715~~		~~1.715~~	~~0.000~~	~~0.000~~	~~0.000~~	~~1.715~~	~~0.000~~			
47	REBA FAIRCHILDMADEN	'40	25	A7	712	38.263		38.263	0.495	0.000	0.495	37.768	0.000			
48	GEORGE EDWARDS, III AND JOHN TALIAFERRO	'39	10	RB26	885	387.000		387.000	1.604	0.000	1.604	385.396	0.000			
49	DONALD G. JONES	'49	16.01	T7	789	1.580		1.580	0.083	0.000	0.083	1.497	0.000	750		7988
~~50~~	~~LARRY WILL~~	~~'40~~	~~19.02~~	~~??~~	~~???~~	~~7.700~~		~~7.700~~	~~0.000~~	~~0.000~~	~~0.000~~	~~7.700~~	~~0.000~~			
51	LAWERENCE AND JUDY GRIFFITH	11	52.03	1026	317	4.667		4.667	0.023	0.000	0.023	4.644	0.000			374
52	SOUTHERN RAIL ROAD ROW	??	??	??	??		3.471	3.471	0.000	0.531	0.531	0.000	2.940			
53	JAMES RICHARD AND PATRICIA WARD	12	6.01	B16	272		1.040	1.040	0.000	0.021	0.021	0.000	1.019			
~~54~~	~~RHONDA LEE~~	~~121-A~~	~~5~~	~~Y17~~	~~301~~		~~1.615~~	~~1.615~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~1.615~~			
54A	JAMES C. AND JUDY S. COLEY	121-A	6,6.01,7	R20	470		2.539	2.539	0.000	1.213	1.213	0.000	1.326			
54B	DOUGLAS WAYNE MOORE	121-A	9	L20	604		0.805	0.805	0.000	0.493	0.493	0.000	0.312			
8054B	DOUGLAS WAYNE MOORE	121-A	9	T21	295		0.312	0.312	0.000	0.312	0.312	0.000	0.000			
54C	RITA JOYCE BARNES AND PETER TMAR	121-A	11.01	T18	7		0.473	0.473	0.000	0.108	0.108	0.000	0.365			
8054C	RITA JOYCE BARNES AND PETER TMAR	121-A	11.01	T18	7		0.365	0.365	0.000	0.365	0.365	0.000	0.000			
~~54D~~	~~NANNIE G. GILMORE~~	~~121-A~~	~~11~~	~~C12~~	~~130~~		~~0.431~~	~~0.431~~	~~0.000~~	~~0.006~~	~~0.006~~	~~0.000~~	~~0.425~~			
54E	SANDRA L. AND JOHN STOUT, JR.	121-A	12.02	Q21	108		1.775	1.775	0.000	0.016	0.016	0.000	1.759			
55	MARY COFER POLSTON	11	52	Y19	261	53.496		53.496	0.000	0.000	0.000	53.496	0.000	919		
56	AHLER TRUST	'49	51	E8	567	41.613		41.613	0.458	0.000	0.458	41.155	0.000	403		
57	WILLIAM TURNER	'49	14.01	60	250	0.327			0.000	0.000	0.000	0.327	0.000	622		
8057	WILLIAM TURNER	'49	14.01	60	250	0.327			0.327	0.000	0.327	0.000	0.000	622		
58	DONALD G. JONES	'49	15	O8	539	1.130		1.130	0.000	0.000	0.000	1.130	0.000	380		1279
~~59~~	~~NICK AND JUDY TANNER~~	~~'40~~	~~16.46~~	~~D9~~	~~175~~		~~4.370~~	~~4.370~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~4.370~~			

DISTURBED AREA	
IN BETWEEN SLOPE LINES	31.312 (AC)
15 FOOT WIDE STRIP (OUTSIDE SLOPE LINES)	7.933 (AC)
TOTAL DISTURBED AREA	39.245 (AC)

CLINT T. BUTLER — REGISTERED ENGINEER — NO. 109631 — STATE OF TENNESSEE — 04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

RIGHT-OF-WAY ACQUISITION TABLE

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	39
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	19

N

BEGIN CONSTRUCTION
FEDERAL PROJECT
NO. NH-29(86)
STA. 250+68.18 S.R. 29
N 609766.8922
E 2411314.5562

D.A.= 121.5Ac.
AREA 21 & 22
MIXED COVER
Q50= 143.40 cfs
Q100= 171.90 cfs

EX. 72" CMP

250+00

BITTER CREEK

260+00

D.A.= 21.3Ac.
AREA 20
MIXED COVER
C= 0.40
Q50= 64.80 cfs
Q100= 70.70 cfs

EX. 30" RCP
EX. 24" RCP
EX. 18" CMP
EX. 36" RCP
EX. 18" RCP
EX. 3@12' X 5' BOX CULVERT

270+00

280+00

BITTER CREEK

FORKED CREEK

290+00

D.A.= 8.5Ac.
AREA 14
MIXED COVER
C= 0.40
Q50= 27.20 cfs
Q100= 28.90 cfs

EX. 30" RCP
EX. 30" CMP

300+00

WHETSTONE ROAD

EX. 18" CMP

D.A.= 8.5Ac.
AREA 16
MIXED COVER
C= 0.40
Q50= 27.20 cfs
Q100= 28.90 cfs

D.A.= 12.8Ac.
AREA 17
MIXED COVER
C= 0.40
Q50= 37.90 cfs
Q100= 41.00 cfs

D.A.= 8.5Ac.
AREA 19
MIXED COVER
C= 0.40
Q50= 25.80 cfs
Q100= 28.20 cfs

D.A.= 6.2Ac.
AREA 18
MIXED COVER
C= 0.40
Q50= 18.80 cfs
Q100= 20.60 cfs

D.A.= 2.8Ac.
AREA 9
MIXED COVER
C= 0.40
Q50= 9.00 cfs
Q100= 9.50 cfs

EX. 24" RCP
EX. 18" CMP
EX. 30" RCP

310+00

BITTER CREEK

HANGING ROCK ROAD

EX. 18" CMP

D.A.= 5.7Ac.
AREA 13
MIXED COVER
C= 0.40
Q50= 18.20 cfs
Q100= 19.40 cfs

D.A.= 9.0Ac.
AREA 12
MIXED COVER
C= 0.40
Q50= 28.80 cfs
Q100= 30.60 cfs

D.A.= 2.8Ac.
AREA 11
MIXED COVER
C= 0.40
Q50= 9.00 cfs
Q100= 9.50 cfs

EX. 8' X 12' BOX CULVERT
EX. 18" CMP
EX. 18" RCP

320+00

D.A.= 5.7Ac.
AREA 10
MIXED COVER
C= 0.40
Q50= 18.20 cfs
Q100= 19.40 cfs

D.A.= 4.3Ac.
AREA 8
MIXED COVER
C= 0.40
Q50= 13.80 cfs
Q100= 14.60 cfs

D.A.= 231.0Ac.
AREA 7
MIXED COVER
Q50= 213.80 cfs
Q100= 255.30 cfs

D.A.= 29.4Ac.
AREA 6
MIXED COVER
C= 0.40
Q50= 76.40 cfs
Q100= 84.70 cfs

EX. 36" RCP

330+00

S.R. 32

340+00

EX. 18" RCP
EX. 24" RCP
EX. 3@12' X 9' BOX CULVERT
EX. 24" RCP
EX. 2@15'X8' BOX CULVERT

MUDDY BRANCH

TINEY ROAD

350+00

EQUATION
S.R. 29 STA. 359+17.69 ~~BACK~~ (ST)=
S.R. 29 STA. 359+20.43 AHEAD

360+00

EX. 24" RCP

D.A.= 9.9Ac.
AREA 1A
MIXED COVER
C= 0.40
Q50= 30.00 cfs
Q100= 33.30 cfs

END CONSTRUCTION
FEDERAL PROJECT
NO. NH-29(86)
STATE PROJECT NO. 65001-3268-14
STA. 359+50.00 S.R. 29
N 617248.3251
E 2404406.0044

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00008178 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

DRAINAGE MAP

STA. 250+00 TO STA. 360+00

SCALE: 1"=500'

CLINT T. BUTLER
REGISTERED ENGINEER
No. 109880
STATE OF TENNESSEE
04/27/2015

Survey & Design Division

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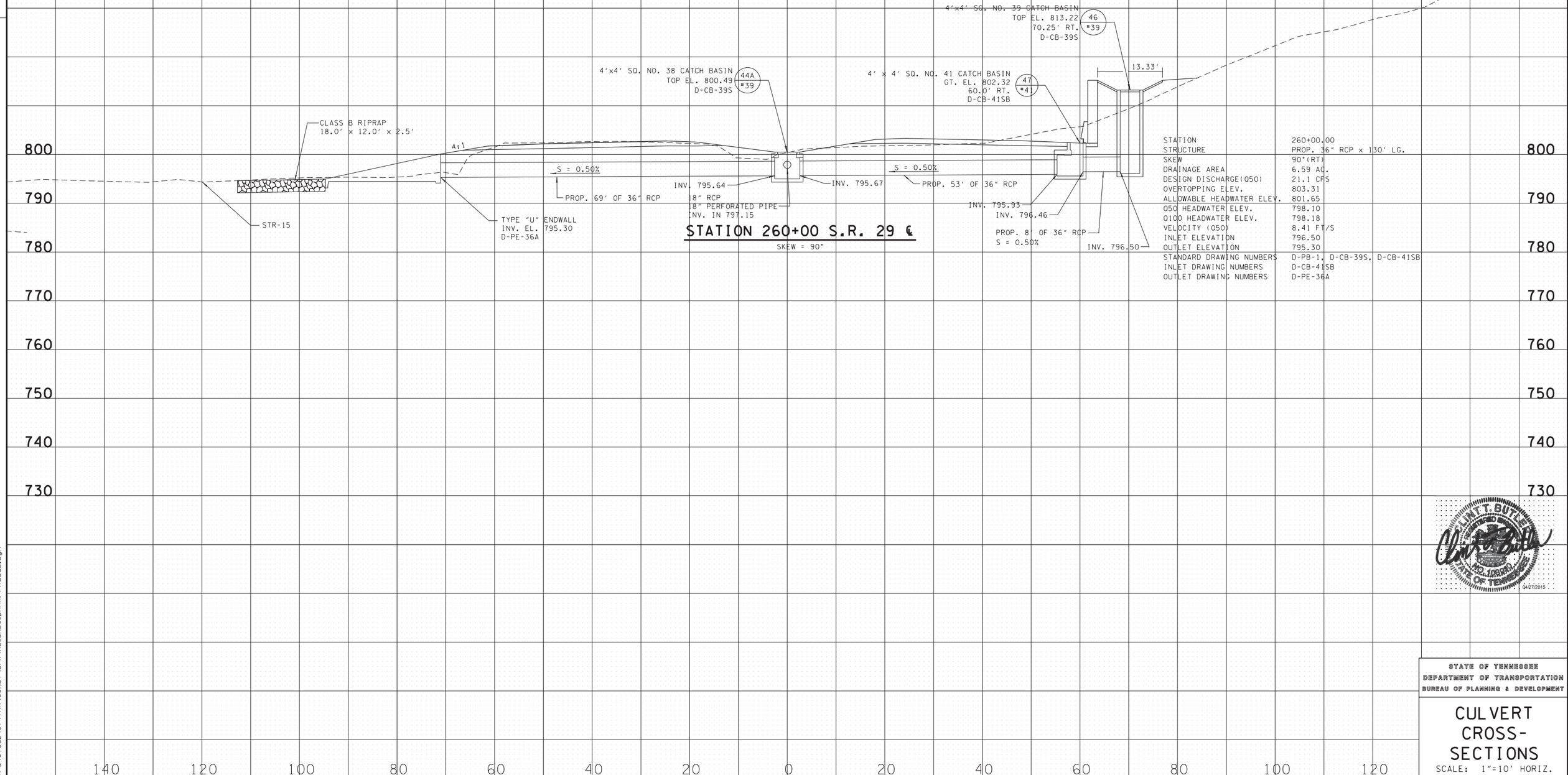
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	59
CONST.	2015	NH-29(86)	20

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.



STATION	260+00.00
STRUCTURE	PROP. 36" RCP x 130' LG.
SKEW	90°(RT)
DRAINAGE AREA	6.59 AC.
DESIGN DISCHARGE(Q50)	21.1 CFS
OVERTOPPING ELEV.	803.31
ALLOWABLE HEADWATER ELEV.	801.65
Q50 HEADWATER ELEV.	798.10
Q100 HEADWATER ELEV.	798.18
VELOCITY (Q50)	8.41 FT/S
INLET ELEVATION	796.50
OUTLET ELEVATION	795.30
STANDARD DRAWING NUMBERS	D-PB-1, D-CB-39S, D-CB-41SB
INLET DRAWING NUMBERS	D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-36A

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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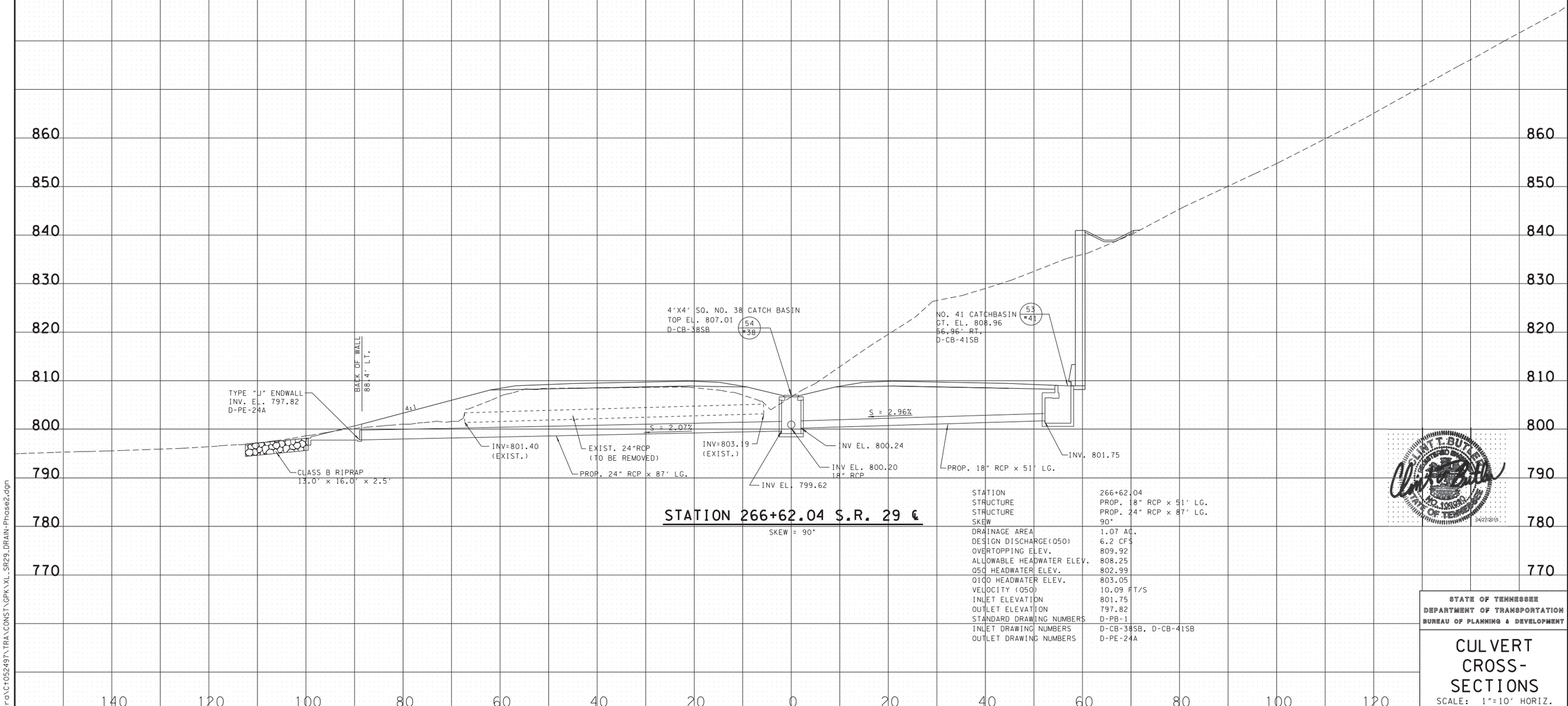
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	60
CONST.	2015	NH-29(86)	21

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.



STATION 266+62.04 S.R. 29 ℄

SKEW = 90°

STATION	266+62.04
STRUCTURE	PROP. 18" RCP x 51' LG.
STRUCTURE	PROP. 24" RCP x 87' LG.
SKEW	90°
DRAINAGE AREA	1.07 AC.
DESIGN DISCHARGE(Q50)	6.2 CFS
OVERTOPPING ELEV.	809.92
ALLOWABLE HEADWATER ELEV.	808.25
Q50 HEADWATER ELEV.	802.99
Q100 HEADWATER ELEV.	803.05
VELOCITY (Q50)	10.09 FT/S
INLET ELEVATION	801.75
OUTLET ELEVATION	797.82
STANDARD DRAWING NUMBERS	D-PB-1
INLET DRAWING NUMBERS	D-CB-38SB, D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-24A

CLINT T. BUTLER
REGISTERED
No. 130991
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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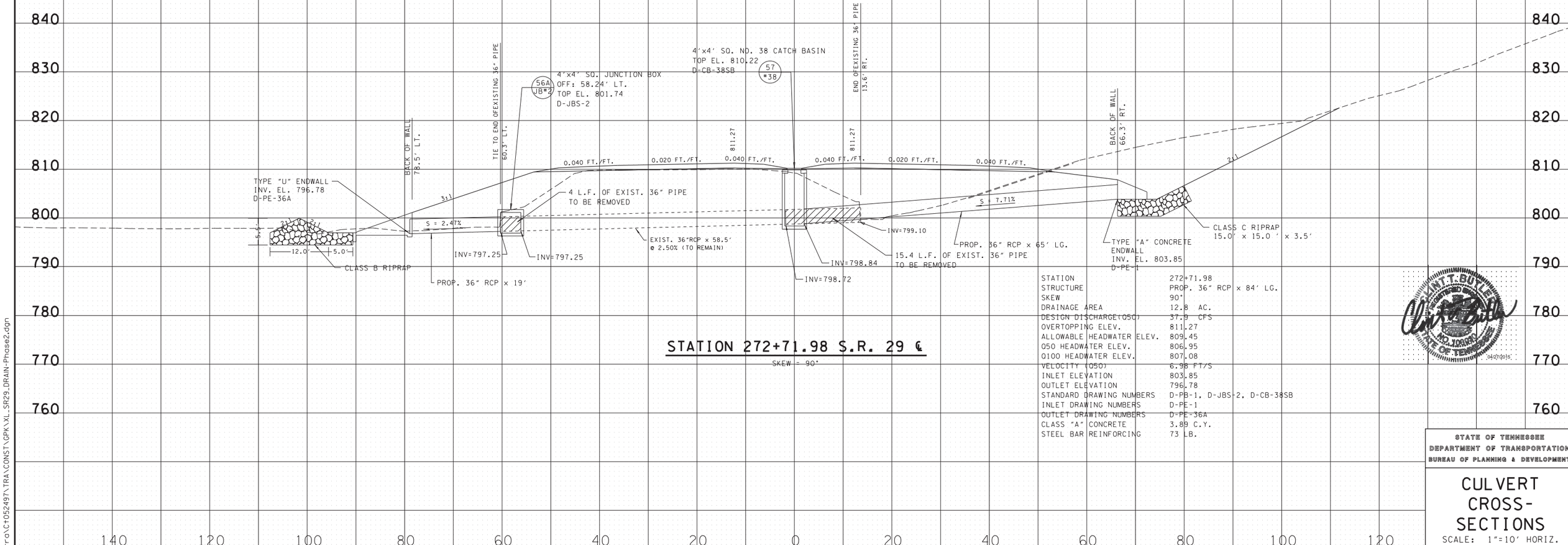
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	62
CONST.	2015	NH-29(86)	22

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.



STATION 272+71.98 S.R. 29 ℄

SKEW = 90°

STATION	272+71.98
STRUCTURE	PROP. 36" RCP x 84' LG.
SKEW	90°
DRAINAGE AREA	12.8 AC.
DESIGN DISCHARGE(Q50)	37.9 CFS
OVERTOPPING ELEV.	811.27
ALLOWABLE HEADWATER ELEV.	809.45
Q50 HEADWATER ELEV.	806.95
Q100 HEADWATER ELEV.	807.08
VELOCITY (Q50)	6.98 FT/S
INLET ELEVATION	803.85
OUTLET ELEVATION	796.78
STANDARD DRAWING NUMBERS	D-PB-1, D-JBS-2, D-CB-38SB
INLET DRAWING NUMBERS	D-PE-1
OUTLET DRAWING NUMBERS	D-PE-36A
CLASS "A" CONCRETE	3.89 C.Y.
STEEL BAR REINFORCING	73 LB.

CLINTT. BULLOCK
REGISTERED ENGINEER
NO. 108687
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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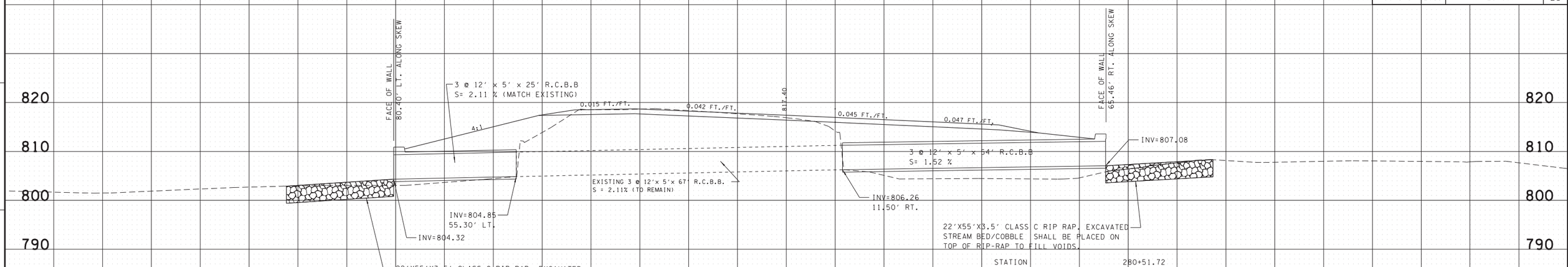
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	63
CONST.	2015	NH-29(86)	23

TENNESSEE D.O.T. DESIGN DIVISION

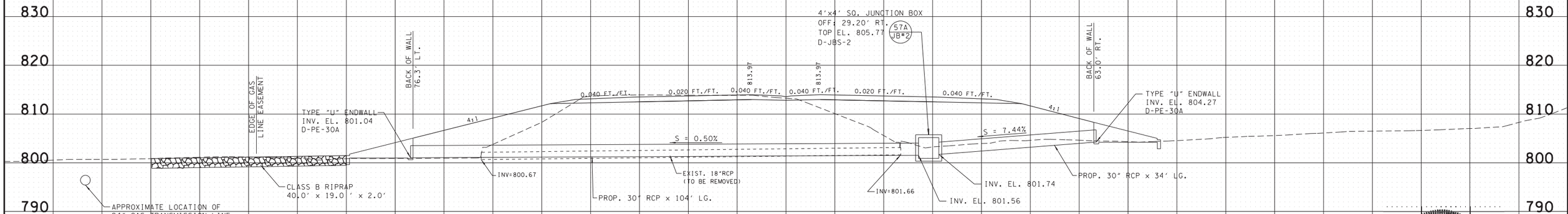
FILE NO.



STATION 280+51.72 S.R. 29 ℄

SKEW = 75° (RT.)

STATION	280+51.72
STRUCTURE	PROP. (3) 12'X5'X79' R.C.B.B.
SKEW	75°
DRAINAGE AREA	1581 AC.
DESIGN DISCHARGE(Q100)	1220 CFS
OVERTOPPING ELEV.	813.79
ALLOWABLE HEADWATER ELEV.	815.29
Q100 HEADWATER ELEV.	812.68
VELOCITY (Q100)	10.3 FT/S
INLET ELEVATION	807.08
OUTLET ELEVATION	804.32
STANDARD DRAWING NUMBERS	STD-15-9, 10, 80 STD-10-1
CLASS "A" CONCRETE	267 C.Y.
STEEL BAR REINFORCING	58577 LB.
BACKFILL MATERIAL	830 TONS



STATION 276+48.08 S.R. 29 ℄

SKEW = 90°

STATION	276+48.08
STRUCTURE	PROP. 30" RCP x 138' LG.
SKEW	90°
DRAINAGE AREA	8.5 AC.
DESIGN DISCHARGE(Q50)	27.2 CFS
OVERTOPPING ELEV.	811.99
ALLOWABLE HEADWATER ELEV.	813.49
Q50 HEADWATER ELEV.	808.38
Q100 HEADWATER ELEV.	808.54
VELOCITY (Q50)	6.76 FT/S
INLET ELEVATION	804.27
OUTLET ELEVATION	801.04
STANDARD DRAWING NUMBERS	D-PB-1, D-JBS-2
INLET DRAWING NUMBERS	D-PE-30A
OUTLET DRAWING NUMBERS	D-PE-30A

CLINTT. BUTLER
REGISTERED
NO. 109691
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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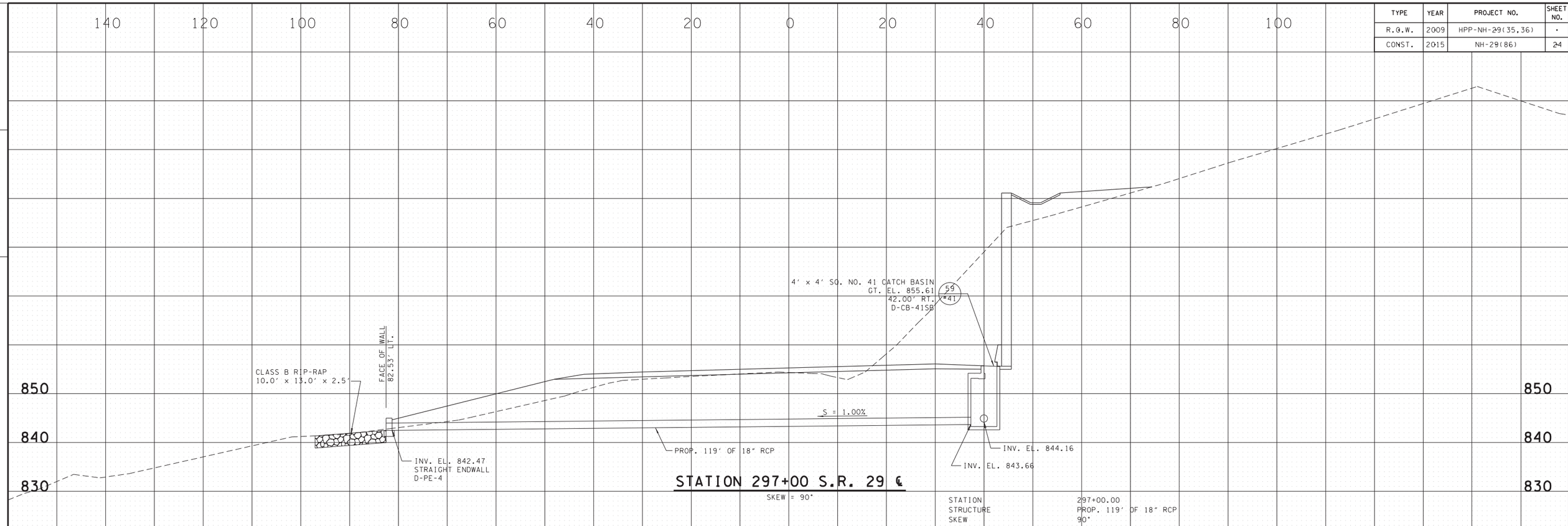
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.G.W.	2009	HPP-NH-29(35,36)	-
CONST.	2015	NH-29(86)	24

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.



STATION 297+00 S.R. 29 ℄

SKEW = 90°

STATION	297+00.00
STRUCTURE	PROP. 119' OF 18" RCP
SKEW	90°
DRAINAGE AREA	0.45 AC.
DESIGN DISCHARGE(Q50)	3.45 CFS
OVERTOPPING ELEV.	856.09
ALLOWABLE HEADWATER ELEV.	855.00
Q50 HEADWATER ELEV.	844.69
Q200 HEADWATER ELEV.	844.72
VELOCITY (Q50)	5.68 FT/S
INLET ELEVATION	843.66
OUTLET ELEVATION	842.47
STANDARD DRAWING NUMBERS	D-PB-1, D-CB-41SB
INLET DRAWING NUMBERS	D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-4
CLASS "A" CONCRETE	1.16 C.Y.
STEEL BAR REINFORCING	40.0 LB.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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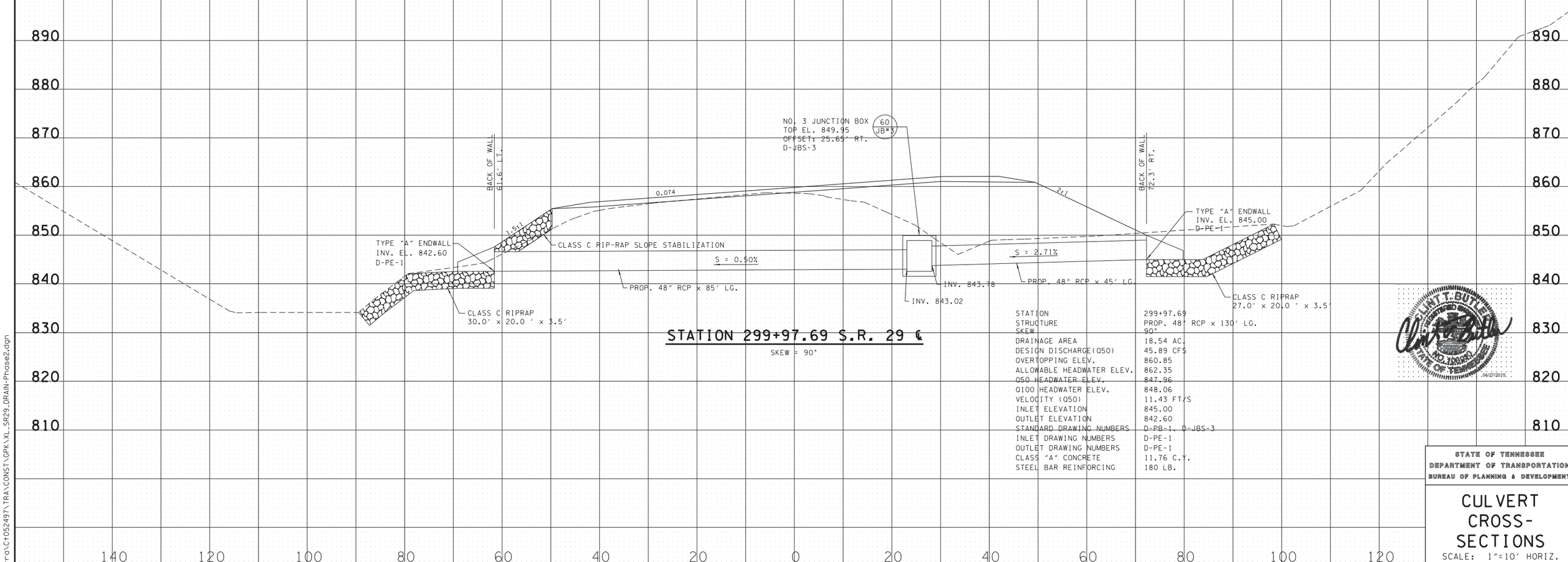
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	65
CONST.	2015	NH-29(86)	25

FILE NO.

TENNESSEE D.O.T.
DESIGN DIVISION



STATION 299+97.69 S.R. 29 ℄

SKEW = 90°

STATION	299+97.69
STRUCTURE	PROP. 48" RCP x 130' LG.
SKEW	90°
DRAINAGE AREA	18.54 AC.
DESIGN DISCHARGE(Q50)	45.89 CFS
OVERTOPPING ELEV.	860.85
ALLOWABLE HEADWATER ELEV.	862.35
Q50 HEADWATER ELEV.	847.96
Q100 HEADWATER ELEV.	848.06
VELOCITY (Q50)	11.43 FT/S
INLET ELEVATION	845.00
OUTLET ELEVATION	842.60
STANDARD DRAWING NUMBERS	D-PB-1, D-JBS-3
INLET DRAWING NUMBERS	D-PE-1
OUTLET DRAWING NUMBERS	D-PE-1
CLASS "A" CONCRETE	11.76 C.Y.
STEEL BAR REINFORCING	180 LB.

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 130600
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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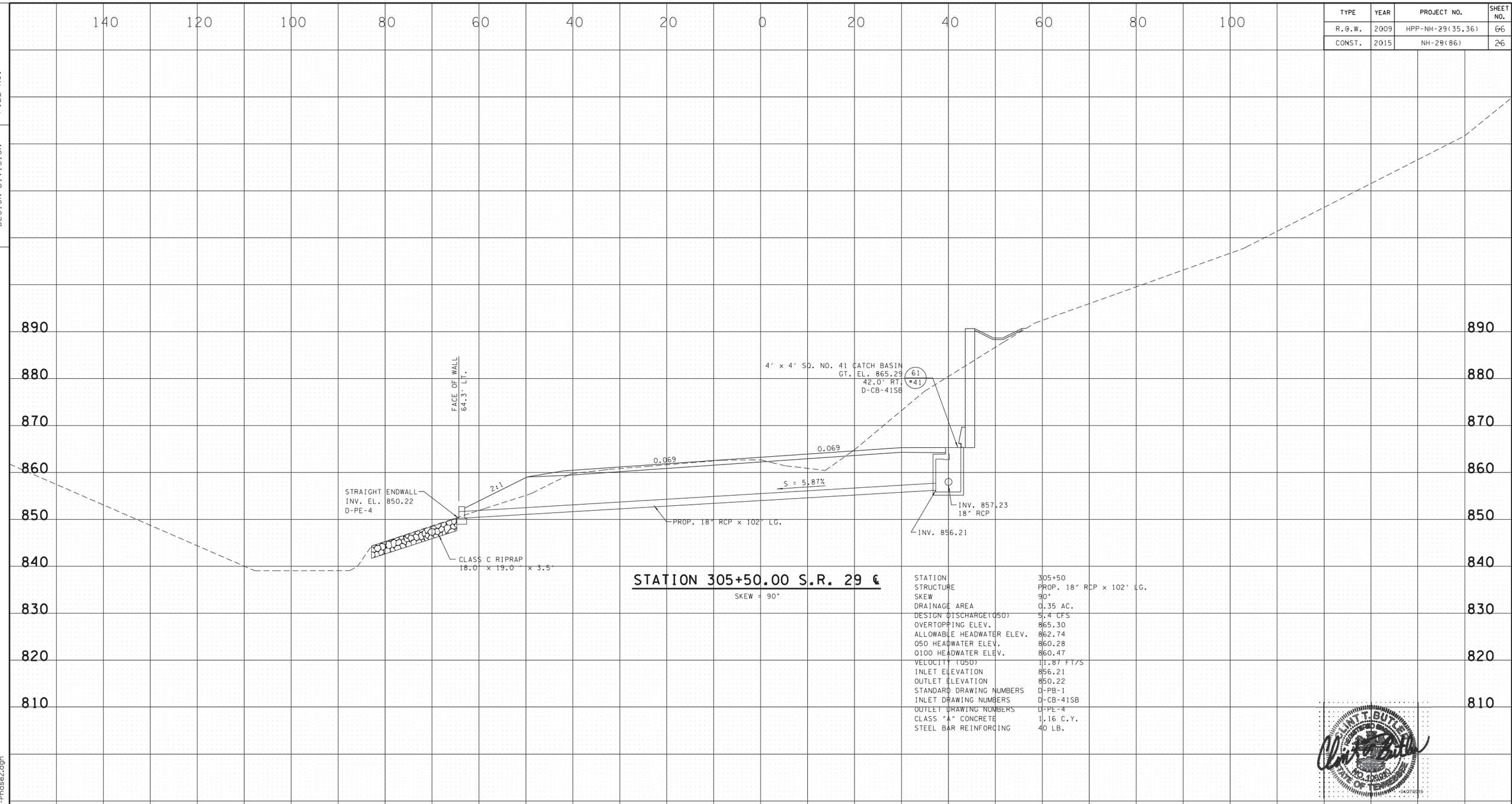
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	66
CONST.	2015	NH-29(86)	26

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.



STATION 305+50.00 S.R. 29 ℄

SKEW = 90°

STATION	305+50
STRUCTURE	PROP. 18" RCP x 102' LG.
SKEW	90°
DRAINAGE AREA	0.35 AC.
DESIGN DISCHARGE(Q50)	5.4 CFS
OVERTOPPING ELEV.	865.30
ALLOWABLE HEADWATER ELEV.	862.74
Q50 HEADWATER ELEV.	860.28
Q100 HEADWATER ELEV.	860.47
VELOCITY (Q50)	11.87 FT/S
INLET ELEVATION	856.21
OUTLET ELEVATION	850.22
STANDARD DRAWING NUMBERS	D-PB-1
INLET DRAWING NUMBERS	D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-4
CLASS "A" CONCRETE	1.16 C.Y.
STEEL BAR REINFORCING	40 LB.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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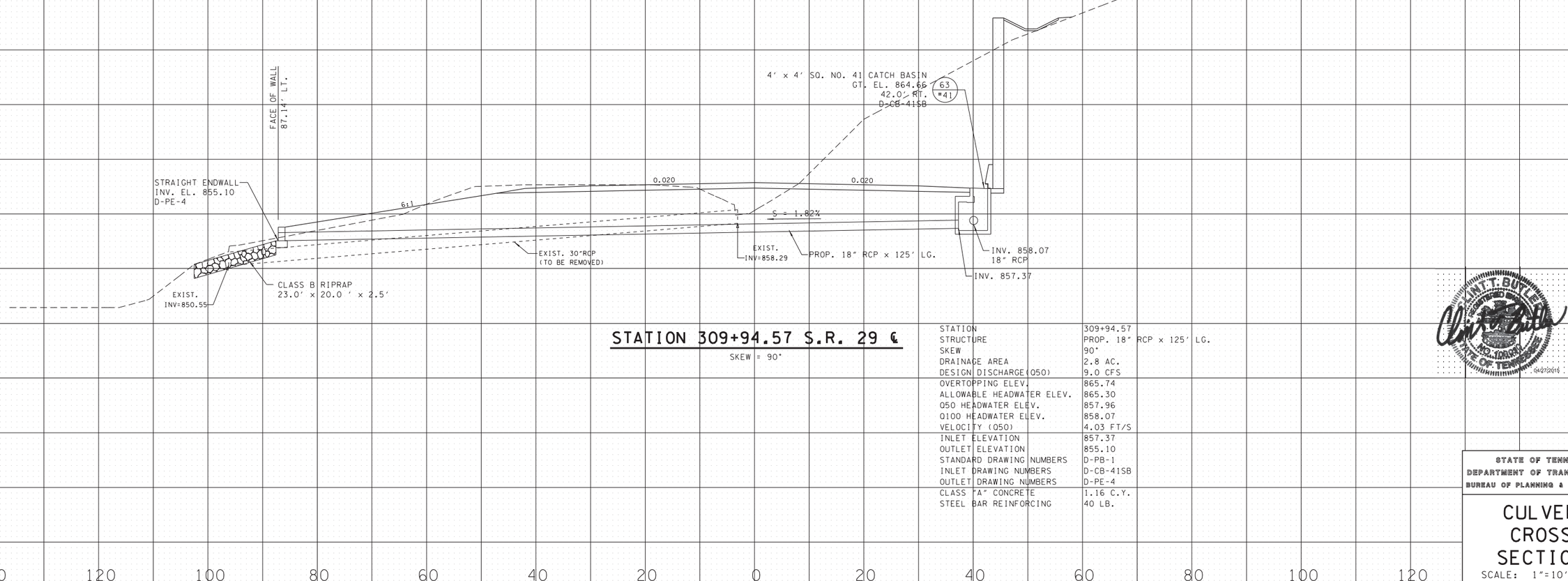
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	67
CONST.	2015	NH-29(86)	27

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.



STATION 309+94.57 S.R. 29 ℄

SKEW = 90°

STATION	309+94.57
STRUCTURE	PROP. 18" RCP x 125' LG.
SKEW	90°
DRAINAGE AREA	2.8 AC.
DESIGN DISCHARGE(Q50)	9.0 CFS
OVERTOPPING ELEV.	865.74
ALLOWABLE HEADWATER ELEV.	865.30
Q50 HEADWATER ELEV.	857.96
Q100 HEADWATER ELEV.	858.07
VELOCITY (Q50)	4.03 FT/S
INLET ELEVATION	857.37
OUTLET ELEVATION	855.10
STANDARD DRAWING NUMBERS	D-PB-1
INLET DRAWING NUMBERS	D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-4
CLASS "A" CONCRETE	1.16 C.Y.
STEEL BAR REINFORCING	40 LB.

CLINT T. BUTLER
REGISTERED
PROFESSIONAL
ENGINEER
No. 109061
STATE OF TENNESSEE
04/27/2016

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

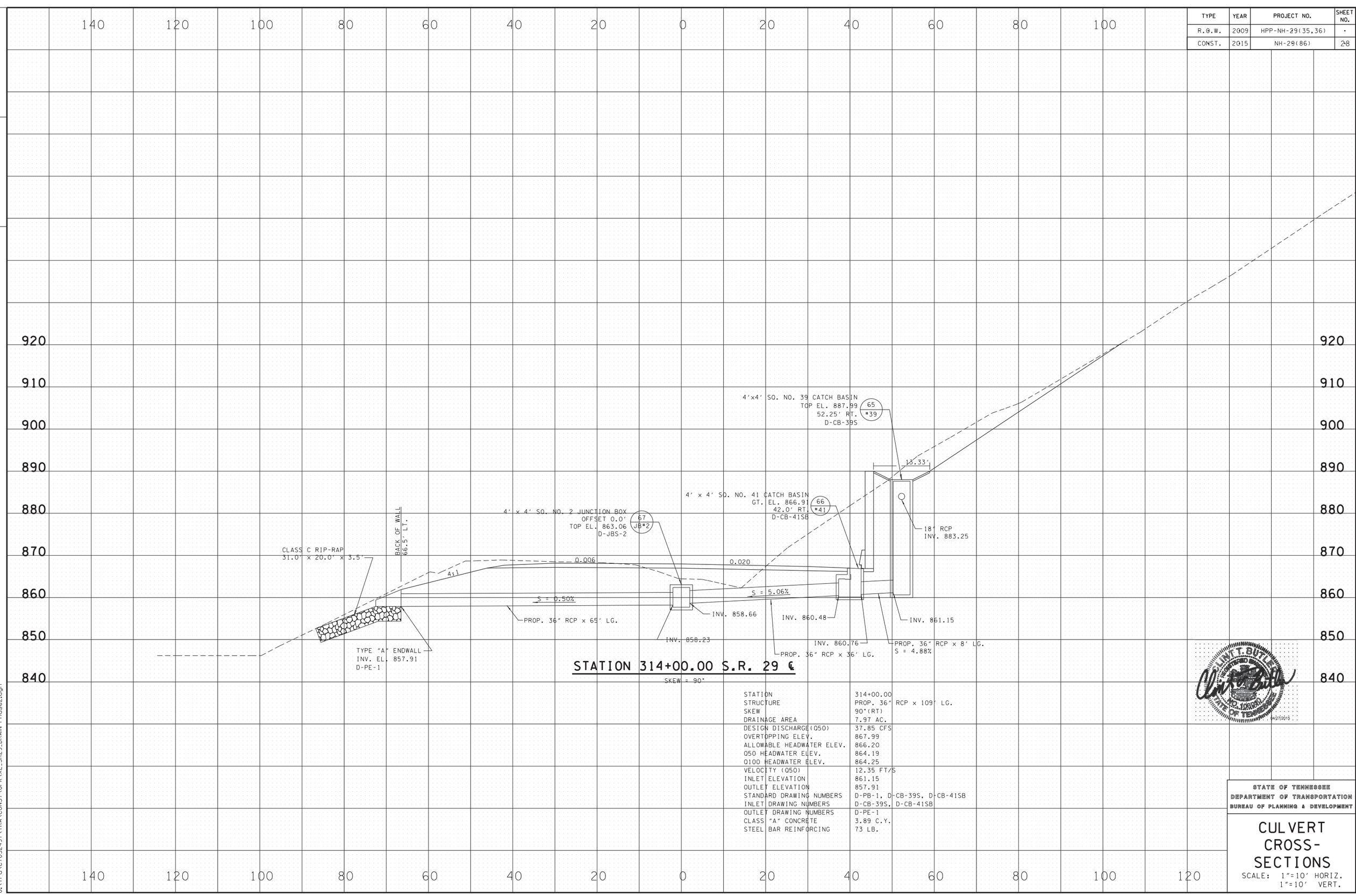
CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	·
CONST.	2015	NH-29(86)	28



STATION 314+00.00 S.R. 29 ℄

SKEW = 90°

STATION	314+00.00
STRUCTURE	PROP. 36" RCP x 109' LG.
SKEW	90°(RT)
DRAINAGE AREA	7.97 AC.
DESIGN DISCHARGE(Q50)	37.85 CFS
OVERTOPPING ELEV.	867.99
ALLOWABLE HEADWATER ELEV.	866.20
Q50 HEADWATER ELEV.	864.19
Q100 HEADWATER ELEV.	864.25
VELOCITY (Q50)	12.35 FT/S
INLET ELEVATION	861.15
OUTLET ELEVATION	857.91
STANDARD DRAWING NUMBERS	D-PB-1, D-CB-39S, D-CB-41SB
INLET DRAWING NUMBERS	D-CB-39S, D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-1
CLASS "A" CONCRETE	3.89 C.Y.
STEEL BAR REINFORCING	73 LB.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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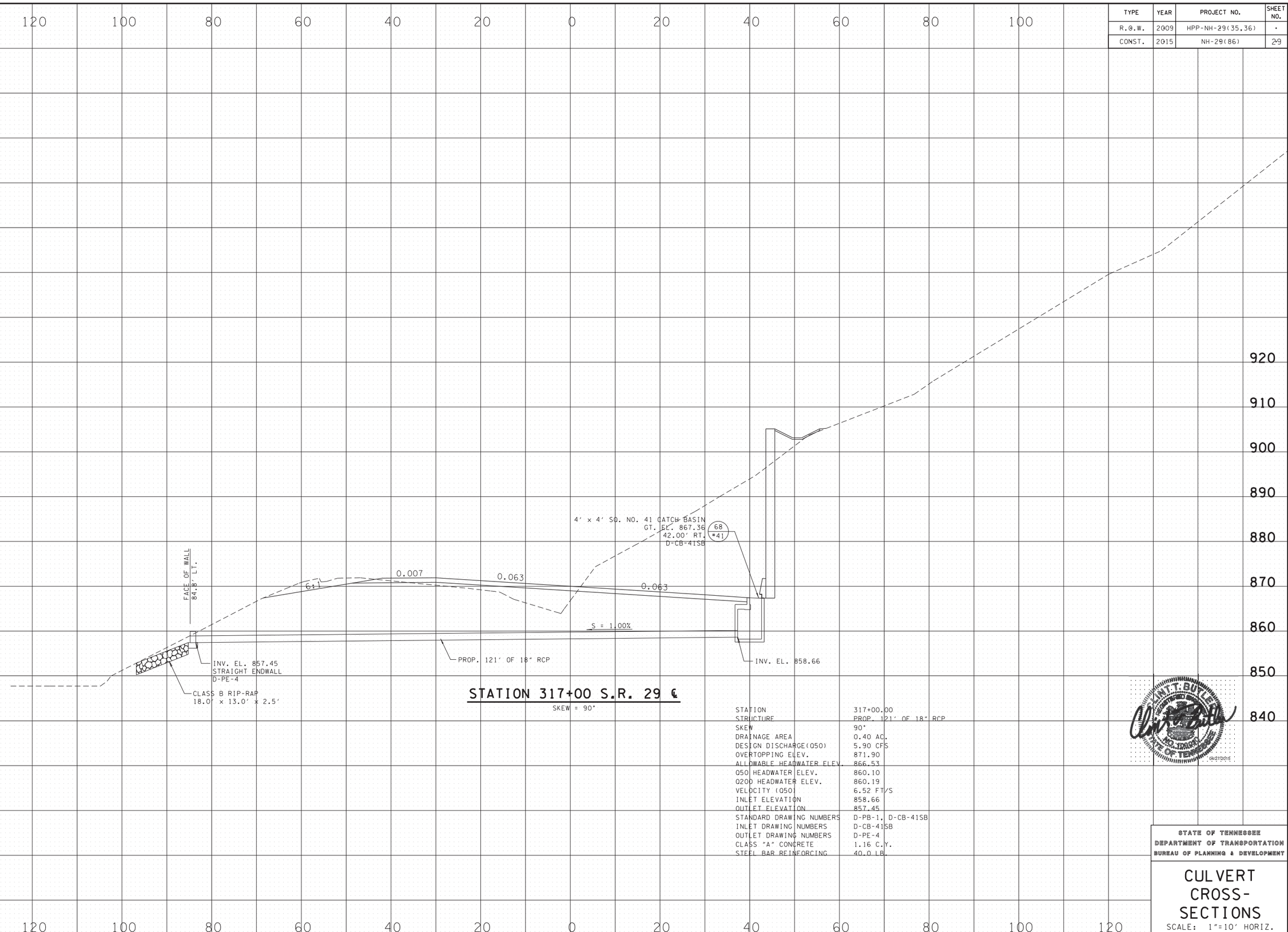
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	-
CONST.	2015	NH-29(86)	29

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.



STATION 317+00 S.R. 29 ℄

SKEW = 90°

STATION	317+00.00
STRUCTURE	PROP. 121' OF 18" RCP
SKEW	90°
DRAINAGE AREA	0.40 AC.
DESIGN DISCHARGE(Q50)	5.90 CFS
OVERTOPPING ELEV.	871.90
ALLOWABLE HEADWATER ELEV.	866.53
Q50 HEADWATER ELEV.	860.10
Q200 HEADWATER ELEV.	860.19
VELOCITY (Q50)	6.52 FT/S
INLET ELEVATION	858.66
OUTLET ELEVATION	857.45
STANDARD DRAWING NUMBERS	D-PB-1, D-CB-41SB
INLET DRAWING NUMBERS	D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-4
CLASS "A" CONCRETE	1.16 C.Y.
STEEL BAR REINFORCING	40.0 LB.

CLINT T. BUTLER
REGISTERED
NO. 102001
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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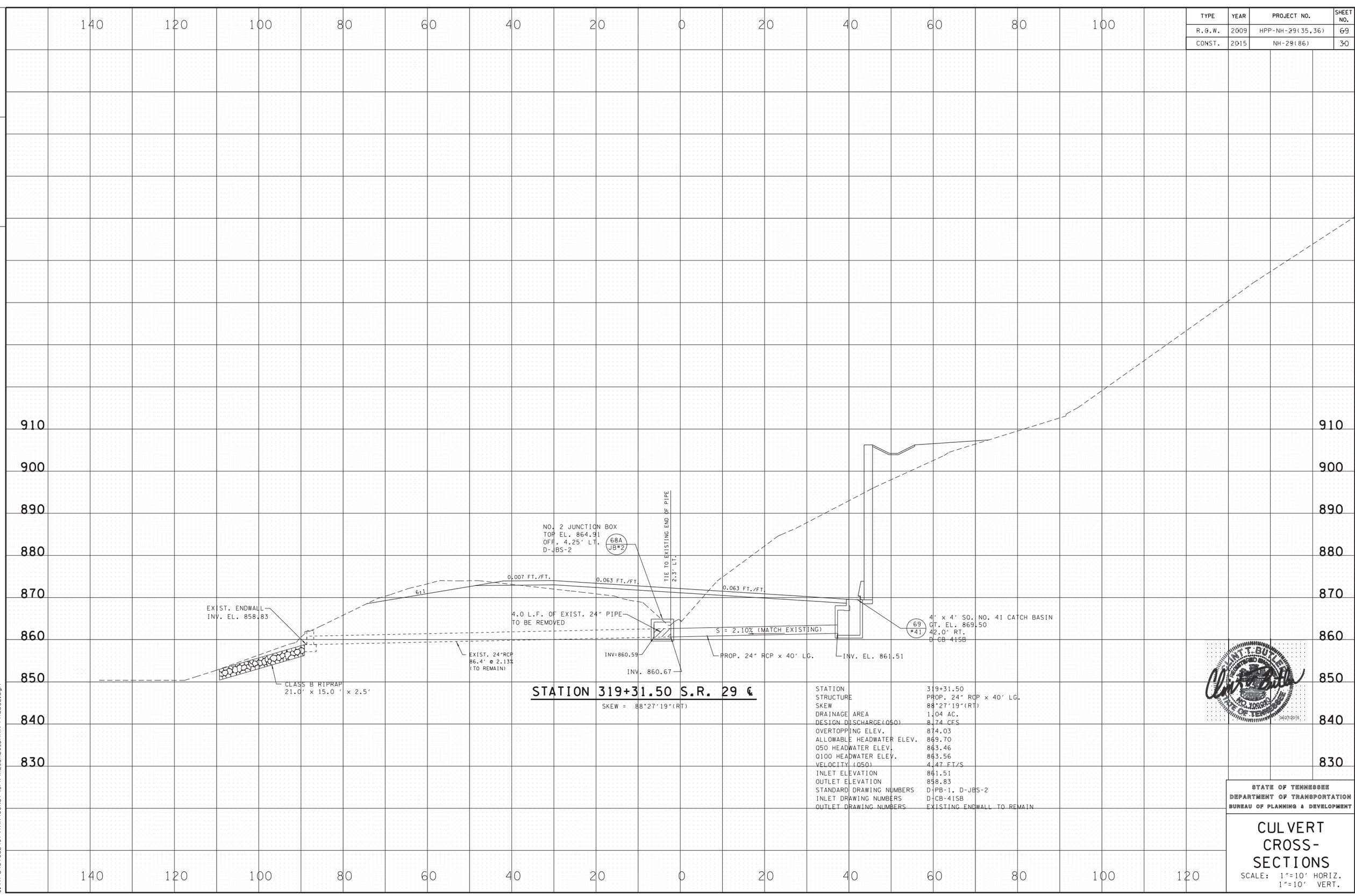
TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	69
CONST.	2015	NH-29(86)	30



STATION 319+31.50 S.R. 29 ℄

SKEW = 88°27'19"(RT)

STATION	319+31.50
STRUCTURE	PROP. 24" RCP x 40' LG.
SKEW	88°27'19"(RT)
DRAINAGE AREA	1.04 AC.
DESIGN DISCHARGE(Q50)	8.74 CFS
OVERTOPPING ELEV.	874.03
ALLOWABLE HEADWATER ELEV.	869.70
Q50 HEADWATER ELEV.	863.46
Q100 HEADWATER ELEV.	863.56
VELOCITY (Q50)	4.47 FT/S
INLET ELEVATION	861.51
OUTLET ELEVATION	858.83
STANDARD DRAWING NUMBERS	D-PB-1, D-JBS-2
INLET DRAWING NUMBERS	D-CB-41SB
OUTLET DRAWING NUMBERS	EXISTING ENDWALL TO REMAIN

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 109860
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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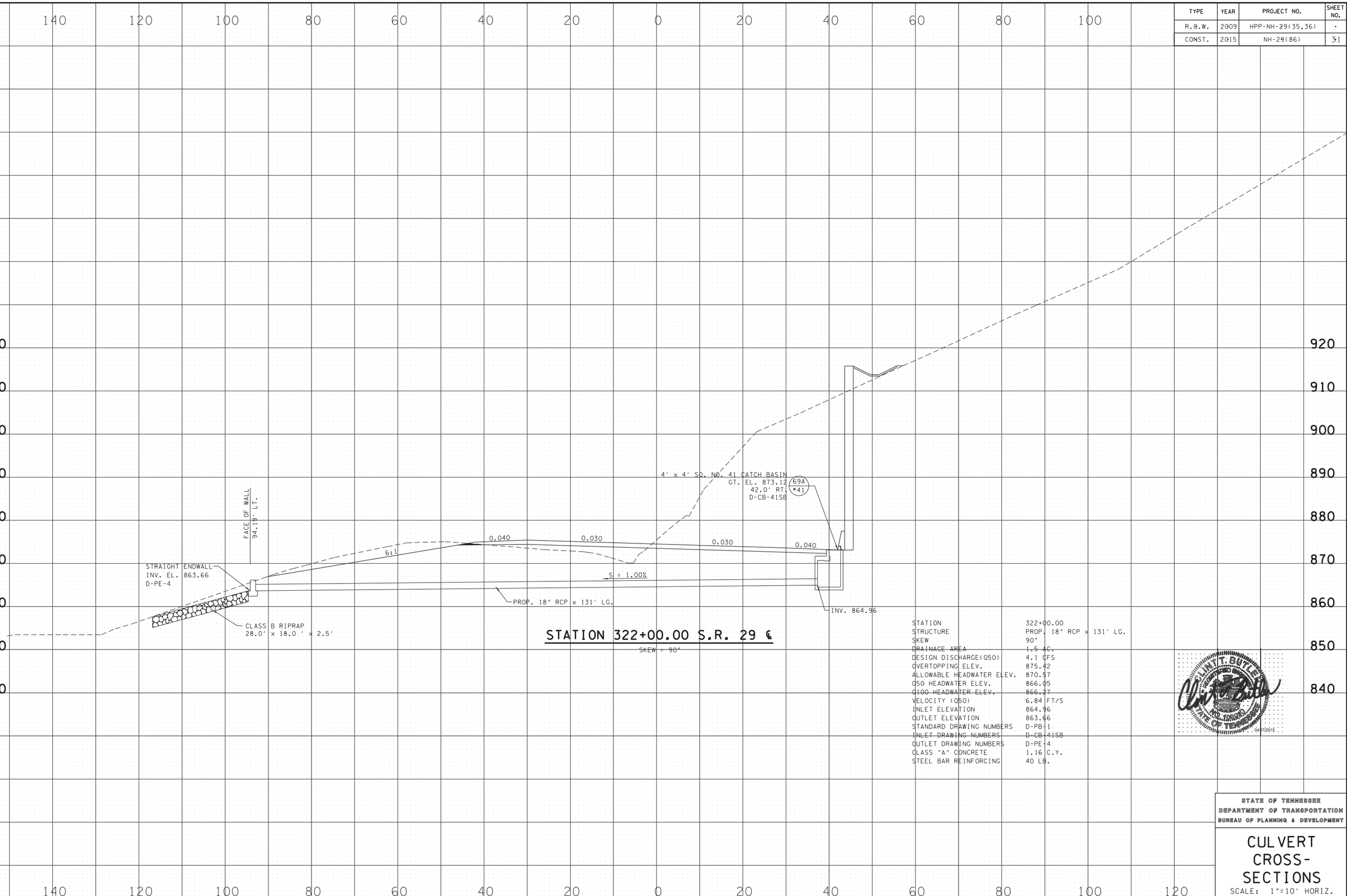
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	-
CONST.	2015	NH-29(86)	31

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.



STATION 322+00.00 S.R. 29 ℄

SKEW = 90°

STATION	322+00.00
STRUCTURE	PROP. 18" RCP x 131' LG.
SKEW	90°
DRAINAGE AREA	1.5 AC.
DESIGN DISCHARGE(Q50)	4.1 CFS
OVERTOPPING ELEV.	875.42
ALLOWABLE HEADWATER ELEV.	870.57
Q50 HEADWATER ELEV.	866.05
Q100 HEADWATER ELEV.	866.27
VELOCITY (Q50)	6.84 FT/S
INLET ELEVATION	864.96
OUTLET ELEVATION	863.66
STANDARD DRAWING NUMBERS	D-PB-1
INLET DRAWING NUMBERS	D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-4
CLASS "A" CONCRETE	1.16 C.Y.
STEEL BAR REINFORCING	40 LB.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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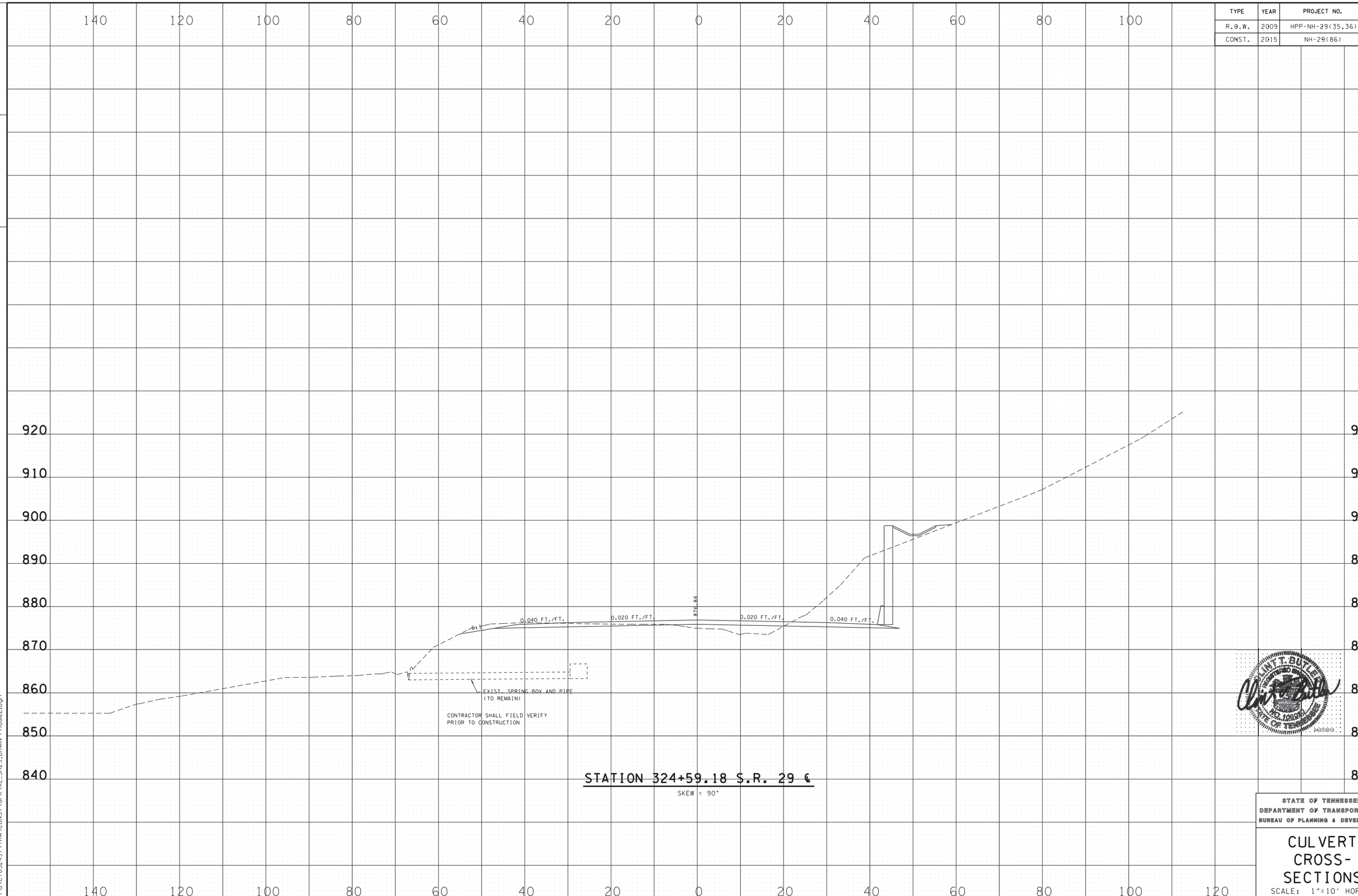
TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	70
CONST.	2015	NH-29(86)	32



STATION 324+59.18 S.R. 29 ℄

SKEW = 90°

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 103809
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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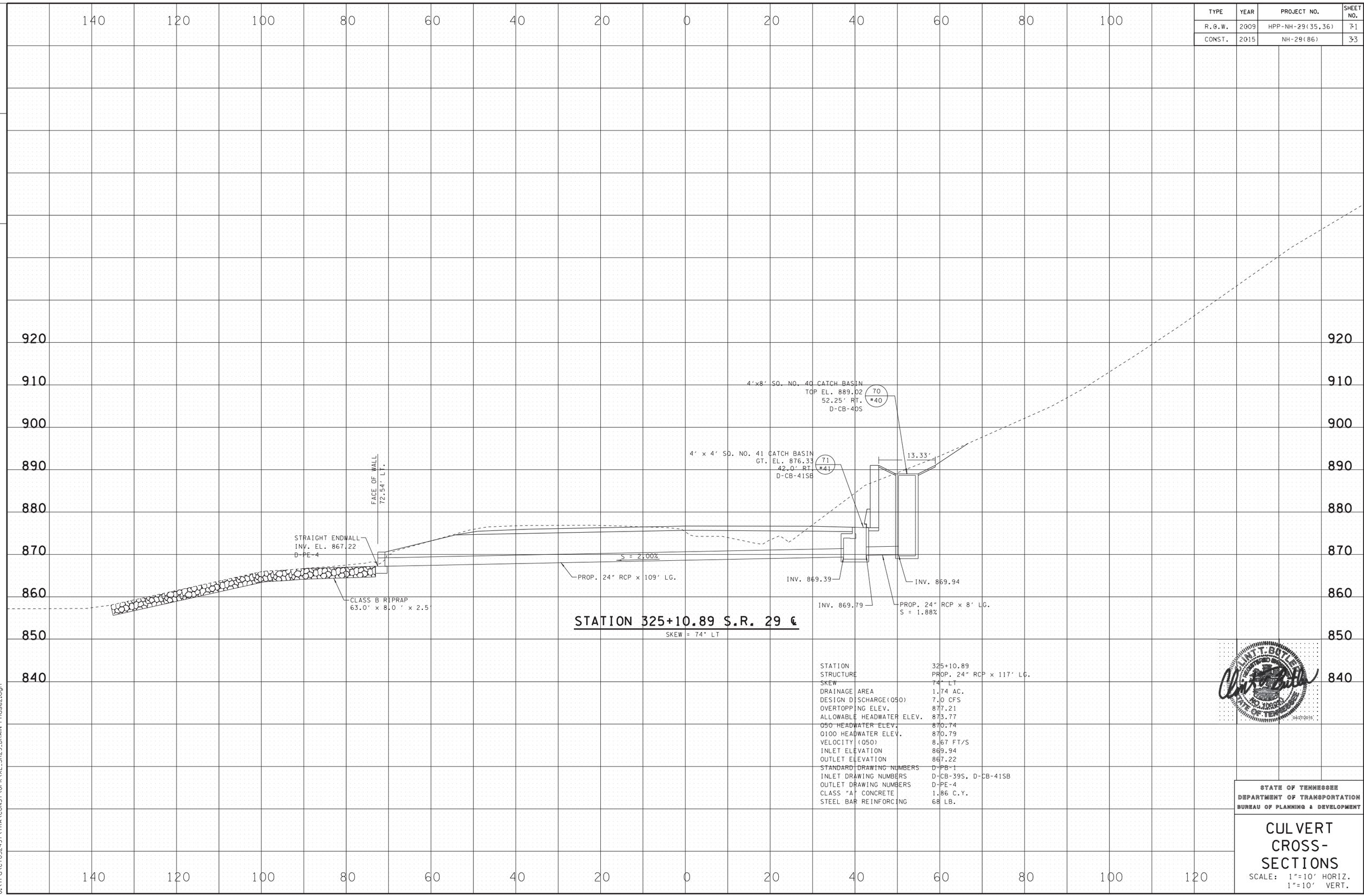
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	71
CONST.	2015	NH-29(86)	33

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.



STATION 325+10.89 S.R. 29 ℄

SKEW = 74° LT

STATION	325+10.89
STRUCTURE	PROP. 24" RCP x 117' LG.
SKEW	74° LT
DRAINAGE AREA	1.74 AC.
DESIGN DISCHARGE(Q50)	7.0 CFS
OVERTOPPING ELEV.	877.21
ALLOWABLE HEADWATER ELEV.	873.77
Q50 HEADWATER ELEV.	870.74
Q100 HEADWATER ELEV.	870.79
VELOCITY (Q50)	8.67 FT/S
INLET ELEVATION	869.94
OUTLET ELEVATION	867.22
STANDARD DRAWING NUMBERS	D-PB-1
INLET DRAWING NUMBERS	D-CB-39S, D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-4
CLASS "A" CONCRETE	1.86 C.Y.
STEEL BAR REINFORCING	68 LB.

CLINT T. BUTLER
REGISTERED ENGINEER
NO. 109629
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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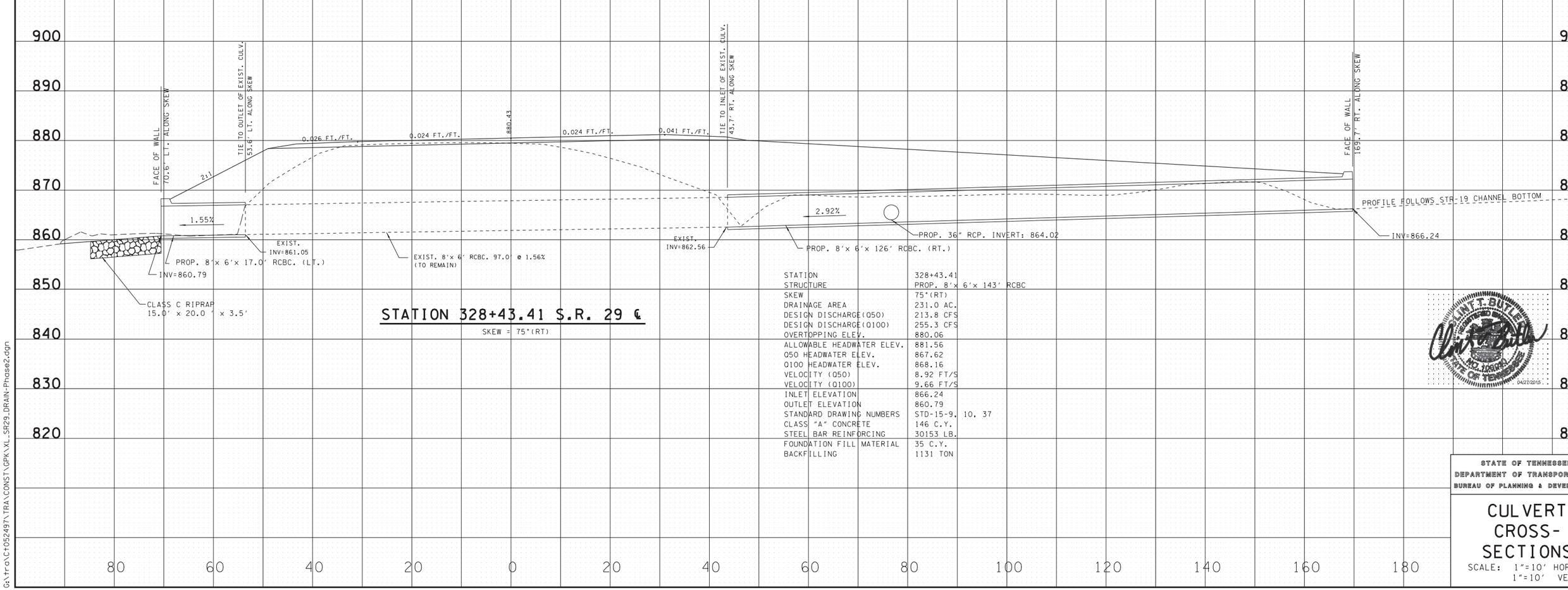
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	72
CONST.	2015	NH-29(86)	34

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.



STATION 328+43.41 S.R. 29 ℄

SKEW = 75°(RT)

STATION	328+43.41
STRUCTURE	PROP. 8'x 6'x 143' RCBC
SKEW	75°(RT)
DRAINAGE AREA	231.0 AC.
DESIGN DISCHARGE(Q50)	213.8 CFS
DESIGN DISCHARGE(Q100)	255.3 CFS
OVERTOPPING ELEV.	880.06
ALLOWABLE HEADWATER ELEV.	881.56
Q50 HEADWATER ELEV.	867.62
Q100 HEADWATER ELEV.	868.16
VELOCITY (Q50)	8.92 FT/S
VELOCITY (Q100)	9.66 FT/S
INLET ELEVATION	866.24
OUTLET ELEVATION	860.79
STANDARD DRAWING NUMBERS	STD-15-9, 10, 37
CLASS "A" CONCRETE	146 C.Y.
STEEL BAR REINFORCING	30153 LB.
FOUNDATION FILL MATERIAL	35 C.Y.
BACKFILLING	1131 TON

CLINT T. BUTLER
REGISTERED
NO. 109824
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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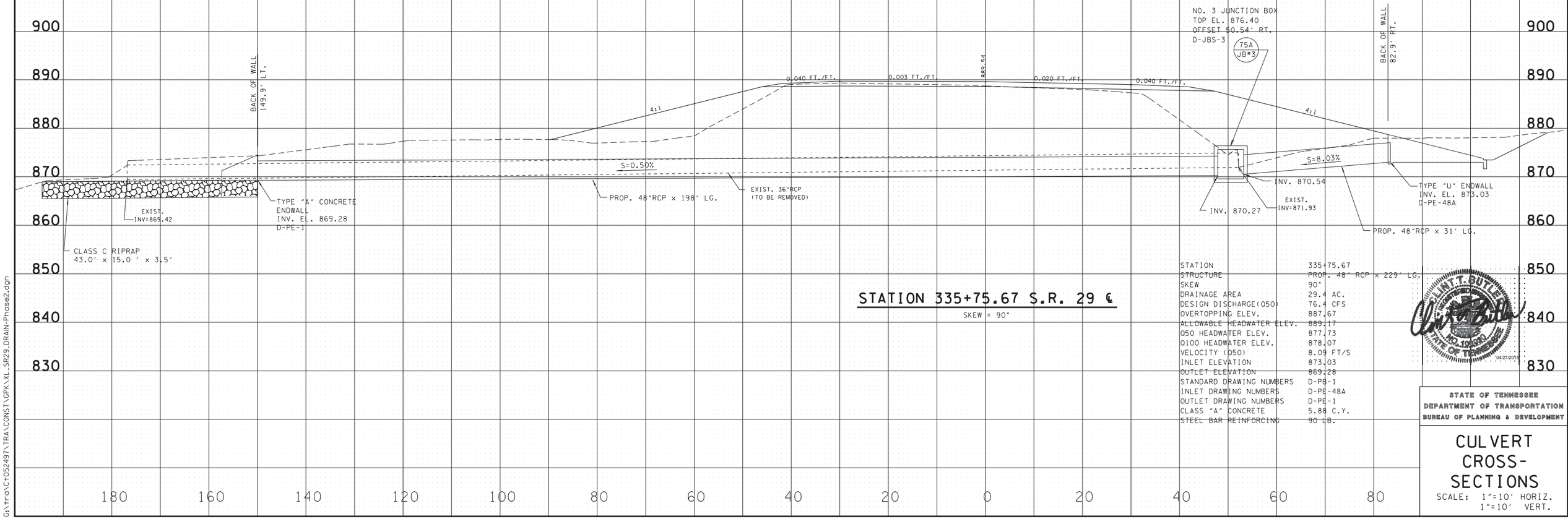
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	73
CONST.	2015	NH-29(86)	35

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.



STATION 335+75.67 S.R. 29 ℄

SKEW = 90°

STATION	335+75.67
STRUCTURE	PROP. 48" RCP x 229' LG.
SKEW	90°
DRAINAGE AREA	29.4 AC.
DESIGN DISCHARGE(Q50)	76.4 CFS
OVERTOPPING ELEV.	887.67
ALLOWABLE HEADWATER ELEV.	889.17
Q50 HEADWATER ELEV.	877.73
Q100 HEADWATER ELEV.	878.07
VELOCITY (Q50)	8.09 FT/S
INLET ELEVATION	873.03
OUTLET ELEVATION	869.28
STANDARD DRAWING NUMBERS	D-PB-1
INLET DRAWING NUMBERS	D-PE-48A
OUTLET DRAWING NUMBERS	D-PB-1
CLASS "A" CONCRETE	5.88 C.Y.
STEEL BAR REINFORCING	90 LB.

CLINT T. BUTLER
REGISTERED
NO. 104661
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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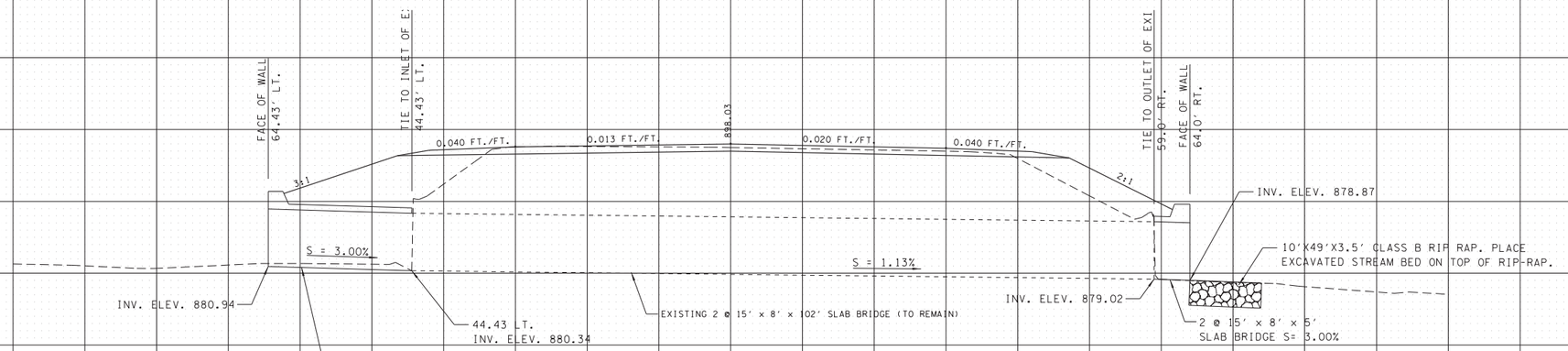
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	74
CONST.	2015	NH-29(86)	36

FILE NO.

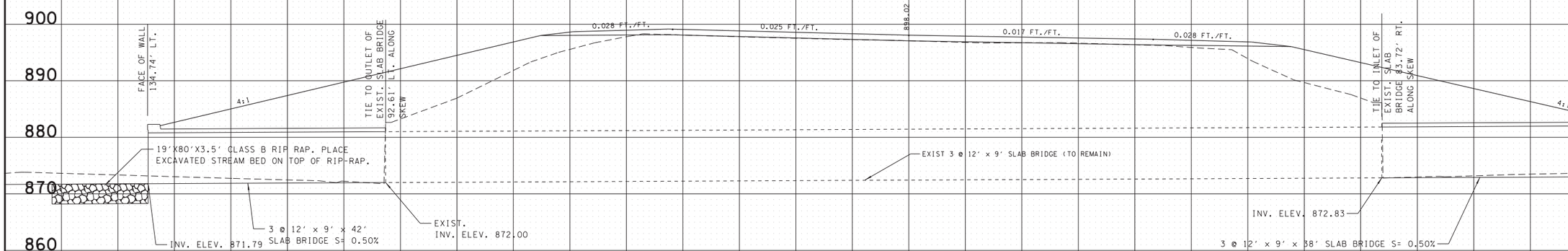
TENNESSEE D.O.T.
DESIGN DIVISION



STATION 349+19.93 S.R. 29 &

SKEW = 90°

STATION	349+19.93
STRUCTURE	2@15'x8'x25' SLAB BRIDGE
SKEW	90°
DRAINAGE AREA	826 AC.
DESIGN DISCHARGE(050)	787.5 CFS
OVERTOPPING ELEV.	896.5
0100 HEADWATER ELEV.	885.87
VELOCITY (050)	6.99 FT/S
INLET ELEVATION	880.94
OUTLET ELEVATION	878.87
STANDARD DRAWING NUMBERS	STD-15-9, 10, 125
CLASS "A" CONCRETE	72 C.Y.
STEEL BAR REINFORCING	14754 LB.
BACKFILLING	345 TONS
FOUNDATION FILL MATERIAL	8 C.Y.



STATION 342+85.29 S.R. 29 &

SKEW = 45° RT.

STATION	342+85.29
STRUCTURE	3@12'x9'x80' SLAB BRIDGE
SKEW	45° RT.
DRAINAGE AREA	3539 AC.
DESIGN DISCHARGE(050)	787.5 CFS
OVERTOPPING ELEV.	896.50
0100 HEADWATER ELEV.	880.70
OUTLET VELOCITY	6.55 FT/S
INLET ELEVATION	873.02
OUTLET ELEVATION	871.79
STANDARD DRAWING NUMBERS	STD-15-9, 11, 141
CLASS "A" CONCRETE	257 C.Y.
STEEL BAR REINFORCING	48859 LB.
BACKFILLING	1307 TONS
FOUNDATION FILL MATERIAL	30 C.Y.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10' HORIZ.
1"=10' VERT.

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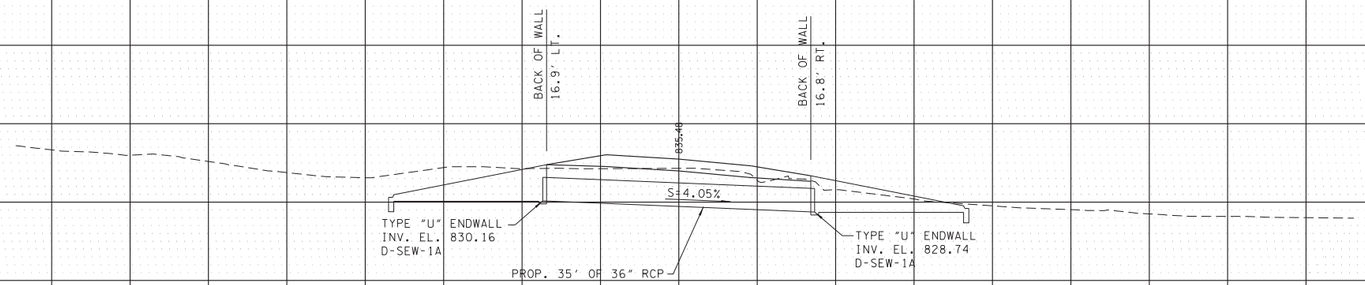
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	79
CONST.	2015	NH-29(86)	37

2/21/2012: REMOVED CULVERT SECTION AT SANDERS LANE STA. 45+36.05.

TENNESSEE D.O.T.
DESIGN DIVISION

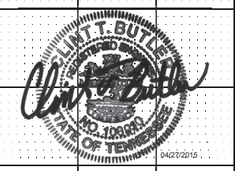
FILE NO.



STATION 50+69.98 WHETSTONE ROAD ℄

SKEW = 75°

STATION	50+69.98
STRUCTURE	PROP. 36" RCP x 35' LG.
SKEW	75°00'00" RT
DRAINAGE AREA	9.6 AC
DESIGN DISCHARGE(Q50)	29.2 CFS
OVERTOPPING ELEV.	832.23
ALLOWABLE HEADWATER ELEV.	833.73
Q50 HEADWATER ELEV.	831.47
Q100 HEADWATER ELEV.	831.35
VELOCITY (Q50)	6.19 FT/S
INLET ELEVATION	830.16
OUTLET ELEVATION	828.74
STANDARD DRAWING NUMBERS	D-PB-1
INLET DRAWING NUMBERS	D-SEW-1A
OUTLET DRAWING NUMBERS	D-SEW-1A



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10 ' HORIZ.
1"=10' VERT.

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130

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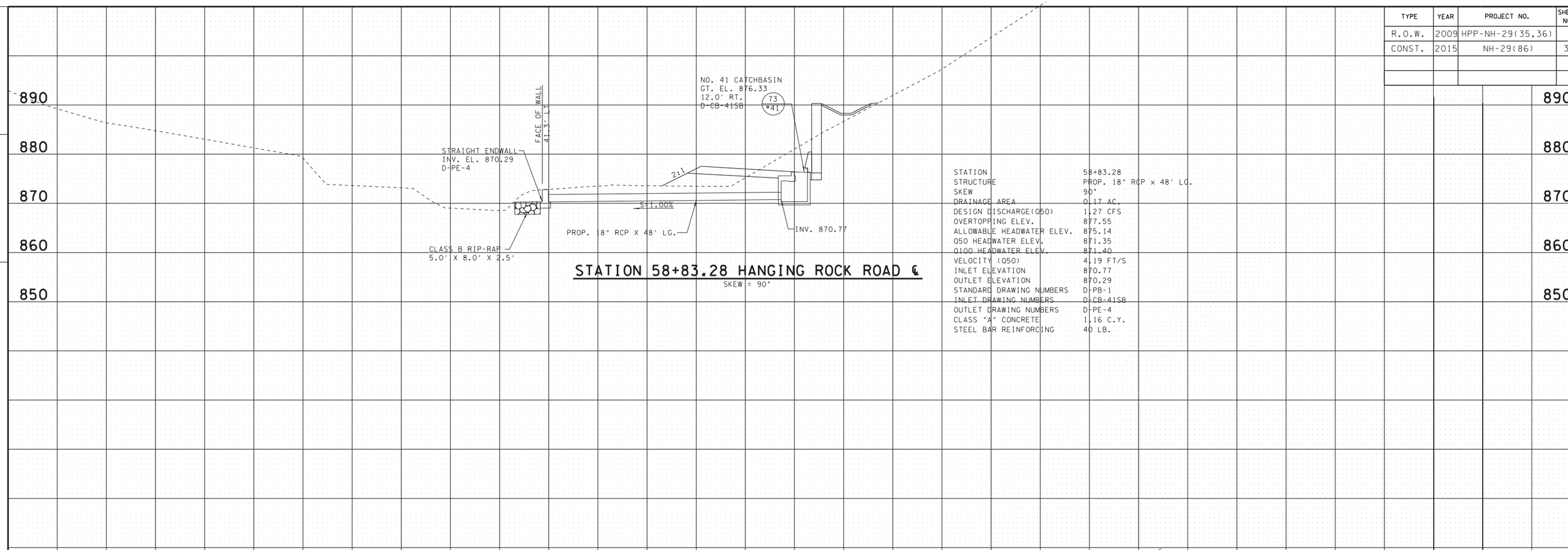
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	
CONST.	2015	NH-29(86)	38

TENNESSEE D.O.T. DESIGN DIVISION

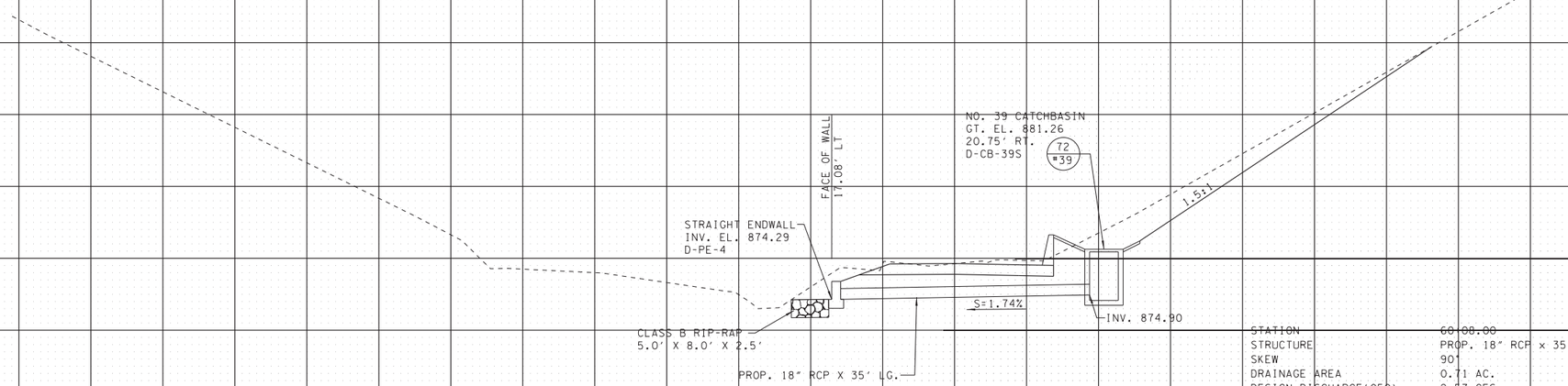
FILE NO.



STATION 58+83.28 HANGING ROCK ROAD ℄

SKEW = 90°

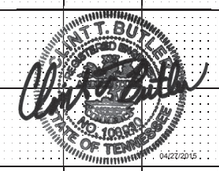
STATION	58+83.28
STRUCTURE	PROP. 18" RCP x 48' LG.
SKEW	90°
DRAINAGE AREA	0.17 AC.
DESIGN DISCHARGE(Q50)	1.27 CFS
OVERTOPPING ELEV.	877.55
ALLOWABLE HEADWATER ELEV.	875.14
Q50 HEADWATER ELEV.	871.35
Q100 HEADWATER ELEV.	871.40
VELOCITY (Q50)	4.19 FT/S
INLET ELEVATION	870.77
OUTLET ELEVATION	870.29
STANDARD DRAWING NUMBERS	D-PB-1
INLET DRAWING NUMBERS	D-CB-41SB
OUTLET DRAWING NUMBERS	D-PE-4
CLASS "A" CONCRETE	1.16 C.Y.
STEEL BAR REINFORCING	40 LB.



STATION 60+08.00 HANGING ROCK ROAD ℄

SKEW = 90°

STATION	60+08.00
STRUCTURE	PROP. 18" RCP x 35' LG.
SKEW	90°
DRAINAGE AREA	0.71 AC.
DESIGN DISCHARGE(Q50)	2.57 CFS
OVERTOPPING ELEV.	880.26
ALLOWABLE HEADWATER ELEV.	878.49
Q50 HEADWATER ELEV.	875.39
Q100 HEADWATER ELEV.	875.41
VELOCITY (Q50)	5.22 FT/S
INLET ELEVATION	874.90
OUTLET ELEVATION	874.29
STANDARD DRAWING NUMBERS	D-PB-1
INLET DRAWING NUMBERS	D-CB-39S
OUTLET DRAWING NUMBERS	D-PE-4
CLASS "A" CONCRETE	1.16 C.Y.
STEEL BAR REINFORCING	40 LB.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10 ' HORIZ.
1"=10' VERT.

Survey & Design Division

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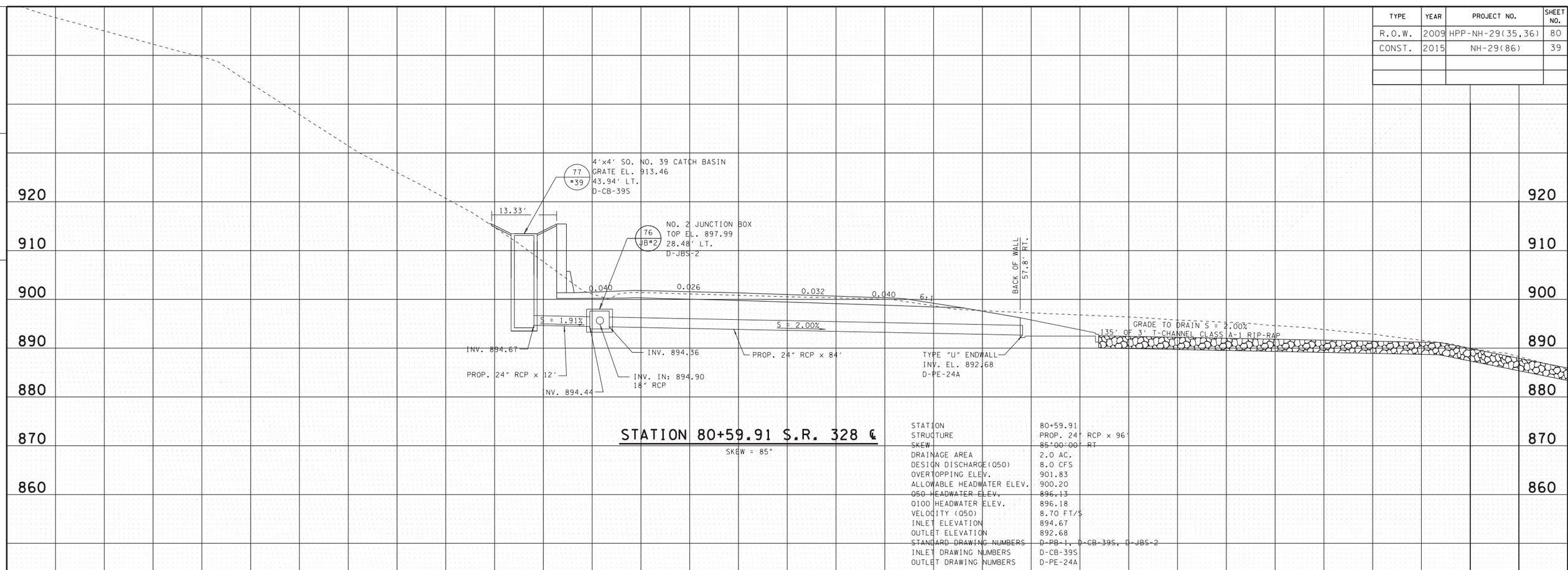
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(35,36)	80
CONST.	2015	NH-29(86)	39

TENNESSEE D.O.T. DESIGN DIVISION

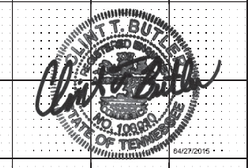
FILE NO.



STATION 80+59.91 S.R. 328 ℄

SKEW = 85°

STATION	80+59.91
STRUCTURE	PROP. 24' RCP x 96'
SKEW	85°00'00" RT
DRAINAGE AREA	2.0 AC.
DESIGN DISCHARGE(Q50)	8.0 CFS
OVERTOPPING ELEV.	901.83
ALLOWABLE HEADWATER ELEV.	900.20
Q50 HEADWATER ELEV.	896.13
Q100 HEADWATER ELEV.	896.18
VELOCITY (Q50)	8.70 FT/S
INLET ELEVATION	894.67
OUTLET ELEVATION	892.68
STANDARD DRAWING NUMBERS	D-PB-1, D-CB-39S, D-JBS-2
INLET DRAWING NUMBERS	D-CB-39S
OUTLET DRAWING NUMBERS	D-PE-24A



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CULVERT CROSS-SECTIONS

SCALE: 1"=10 ' HORIZ.
1"=10' VERT.

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	81
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	40

EROSION PREVENTION AND SEDIMENT CONTROL NOTES

STREAM/WETLAND

(1) ANY WORK WITHIN THE STREAM CHANNEL AREA (E.G., FOR PIER FOOTING, RIP-RAP PLACEMENT, MULTI-BARREL CULVERT/BRIDGE CONSTRUCTION, ETC.) SHALL BE SEPARATED FROM FLOWING WATER OR EXPECTED FLOW PATH AND PERFORMED DURING LOW FLOW CONDITIONS. ALL ITEMS USED WITHIN THE STREAM CHANNEL AREA FOR DIVERSION OF FLOW (OR EXPECTED FLOW), UNLESS SPECIFIED IN THE PLANS, SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE COST OF OTHER ITEMS. THIS NOTE EXCLUDES ANY ITEMS SPECIFIED IN THE PLANS FOR THE TEMPORARY DIVERSION CHANNELS, EC-STR-31 AND TEMPORARY DIVERSION CULVERTS, EC-STR-32 FOR SINGLE BARREL CULVERT CONSTRUCTION.

(2) A 30 FOOT NATURAL RIPARIAN BUFFER ZONE ADJACENT TO AND ON BOTH SIDES OF THE RECEIVING STREAM SHALL BE PRESERVED, TO THE MAXIMUM EXTENT PRACTICABLE, DURING CONSTRUCTION ACTIVITIES AT THE SITE. BUFFER ZONES ARE NOT SEDIMENT CONTROL MEASURES AND SHOULD NOT BE RELIED UPON AS PRIMARY SEDIMENT CONTROL MEASURES. THE RIPARIAN BUFFER ZONE SHALL BE ESTABLISHED BETWEEN THE TOP OF THE STREAM BANK AND THE DISTURBED CONSTRUCTION AREA. THE 30 FOOT CRITERION FOR THE WIDTH OF THE BUFFER ZONE CAN BE ESTABLISHED ON AN AVERAGE WIDTH BASIS AT A PROJECT, AS LONG AS THE MINIMUM WIDTH OF THE BUFFER ZONE IS MORE THAN 15 FEET AT ANY MEASURED LOCATION. EVERY ATTEMPT SHALL BE MADE FOR CONSTRUCTION ACTIVITIES NOT TO TAKE PLACE WITHIN THE BUFFER ZONES. BEST MANAGEMENT PRACTICES (BMPS) PROVIDING EQUIVALENT PROTECTION AS THE NATURAL RIPARIAN ZONE MAY BE USED. A JUSTIFICATION FOR USE AND DESIGN EQUIVALENCY SHALL BE DOCUMENTED WITHIN THE SWPPP. THE ENVIRONMENTAL AND DESIGN DIVISIONS SHALL REVIEW AND APPROVE THIS REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE SITE PROCEEDS, UNLESS PREVIOUSLY EXEMPT IN THE NPDES CONSTRUCTION GENERAL PERMIT. WHERE ISSUED, ARAP/401 REQUIREMENTS WILL PREVAIL IF IN CONFLICT WITH THESE BUFFER ZONE REQUIREMENTS.

NPDES

(3) NO WORK SHALL BE STARTED UNTIL THE CONTRACTOR'S PLAN FOR THE STAGING OF THEIR OPERATIONS, INCLUDING THE PLAN FOR STAGING OF TEMPORARY AND PERMANENT EPSC MEASURES, HAS BEEN ACCEPTED BY THE ENGINEER. THE CONTRACTOR'S EPSC PLAN SHALL INCORPORATE AND SUPPLEMENT, AS ACCEPTABLE, THE BASIC EPSC DEVICES ON THE EPSC PLAN CONTAINED IN THE APPROVED SWPPP.

(4) THE EPSC MEASURES AND/OR PLAN SHALL BE MODIFIED AS NECESSARY SO THAT THEY ARE EFFECTIVE AT ALL TIMES THROUGHOUT THE COURSE OF THE PROJECT.

(5) THE ACCEPTED EPSC PLAN SHALL REQUIRE THAT EPSC MEASURES BE IN PLACE BEFORE CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING OCCURS, EXCEPT AS SUCH WORK MAY BE NECESSARY TO INSTALL EPSC MEASURES, INCLUDING WITHOUT LIMITATION AS FOLLOWS:

A. INITIAL CLEARING AND GRUBBING SHALL BE LIMITED TO THAT NECESSARY FOR THE INSTALLATION OF APPLICABLE EPSC MEASURES IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.

B. NO OTHER CLEARING AND GRUBBING OPERATIONS SHALL BE STARTED BEFORE APPLICABLE EPSC MEASURES ARE IN PLACE IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.

C. NO CULVERT OR BRIDGE CONSTRUCTION SHALL BE STARTED BEFORE APPLICABLE EPSC MEASURES ARE IN PLACE IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.

D. NO GRADING, EXCAVATION, CUTTING, FILLING, OR OTHER EARTHWORK SHALL BE STARTED BEFORE EPSC MEASURES ARE IN PLACE IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.

(6) PERMANENT EPSC MEASURES SHALL BE INITIATED WITHIN 14 CALENDAR DAYS AFTER FINAL GRADING OF ANY SEQUENCE OR PHASE. TEMPORARY OR PERMANENT STABILIZATION SHALL BE INITIATED WITHIN 14 CALENDAR DAYS AFTER FINAL GRADING OR WHEN CONSTRUCTION ACTIVITIES ON A PORTION OF THE SITE ARE TEMPORARILY CEASED AND EARTH DISTURBING ACTIVITIES WILL NOT RESUME UNTIL AFTER 14 CALENDAR DAYS. PERMANENT STABILIZATION WITH PERENNIAL VEGETATION OR OTHER PERMANENTLY STABLE NON-ERODING SURFACE SHALL REPLACE ANY TEMPORARY MEASURES AS SOON AS PRACTICABLE. UNPACKED GRAVEL CONTAINING FINES (SILT AND CLAY SIZED PARTICLES) OR CRUSHER-RUN WILL NOT BE CONSIDERED A NON-ERODIBLE SURFACE.

(7) STEEP SLOPES (A NATURAL OR CREATED SLOPE OF 35% GRADE (2.8H:1V) OR GREATER REGARDLESS OF HEIGHT) SHALL BE TEMPORARILY STABILIZED NO LATER THAN 7 CALENDAR DAYS AFTER CONSTRUCTION ACTIVITY ON THE SLOPE HAS TEMPORARILY OR PERMANENTLY CEASED.

(8) FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION SUPPORT ACTIVITIES; TDOT PROJECTS ARE COVERED UNDER THE "WASTE AND BORROW" MANUAL PER THE SSWMP.

(9) EXCEPT AS OTHERWISE SPECIFIED, THERE ARE NO KNOWN SPECIAL ENVIRONMENTAL FACTORS PRESENT ON THIS PROJECT THAT INDICATE A NEED FOR SEASONAL LIMITATIONS ON THE CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING OPERATIONS OR ON THE TOTAL AREA OF EXPOSED SOIL. Please see Environmental boundaries. There is a seasonal Tree Cutting Restriction due to Indiana Bat Habitat.

UTILITY RELOCATION

(10) RAIN WATER WHICH COLLECTS IN THE UTILITY TRENCH SHALL BE PUMPED INTO A DEWATERING STRUCTURE OR SEDIMENT FILTER BAG AND MAINTAINED.

(11) SILT FENCE SHALL BE INSTALLED ON THE DOWNSTREAM SIDE OF STOCKPILED SOIL. TRENCHING ACROSS WET WEATHER CONVEYANCES SHALL BE DONE DURING NO FLOW CONDITIONS AND STABILIZED BY THE END OF THE WORK DAY

(12) UTILITY CROSSINGS FOR PERENNIAL STREAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TDOT STANDARDS AND NO WORK SHALL BE CONDUCTED IN FLOWING WATERS. TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) REGULATIONS APPLY TO UTILITIES IN THIS PROJECT IN REGARD TO EROSION PREVENTION AND SEDIMENT CONTROL (EPSC). THE STATE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE STORM WATER POLLUTION PREVENTION PLANS (SWPPP).

(13) IT IS THE RESPONSIBILITY OF THE STATE UTILITY CONTRACTOR INSTALLER TO PROTECT FROM EROSION EXPOSED EARTH RESULTING FROM THEIR OPERATIONS AND TO PROVIDE FOR CONTAINMENT OF SEDIMENT THAT MAY RESULT FROM THEIR WORK. PRIOR TO BEGINNING WORK, ADEQUATE MEASURES MUST BE IN PLACE TO TRAP ANY SEDIMENT THAT MAY TRAVEL OFF-SITE IN THE EVENT OF RAIN. DURING THE PROGRESSION OF THEIR WORK, EXPOSED EARTH AREAS SHALL BE STABILIZED AS SOON AS POSSIBLE TO PREVENT EROSION. AT NO TIME SHALL EXPOSED EARTH RESULTING FROM THEIR OPERATIONS HAVE UNPROTECTED ACCESS TO FLOWING OFF-SITE AND ENTERING WATERS OF THE STATE/U.S.

(14) FOR THE INSTALLATION OF BURIED UTILITIES (PIPES AND CABLES), TRENCHES SHALL BE BACKFILLED DAILY AS CONSTRUCTION PROCEEDS. BACKFILLED TRENCHES SHALL BE SEEDED AND MULCHED OR SODDED DAILY IF POSSIBLE, BUT NO LATER THAN SEVEN DAYS AFTER BEING BACKFILLED. ANY TEMPORARY SPOIL OF EXCAVATED EARTH SHALL BE LOCATED WITHIN TDOT EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES OR RECEIVE SEPARATE EPSC MEASURES. IF TRENCHES ARE NOT BACKFILLED OVERNIGHT, APPROPRIATE EPSC MEASURES WILL BE INSTALLED BY THE STATE UTILITY CONTRACTOR UNTIL SUCH TIME AS THE TRENCH IS BACKFILLED.

(15) IN REGARD TO EROSION PREVENTION AND SEDIMENT CONTROL (EPSC), TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) REGULATIONS APPLY TO THE STATE UTILITY CONTRACTORS IN THIS PROJECT, THEREFORE, THE STATE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE STORM WATER POLLUTIONS PREVENTION PLANS (SWPPP). THE STATE CONTRACTOR IS RESPONSIBLE FOR EPSC MEASURES RELATED TO UTILITY CONSTRUCTION INCLUDED IN THE STATE CONTRACT WORK.

(16) TRENCHES FORMED FOR THE INSTALLATION OF BURIED UTILITIES MAY CAUSE STORM WATER RUNOFF TO CONCENTRATE AT THE TRENCH LINE. ADDITIONAL EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES MAY BE REQUIRED TO BE INSTALLED AS APPROVED BY THE TDOT PROJECT ENGINEER.

(17) FOR THE INSTALLATION OF UNDERGROUND UTILITIES OUTSIDE OF THE TDOT RIGHT-OF-WAY, EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) SHALL BE INSTALLED PRIOR TO CLEARING (TRENCHING AND ASSOCIATED BLASTING) IN THOSE AREAS NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE CONSTRUCTION AREA. THESE EPSC MEASURES SHALL REMAIN UNTIL THE BACKFILLED TRENCH IS STABILIZED WITH FINAL VEGETATIVE COVER.

(18) THE UTILITY CONTRACTOR SHALL RESTORE ALL AFFECTED WET WEATHER CONVEYANCES TO THE EXISTING TOPOGRAPHIC CONDITIONS (AS APPROVED BY THE TDOT PROJECT ENGINEER).

(19) THE UTILITY CONTRACTOR WILL PROVIDE APPROPRIATE EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES TO REPLACE IN-PLACE EPSC MEASURES REMOVED TO FACILITATE THE INSTALLATION OF UTILITIES. REPLACEMENT OF EPSC MEASURES WILL BE COORDINATED WITH THE TDOT PROJECT ENGINEER BEFORE COMMENCING WORK.

LITTER, DEBRIS, WASTE, PETROLEUM

(22) THE CONTRACTOR SHALL MAINTAIN A COMPLETE AND COMPREHENSIVE EROSION PREVENTION AND SEDIMENT CONTROL PLAN TO PREVENT ROADWAY AND/OR CONSTRUCTION SEDIMENT OR DEBRIS AND ANY PETROLEUM BASED PRODUCTS OR CHLORINATED SOLVENTS, PAINTS OR COATINGS ETC. FROM FALLING ONTO THE RAILROAD'S RIGHTS-OF-WAY AND/OR FROM ENTERING THE DRAINAGE DITCHES OR DRAINAGE STRUCTURES OF THE RAILROAD, AND ANY SEDIMENT OR DEBRIS OR PETROLEUM BASED PRODUCTS OR CHLORINATED SOLVENTS, ETC. THAT DO ENTER SUCH DRAINAGE AREAS OF THE RAILROAD'S RIGHTS-OF-WAY ARE TO BE REMOVED IN ACCORDANCE WITH RULES SET FORTH BY SOUTHERN RAILROAD AND AT THE CONTRACTOR'S EXPENSE.

POLYACRYLAMIDE

(23) ENSURE POLYACRYLAMIDE (PAM) EMULSIONS AND POWDERS ARE OF THE ANIONIC TYPE AND MEET THE FOLLOWING REQUIREMENTS:

(24) MEETS THE EPA AND FDA ACRYLAMIDE MONOMER LIMITS OF EQUAL TO OR GREATER THAN 0.005% ACRYLAMIDE MONOMER.

(25) HAS A DENSITY OF 10% TO 55% BY WEIGHT AND A MOLECULAR WEIGHT OF 16 TO 24 MG/MOLE.

(26) MIXTURE IS NON-COMBUSTIBLE.

(27) CONTAINS ONLY MANUFACTURER'S RECOMMENDED ADDITIVES.

(28) PAM SHALL BE MIXED AND APPLIED IN ACCORDANCE WITH ALL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS AND THE MANUFACTURER'S RECOMMENDATIONS FOR THE SPECIFIED USES CONFORMING TO ALL FEDERAL, STATE, AND LOCAL LAWS, RULES, AND REGULATIONS.

(29) ALL VENDERS AND SUPPLIERS OF PAM, PAM MIX, OR PAM BLENDS SHALL PRESENT OR SUPPLY A WRITTEN TOXICITY REPORT WHICH VERIFIES THAT THE PAM, PAM MIX, PAM BLEND EXHIBITS ACCEPTABLE TOXICITY PARAMETERS WHICH MEET OR EXCEED THE EPA REQUIREMENTS FOR THE STATE AND FEDERAL WATER QUALITY STANDARDS. WHOLE EFFLUENT TESTING DOES NOT MEET THIS REQUIREMENT AS PRIMARY REACTIONS HAVE OCCURRED AND TOXIC POTENTIALS HAVE BEEN REDUCED. CATIONIC FORMS OF PAM ARE NOT ALLOWED FOR UNDER THIS GUIDELINE DUE TO THEIR HIGH LEVELS OF TOXICITY TO AQUATIC ORGANISMS. PAM EMULSIONS SHALL NEVER BE APPLIED DIRECTLY TO STORMWATER RUNOFF OR RIPARIAN WATERS DUR TO SURFACTANT TOXICITY. CONTRACTOR MUST SEEK THE APPROVAL OF THE EPSC DESIGN ENGINEER AND TDOT IF CHITOSAN IS PROPOSED FOR USE ON THIS PROJECT.

(30) ALL VENDORS AND SUPPLIERS OF PAM, PAM MIX, OR PAM BLENDS SHALL SUPPLY WRITTEN "SITE SPECIFIC" TESTING RESULTS SDEMONSTRATING THAT A PERFORMANCE OF 95% OR GREATER REDUCTION OF NTU OR TSS FROM STORMWATER DISCHARGES.

(31) EMULSION BATCHES SHALL BE MIXED FOLLOWING RECOMMENDATIONS OF A TESTING LABORATORY THAT DETERMINES THE PROPER PRODUCT AND RATE TO MEET SITE REQUIREMENTS. APPLICATION METHOD SHALL ENSURE UNIFORM COVERAGE TO THE TARGET AREA. EMULSIONS SHALL NEVER BE APPLIED DIRECTLY TO STORMWATER RUNOFF OR RIPARIAN WATERS.

(32) PAM POWDER MAY BE APPLIED BY A HAND SPREADER OR A MECHANICAL SPREADER. MIXING PAM POWDER WITH DRY SILICA SAND WILL AID IN SPREADING.

(33) PREMIXING OF PAM POWDER INTO FERTILIZER, SEED, OR OTHER SOIL AMENDMENTS IS ALLOWED WHEN SPECIFIED IN THE DESIGN PLAN. APPLICATION METHOD SHALL ENSURE UNIFORM COVERAGE TO THE TARGET AREA.

(34) PAM LOGS OR BLOCKS SHALL BE APPLIED FOLLOWING SITE TESTING RESULTS TO ENSURE PROPER PLACEMENT AND PERFORMANCE AND SHALL MEET OR EXCEED STATE AND FEDERAL WATER QUALITY REQUIREMENTS.

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AGRICULTURAL
No. 126940
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL NOTES

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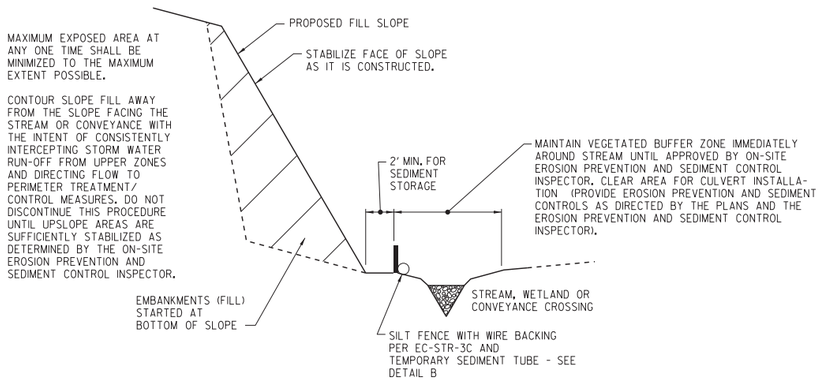
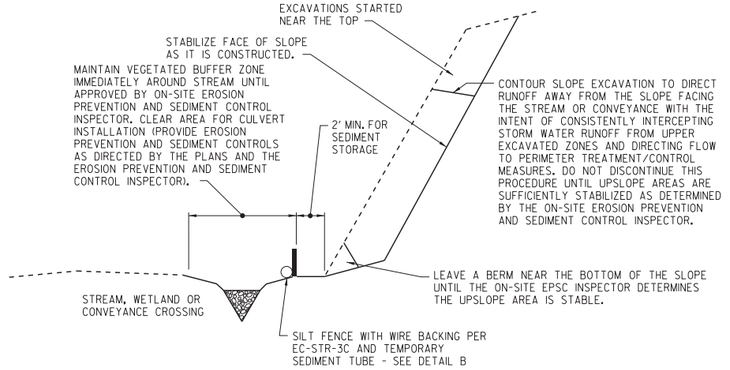
Survey & Design Division

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	81A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	40A

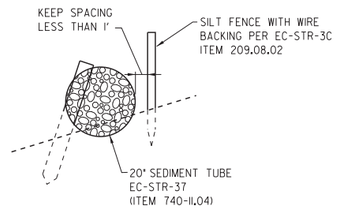


FILL SECTION



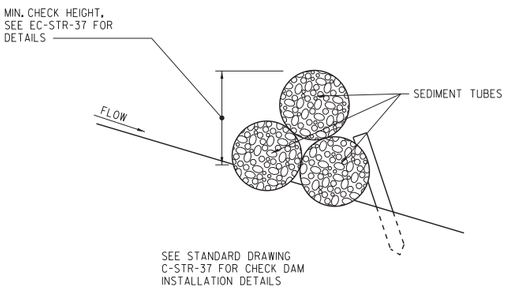
CUT SECTION

DETAIL A
SCALE: N.T.S.



SILT FENCE WITH WIRE BACKING WITH SEDIMENT TUBE

DETAIL B
SCALE: N.T.S.

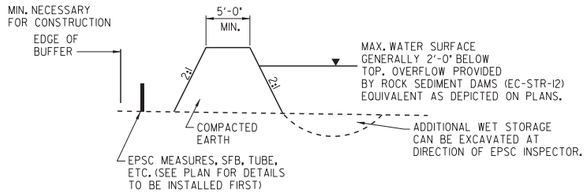


TRIPLE STACKED SEDIMENT TUBES OR TEMPORARY SEDIMENT TUBE CHECK DAM IN DITCH

DETAIL C
SCALE: N.T.S.

BERM SLOPES TO BE COMPACTED AND TRACKED. AT A MINIMUM, THE SLOPES SHOULD BE TEMPORARY SEEDED AND MULCHED AT THE DIRECTION OF EPSC INSPECTOR. ADDITIONAL MEASURES SUCH AS RIPRAP MAY BE REQUIRED FOR STABILIZATION.

NOTES:
1. DIVERSION BERMS ARE TO BE UTILIZED FOR SEDIMENT CONTROL STRUCTURES OR DIVERSIONS FOR DIRECTING RUNOFF TO TREATMENT AREA.
2. BEGIN BY DELINEATING THE BUFFER ZONE AND INSTALLING EPSC MEASURES ALONG BUFFER. ONCE INSTALLED, THE BERM CAN BE CONSTRUCTED.
3. EARTH CORE TO BE PAID FOR AS 203-01 ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED).
4. UNLESS STATED OTHERWISE, THE HEIGHT OF THE DIVERSION BERM SHALL BE 5 FEET MINIMUM.
5. SEE EC-STR-27 FOR ADDITIONAL DETAILS.



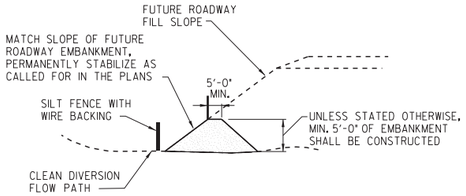
BERMS

DIVERSION BERMS

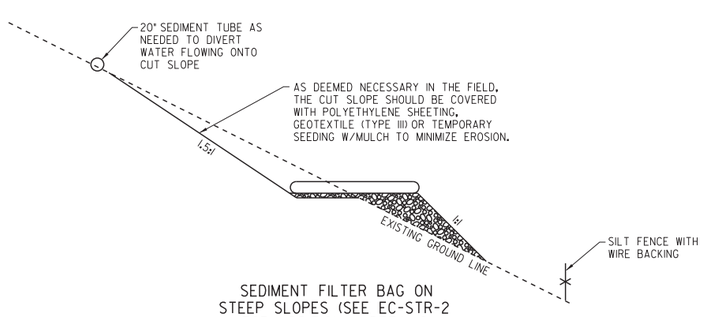
DIVERSION BERMS

DETAIL D
SCALE: N.T.S.

NOTES:
1. EMBANKMENT BERMS SHOULD BE CONSTRUCTED AS SHOWN IN THE PLANS TO CREATE CLEAN DIVERSION.
2. EARTH EMBANKMENT TO BE PAID FOR AS 203-01 ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED).

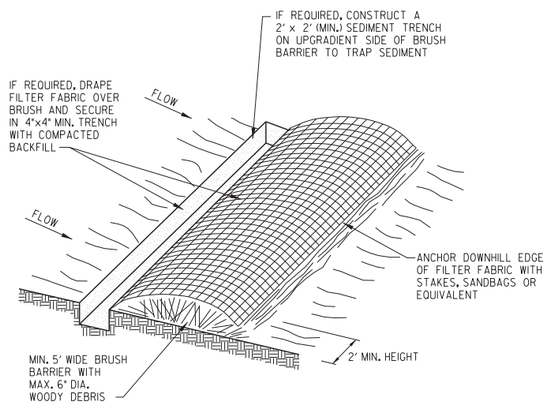


EMBANKMENT BERMS



SEDIMENT FILTER BAG ON STEEP SLOPES (SEE EC-STR-2 FOR ADDITIONAL DETAILS)

DETAIL E
SCALE: N.T.S.



BRUSH BARRIER

DETAIL F
SCALE: N.T.S.

NOTES:

1. BRUSH BARRIERS MAY BE USED DOWNSLOPE OF ALL DISTURBED AREAS OF LESS THAN ONE-QUARTER ACRE.
2. BRUSH BARRIERS ARE NOT INTENDED TO TREAT CONCENTRATED FLOWS, NOR ARE THEY INTENDED TO TREAT SUBSTANTIAL AMOUNTS OF OVERLAND FLOW. ANY CONCENTRATED FLOWS MUST BE CONVEYED THROUGH A TEMPORARY DRAINAGE SYSTEM TO A SEDIMENT STORAGE AREA OR DOWNGRADIENT EPSC MEASURES.
3. BRUSH BARRIERS SHOULD ONLY BE INSTALLED PARALLEL ALONG THE CONTOURS.
4. HEIGHT 2 FEET (MIN.) TO 5 FEET (MAX.).
5. WIDTH 5 FEET AT BASE (MIN.) TO 15 FEET (MAX.).
6. FILTER FABRIC (GEOTEXTILE) MAY BE ANCHORED OVER THE BRUSH BERM TO ENHANCE THE FILTRATION ABILITY OF THE BARRIER. FILTER FABRIC SHALL BE INCLUDED IN THE COST OF THE BRUSH BARRIER.
7. CHIPPED SITE VEGETATION OR WOOD-BASED MULCH CAN BE USED TO CONSTRUCT BRUSH BARRIERS.
8. THERE SHALL BE NO SIGNS OF EROSION OR CONCENTRATED RUNOFF UNDER OR AROUND THE BARRIER. IF CONCENTRATED FLOWS ARE BYPASSING THE BARRIER, IT MUST BE EXPANDED OR AUGMENTED BY TOED-IN FILTER FABRIC.
9. BRUSH BARRIERS SHALL BE CONSTRUCTED BY USING ON-SITE PROJECT VEGETATION THAT CONSIST OF WOODY DEBRIS WITH A MAXIMUM DIAMETER OF 6 INCHES.
10. ALL ITEMS NECESSARY TO CONSTRUCT BRUSH BARRIERS SHALL BE PAID FOR UNDER PAY ITEM NO. 209-04. INCLUDES COST FOR REMOVAL.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL DETAILS

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	94
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	41

245+00

250+00

ADJACENT PROJECT
NO. NH-29 (84)

BEGIN CONSTRUCTION FEDERAL PROJECT
NO. NH-29(86)
STATE PROJECT NO. 65001-3268-14
STA. 250+68.18 S.R. 29
N 609766.8922
E 2411314.5562

BITTER CREEK

STR-6

INV=770.84

N 42° 02' 22" W

℄ S.R. 29

INV=771.82

STR-14

6'-0" x 4'-0" RCBC

INV=780.63

INV=789.58

OUT-110

INV=790.58

6'-0" x 3'-0" RCBC

OUT-109

SEE SHEET NO. 42

252+00

STA.

MATCH LINE

N

EROSION PREVENTION AND SEDIMENT CONTROL LEGEND

SYMBOL	ITEM	STD. DWG.
	DIVERSION/EMBANKMENT BERM	DETAIL E
	BRUSH BARRIER	DETAIL F
SFB SFB SFB	SEDIMENT FILTER BAG	EC-STR-2
SF SF SF	SILT FENCE	EC-STR-3B
SFB SFB SFB	SILT FENCE WITH WIRE BACKING	EC-STR-3C
	ROCK CHECK DAM (V-DITCH)	EC-STR-6
	ENHANCED ROCK CHECK DAM (TRAPEZOIDAL DITCH)	EC-STR-6A
	ENHANCED ROCK CHECK DAM (V-DITCH)	EC-STR-6A
	SEDIMENT TRAP WITH ENHANCED ROCK CHECK DAM	EC-STR-7
	CULVERT PROTECTION (TYPE 1)	EC-STR-11
	CULVERT PROTECTION (TYPE 2)	EC-STR-11A
	ROCK SEDIMENT DAM	EC-STR-12
D	CATCH BASIN PROTECTION (TYPE D)	EC-STR-19
TCE	TEMPORARY CONSTRUCTION EXIT	EC-STR-25
	TEMPORARY BERM	EC-STR-27
	TEMPORARY SLOPE DRAIN WITH CLASS A-1 RIP-RAP	EC-STR-27
	TEMPORARY DIVERSION CHANNEL	ESC-STR-31
	SAND BAG BERM/DAM	EC-STR-32
	SUSPENDED PIPE DIVERSION	EC-STR-33 EC-STR-33A
MFB	MULCH FILTER BERM	EC-STR-35
TUBE TUBE TUBE	SEDIMENT TUBE	EC-STR-37
2	CURB INLET PROTECTION (TYPE 2)	EC-STR-39
1	CATCH BASIN FILTER ASSEMBLY (TYPE 1)	EC-STR-41
2	CATCH BASIN FILTER ASSEMBLY (TYPE 2)	EC-STR-42
8	CATCH BASIN FILTER ASSEMBLY (TYPE 8)	EC-STR-48
HVF HVF	HIGH VISIBILITY FENCE	S-F-1

NOTE:
OUTFALL NUMBERS DEPICTED ARE A CONTINUATION OF THE NUMBERING USED FOR THE ADJACENT PROJECT (PIN 101411.04).

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

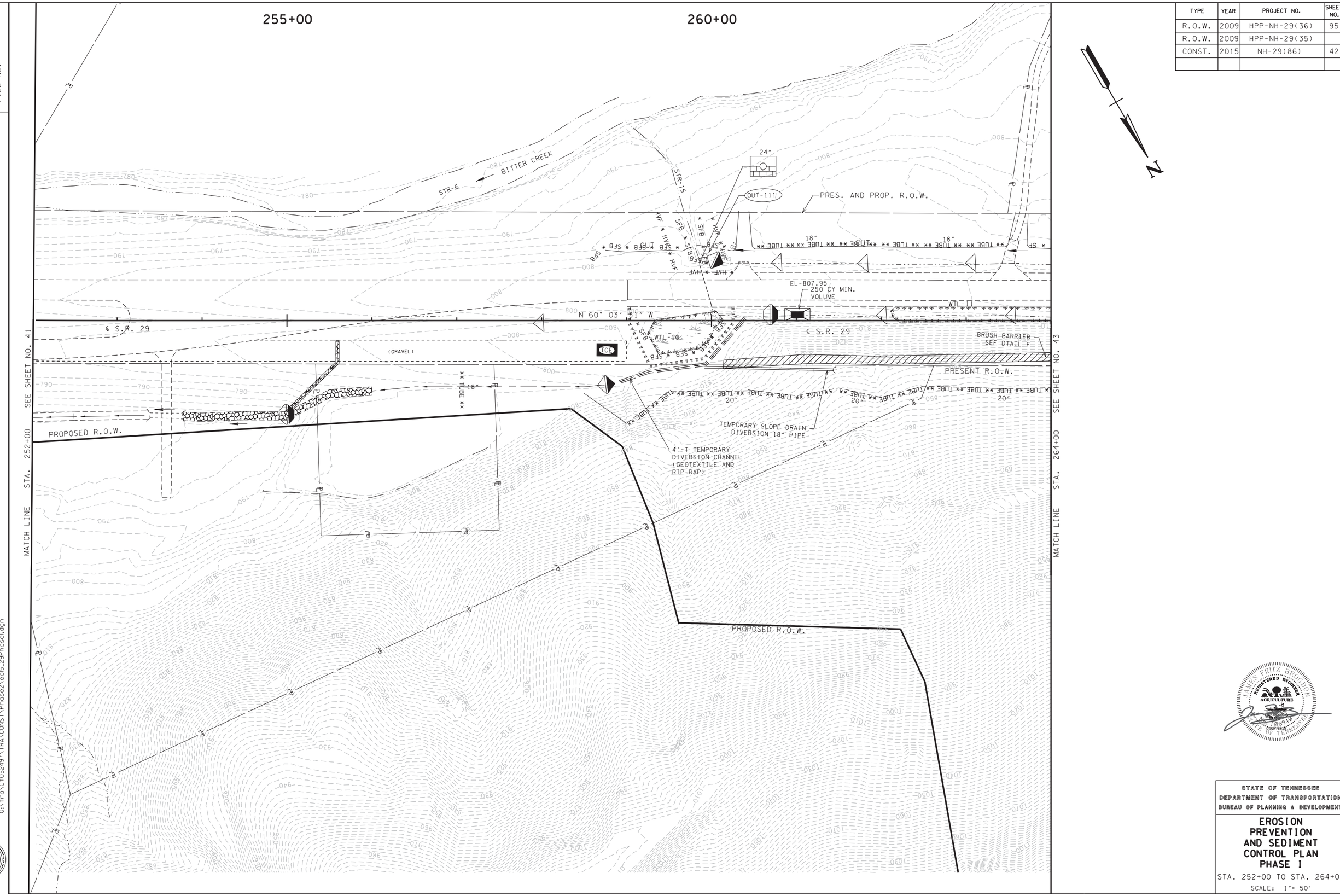
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 240+00 TO STA. 252+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	95
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	42



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DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

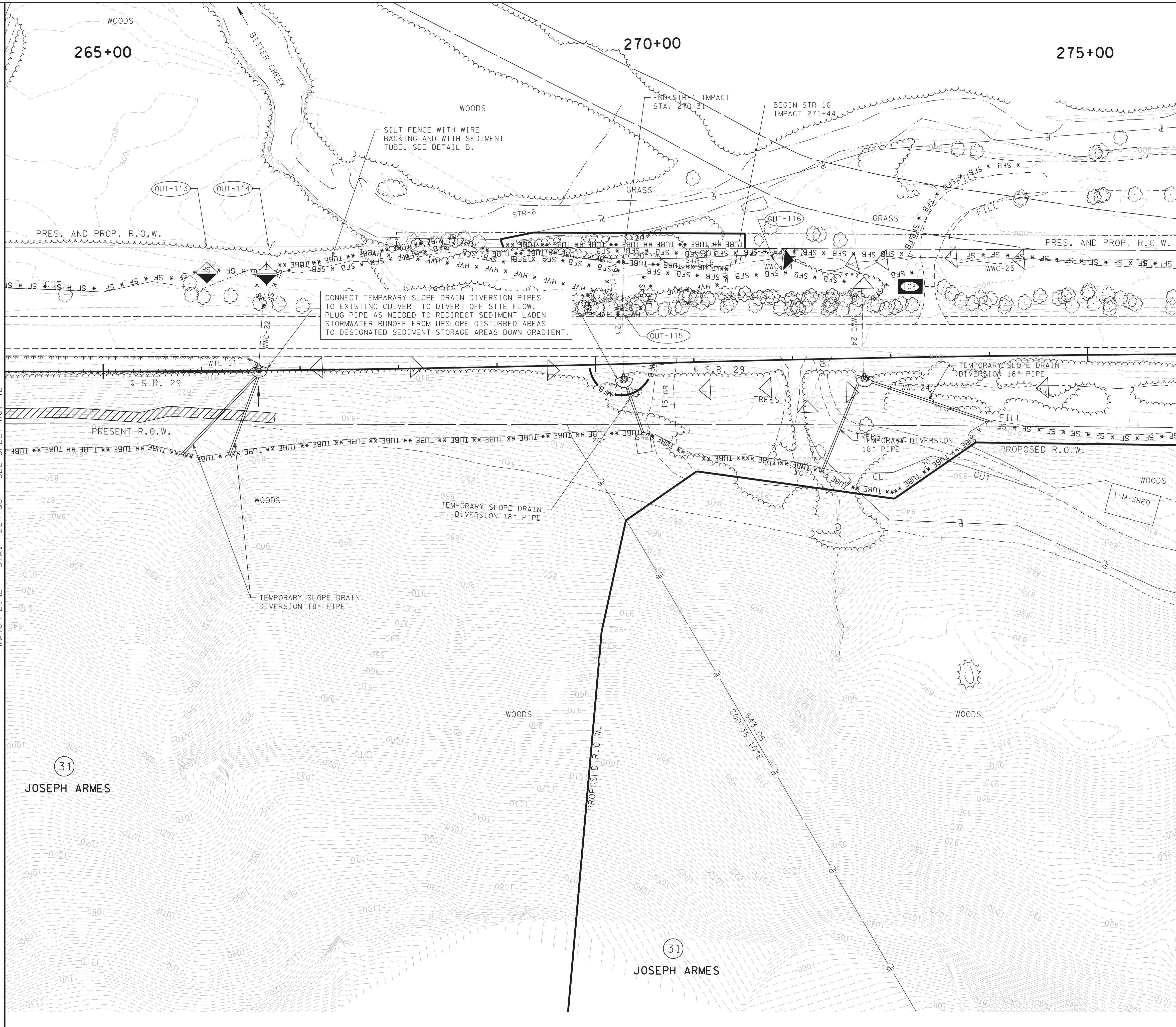
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 252+00 TO STA. 264+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	96
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	43



265+00
270+00
275+00
WOODS
BITTER CREEK
SILT FENCE WITH WIRE BACKING AND WITH SEDIMENT TUBE. SEE DETAIL B.
END STR-1 IMPACT STA. 270+31
BEGIN STR-16 IMPACT 271+44
OUT-113
OUT-114
OUT-115
OUT-116
GRASS
STR-6
STR-16
PRES. AND PROP. R.O.W.
CONNECT TEMPARARY SLOPE DRAIN DIVERSION PIPES TO EXISTING CULVERT TO DIVERT OFF SITE FLOW. PLUG PIPE AS NEEDED TO REDIRECT SEDIMENT LADEN STORMWATER RUNOFF FROM UPSLOPE DISTURBED AREAS TO DESIGNATED SEDIMENT STORAGE AREAS DOWN GRADIENT.
WWC-22
WWC-24
WWC-25
WTL-11
TCE
℄ S.R. 29
PRESENT R.O.W.
TREES
FILL
CUT
TEMPORARY SLOPE DRAIN DIVERSION 18" PIPE
PROPOSED R.O.W.
I-M-SHED
SEE SHEET NO. 42
MATCH LINE STA. 264+00
SEE SHEET NO. 44
MATCH LINE STA. 276+00
643.05'
S00°36'10"E
31
JOSEPH ARMES

N

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 264+00 TO STA. 276+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	97
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	44

280+00

285+00

WOODS

BITTER CREEK

STR-6/BITTER CREEK

SEE DETAIL - INSTREAM DIVERSION EC-STR-30A FOR CONSTRUCTION OF BOX EXTENSION ON BOTH ENDS.

OUT-120

OUT-118

OUT-121

SEDIMENT STORAGE AREA FOR SLOPES FROM STA. 283+50, RT TO STA. 297+50, RT. 300 CY MIN SEDIMENT STORAGE

PRES. AND PROP. R.O.W.

GRASS

20" SEDIMENT TUBE CHECK DAM

60 CY MIN. VOLUME

N 60° 03' 31" W

S.R. 29

TEMPORARY SLOPE DRAIN DIVERSION 18" PIPE W/ SANDBAG ENDWALL

FILL

CUT

PROPOSED R.O.W.

TO BE REMOVED

WWC-26

WWC-27

WWC-28

SEE SHEET NO. 43

SEE SHEET NO. 45

STA. 276+00

STA. 287+00

MATCH LINE

5'-T PERMANENT DIVERSION CHANNEL (GEOTEXTILE AND CLASS B RIP-RAP) FOR OFFSITE DRAINAGE

STR-1 FORKED CREEK

REDIRECT FLOW FROM WWC-28 TO OUTSIDE OF BERM AND INTO TEMPORARY DIVERSION CHANNEL

MOBILE HOME

SHED

TO DIVERT OFFSITE DRAINAGE FROM APPROX. 281+00 RT TO 290+50 RT THE 5'-T CLASS B PERMANENT RIP-RAP DITCH AND ASSOCIATED 36" SIDE DRAINS BENEATH DRIVEWAYS AND THE 36" CROSS DRAIN BENEATH WHETSTONE ROAD SHALL BE CONSTRUCTED AND STABILIZED PRIOR TO BEGINNING ANY MASS GRADING FROM 281+00 RT TO 299+00 RT.

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No. 086440
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 276+00 TO STA. 287+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	98
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	45

290+00

295+00

GRASS

TREES

WOODS

BITTER CREEK

STR-6

POS STA. 290+51.96 S.R. 29 =
POT STA. 50+00.00 WHETSTONE ROAD
N 612052.6872
E 2408162.2162
LAT: 36.005466147
LONG: -84.514146890

CONNECT TEMPORARY SLOPE DRAIN DIVERSION PIPE TO EXISTING CULVERT TO DIVERT OFF SITE FLOW. PLUG AS NEEDED TO REDIRECT SEDIMENT LADEN STORMWATER RUNOFF FROM UPSLOPE DISTURBED AREAS TO DESIGNATED SEDIMENT STORAGE AREAS DOWN GRADIENT

OUT-123

OUT-124

OUT-125

SCARIFY & SOIL CUT AND SEED

PRES. AND PROP. R.O.W.

150 CY MIN. VOLUME

N 13° 16' 43" W

℄ S.R. 29

WWC-27

WWC-28

WWC-29

TEMPORARY SLOPE DRAIN DIVERSION 18" PIPE

20" TUBE

TEMPORARY SLOPE DRAIN DIVERSION 18" PIPE

N 74° 22' E

57.7'

MATCH LINE STA. 287+00

SEE SHEET NO. 44

MATCH LINE STA. 298+00

SEE SHEET NO. 46

SHED

LIMIT OF CONST.
WHETSTONE ROAD
STA. 52+53.66
N 612027.0451
E 2408405.8009

PROPOSED R.O.W.

JAMES FRITZ BRIDGES
REGISTERED ENGINEER
AGRICULTURE
NUMBER 109864
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 287+00 TO STA. 298+00

SCALE: 1"= 50'

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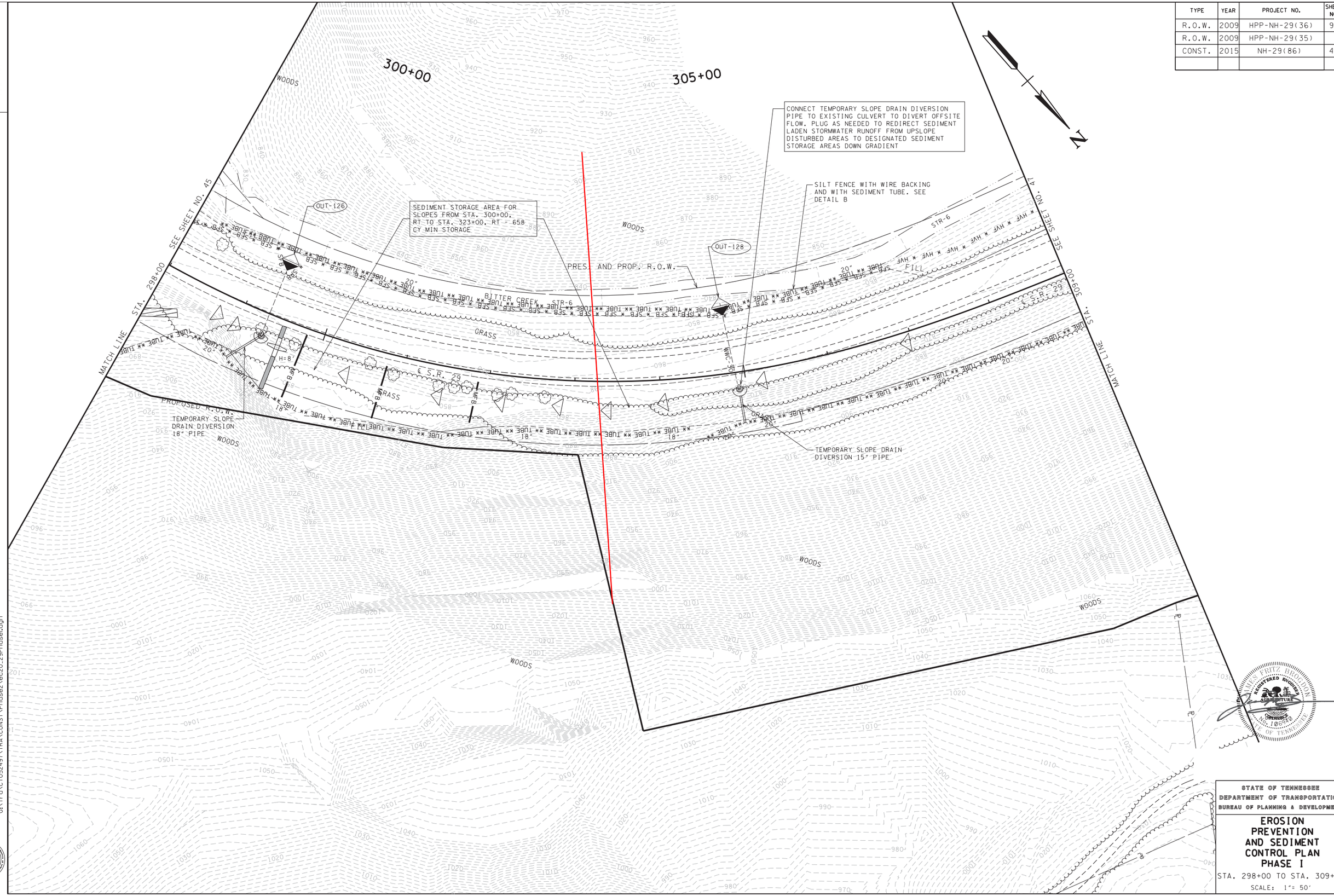
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	99
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	46



JAMES FRITZ BRODHEAD
REGISTERED ENGINEER
AGRICULTURE
No. 106470
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 298+00 TO STA. 309+00

SCALE: 1"= 50'

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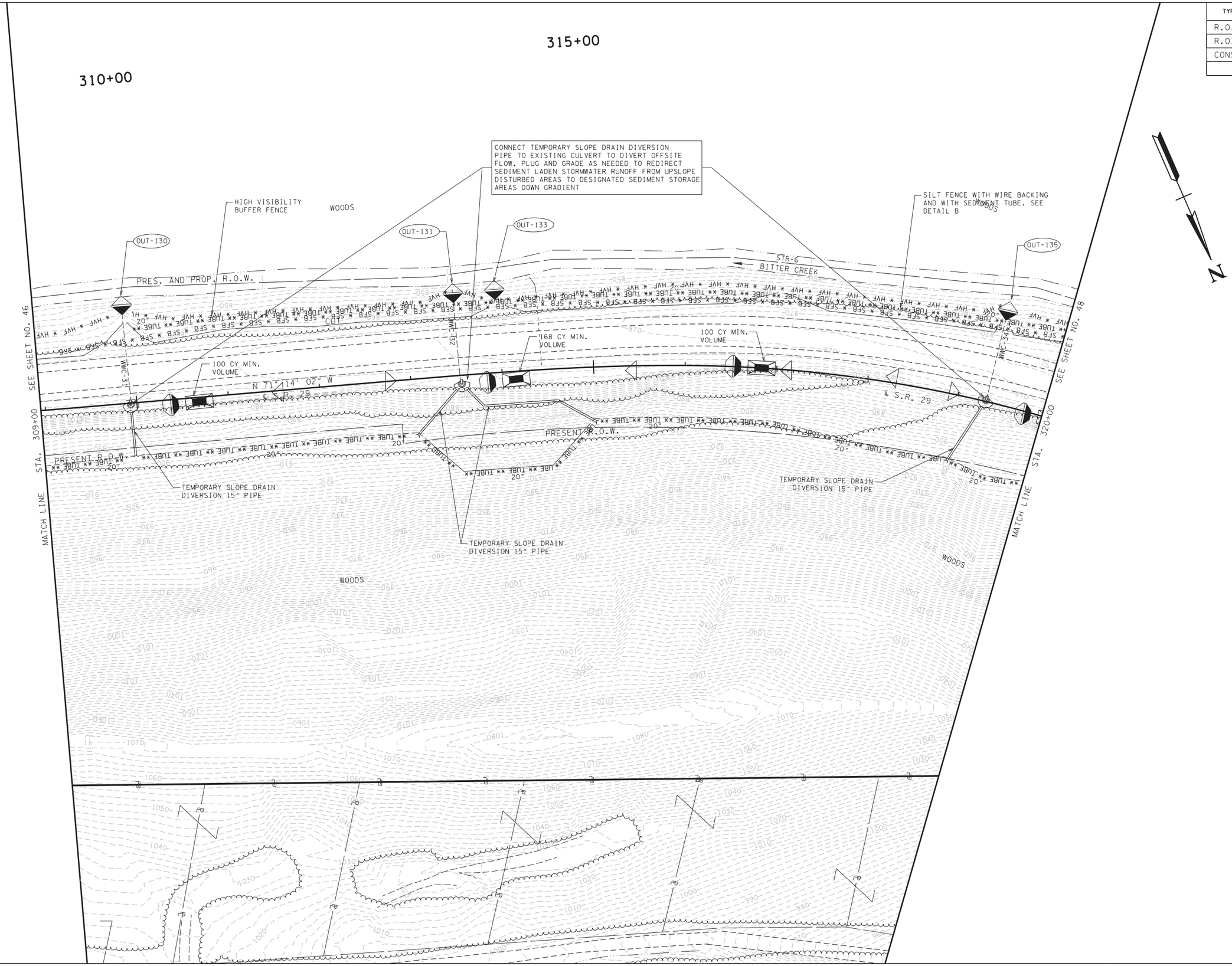
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	100
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	47



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Survey & Design Division

LANCE FRITZ BROOKS
REGISTERED ENGINEER
AGRICULTURE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 309+00 TO STA. 320+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	101
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	48

320+00

325+00

330+00

CONNECT TEMPORARY SLOPE DRAIN DIVERSION PIPE TO EXISTING CULVERT TO DIVERT OFFSITE FLOW.

POC STA. 328+19.91 S.R. 29 =
POT STA. 57+00.00 HANGING ROCK ROAD
N 614527.7338
E 2405632.5326

SILT FENCE WITH WIRE BACKING AND WITH SEDIMENT TUBE. SEE DETAIL B

HIGH VISIBILITY BUFFER FENCE

PRES. AND PROP. R.O.W.

STR-6

BITTER CREEK

OUT-137

SILT FENCE WITH WIRE BACKING AND WITH SEDIMENT TUBE. SEE DETAIL B

OUT-138

OUT-139

WOODS

PRES. AND PROP. R.O.W.

SEE SHEET NO. 47

SEE SHEET NO. 49

STA. 320+00

STA. 331+00

MATCH LINE

MATCH LINE

100 CY MIN. VOLUME

SPG-3

60 CY MIN. VOLUME

N 40° 29' 49" W

85 CY MIN. VOLUME

OUT-140 @ S.R. 29

195 CY MIN. STORAGE

HIGH VISIBILITY BUFFER FENCE

WTL-12

WWC-3

PRESENT R.O.W. 20'

TEMPORARY SLOPE DRAIN DIVERSION 18" PIPE

TEMPORARY STREAM DIVERSION 42" PIPE WITH SAND BAG PLUGS

WOODS

HANGING ROCK ROAD

CUT

TEMPORARY SLOPE DRAIN DIVERSION 15" PIPE

60+00

WOODS

WOODS

LIMIT OF CONST.
HANGING ROCK ROAD
STA. 60+40.00
N 614610.8660
E 2405935.1850

SEQUENCE OF CONSTRUCTION:

1. INSTALL TEMPORARY STREAM DIVERSION CULVERT 42" PIPE WITH SAND BAG PLUGS FROM BOX CULVERT INLET TO OUTLET OF EXISTING PIPE CULVERT BENEATH DRIVEWAY.
2. CONSTRUCT BOX CULVERT INLET EXTENSION. REVISE STREAM DIVERSION AS NEEDED.
3. REMOVE TEMPORARY STREAM DIVERSION AND DIVERT FLOW INTO BOX CULVERT.
4. INSTALL SUSPENDED PIPE DIVERSION FROM EXISTING BOX CULVERT OUTLET TO END OF PROPOSED OUTLET.
5. CONSTRUCT BOX CULVERT OUTLET EXTENSION.

N

JAMES FRITZ BROOKS
REGISTERED ENGINEER
AGRICULTURE
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 320+00 TO STA. 331+00

SCALE: 1"= 50'

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	102
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	49

WOODS
335+00
340+00
TREES
BRU
WOODS
TREES
BITTER CREEK
PRES. AND PROP. R.O.W.
OUT-147
OUT-146
OUT-148
SILT FENCE WITH WIRE BACKING AND WITH SEDIMENT TUBE. SEE DETAIL B
STR-6
HIGH VISIBILITY BUFFER FENCE
BRUSH
GRASS
FILL
TREE
SEE SHEET NO. 48
SEE SHEET NO. 50
STA. 331+00
STA. 342+00
MATCH LINE
N 46° 05' 28" W
℄ S.R. 29
WWC-37
100 CY MIN. VOLUME
WTL-13
PROPOSED R.O.W.
PRESENT R.O.W.
TEMPORARY SLOPE DRAIN DIVERSION 18" PIPE
BRUSH BARRIER SEE DETAIL F
WOODS
GRASS
WOODS
WOODS
WOODS

N

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JAMES FRITZ BRIGHTON
REGISTERED ENGINEER
AGRICULTURE
NUMBER 105540
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

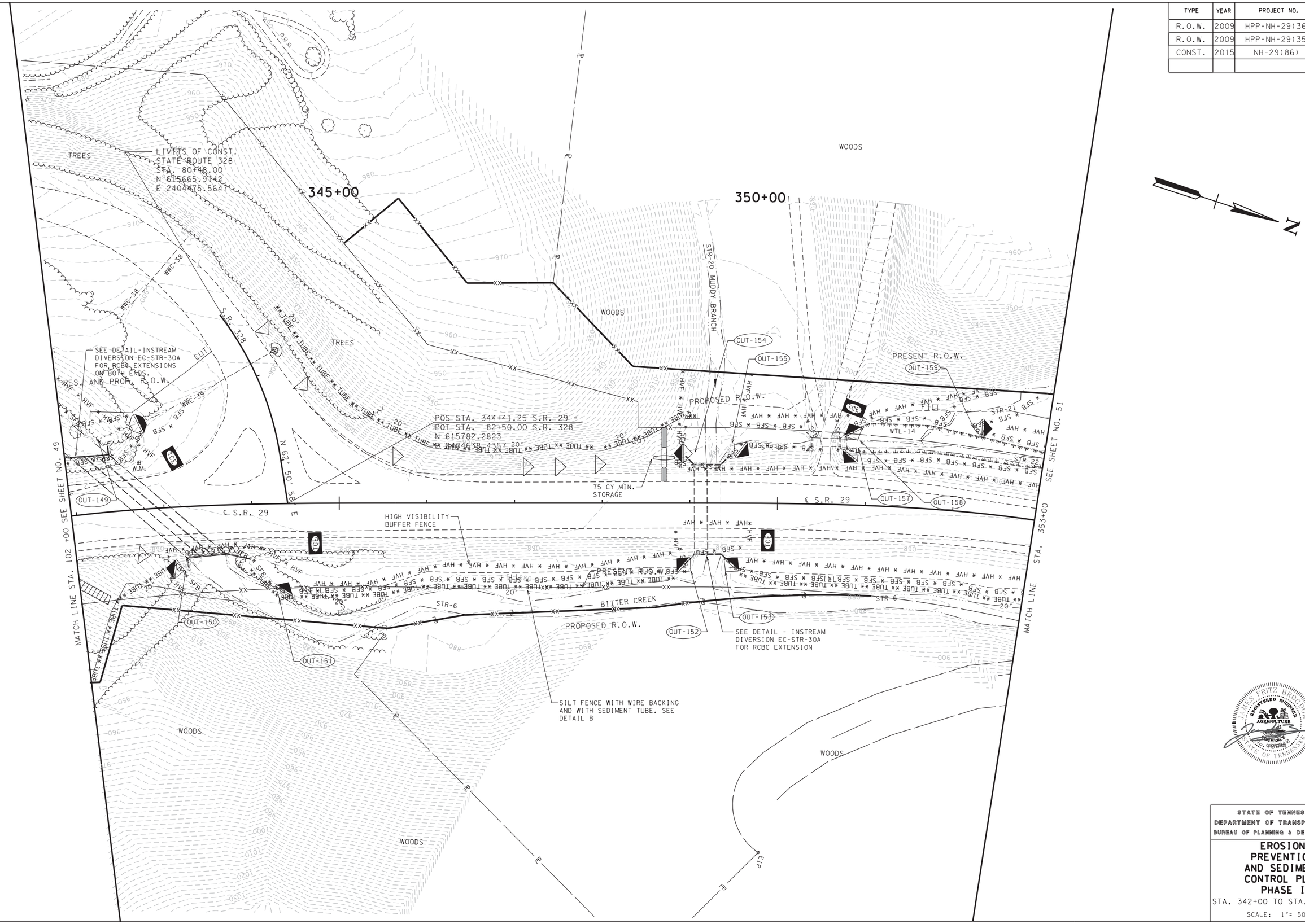
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 331+00 TO STA. 342+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	103
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	50



JAMES FRITZ BRODDY
REGISTERED ENGINEER
AGRICULTURE
No. 109844
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 342+00 TO STA. 353+00

SCALE: 1"= 50'

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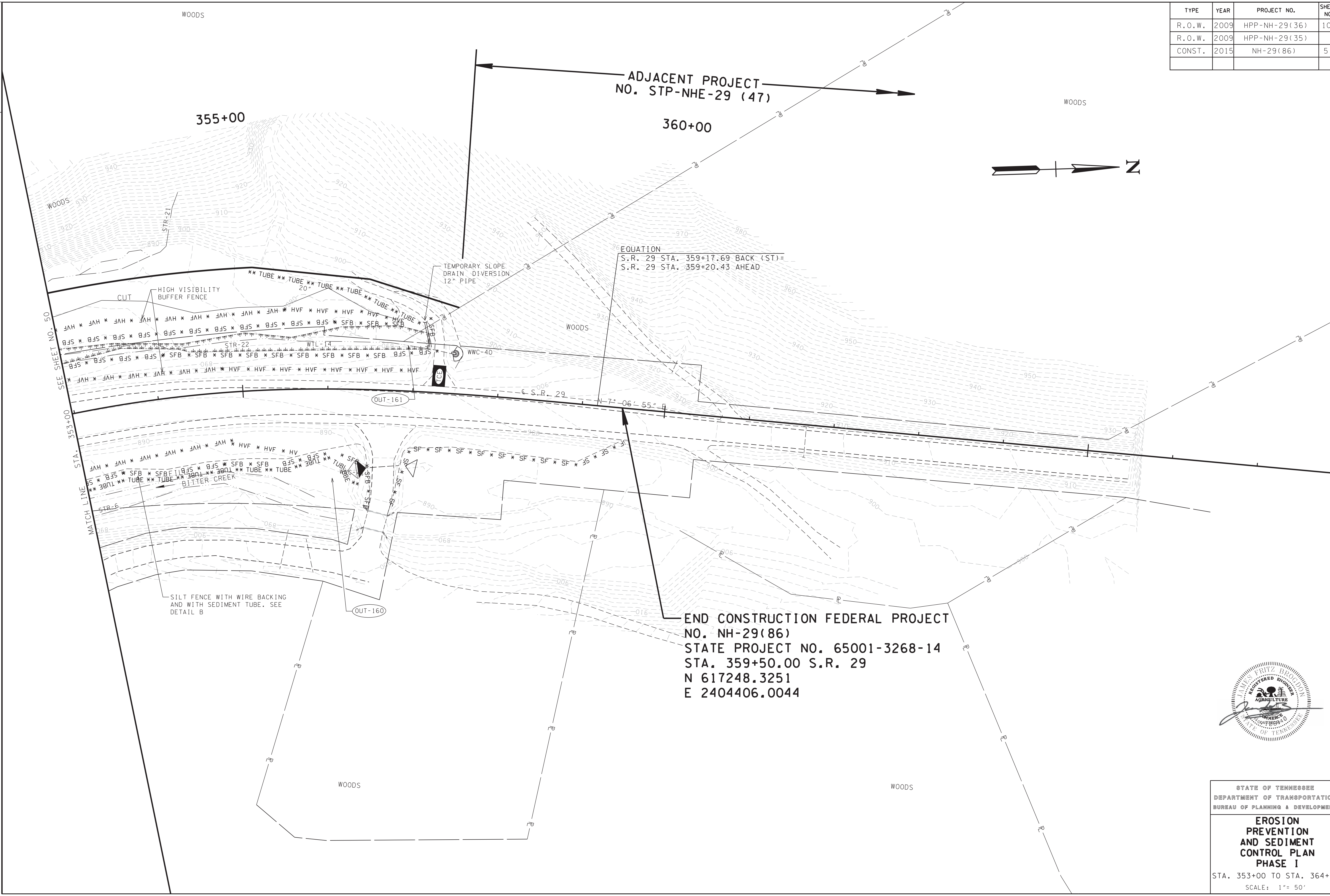
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	104
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	51



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Survey & Design Division

JAMES FRITZ BROGDON
REGISTERED ENGINEER
AGRICULTURE COMMERCE
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE I

STA. 353+00 TO STA. 364+74

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	118
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	52

245+00

ADJACENT PROJECT
NO. NH-29 (84)

250+00

BEGIN CONSTRUCTION FEDERAL PROJECT
NO. NH-29(86)
STATE PROJECT NO. 65001-3268-14
STA. 250+68.18 S.R. 29
N 609766.8922
E 2411314.5562

BITTER CREEK

STR-6

N 42° 02' 22" W

℄ S.R. 29

STR-14

WTL-8

6'X4'X45' RCBC

6'X4'X36' RCBC

OUT-110

OUT-109

SEE SHEET NO. 53

STA. 252+00

MATCH LINE

NOTE:
OUTFALL NUMBERS DEPICTED ARE A CONTINUATION OF THE NUMBERING USED FOR THE ADJACENT PROJECT (PIN 101411.04).

JAMES FRITZ BROOKS
REGISTERED ENGINEER
AGRICULTURE
NUMBER 109558
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 240+00 TO STA. 252+00

SCALE: 1"= 50'

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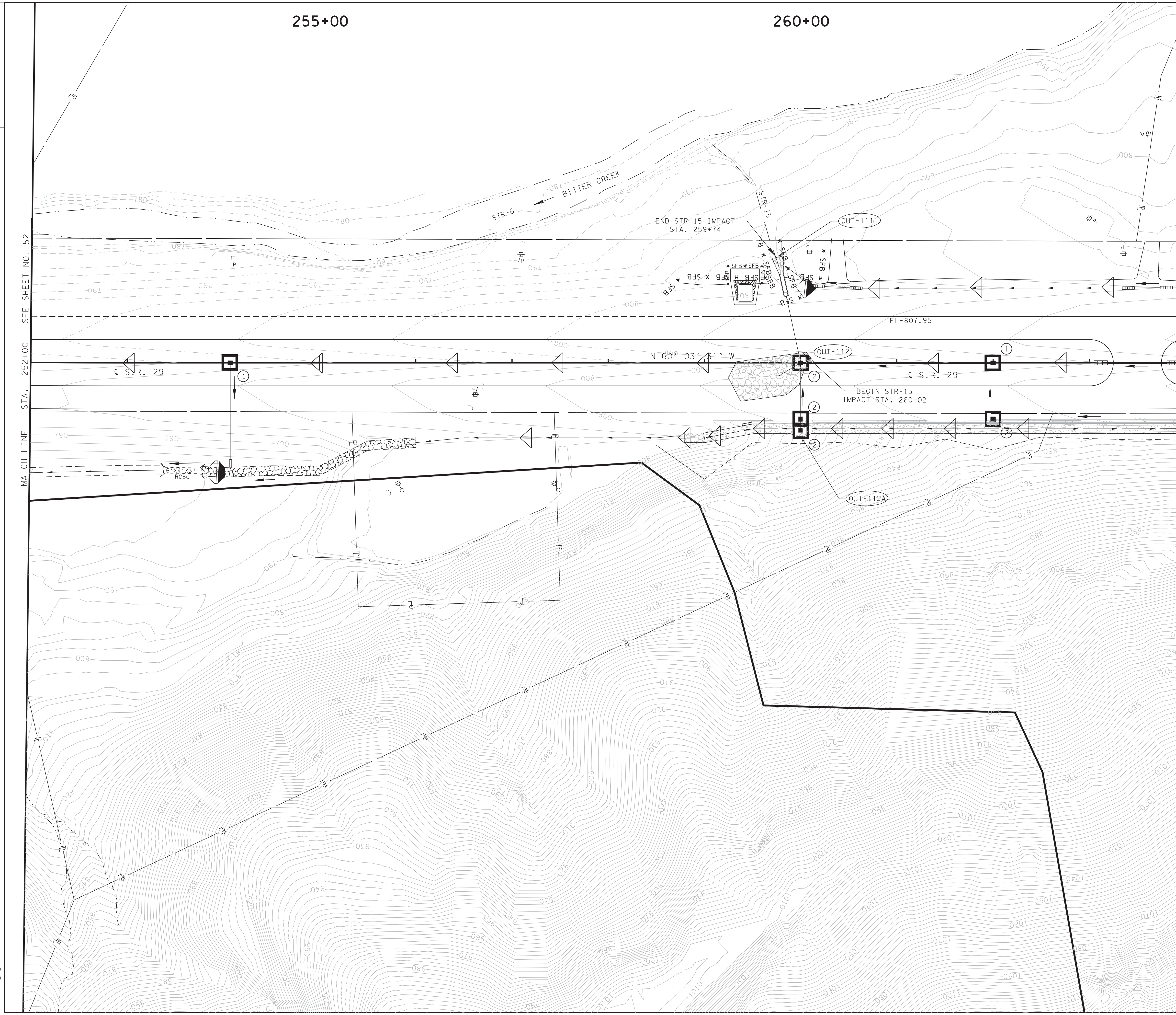
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	119
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	53

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.



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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

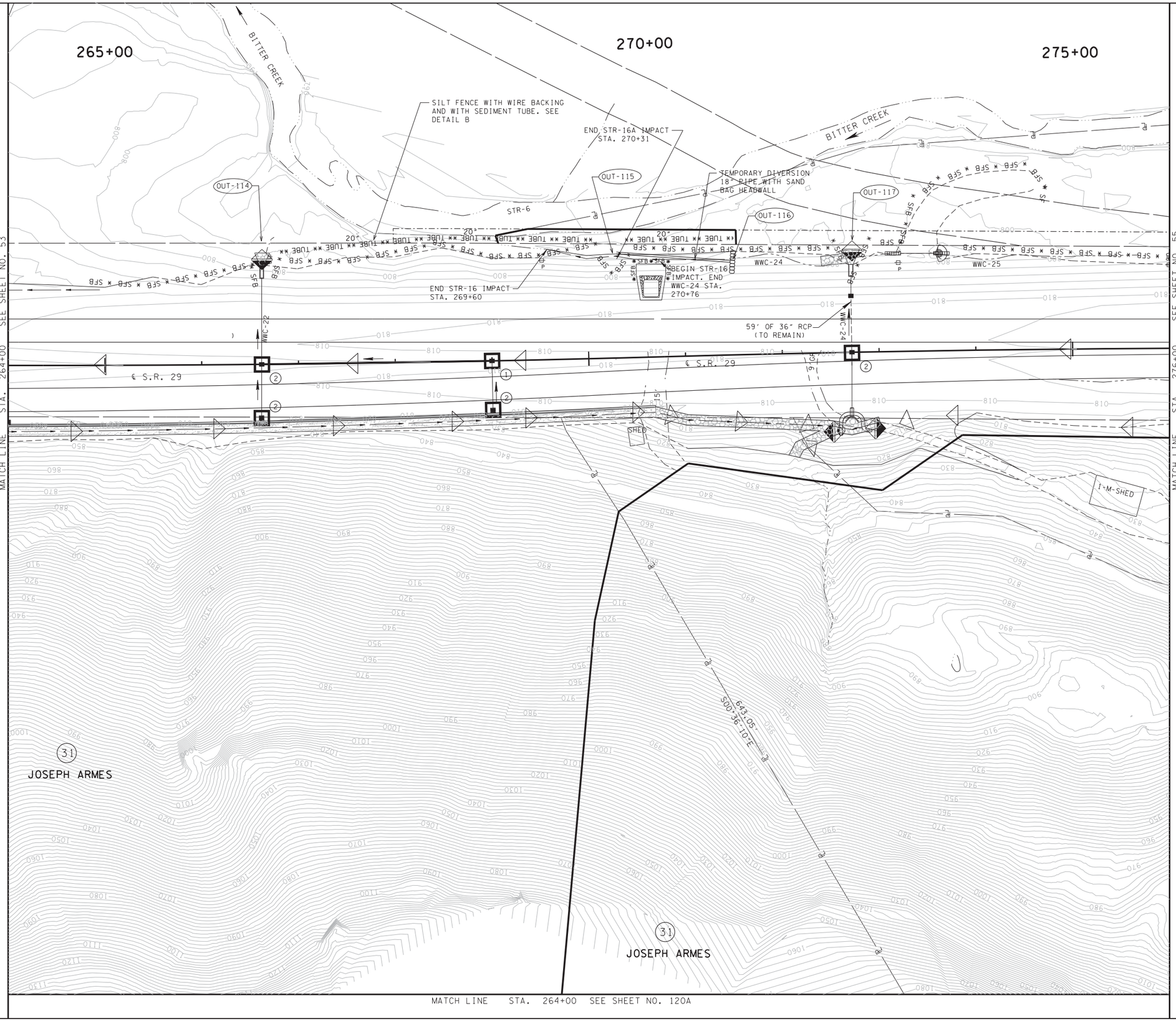
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 252+00 TO STA. 264+00

SCALE: 1" = 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	120
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	54



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 264+00 TO STA. 276+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	121
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	55

280+00

285+00

N

END STR-17 IMPACT
STA. 280+28

OUT-120

BITTER CREEK

STR-6/BITTER CREEK

STR-6

TEMPORARY INSTREAM
DIVERSION (-IN-DIV-)
(EC-STR-30A)

OUT-118

OUT-119

OUT-122

3067'x12'x5'
RCBC
(TO REMAIN)

SEE SHEET NO. 54

SEE SHEET NO. 56

STA. 276+00

STA. 287+00

MATCH LINE

MATCH LINE

℄ S.R. 29

N 60° 03' 31" W

℄ S.R. 29

10"

TO BE
REMOVED

WWC-26

WWC-27

TEMPORARY INSTREAM
DIVERSION (-IN-DIV-)
(EC-STR-30A)

STR-17 FORKED CREEK

BEGIN STR-17
IMPACT
STA. 280+71

MOBILE HOME

SHED

SHED

SHED

8" CIP

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Survey & Design Division

JAMES FRITZ BRODIE
REGISTERED ENGINEER
AGRICULTURE
NUMBER 109511
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 276+00 TO STA. 287+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	122
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	56

290+00

295+00

POS STA. 290+51.96 S.R. 29 =
POT STA. 50+00.00 WHETSTONE ROAD
N 612052.6872
E 2408162.2162
LAT: 36.005466147
LONG: -84.514146890

BITTER CREEK
STR-6

OUT-123

OUT-124

18" CMP
(TO BE REMOVED)

30" RCP
(REMOVE)

N 13° 16' 43" W

℄ S.R. 29

N 74° 22' 57" E

WHETSTONE ROAD

MATCH LINE STA. 287+00
SEE SHEET NO. 55

MATCH LINE STA. 298+00
SEE SHEET NO. 57

LIMIT OF CONST.
WHETSTONE ROAD
STA. 52+53.55
N 612027.0451
E 2408405.8009

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JAMES FRITZ BRODDY
REGISTERED ENGINEER
AGRICULTURE
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

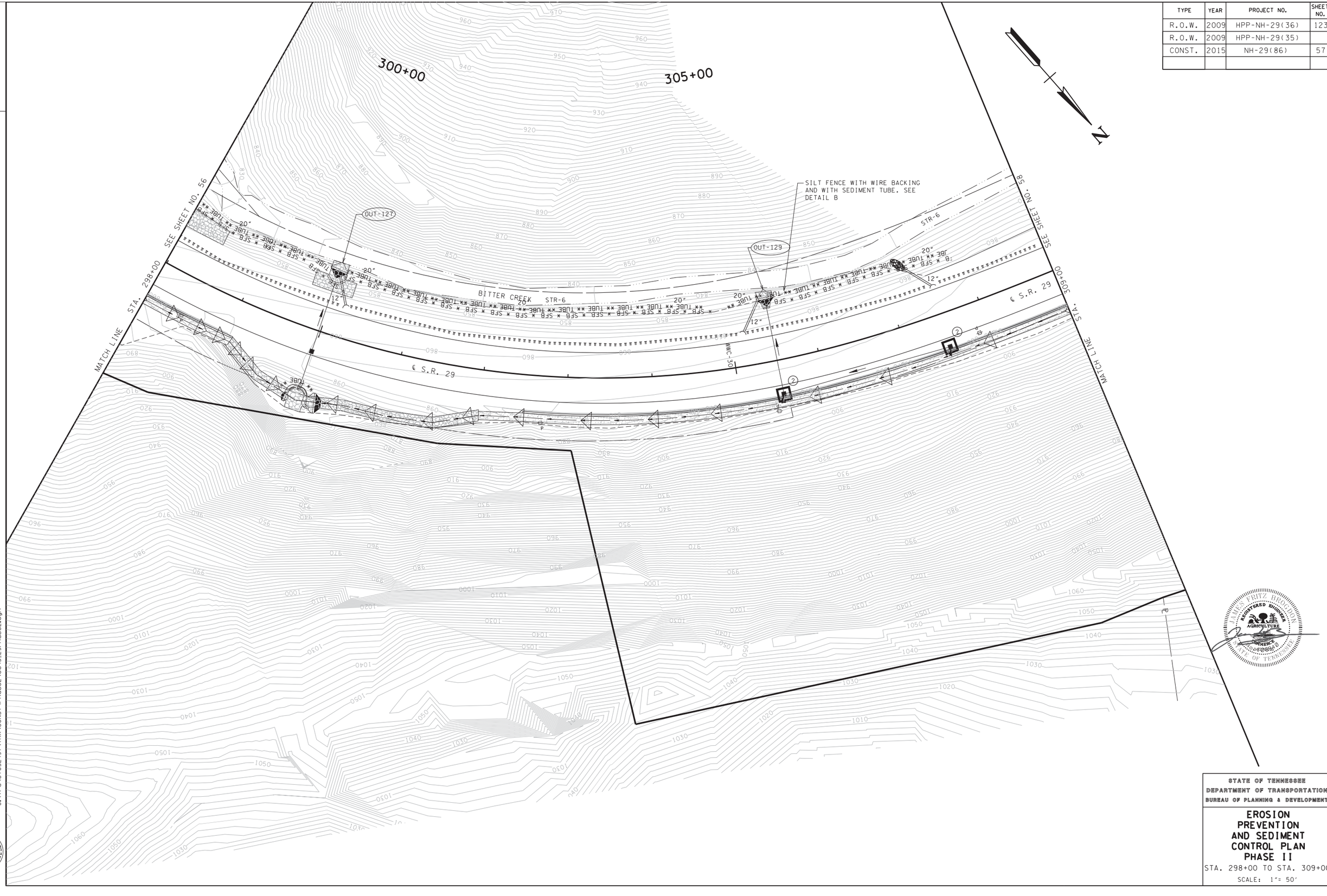
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 287+00 TO STA. 298+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	123
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	57



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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

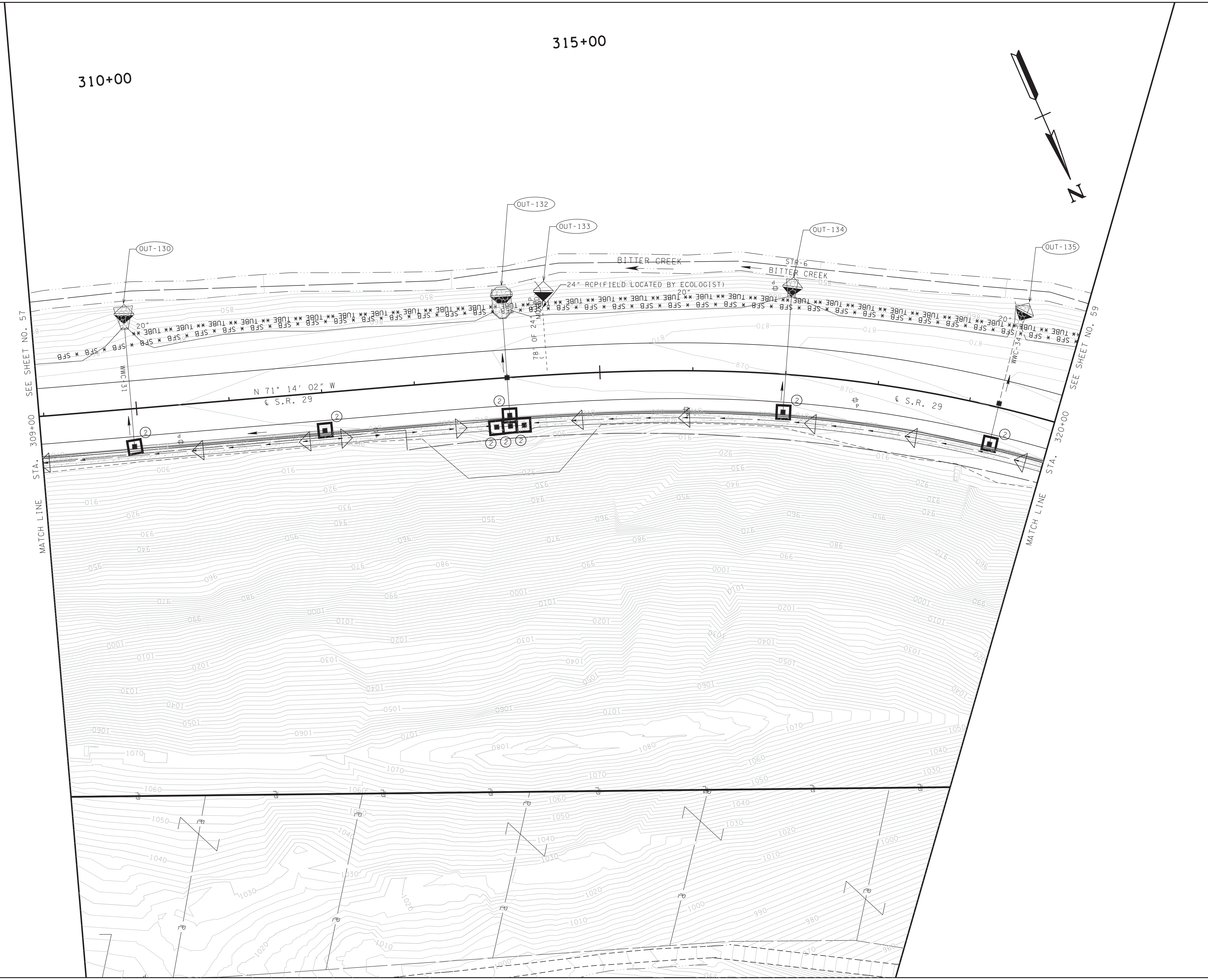
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 298+00 TO STA. 309+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	124
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	58



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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 309+00 TO STA. 320+00

SCALE: 1" = 50′

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	125
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	59

320+00

325+00

330+00

N

POC STA. 328+19.91 S.R. 29 =
POT STA. 57+00.00 HANGING ROCK ROAD
N 614527.7338
E 2405632.5326

END STREAM-19 IMPACT
STA. 328+50

OUT-136
OUT-137
OUT-138
OUT-139
OUT-141
OUT-142
OUT-143
OUT-144
OUT-145

STR-6
BITTER CREEK
STR-18
STR-19
SWC-35
SPG-3
N 40° 29' 49" W
N 47° 11' 28" E
EXIST. R.C.B.C.
(TO REMAIN)
℄ S.R. 29
HANGING ROCK ROAD (LC)
58' ± L
EXIST. 18" CMP
(TO REMAIN)
BEGIN STREAM-19 IMPACT
STA. 328+71

MATCH LINE STA. 320+00
SEE SHEET NO. 58
MATCH LINE STA. 331+00
SEE SHEET NO. 60

60+00

LIMIT OF CONST.
HANGING ROCK ROAD
STA. 60+40.00
N 614610.8660
E 2405935.1850

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Survey & Design Division

JAMES FRITZ BRODERICK
REGISTERED ENGINEER
No. 106940
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 320+00 TO STA. 331+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	126
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	60

335+00

340+00

OUT-147

OUT-146

OUT-148

BITTER CREEK

SILT FENCE WITH WIRE BACKING AND WITH SEDIMENT TUBE. SEE DETAIL B

STR-6

WWC-37

WTL-13

WTL-13

TEMPORARY INSTREAM DIVERSION (-IN-DIV-) (EC-STR-30A)

100 CY MIN. VOLUME

N 46° 05' 28" W

℄ S.R. 29

SEE SHEET NO. 59

SEE SHEET NO. 61

STA. 331+00 MATCH LINE

STA. 342+00 MATCH LINE

N

JAMES FRITZ BRODDY
REGISTERED ENGINEER
AGRICULTURE
No. 18694
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 331+00 TO STA. 342+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	127
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	61

345+00

350+00

LIMITS OF CONST.
STATE ROUTE 328
STA. 80+48.00
N 615665.9142
E 2404475.5647

INV. EL.
900.20

S.R. 328

24" RCP

INV. EL.
OUT 892.68

OUT-149

INV. EL.
OUT 871.43

EXIST. INV.
EL. OUT 872.00

W.M.

TEMPORARY INSTREAM
DIVERSION (-IN-DIV-)
(EC-STR-30A)

24" RCP
(TO BE REMOVED)

POS STA. 344+41.25 S.R. 29 =
POT STA. 82+50.00 S.R. 328
N 615782.2823
E 2404638.4357

N 624° 50' 58" E

STR-20 MUDDY BRANCH

EXTEND EXIST.
SLAB BRIDGE
20' LT.

TEMPORARY INSTREAM
DIVERSION (-IN-DIV-)
(EC-STR-30A)

OUT-156

OUT-158

OUT-154

INV. EL.
IN 883.5

STR-21

RCBC
0'X4'X3'

INV. EL.
OUT 883.41

INV. EL.
IN 880.94

OUT-155

OUT-157

℄ S.R. 29

EXIST.
3@176'x12'x9' SLAB
BRIDGE (TO REMAIN)

OUT-151

EXIST. INV.
EL. IN 872.83

INV. EL.
OUT 872.83

EXIST. 2@15'X8'X102'
SLAB BRIDGE (TO REMAIN)

INV. EL.
OUT 878.87

STR-6

BITTER CREEK

OUT-150

TEMPORARY INSTREAM
DIVERSION (-IN-DIV-)
(EC-STR-30A)

OUT-152

EXTEND EXIST.
SLAB BRIDGE 5' RT.

TEMPORARY INSTREAM
DIVERSION (-IN-DIV-)
(EC-STR-30A)

OUT-153

SILT FENCE WITH WIRE BACKING
AND WITH SEDIMENT TUBE. SEE
DETAIL B

SEE SHEET NO. 60

STA. 342+00

MATCH LINE

SEE SHEET NO. 62

STA. 353+00

MATCH LINE

NOTE:
SEDIMENT TUBES, ROCK CHECK DAMS AND ENHANCED ROCK CHECK DAMS SHALL BE UTILIZED WITHIN THE RELOCATED STREAM CHANNEL DURING STREAM CHANNEL CONSTRUCTION. ALL EPSC MEASURES LOCATED WITHIN THE RELOCATED STREAM CHANNEL SHALL BE REMOVED PRIOR TO DIVERTING STREAM FLOW INTO THE RELOCATED CHANNEL.

STREAM CHANNEL
SEQUENCE OF CONSTRUCTION:

1. CONSTRUCT AND STABILIZE PROPOSED STREAM CHANNEL LOCATION AND BOX CULVERT AT PRIVATE DRIVEWAY. MAINTAIN UPSTREAM PLUG.
2. INSTALL TEMPORARY STREAM DIVERSION (24") PIPE WITHIN STR-21, IF NEEDED, TO CONVEY STREAMS STR-21 AND STR-22 THROUGH WORK ZONE.
3. INSTALL 30" RCP UPSLOPE.
4. REMOVE PLUG AND DIVERT FLOW INTO STABILIZED RELOCATED STREAM CHANNEL AND 30" RCP.

JAMES FRITZ BRODIE
REGISTERED ENGINEER
AGRICULTURE
No. 106140
DATE 7/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 342+00 TO STA. 353+00

SCALE: 1"= 50'

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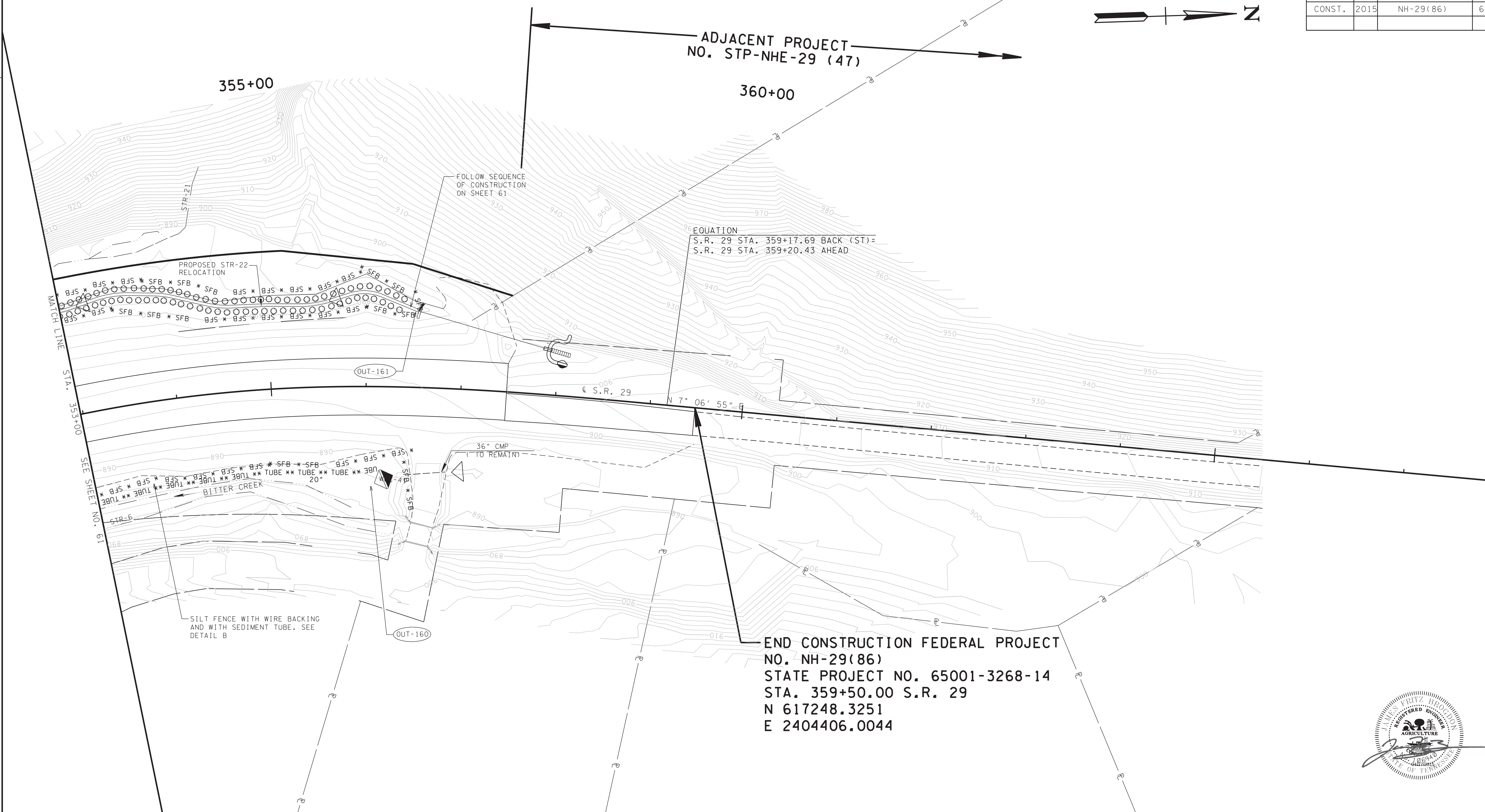
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	128
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	62



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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

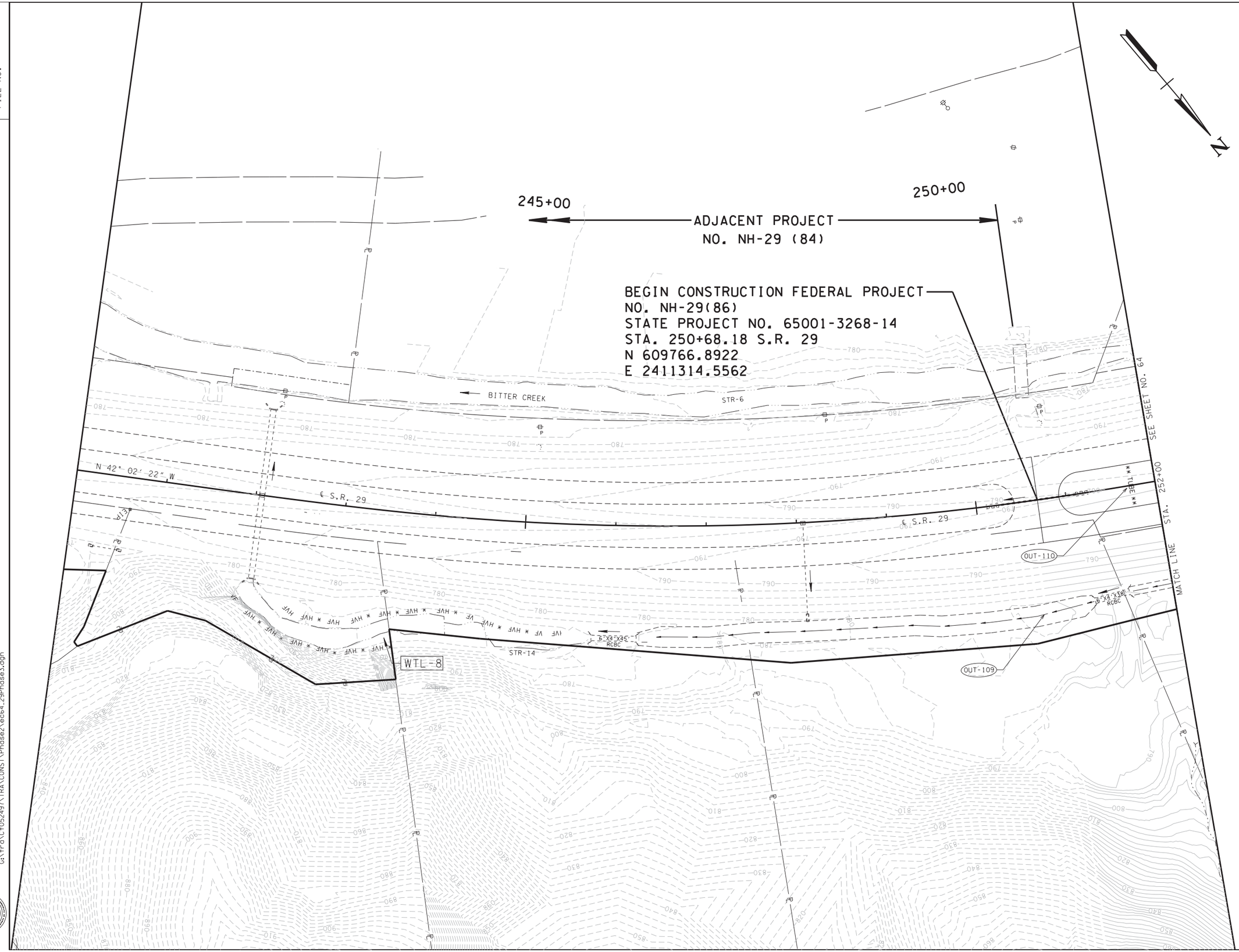
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE II

STA. 353+00 TO STA. 364+74

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	118
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	63



NOTE:
OUTFALL NUMBERS DEPICTED ARE A CONTINUATION OF THE NUMBERING USED FOR THE ADJACENT PROJECT (PIN 101411.04).

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 240+00 TO STA. 252+00

SCALE: 1"= 50'

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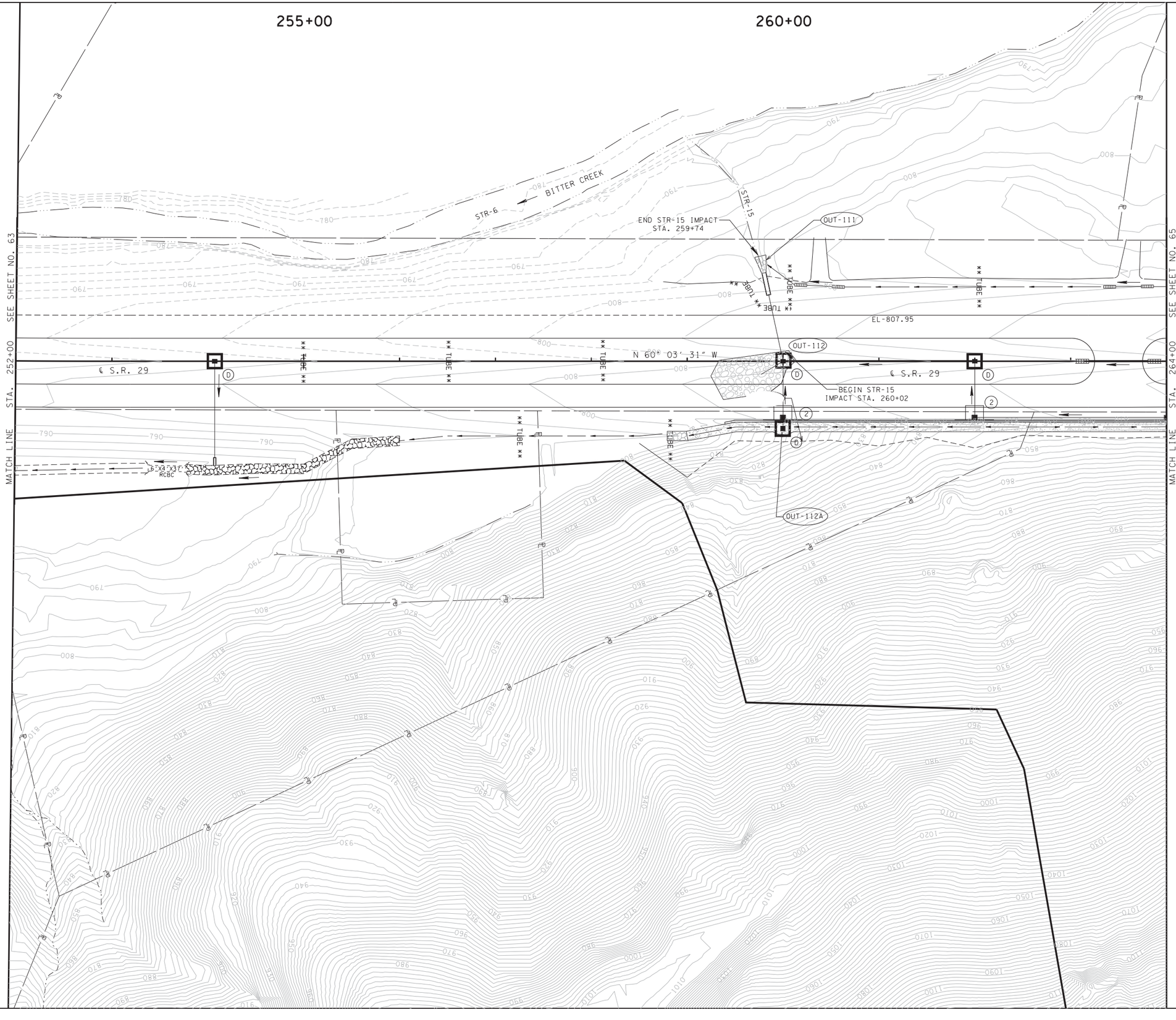
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	143
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	64



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JAMES FRITZ BRIGHTON
REGISTERED ENGINEER
AGRICULTURE
No. 24472
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

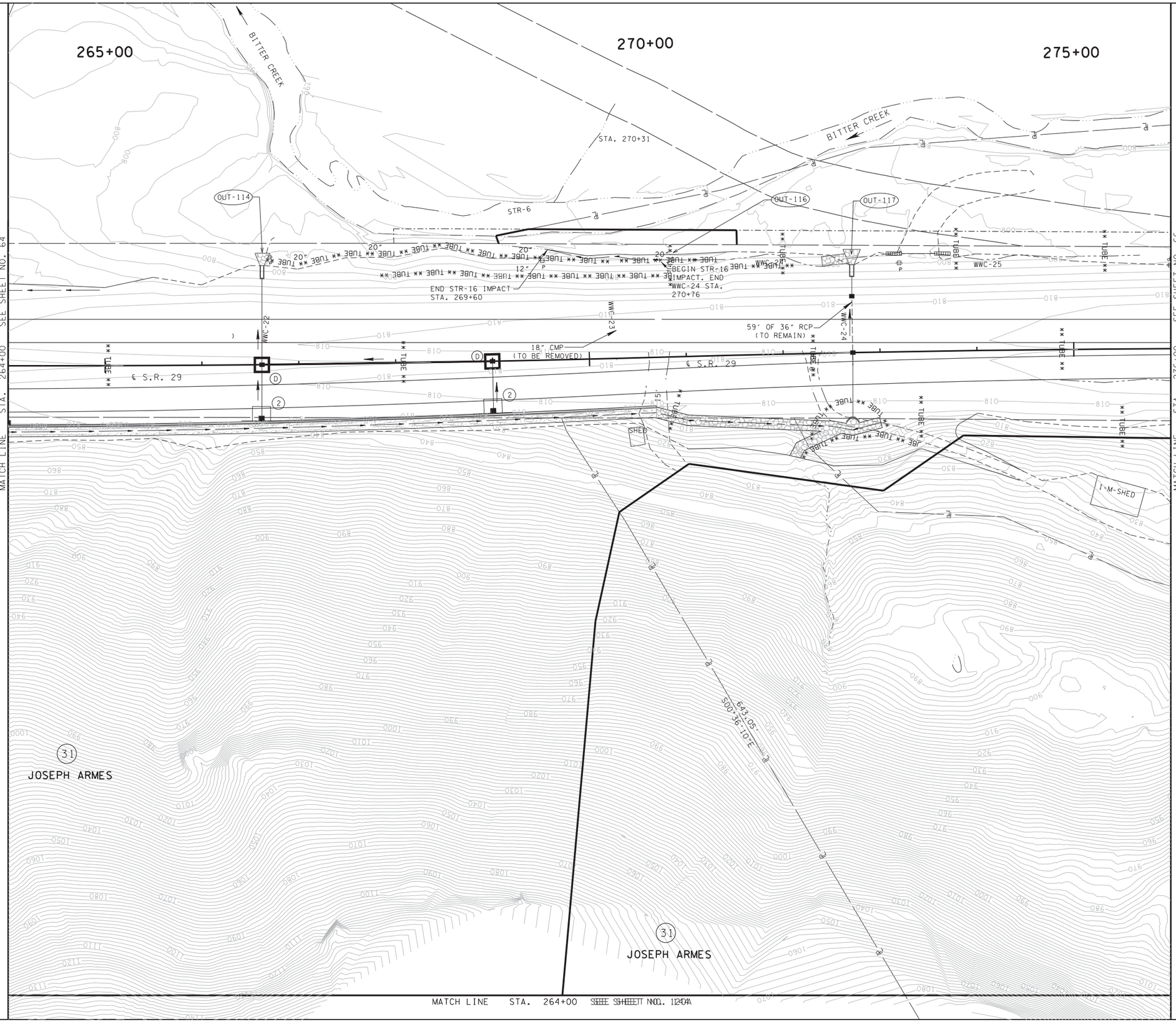
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 252+00 TO STA. 264+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	144
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	65



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 264+00 TO STA. 276+00

SCALE: 1"= 50'

Survey & Design Division

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	145
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	66

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 276+00 TO STA. 287+00

SCALE: 1" = 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	146
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	67

290+00

295+00

POS STA. 290+51.96 S.R. 29 =
POT STA. 50+00.00 WHETSTONE ROAD
N 612052.6872
E 2408162.2162
LAT: 36.005466147
LONG: -84.514146890

BITTER CREEK
STR-6

OUT-124

SCARIFY, TOPSOIL, AND SEED

** TUBE ** TUBE ** TUBE **

** TUBE ** TUBE ** TUBE **

MATCH LINE STA. 287+00
SEE SHEET NO. 66

MATCH LINE STA. 298+00
SEE SHEET NO. 68

℄ S.R. 29

N 13° 16′ 43″ W

S 57° 22′ E

N 74° 40′ 01″ E

WHETSTONE ROAD

SHED

LIMIT OF CONST.
WHETSTONE ROAD
STA. 52+53.55
N 612027.0451
E 2408405.8009

N

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Survey & Design Division

JAMES FRITZ BRADLEY
REGISTERED ENGINEER
AGRICULTURE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

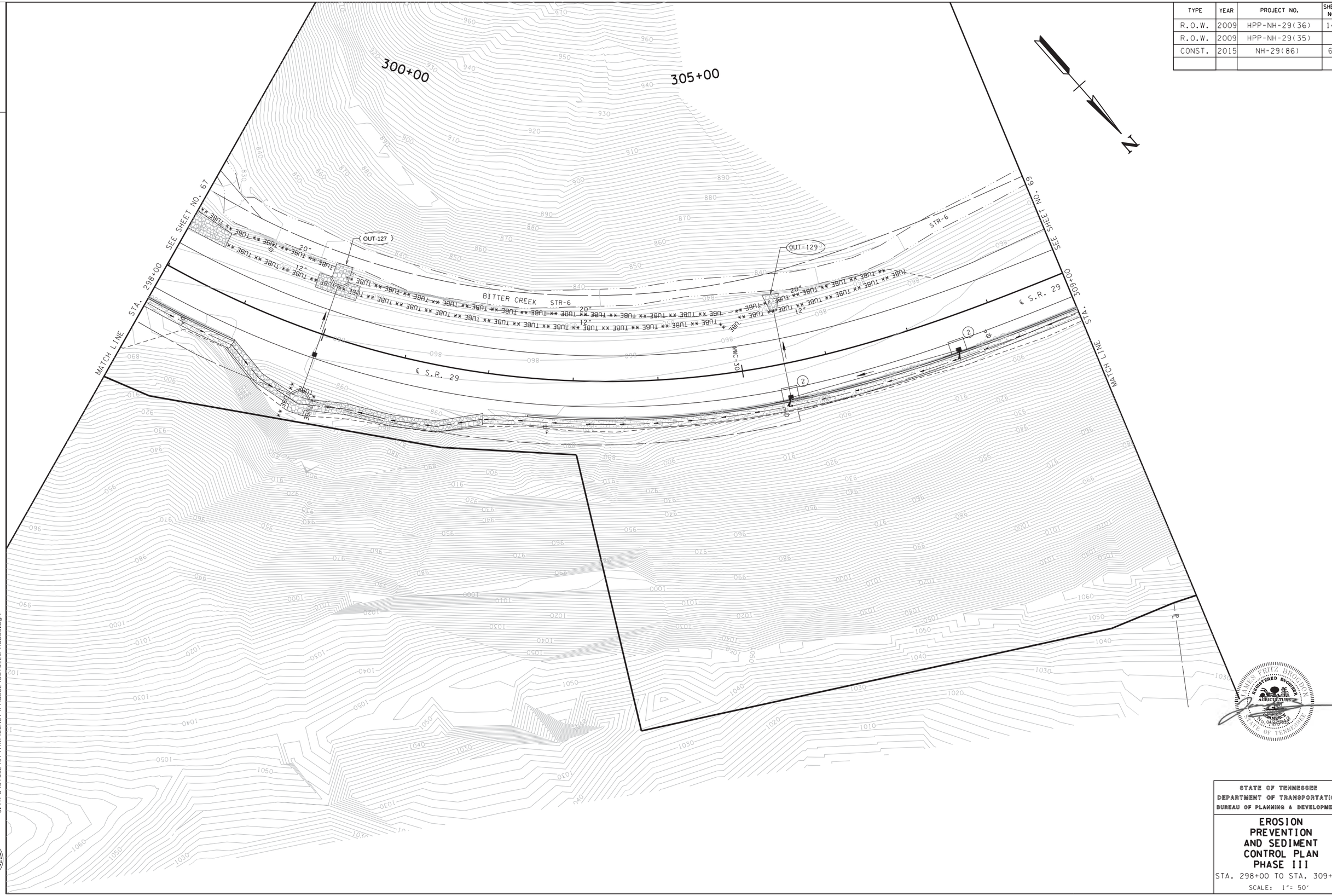
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 287+00 TO STA. 298+00

SCALE: 1"= 50′

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	147
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	68



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JAMES FRITZ BRONDI
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 298+00 TO STA. 309+00

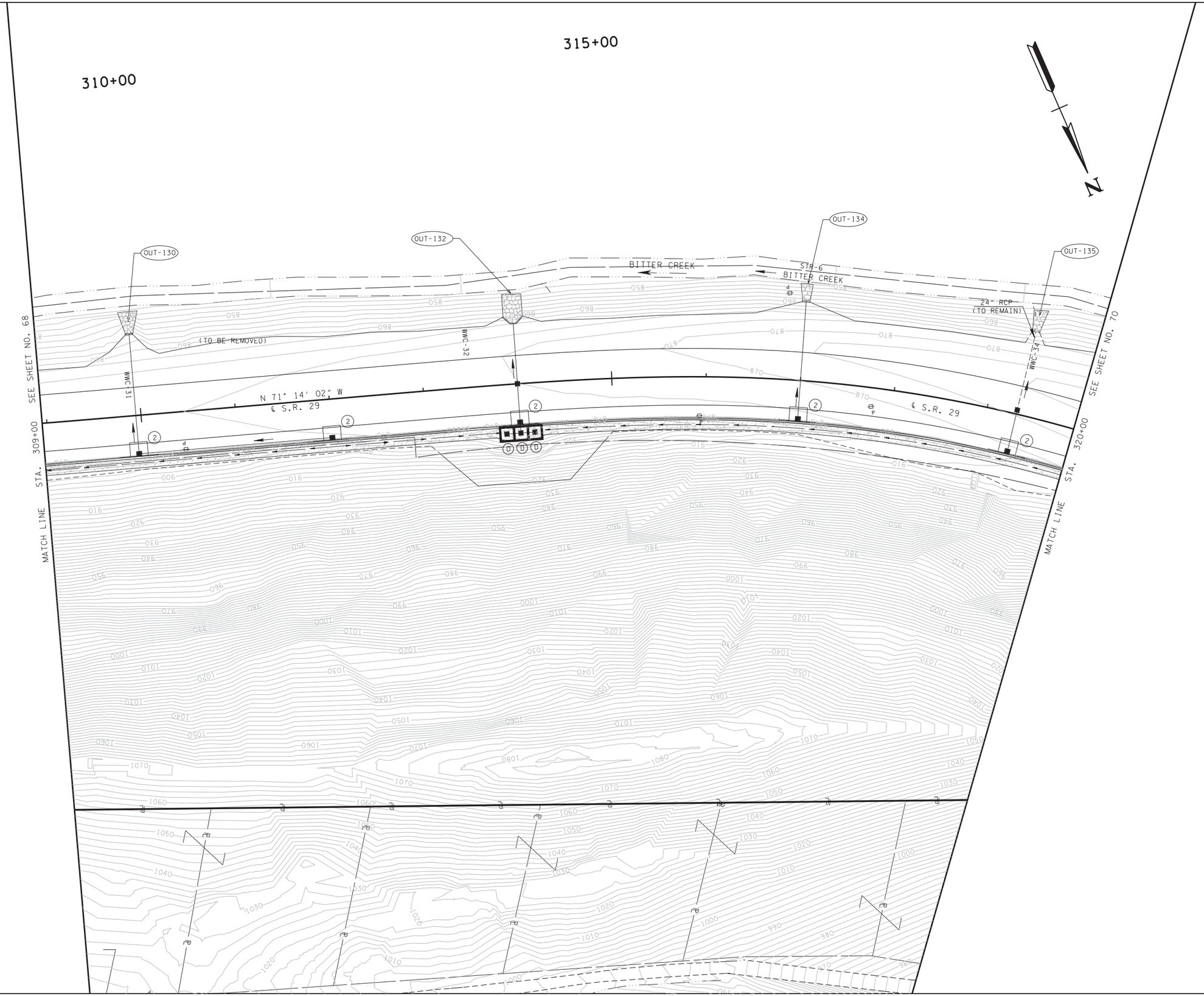
SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	148
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	69

310+00

315+00



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Survey & Design Division

JAMES FRITZ BRONDT
REGISTERED ENGINEER
AGRICULTURE
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

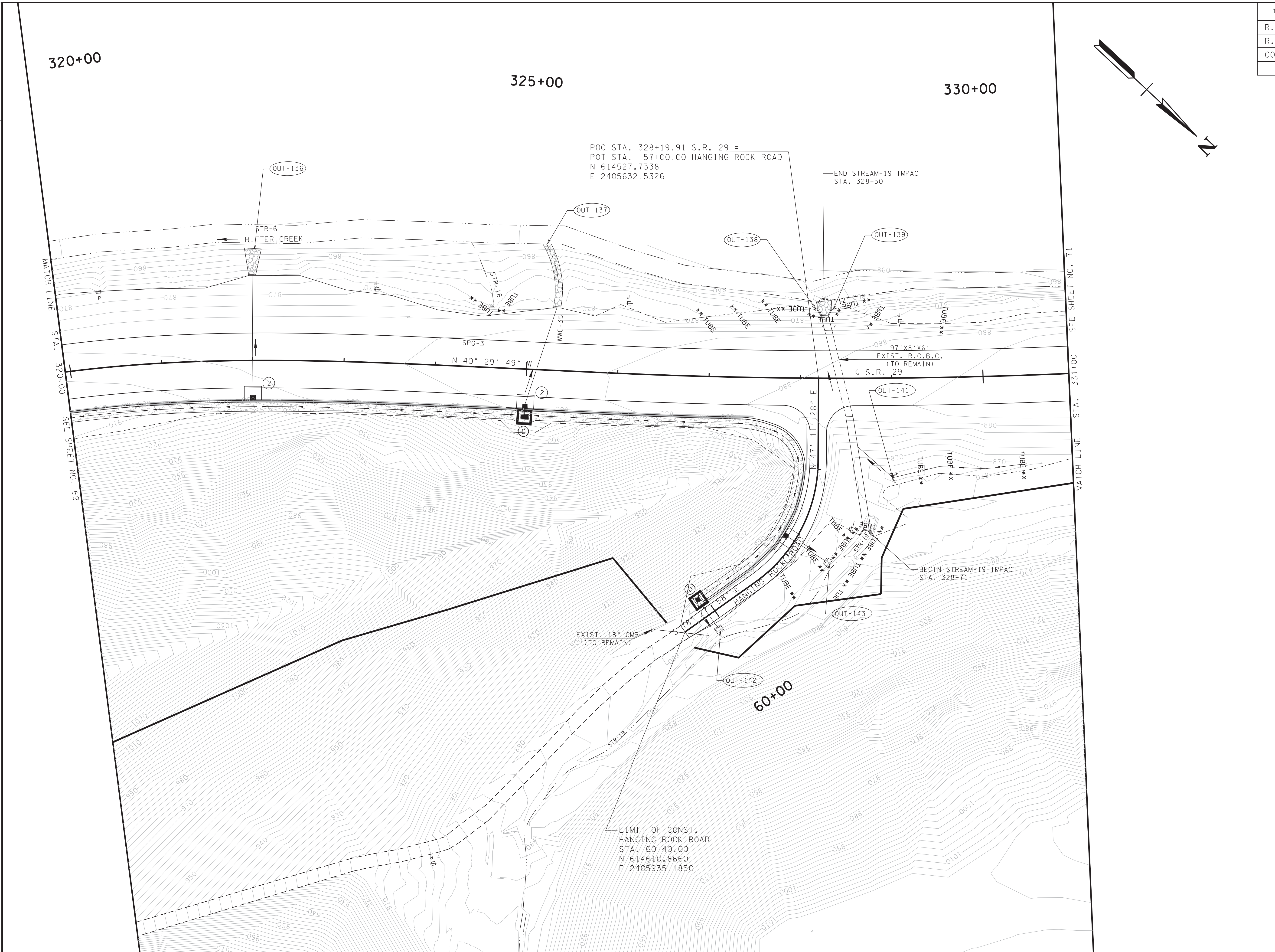
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 309+00 TO STA. 320+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	149
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	70



320+00
325+00
330+00
N
POC STA. 328+19.91 S.R. 29 =
POT STA. 57+00.00 HANGING ROCK ROAD
N 614527.7338
E 2405632.5326
OUT-136
OUT-137
OUT-138
OUT-139
OUT-141
OUT-142
OUT-143
END STREAM-19 IMPACT
STA. 328+50
BEGIN STREAM-19 IMPACT
STA. 328+71
STR-6
BITTER CREEK
STR-18
WWC-35
SPG-3
N 40° 29′ 49″ W
97′X8′X6′
EXIST. R.C.B.C.
(TO REMAIN)
℄ S.R. 29
N 47° 11′ 28″ E
HANGING ROCK ROAD
EXIST. 18″ CMP
(TO REMAIN)
60+00
STR-19
LIMIT OF CONST.
HANGING ROCK ROAD
STA. 60+40.00
N 614610.8660
E 2405935.1850
MATCH LINE STA. 320+00
SEE SHEET NO. 69
MATCH LINE STA. 331+00
SEE SHEET NO. 71

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 320+00 TO STA. 331+00

SCALE: 1″= 50′

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	150
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	71

335+00

340+00

OUT-147

OUT-148

BITTER CREEK

** TUBE **

20" ** TUBE **

12" ** TUBE **

STR-6

WWC-37

WTL-13

N 46° 05' 28" W

℄ S.R. 29

SEE SHEET NO. 70

STA. 331+00

MATCH LINE

SEE SHEET NO. 72

STA. 342+00

MATCH LINE

N

JAMES FRITZ BRADSHAW
REGISTERED ENGINEER
AGRICULTURE
STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 331+00 TO STA. 342+00

SCALE: 1"= 50'

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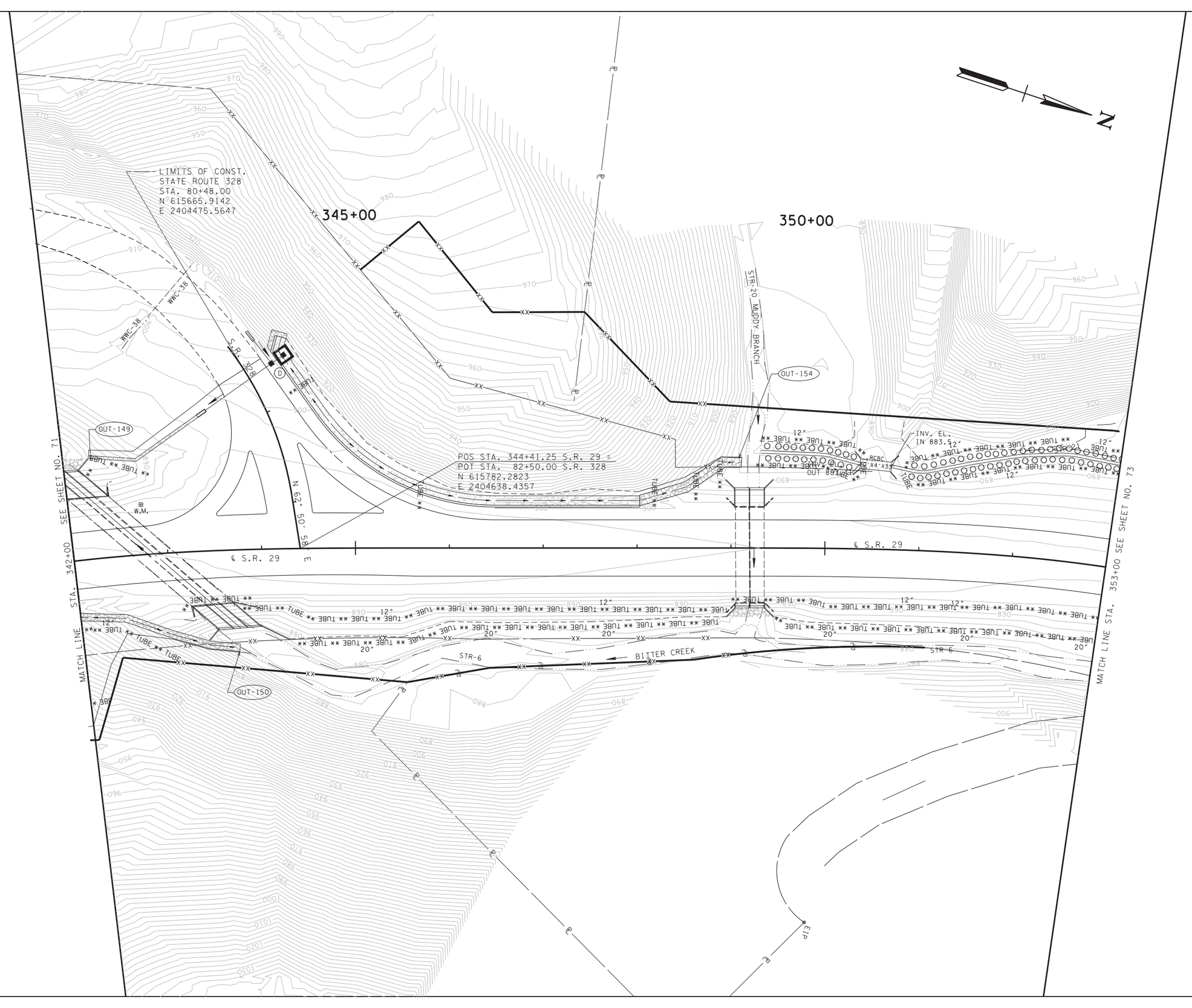
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	151
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	72



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Survey & Data Division

JAMES FRITZ BRODSON
REGISTERED ENGINEER
AGRICULTURE
No. 27203
4/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

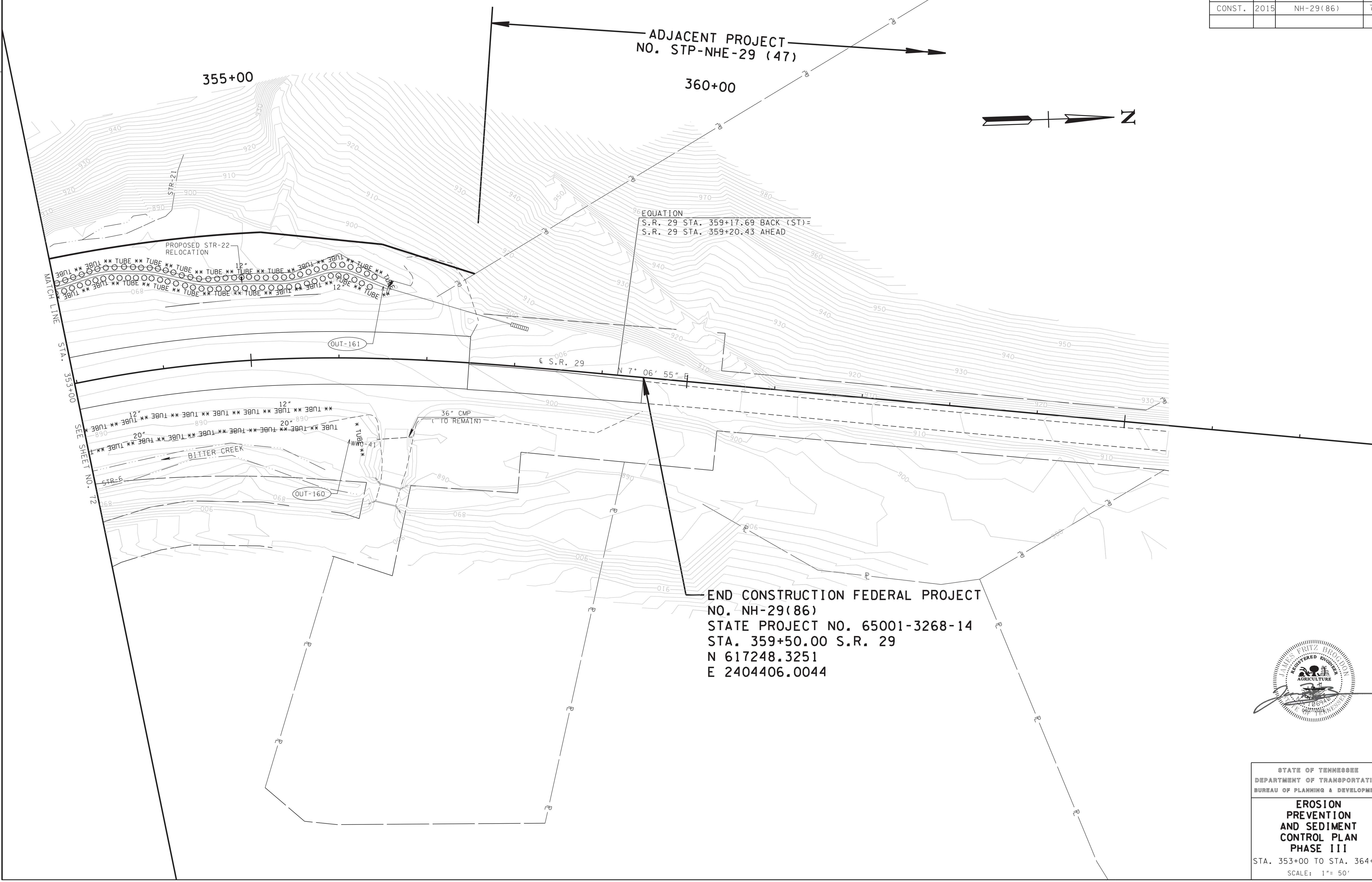
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 342+00 TO STA. 353+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	152
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	73



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Survey & Design Division

JAMES FRITZ BROGDON
REGISTERED ENGINEER
AGRICULTURE COMMERCE
No. 106940
STATE OF TENNESSEE
04/27/2015

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

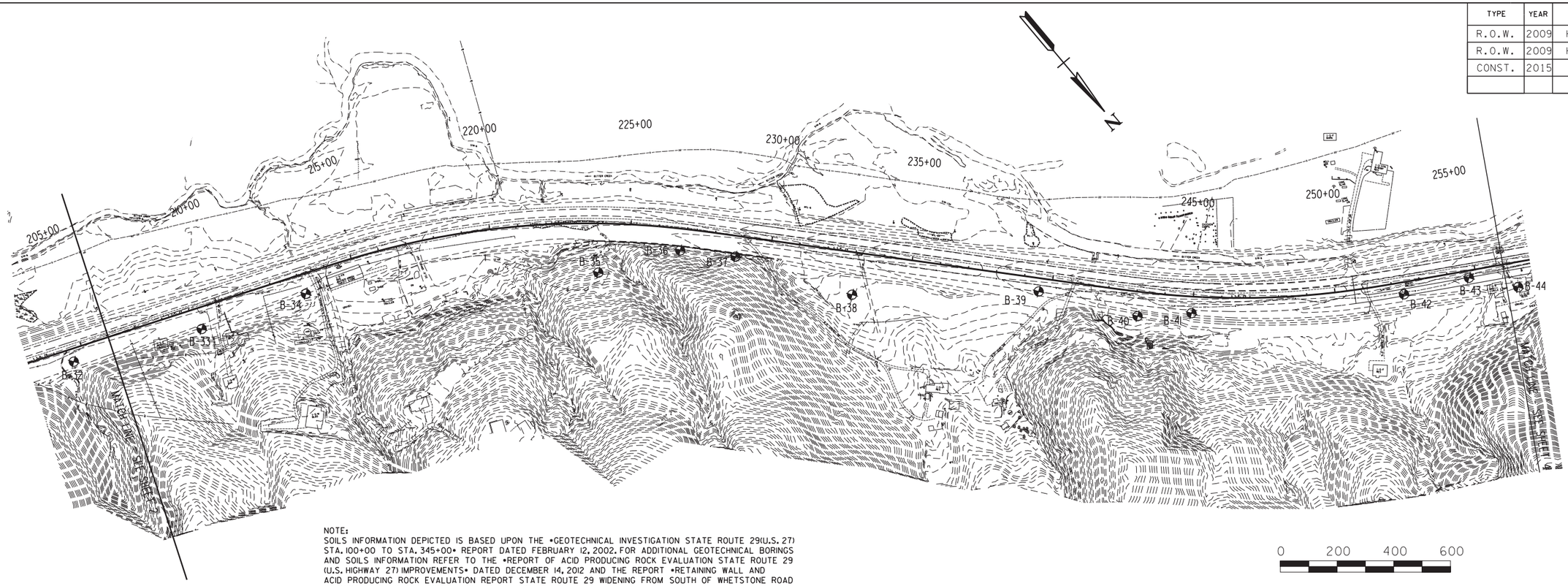
EROSION PREVENTION AND SEDIMENT CONTROL PLAN PHASE III

STA. 353+00 TO STA. 364+74

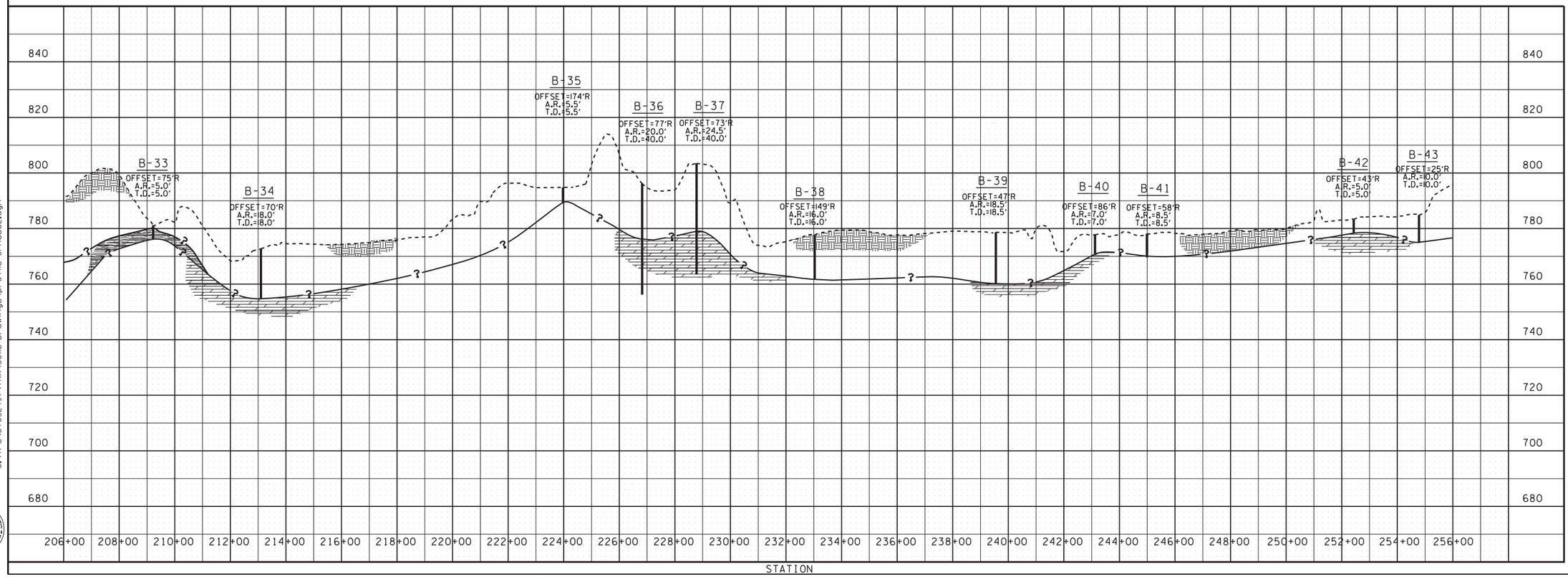
SCALE: 1″= 50′

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	155
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	77



NOTE:
SOILS INFORMATION DEPICTED IS BASED UPON THE •GEOTECHNICAL INVESTIGATION STATE ROUTE 29(U.S. 27) STA. 100+00 TO STA. 345+00• REPORT DATED FEBRUARY 12, 2002. FOR ADDITIONAL GEOTECHNICAL BORINGS AND SOILS INFORMATION REFER TO THE •REPORT OF ACID PRODUCING ROCK EVALUATION STATE ROUTE 29 (U.S. HIGHWAY 27) IMPROVEMENTS• DATED DECEMBER 14, 2012 AND THE REPORT •RETAINING WALL AND ACID PRODUCING ROCK EVALUATION REPORT STATE ROUTE 29 WIDENING FROM SOUTH OF WHETSTONE ROAD TO NOURTH OF STATE ROUTE 328• DATED JUNE 11, 2013.



LEGEND

- OVERBURDEN
- PARTIALLY WEATHERED ROCK
- BEDROCK
- B-12 - BORING NO.
- OFFSET - DISTANCE FROM CENTERLINE
- A.R. - AUGER REFUSAL
- T.D. - TERMINATION DEPTH

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

SOILS PROFILE

STA.206+00 TO STA.256+00

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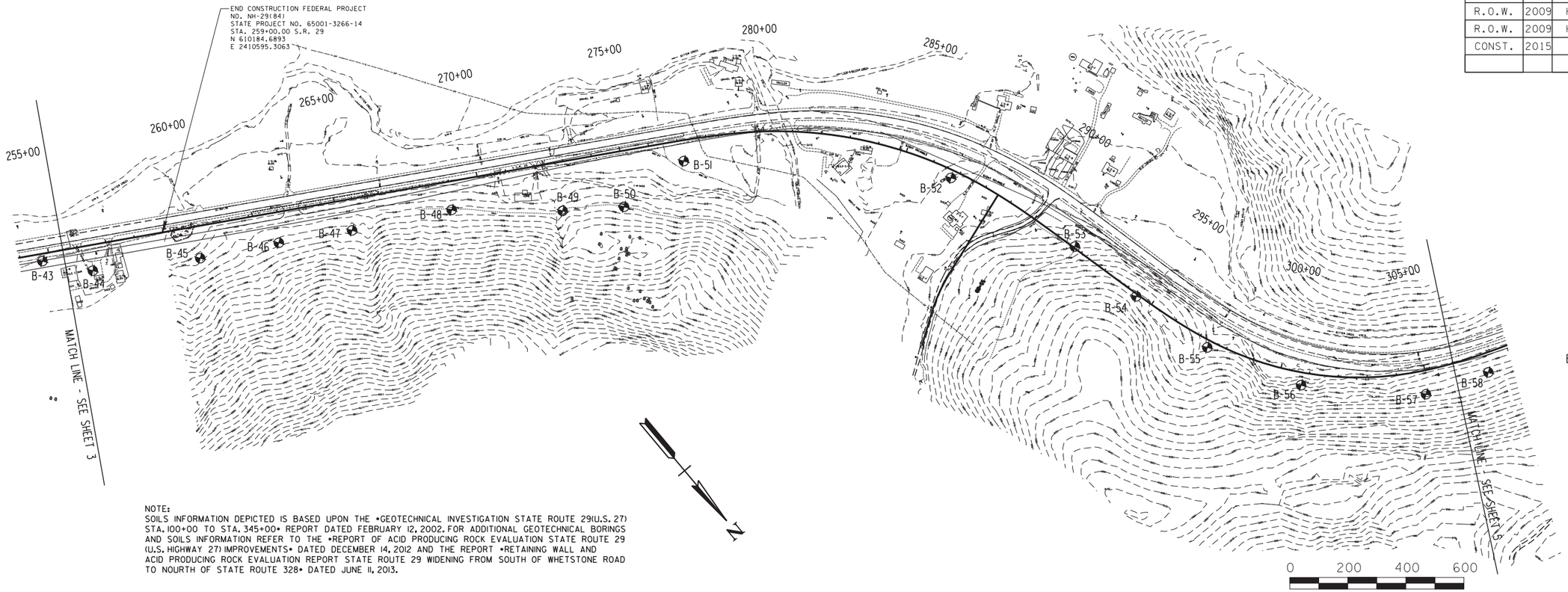
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	156
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	77A



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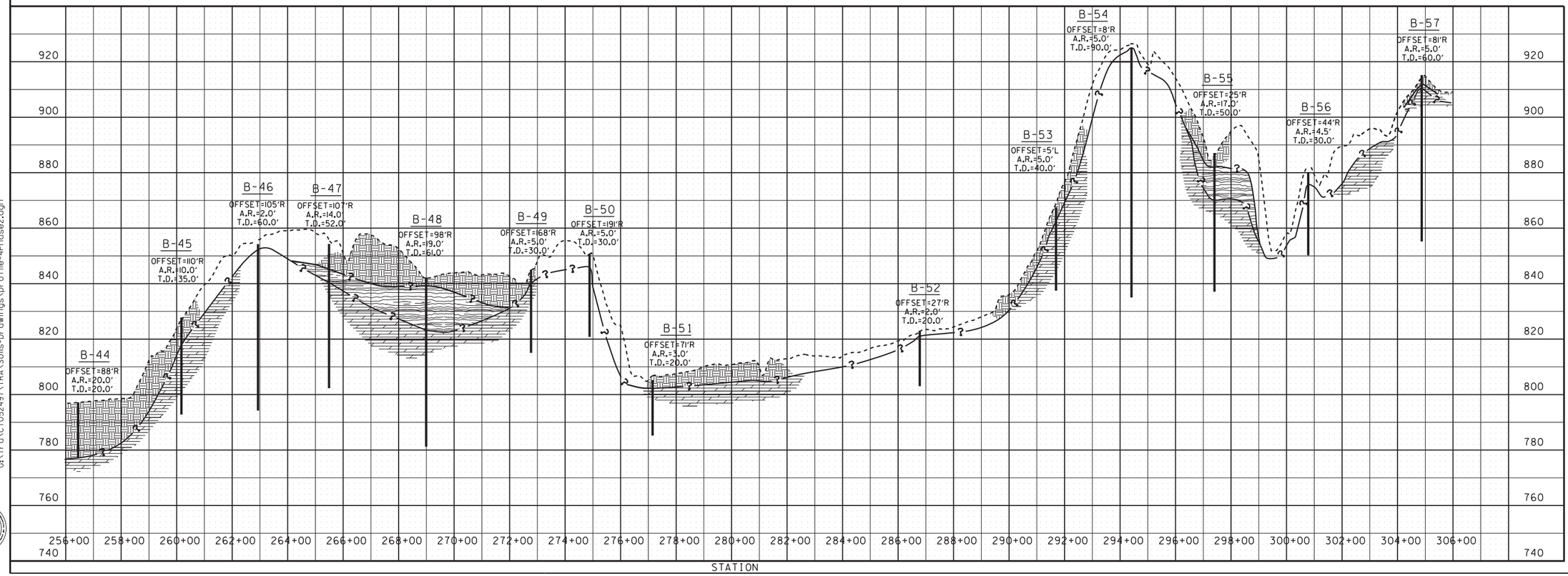
SOILS INFORMATION DEPICTED IS BASED UPON THE "GEOTECHNICAL INVESTIGATION STATE ROUTE 29(U.S. 27) STA. 100+00 TO STA. 345+00" REPORT DATED FEBRUARY 12, 2002. FOR ADDITIONAL GEOTECHNICAL BORINGS AND SOILS INFORMATION REFER TO THE "REPORT OF ACID PRODUCING ROCK EVALUATION STATE ROUTE 29 (U.S. HIGHWAY 27) IMPROVEMENTS" DATED DECEMBER 14, 2012 AND THE REPORT "RETAINING WALL AND ACID PRODUCING ROCK EVALUATION REPORT STATE ROUTE 29 WIDENING FROM SOUTH OF WHETSTONE ROAD TO NOURTH OF STATE ROUTE 328" DATED JUNE 11, 2013.



LEGEND

- OVERBURDEN
- PARTIALLY WEATHERED ROCK
- BEDROCK
- B-12 - BORING NO.
- OFFSET - DISTANCE FROM CENTERLINE
- A.R. - AUGER REFUSAL
- T.D. - TERMINATION DEPTH

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

SOILS PROFILE

STA. 256+00 TO STA. 306+00

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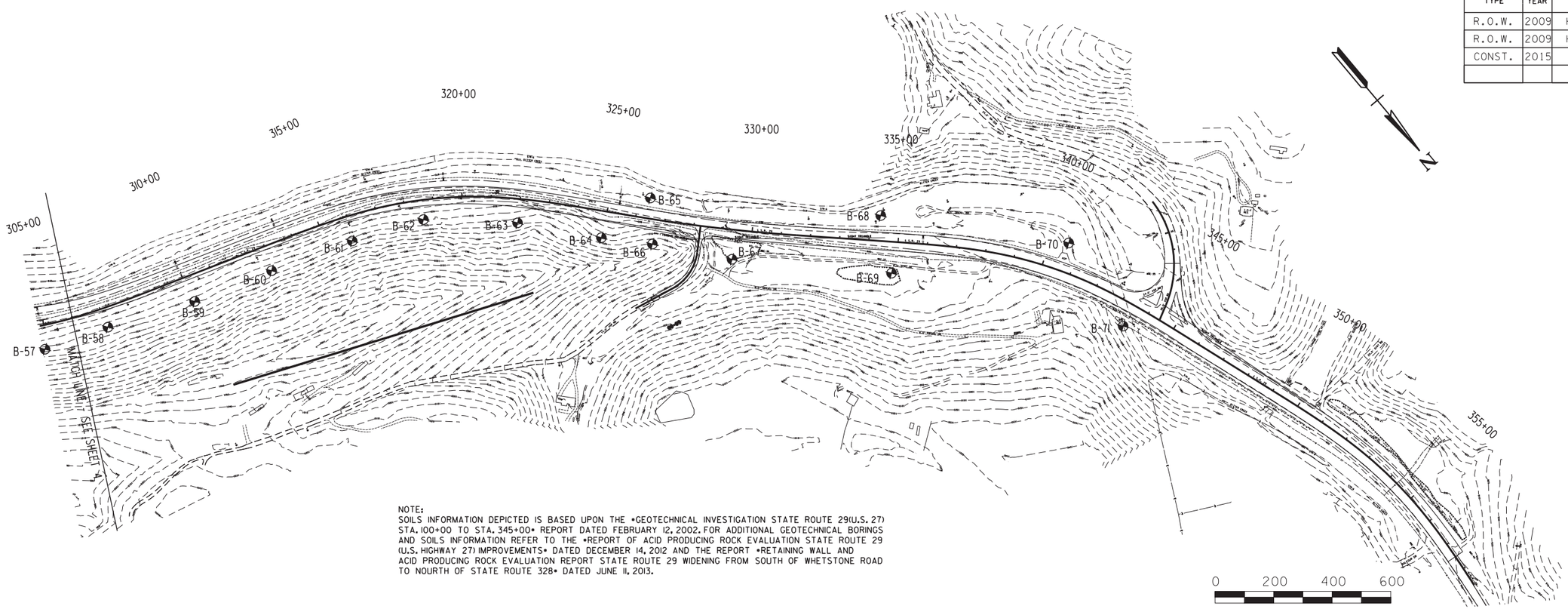
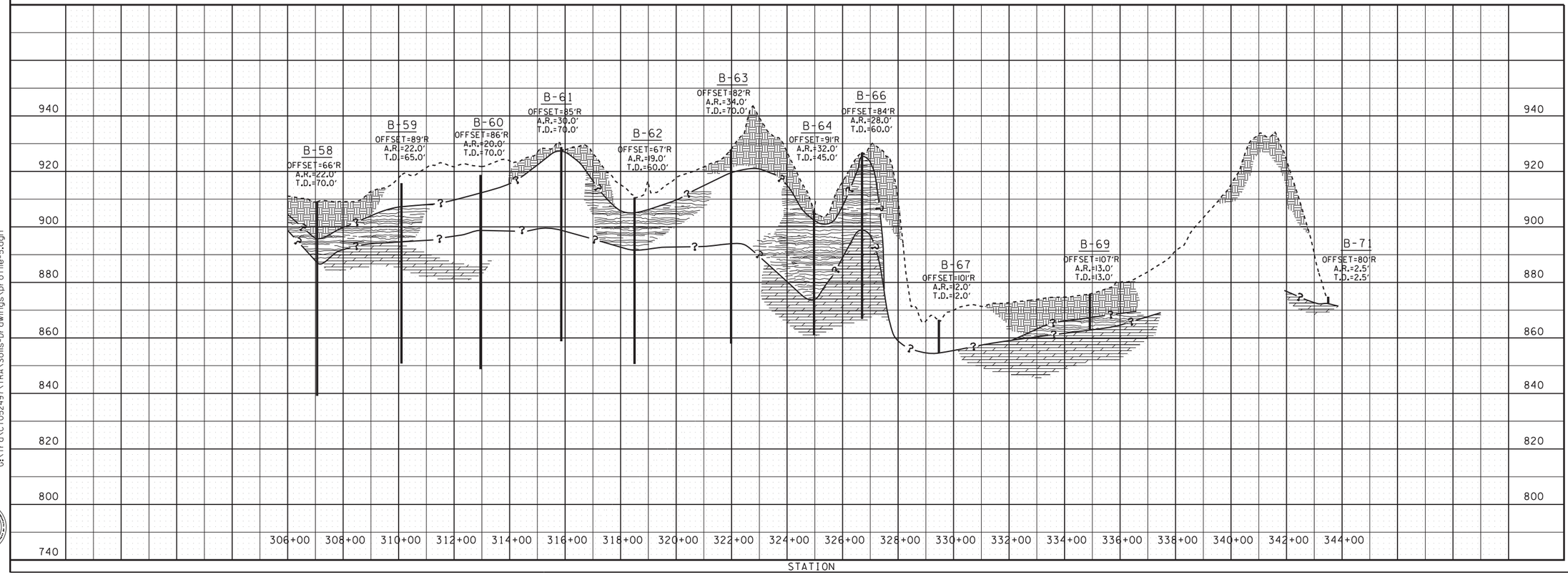
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	157
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2015	NH-29(86)	77B



NOTE:
SOILS INFORMATION DEPICTED IS BASED UPON THE •GEOTECHNICAL INVESTIGATION STATE ROUTE 29(U.S. 27) STA. 100+00 TO STA. 345+00• REPORT DATED FEBRUARY 12, 2002. FOR ADDITIONAL GEOTECHNICAL BORINGS AND SOILS INFORMATION REFER TO THE •REPORT OF ACID PRODUCING ROCK EVALUATION STATE ROUTE 29 (U.S. HIGHWAY 27) IMPROVEMENTS• DATED DECEMBER 14, 2012 AND THE REPORT •RETAINING WALL AND ACID PRODUCING ROCK EVALUATION REPORT STATE ROUTE 29 WIDENING FROM SOUTH OF WHETSTONE ROAD TO NOURTH OF STATE ROUTE 328• DATED JUNE 11, 2013.



LEGEND

- OVERBURDEN
- PARTIALLY WEATHERED ROCK
- BEDROCK
- B-12 - BORING NO.
- OFFSET - DISTANCE FROM CENTERLINE
- A.R. - AUGER REFUSAL
- T.D. - TERMINATION DEPTH

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

SOILS PROFILE

STA. 306+00 TO STA. 344+00

SHEET 5 OF 5

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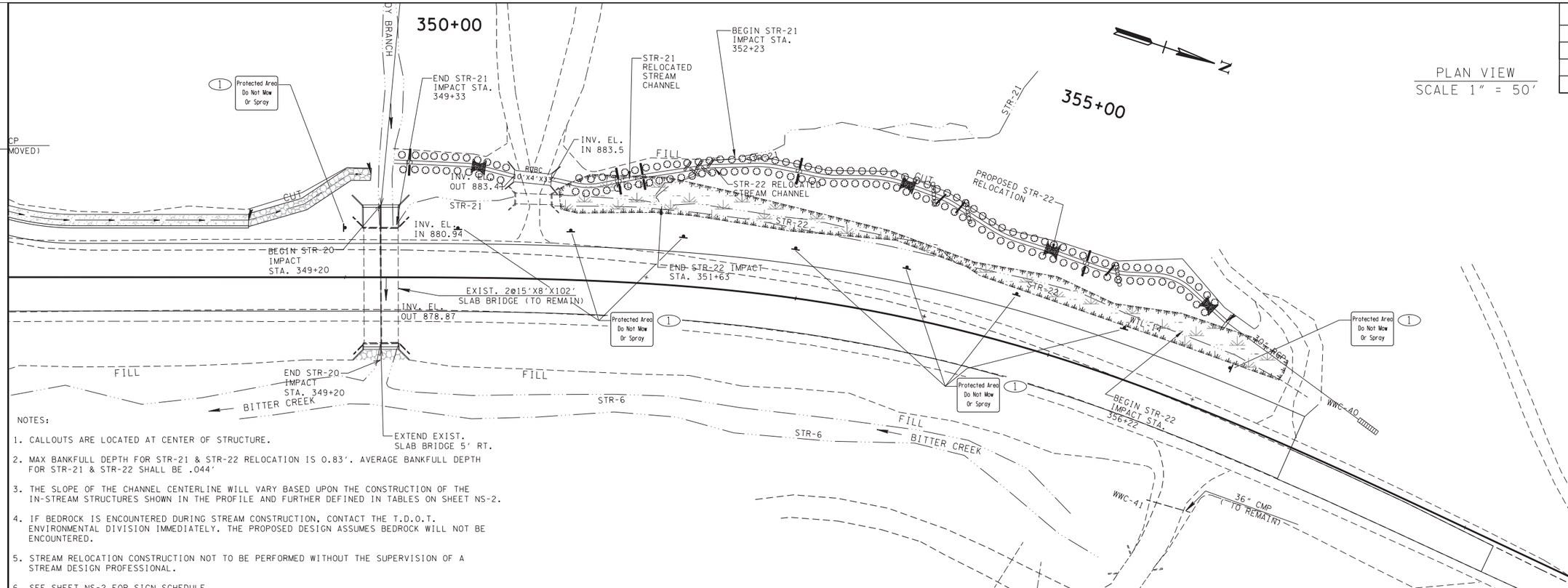
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

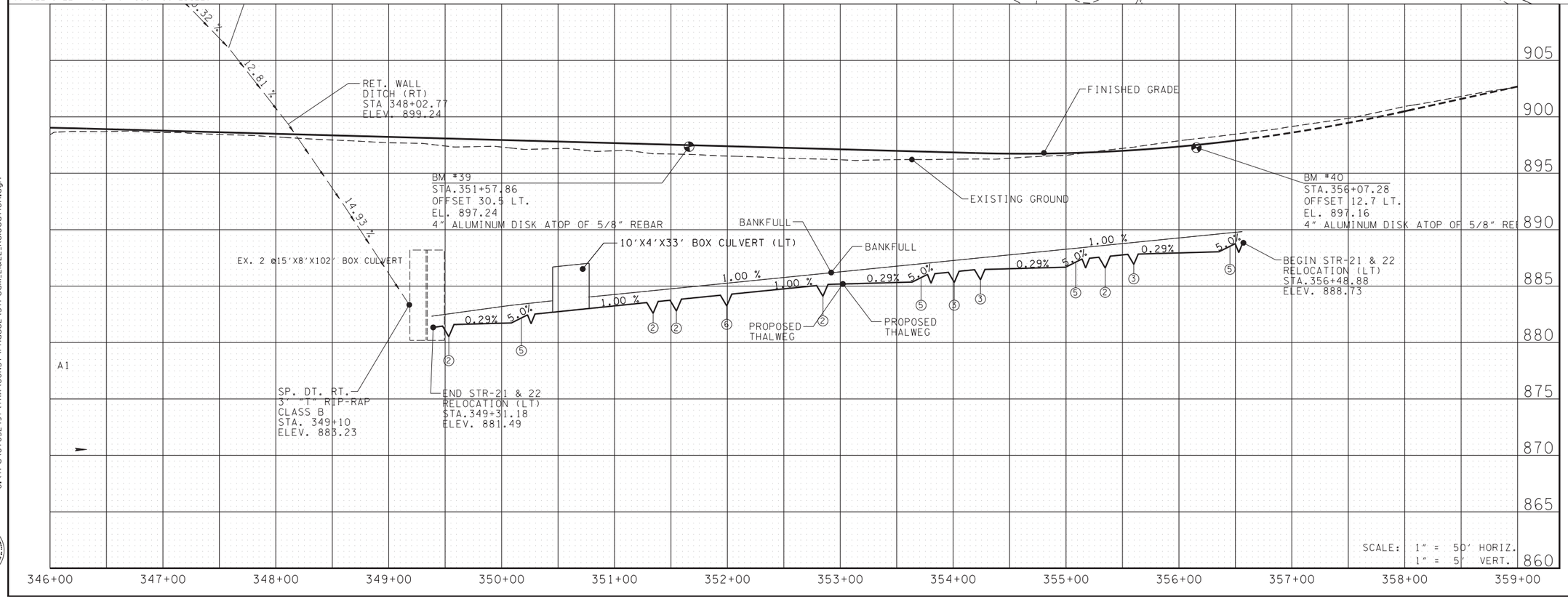
TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	NS-1

PLAN VIEW
SCALE 1" = 50'



NOTES:

1. CALLOUTS ARE LOCATED AT CENTER OF STRUCTURE.
2. MAX BANKFULL DEPTH FOR STR-21 & STR-22 RELOCATION IS 0.83'. AVERAGE BANKFULL DEPTH FOR STR-21 & STR-22 SHALL BE .044'
3. THE SLOPE OF THE CHANNEL CENTERLINE WILL VARY BASED UPON THE CONSTRUCTION OF THE IN-STREAM STRUCTURES SHOWN IN THE PROFILE AND FURTHER DEFINED IN TABLES ON SHEET NS-2.
4. IF BEDROCK IS ENCOUNTERED DURING STREAM CONSTRUCTION, CONTACT THE T.D.O.T. ENVIRONMENTAL DIVISION IMMEDIATELY. THE PROPOSED DESIGN ASSUMES BEDROCK WILL NOT BE ENCOUNTERED.
5. STREAM RELOCATION CONSTRUCTION NOT TO BE PERFORMED WITHOUT THE SUPERVISION OF A STREAM DESIGN PROFESSIONAL.
6. SEE SHEET NS-2 FOR SIGN SCHEDULE.



STREAM RELOCATION LEGEND

SYMBOL	ITEM	PROFILE	STD. DWG.
—S—	LOG DROP STRUCTURE	②	D-NSD-4
	LOG VANE DEFLECTOR	③	D-NSD-3
	ROCK RIFFLE	⑤	D-NSD-6
	BOULDER SILL	⑥	SEE SHEET NS-3
✳ ROLL ✳	COCONUT FIBER ROLL		D-NSD-7

CLINT T. BUTLER REGISTERED ENGINEER NO. 109361 STATE OF TENNESSEE
04/27/2015

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00008178 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

SR-29 STR-21&22 RELOCATION PLAN & PROF.
SCALE: AS SHOWN

Survey & Design Division

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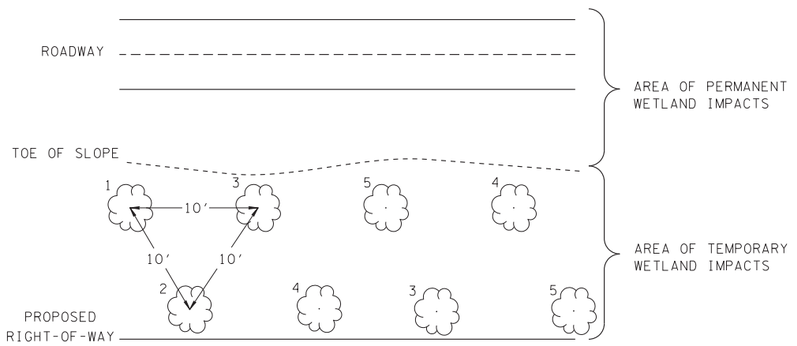
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	NS-2

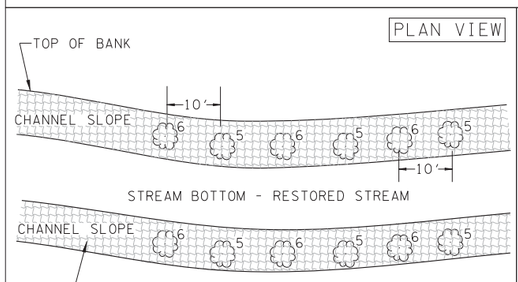
TREE PLANTING SCHEME FOR TEMPORARY WETLAND IMPACT AREAS



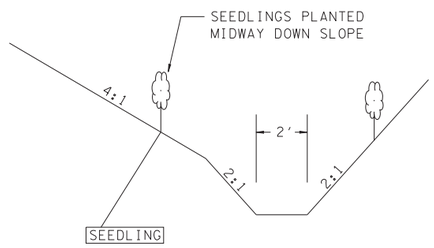
① RED MAPLE (ACER RUBRUM)
② AMERICAN HORNBEAM (CARPINUS CAROLINIANA)
③ SWEETGUM (LIQUIDAMBAR STYRACIFLUA)
④ AMERICAN HOLLY (ILEX OPACA)
⑤ PAWPAW (ASIMINA TRILOBA)

PLAN VIEW

TYPICAL CHANNEL RESTORATION & TREE PLANTING DETAIL FOR STREAM RELOCATION - STR-21&22



⑤ ALNUS SERRULATA (HAZEL ALDER), 18-24 INCH BARE ROOT SEEDLINGS
⑥ ASIMINA TRILOBA (PAWPAW) 18-24 INCH BARE ROOT SEEDLINGS



PROPOSED CHANNEL CROSS SECTION
FOR EACH STREAM MUST MATCH
EXISTING CHANNEL CROSS SECTION

CROSS SECTION - VIEW UPSTREAM

PROPOSED MORPHOLOGY FOR STREAM 21
(STA 349+25 – STA 352+50)
MORGAN COUNTY

PARAMETER	STREAM 22	
	MIN	MAX
MEAN DEPTH @ BANKFULL (BKF)' (FT)	0.83	
RUN LENGTH @ BKF (FT)	15	70
RUN WIDTH @ BKF (FT)	6	
RUN DEPTH @ BKF (FT)	1	
SLOPE RUN (FT/FT)	0.29%	1%
RIFFLE LENGTH @ BKF (FT)	7	12
RIFFLE WIDTH @ BKF (FT)	6	
RIFFLE DEPTH @ BKF (FT)	1	
SLOPE RIFFLE (FT/FT)	4%	7%
RIFFLE DMIN, D50², DMAX (IN)	1, 2.5, 4	
AVG. DROP FOR CROSS VANE, LOG DROPS, AND SINGLE LOG VANE (FT)	0.5	

PROPOSED MORPHOLOGY FOR STREAM 22
(STA 352+50 – 356+50)

PARAMETER	STREAM 21	
	MIN	MAX
MEAN DEPTH @ BANKFULL (BKF)' (FT)	0.44	
RUN LENGTH @ BKF (FT)	15	70
RUN WIDTH @ BKF (FT)	5	
RUN DEPTH @ BKF (FT)	0.6	
SLOPE RUN (FT/FT)	0.29%	1%
RIFFLE LENGTH @ BKF (FT)	5	10
RIFFLE WIDTH @ BKF (FT)	6	
RIFFLE DEPTH @ BKF (FT)	0.6	
SLOPE RIFFLE (FT/FT)	4%	7%
RIFFLE DMIN, D50², DMAX (IN)	1, 2, 3	
AVG. DROP FOR CROSS VANE, LOG DROPS, AND SINGLE LOG VANE (FT)	0.5	

[1]AVERAGE DEPTH ACROSS SECTION AT BANKFULL.
[2]D50 IS THE AVERAGE SUBSTRATE SIZE OBSERVED AT FEATURE (I.E., RIFFLE, RUN, POOL) IN EXISTING CHANNEL. PROPOSED CHANNEL FEATURES SHOULD BE CONSTRUCTED WITH SUBSTRATE FROM THE EXISTING CHANNEL. PROPOSED NEWBURY RIFFLES MAY BE ALSO CONSTRUCTED USING CLASS A1 RIPRAP; HOWEVER, CONTRACTOR SHOULD BE CAREFUL WHEN SELECTING APPROPRIATE SUBSTRATE DIAMETER SIZES.

ALL SIGNS SHOWN ARE TO BE FABRICATED AS DETAILED IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND THE "TN-SUPPLEMENT TO HIGHWAY SIGNS" (CURRENT EDITIONS)

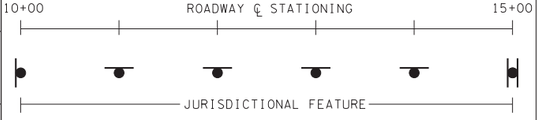
SEE STD. DWG. NO. T-S-19

SIGN NO.	LEGEND	SIZE		SIGN FACE			STEEL DESIGN (BREAK-AWAY)		MIN. VERTICAL CLEARANCE
		LENGTH	HEIGHT	COPY	BACKGROUND	MATERIAL	SUPPORT TYPE	SUPPORT LENGTH	
1	Protected Area Do Not Mow Or Spray	24"	18"	BLACK	WHITE (REF.)	0.080" SHEET ALUMINUM	U6	h=13′-6"	5′-0"

"PROTECTED AREA DO NOT MOW OR SPRAY" SIGN LAYOUT TABLE

FEATURE	STATION FROM	STATION TO	SPACING	NO. OF SIGNS
STR-21/22	348+85	356+85	100′	9
WTL-13	230+00	233+00	100′	4

SEE TABLE FOR SPACING



FOR STANDARDIZATION OF LOCATION AND LATERAL CLEARANCE SEE SUBSECTIONS 2A-16 AND 2A-19 OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

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COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00008178 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

SR-29 STREAM RELOCATION DETAILS

Survey & Design Division

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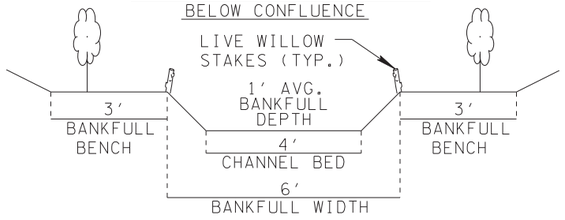
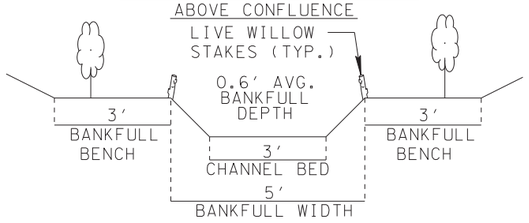
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	NS-3

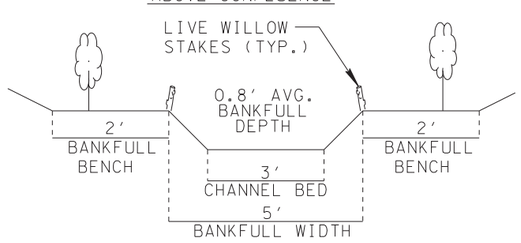
STR-21 TYPICAL RIFFLE/RUN SECTION BELOW CONFLUENCE

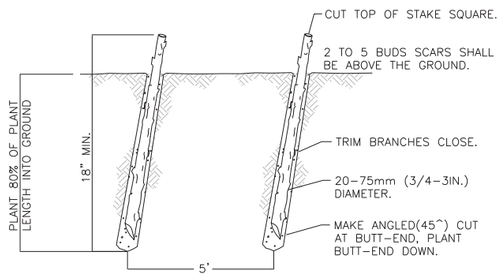


STR-21 TYPICAL RIFFLE/RUN SECTION ABOVE CONFLUENCE



STR-22 TYPICAL RIFFLE/RUN SECTION ABOVE CONFLUENCE

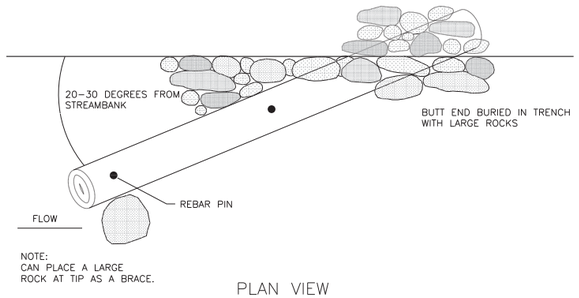




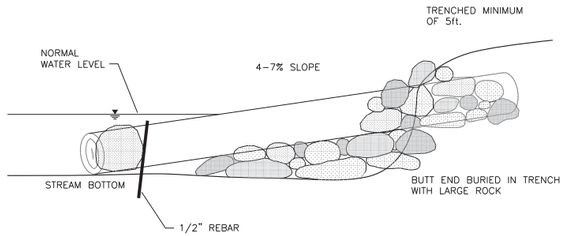
DETAIL:
LIVE STOUT STAKES SHOULD BE LONG ENOUGH TO REACH BELOW THE GROUNDWATER TABLE. (GENERALLY, A LENGTH OF 2 TO 3 FEET) ADDITIONALLY, THE STAKES SHOULD HAVE A DIAMETER IN THE RANGE OF 0.75 TO 3.0 INCHES.

NOTES:
1. HARVEST AND PLANT STAKES DURING THE DORMANT SEASON.
2. USE HEALTHY, STRAIGHT AND LIVE WOOD AT LEAST 1 YEAR OLD.
3. MAKE CLEAN CUTS AND DO NOT DAMAGE STAKES OR SPLIT ENDS DURING INSTALLATION: USE AN IRON BAR AND PILOT HOLE IN FIRM SOILS.
4. SOAK CUTTINGS FOR AT LEAST 24 HOURS PRIOR TO INSTALLATION. SOAK FOR 5-7 DAYS FOR BEST RESULTS.
5. PLANT STAKE AT THE BREAK POINT OF THE BANKFULL BENCH AND CHANNEL BED SLOPE.
6. TAMP THE SOIL AROUND THE STAKE.

LIVE STAKES
N.T.S.

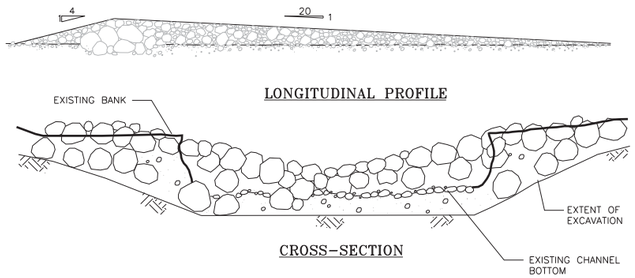


PLAN VIEW



SECTION VIEW

SINGLE LOG VANE DEFLECTOR
N.T.S.



NEWBURY ROCK RIFFLES
N.T.S.

SCOPE

A BOULDER SILL IS PRIMARILY USED FOR GRADE CONTROL. THIS STRUCTURE SERVES TO MAINTAIN THE INTEGRITY OF THE UPSTREAM PROFILE FEATURE AND PREVENT A HEADCUT. BOULDERS ARE PLACED IN THE CHANNEL BOTTOM FOR STABILITY. EXISTING COARSE CHANNEL SUBSTRATE SHALL BE USED FOR BACKFILL. THE QUANTITY OF BOULDER SILLS MAY BE INCREASED, DECREASED, OR ELIMINATED ENTIRELY AT THE DIRECTION OF THE DESIGNER.

MATERIALS

ALL MATERIALS SHALL MEET THE REQUIREMENTS OF STRUCTURE BOULDERS AS OUTLINED IN SPECIAL PROVISION ?STRUCTURE BOULDERS, SECTION 4.01.

CONSTRUCTION METHOD

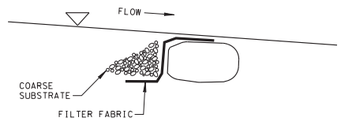
A TRENCH SHALL BE DUG IN SUCH A MANNER THAT THE BOULDERS ARE BURIED BENEATH THE BED SURFACE ELEVATION. THE ELEVATION AT THE TOP OF THE BOULDER IN THE CENTER OF THE STREAM SHOULD BE THE DESIGN ELEVATION. REFER TO THE CONSTRUCTION PLANS FOR EXACT INSTALLATION GUIDE AND LOCATIONS OF BOULDER SILLS TO BE CONSTRUCTED. AN EXCAVATOR, WITH A BUCKET THAT INCLUDES A HYDRAULIC THUMB, SHALL BE USED TO PLACE BOULDERS UNDER THE SUPERVISION OF DESIGNER. BOULDERS SHALL BE SELECTED AND POSITIONED SUCH THAT THEY BUTT TIGHTLY TOGETHER AND THERE ARE MULTIPLE CONTACT POINTS BETWEEN ALL BOULDERS (FLAT SMOOTH SURFACES THAT FIT TOGETHER). LARGE GAPS BEHIND BOULDERS SHALL BE CHINKED BEFORE LAYING DOWN FILTER FABRIC TO PREVENT PIPING ISSUES, SEALING UP-STREAM SIDE OF STRUCTURE. FILTER FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE STRUCTURE. FILTER FABRIC SHALL BE PLACED THE ENTIRE LENGTH OF THE STRUCTURE. GAPS BETWEEN BOULDERS SHALL BE FILLED WITH A COARSE CHANNEL SUBSTRATE WHEN AVAILABLE UNTIL PLUGGED. IF EXISTING CHANNEL SUBSTRATE IS NOT AVAILABLE, A COMBINATION OF CLASS A AND NO. 57 STONE CAN BE USED. BOULDERS AT BOTH BANKS SHALL BE TIED IN SECURELY TO THE BANK IN SUCH A WAY THAT ELIMINATES THE CUTTING AROUND THE STRUCTURE. STRUCTURES SHALL BE BUILT TO THE APPROVAL OF THE DESIGNER. THE DESIGNER MAY ADJUST THE NUMBER AND PLACEMENT OF STRUCTURES IN THE FIELD.

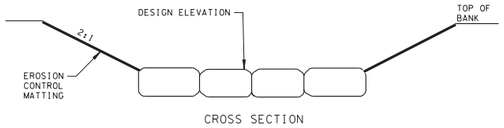
METHOD OF MEASUREMENT

THE QUANTITY OF BOULDER SILLS TO BE PAID FOR WILL BE MEASURED IN THE NUMBER OF BOULDER SILLS PROPERLY CONSTRUCTED AND APPROVED BY THE DESIGNER. BOULDERS, NO. 57 STONE, CLASS A STONE, AND FILTER FABRIC WILL BE INCIDENTAL.

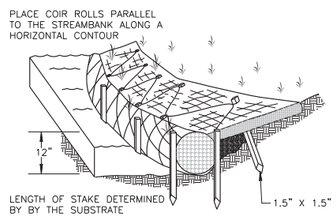
BASIS OF PAYMENT

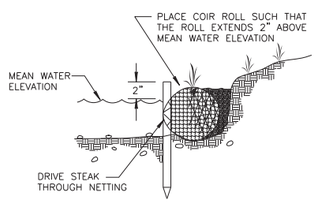
PAYMENT FOR CONSTRUCTION OF BOULDER SILL SHALL BE FOR AS OUTLINED. THIS PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL LABOR, EQUIPMENT, HAULING, PLACING, HANDLING, SORTING, FITTING, MATERIALS, AND INCIDENTALS NECESSARY TO CONSTRUCT THE BOULDER SILL (IE. BOULDERS, FILTER FABRIC, ETC.).





DETAIL - BOULDER SILL
N.T.S.





DETAIL - COIR ROLL
N.T.S.

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COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00008178 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

SR-29 STREAM RELOCATION DETAILS

SCALE: AS SHOWN

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	NH-29(86)	NS-4

ENVIRONMENTAL – ECOLOGY

1. THE NEW CHANNEL MUST BE CONSTRUCTED TO ALLOW NATIVE STONE (BOULDERS, COBBLES, ETC.) FROM THE EXISTING CHANNEL TO BE HARVESTED FOR PLACEMENT IN THE NEW CHANNEL.

2. THE FOLLOWING IS THE RECOMMENDED CONSTRUCTION SEQUENCE:

   A. FLAG EDGE OF THE NEW CHANNEL TOP BANK PRIOR TO CLEARING. DO NOT CLEAR LARGE TREES IN POSITION TO SHADE THE NEW CHANNEL. LEAVE AS MANY TREES AND SHRUBS AS POSSIBLE AS A STREAM BUFFER.
   B. EXCAVATE CHANNEL "IN THE DRY" LEAVING AREAS OF UNDISTURBED EARTH AT BOTH ENDS.
   C. INSTALL GRAVITY BYPASS PIPE FOR EXISTING STREAM.
   D. SHAPE CHANNEL TO SPECIFICATIONS SHOWN. REMOVE LOOSE SOILS AND DEBRIS.
   E. IF SUFFICIENT NATIVE STONE (AS APPROVED BY ENGINEER) IS NOT ENCOUNTERED WITHIN THE NEW CHANNEL EXCAVATION, THEN EXCAVATE NATIVE STONE. FROM EXISTING STR-1.
   F. PLACE TOPSOIL, SEED & EROSION CONTROL BLANKET AS SPECIFIED.
   G. REMOVE DIVERSION BERMS, BEGINNING WITH THE MOST DOWNSTREAM BERM. BANKS AND BOTTOM ELEVATION OF THE OLD CHANNEL SHOULD TRANSITION SMOOTHLY INTO THE NEW CHANNEL. THE ELEVATIONS OF THE NEW CHANNEL BOTTOM AT EACH END OF THE RELOCATION SEQUENCE SHOULD MATCH THE ELEVATIONS OF THE EXISTING CHANNEL, AND A STEADY PERCENT SLOPE SHOULD BE MAINTAINED THROUGHOUT THE RELOCATED CHANNEL CENTERLINE OR AS SPECIFIED.
   J. INSTALL TREES ACCORDING TO DETAIL.

3. CONTRACTOR IS ENCOURAGED TO EXCAVATE THE MAIN PROFILE OF THE NEW CHANNEL FIRST, THEN, AS DROP STRUCTURES ARE CONSTRUCTED WITHIN THE NEW CHANNEL, POOLS CAN BE EXCAVATED ACCORDING TO THE TYPICAL PROFILE FOR THE GIVEN REACH (UPPER, MIDDLE, OR LOWER).

4. STABILIZE THE BANKS OF THE NEW CHANNEL WITH SEED AND COIR EROSION CONTROL BLANKET BEFORE ANTICIPATED RAINFALL.

5. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. LIVE STAKES, BIOENGINEERING MEASURES, SEEDING, AND SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW?WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.

6. REQUESTS BY ANY AGENCY THAT WOULD REQUIRE THE MODIFICATION OF CHANNELS, DITCHES, ELEVATIONS, RIP?RAP OR ANY OTHER STREAM MITIGATION ITEMS ASSOCIATED WITH THE CHANNEL RELOCATIONS SHALL BE REFERRED TO THE PROJECT ENGINEER.

SPECIAL NOTES

1. THIS IS A STREAM RELOCATION PROJECT THAT IS TO BE DONE IN ACCORDANCE WITH 404/401 WATER QUALITY CERTIFICATION.

2. ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE WITH SEED/STRAW MULCH OR HYDROSEED UNLESS OTHERWISE NOTED IN THE PLANS OR BY THE ENGINEER.

TREES:

NO SUBSTITUTIONS OF TREE SPECIES OR SIZES SHALL BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER/LANDSCAPE ARCHITECT. CONCERNING STREAM MITIGATION, TREES SHALL BE OF THE VARIETY REQUESTED, BARE ROOT (ROOTS MUST BE KEPT MOIST AT ALL TIMES), AND FIRST QUALITY. ANY FOUND TO BE INCORRECT SPECIES, OR IMPROPERLY PLANTED, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. STAKES AND WIRES SHALL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER.

SHRUB SPECIES SHOULD BE 1-GALLON CONTAINER GROWN OR BALL AND BURLAP STOCK. SHRUBS SHOULD BE PLACED ON 10-FOOT CENTERS.

LIVE STAKE ELDERBERRY AND SILKY DOGWOODS WILL ALSO BE USED ALONG THE STREAMBANK. CONSTRUCTION SPECIFICATIONS FOR LIVE STAKES.

1. HARVESTING:

   A. LIVE STAKES MAY CONSIST OF A COMBINATION OF SILKY DOGWOOD AND ELDERBERRY.

   B. STAKES SHOULD BE HARVESTED AND. PLANTED WHEN THE WILLOWS OR OTHER CHOSEN SPECIES ARE DORMANT. THIS PERIOD IS GENERALLY FROM LATE FALL TO EARLY SPRING, OR BEFORE THE BUDS START TO BREAK.

   C. WHEN HARVESTING CUTTINGS, SELECT HEALTHY, LIVE WOOD THAT IS REASONABLY STRAIGHT.

   D. USE LIVE WOOD AT LEAST 1 YEAR OLD OR OLDER. THE BEST WOOD IS 2 TO 5 YEARS OLD WITH SMOOTH BARK THAT IS NOT DEEPLY FURROWED.

   E. MAKE CLEAN CUTS WITH UNSPLIT ENDS. TRIM BRANCHES FROM CUTTING AS CLOSE AS POSSIBLE. CUT THE BUTT END OF THE CUTTING AT AN ANGLE (r-45 DEGREES) AND THE TOP END SQUARE.

   F. THE TOP. (SQUARE CUT END) SHOULD BE PAINTED AND SEALED BY DIPPING THE TOP 1-INCH TO 2-INCHES INTO A 50-50 MIX OF LIGHT COLORED LATEX PAINT AND WATER. THIS REDUCES THE POSSIBILITY OF DESICCATION AND DISEASE CAUSING MORTALITY AND MAKES THEM MORE VISIBLE FOR SUBSEQUENT PLANTING EVALUATIONS. ASSURE THE STAKES ARE PLANTED WITH THE TOP UP.

   G. CUTTINGS SHOULD GENERALLY BE BETWEEN 0.5-INCHES TO 2-INCHES IN DIAMETER BUT CAN BE LARGER DEPENDING ON THE SPECIES. HIGHEST SURVIVAL RATES ARE OBTAINED FROM USING CUTTINGS 2-INCHES TO 3-INCHES IN DIAMETER. LARGER DIAMETER CUTTINGS ARE NEEDED FOR PLANTING INTO ROCK RIPRAP.

   H. CUTTINGS. OF SMALL DIAMETER (UP TO 1.5-INCHES) SHOULD BE 18 INCHES LONG MINIMUM. THICKER CUTTINGS SHOULD BE LONGER.

   I. STAKES SHOULD BE CUT SO A TERMINAL BUD SCAR IS WITHIN 1-INCH TO 4-INCHES OF THE TOP. AT LEAST TWO BUDS AND/OR BUD SCARS SHOULD BE ABOVE THE GROUND AFTER PLANTING.

2. INSTALLATION:

   A. STAKES MUST BE PLANTED WITH BUTT-ENDS INTO THE GROUND. LEAF BUD SCARS OR EMERGING BUDS SHOULD ALWAYS POINT UP.

   B. STAKES MUST NOT BE ALLOWED TO DRY OUT. THE CUTTINGS NOT PLANTED THE DAY THEY ARE HARVESTED SHOULD BE SOAKED IN WATER FOR A MINIMUM OF 24 HOURS AS SOAKING SIGNIFICANTLY INCREASES THE SURVIVAL RATE OF THE CUTTINGS.

   C. PLANT STAKE AT THE BREAK POINT OF THE BANKFULL BENCH AND CHANNEL BED SLOPE.

   D. PLANT STAKES 5 FEET APART AND ALTERNATE SPECIES.

   E. SET THE STAKE AS DEEP AS POSSIBLE INTO THE SOIL, PREFERABLY WITH '80 PERCENT OF ITS LENGTH BURIED BUT NO LESS THAN ONE-HALF OF THE TOTAL LENGTH BURIED.

   F. TAMP THE SOIL AROUND THE CUTTING.

USE AN IRON STAKE OR BAR TO MAKE A PILOT HOLE IN FIRM SOIL OR BETWEEN RIPRAP. DRIVE LIVE STAKES INTO THE SOIL WITH A RUBBER MALLET OR DEAD-BLOW HAMMER.

MULCHING OF SEEDED AREAS

ALL SEEDED AREAS ARE TO BE COVERED BY STRAW MULCH. HYDROSEEDING IN WHICH SEED, TACKIFIER, AND MULCH IS IN THE MIX MAY BE USED IN LIEU OF STRAW MULCH.

STANDARD STREAM MITIGATION

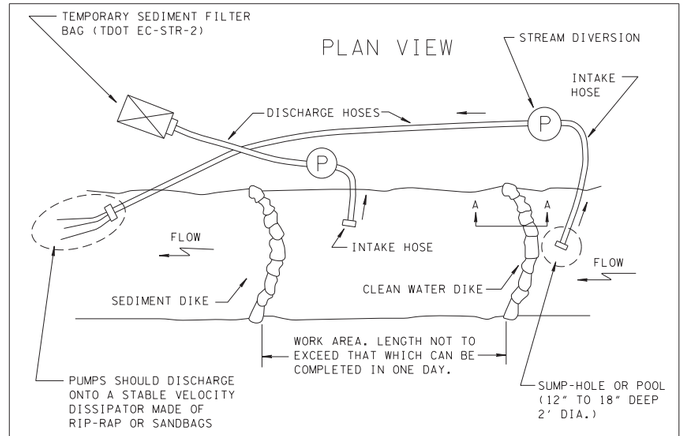
1. CHANNEL LENGTH PLACED IN SPRING-BOXES OR CULVERTS COUNTS AS PART OF THE NEW CHANNEL LENGTH (BUT MAY REQUIRE OFF-SITE COMPENSATORY MITIGATION THAT WOULD NOT BE REQUIRED FOR AN OPEN CHANNEL).
2. THE USE OF RIP-RAP SHOULD BE AVOIDED IF POSSIBLE. IF RIP-RAP IS REQUIRED, THE RIP-RAP SHOULD BE IMBEDDED INTO THE SOIL SO THE TOP OF THE RIP-RAP IS FLUSH WITH THE BOTTOM AND SIDES OF THE CHANNEL.
3. PLANT TWO ALTERNATING ROWS OF TREE OR SHRUB SPECIES ON BOTH SIDES OF THE NEW CHANNELS; THE FIRST ROW SHALL BE BARE ROOT SEEDLINGS THAT ARE PLANTED ON THE CHANNEL SLOPE, CENTERED ON THE MIDPOINT OF THE SLOPE. ALONG THE TOP OF BANK, 3-GALLON CONTAINER-GROWN TREES ARE TO BE PLANTED WITHIN ONE FOOT OF THE TOP OF BANK.
4. RIP-RAP, IF REQUIRED, SHOULD BE LIMITED TO ENDS OF CULVERTS.
5. ALL RELOCATED CHANNELS AND THEIR ACCOMPANYING MITIGATION FEATURES, INCLUDING TREES, ARE TO BE PLACED IN RIGHT-OF-WAY RATHER THAN EASEMENTS.

CHANNEL RELOCATION SEQUENCE AND IMPELEMENTATION NOTES FOR RELOCATED STREAM CHANNELS (IGNORE REFERENCES TO ITEMS NOT SPECIFIED)

1. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. RIP-RAP (ONLY AS SHOWN ON PLANS), SEEDING, AND SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW-WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.
2. CHANNEL RELOCATION SEQUENCE:
   A. FLAG EDGE OF THE NEW CHANNEL TOP BANK PRIOR TO CLEARING. DO NOT CLEAR LARGE TREES IN POSITION TO SHADE THE NEW CHANNEL. LEAVE AS MANY TREES AND SHRUBS AS POSSIBLE BETWEEN THE TOE OF THE NEW HIGHWAY SLOPE AND THE STREAM.
   B. EXCAVATE THE NEW CHANNEL "IN THE DR Y" BY LEAVING AREAS OF UNDISTURBED EARTH (DIVERSION BERMS) IN PLACE AT BOTH ENDS.
   C. SHAPE CHANNEL TO SPECIFICATIONS SHOWN. REMOVE LOOSE SOILS AND DEBRIS.
   D. PLACE TOPSOIL, EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER, SEED AND SOD AS SPECIFIED
   E. REMOVE DIVERSION BERMS, BEGINNING WITH THE MOST DOWNSTREAM, BANKS AND BOTTOM ELEVATION OF THE OLD CHANNEL SHOULD TRANSITION SMOOTHLY INTO THE NEW CHANNEL. THE ELEVATIONS OF THE NEW CHANNEL BOTTOM AT EACH END OF THE RELOCATION SEQUENCE SHOULD MATCH THE ELEVATIONS OF THE EXISTING CHANNEL, AND A STEADY PERCENT SLOPE SHOULD BE MAINTAINED THROUGHOUT THE RELOCATED CHANNEL CENTERLINE OR AS SPECIFIED.
   F. INSTALL TREES ACCORDING TO STANDARD SPECIFICATIONS SECTION 802.
3. ONLY RIP-RAP SHOWN ON PLANS SHOULD BE USED IN THE RELOCATED CHANNEL REACH. ANY OTHER PROPOSED RIP-RAP SHOULD BE COORDINATED WITH THE ENVIRONMENTAL DIVISION THROUGH THE TDOT HEADQUARTERS CONSTRUCTION OFFICE.
4. REQUESTS BY ANY AGENCY THAT WOULD REQUIRE THE MODIFICATION OF CHANNELS, DITCHES, ELEVATIONS, RIP-RAP OR ANY OTHER STREAM MITIGATION ITEMS ASSOCIATED WITH THE CHANNEL RELOCATIONS SHALL BE REFERRED TO THE TDOT ENVIRONMENTAL DIVISION VIA THE HEADQUARTERS CONSTRUCTION OFFICE FOR COORDINATION WITH ALL INVOLVED AGENCIES AND TDOT DIVISIONS.
5. IF THE RELOCATED CHANNEL FLOWS INTO A PROPOSED CULVERT, THE NEW CHANNEL SHALL BE RELOCATED PRIOR TO INSTALLATION OF THE CULVERT TO ENSURE CORRECT ELEVATION LEVELS ARE SET FOR THE INLET. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. RIP-RAP (ONLY AS SHOWN ON PLANS). SEEDING OR SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.

TREES

1. NO SUBSTITUTIONS OF TREE SPECIES OR SIZES SHALL BE ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE TOOT ENVIRONMENTAL DIVISION. CONCERNING STREAM MITIGATION, TREES SHALL BE OF THE VARIETY REQUESTED, AND FIRST QUALITY. CONCERNING TEMPORARY WETLAND MITIGATION, TREES SHALL BE OF THE VARIETY REQUESTED, WELL BRANCHED, BARE ROOT (ROOTS MUST BE KEPT MOIST AN ALL TIMES), AND FIRST QUALITY. NO CLONES OR CULTIVARS WILL BE ACCEPTED. ANY FOUND TO BE INCORRECT SPECIES, OR IMPROPERLY PLANTED, AT ANY TIME PRIOR TO TERMINATION OF THE CONTR ACT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. STAKES AND WIRES SHALL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION, UNLESS OTHER WISE DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHOULD ARRANGE SEVERAL MONTHS AHEAD OF TIME TO OBTAIN THE CORRECT TREE SPECIES, AS SOME MAY REQUIRE SOME TIME TO LOCATE.
3. ALL TREES PLANTED SHALL BE WRAPPED AS PER SECTION 802.07 OF TD OT STANDARD SPECIFICATIONS FOR THE ROAD AND BRIDGE CONSTRUCTION.
4. TREES SHALL BE WATERED AS REQUIRED THROUGH THE PERIOD OF ESTABLISHMENT TO ENSURE SURVIVAL.



NOTE: ALL IN STREAM WORK IS TO BE PERFORMED IN THE DRY, SEPERATED FROM FLOWING WATER.

PUMP AROUND TYPICAL
N.T.S.

SOURCE: MARYLAND'S WATERWAY CONSTRUCTION GUIDELINES, NOVEMBER 2000

DESCRIPTION

THE WORK SHOULD CONSIST OF INSTALL'NG A TEMPORARY PUM? AROUND AND SUPPORTING MEASURES TO DIVERT FLOW AROUND IN-STREAM CONSTRUCTION SITES.

IMPLEMENTATION SEQUENCE

SEDIMENT CONTROL MEASURES, PUMP-AROUND PRACTICES, AND ASSOCIATED CHANNEL AND BANK CONSTRUCTION SHOULD BE COMPLETED IN THE FOLLOWING SEQUENCE

1. CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHOULD NOT BEGIN UNTIL ALL NECESSARY EASEMENTS AND/OR RIGHT-OF-WAYS HAVE BEEN ACQUIRED. ALL EXISTING UTILITIES SHOULD BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES THAT MAY RESULT FROM CONSTRUCTION AND SHOULD REPAIR THE DAMAGE AT HIS/HER OWN EXPENSE TO THE CITY'S, COUNTY'S OR UTILITY COMPANY'S SATISFACTION.
2. THE CONTRACTOR SHOULD STAKE OUT ALL LIMITS OF DISTURBANCE PRIOR TO THE PRE-CONSTRUCTION MEETING SO THEY MAY BE REVIEWED. THE PARTICIPANTS WILL ALSO DESIGNATE THE CONTRACTOR'S STAGING AREAS AND FLAG OLL TREES WITHIN THE LIMIT OF DISTURBANCE WHICH WILL BE REMOVED FOR CONSTRUCTION ACCESS. TREES SHOULD NOT BE REMOVED WITHIN THE LIMIT OF DISTURBANCE WITHOUT APPROVAL FROM T.D.O.T. OR THEIR DESIGNATED REPRESENTATIVE.
3. CONSTRUCTION SHOULD NOT BEGIN UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. THE CONTRACTOR SHOULD STAY WITHIN THE LIMITS OF THE DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORK AREA WHENEVER POSSIBLE.
4. UPON INSTALLATION OF ALL SEDIMENT CONTROL MEASURES AND APPROVAL BY THE SEDIMENT CONTROL INSPECTOR, THE CONTRACTOR SHOULD BEGIN WORK AT THE UPSTREAM SECTION AND PROCEED DOWNSTREAM BEGINNING WITH THE ESTABLISHMENT OF STABILIZED CONSTRUCTION ENTRANCES. IN SOME CASES, WORK MAY BEGIN DOWNSTREAM, IF APPROPRIATE, THE CONTRACTOR SHOULD ONLY BEGIN WORK IN AN AREA WHICH CAN BE COMPLETED BY THE END OF THE DAY INCLUDING GRADING ADJACENT TO THE CHANNEL. AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED FROM THE CHANNEL. WORK SHOULD NOT BE CONDUCTED IN THE CHANNEL DURING RAIN EVENTS.
5. SANDBAG DIKES SHOULD BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA AS SHOWN ON THE PLANS, AND STREAM FLOW SHOULD BE PUMPED AROUND THE WORK AREA. THE PUMP SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER MADE OF RIPRAP OR SANDBAGS.
6. WATER FROM THE WORK AREA SHOULD BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN, SEDIMENT BAG, OR OTHER APPROVED SOURCE. THE MEASURE SHOULD BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DIKE.
7. TRAVERSING A CHANNEL REACH WITH EQUIPMENT WITHIN THE WORK AREA WHERE NO WORK IS PROPOSED SHOULD BE AVOIDED. IF EQUIPMENT HAS TO TRAVERSE SUCH A REACH FOR ACCESS TO ANOTHER AREA, THEN TIMBER MATS OR SIMILAR MEASURES SHOULD BE USED TO MINIMIZE DISTURBANCE TO THE CHANNEL. TEMPORARY STREAM CROSSINGS SHOULD BE USED ONLY WHEN NECESSARY AND ONLY WHERE NOTED ON THE PLANS OR SPECIFIED.
8. ALL STREAM RESTORATION MEASURES SHOULD BE INSTALLED AS INDICATED BY THE PLANS AND ALL BANKS GRADED IN ACCORDANCE WITH THE GRADING PLANS AND TYPICAL CROSS-SECTIONS. ALL GRADING MUST BE STABILIZED AT THE END OF EACH DAY WITH SEED AND MULCH OR SEED AND MATTING AS SPECIFIED ON THE PLANS.
9. AFTER AN AREA IS COMPLETED AND STABILIZED, THE CLEAN WATER DIKE SHOULD BE REMOVED. AFTER THE FIRST SEDIMENT FLUSH, A NEW CLEAN WATER DIKE SHOULD BE ESTABLISHED UPSTREAM FROM THE OLD SEDIMENT DIKE. FINALLY, UPON ESTABLISHMENT OF A NEW SEDIMENT DIKE BELOW THE OLD ONE, THE OLD SEDIMENT DIKE SHOULD BE REMOVED.
10. A PUMP AROUND MUST BE INSTALLED ON ANY TRIBUTARY OR STORM DRAIN OUTFALL WHICH CONTRIBUTES BASEFLOW TO THE WORK AREA. THIS SHOULD BE ACCOMPLISHED BY LOCATING A SANDBAG DIKE AT THE DOWNSTREAM END OF THE TRIBUTARY OR STORM DRAIN OUTFALL AND PUMPING THE STREAM FLOW AROUND THE WORK AREA. THIS WATER SHOULD DISCHARGE ONTO THE SAME VELOCITY DISSIPATER USED FOR THE MAIN STEM PUMP AROUND.
11. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ACCESS TO AND MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES UNTIL THE SEDIMENT CONTROL INSPECTOR APPROVES THEIR REMOVAL.
12. AFTER CONSTRUCTION, OIL DISTURBED AREAS SHOULD BE REGRADED AND REVEGETATED AS PER THE PROJECT SPECIFICATIONS.

CLINT T. BUTLER
REGISTERED ENGINEER
No. 109641
STATE OF TENNESSEE
04/27/2015

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00008178 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

SR-29 STREAM RELOCATION DETAILS

SCALE: AS SHOWN

4/21/2015 2:07:18 PM
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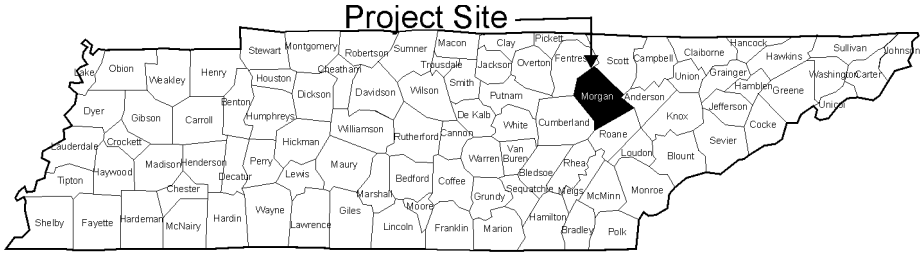
Survey & Design Division

Documentation and Permits Binder

Project Name: **SR-29 (US-27): From South of Whetstone Road to North of State Route 328**
Project No.: 65001-1256-14
PIN: 101411.05

Morgan County, Tennessee



Prepared for:
Tennessee Department of Transportation – TDOT

Prepared by:
NEEL-SCHAFFER
Solutions you can build upon

Consultant Reference No.: 11187.034

DOCUMENTS AND PERMITS BINDER

CHECKLIST

PROJECT NAME: SR-29(US-27): From South of Whetstone Rd to North of SR-328
PIN: 104411.05
PROJECT NO.: 65001-1256-14
COUNTY: Morgan County, Tennessee

1. ☒ INDEX OF REVISIONS

2. ☒ RAINFALL RECORD SHEETS

3. ☒ EPSC INSPECTION REPORTS

4. ☒ NOI AND ☐ NOC

5. ☒ BLANK NOT

6. ☒ CONSTRUCTION GENERAL PERMIT (CGP)

7. ENVIRONMENTAL PERMITS
   7.1 ☒ PERMIT APPLICATION LETTER
   7.2 PERMITS
   a. ☒ TDEC ARAP
   b. ☒ CORPS OF ENGINEERS (COE)
   c. ☒ TVA 26A
   d. ☐ OTHER

8. ☒ ECOLOGY REPORT

9. TRAINING CERTIFICATIONS

   TDEC LEVEL I
   a. ☐ EPSC INSPECTOR
   b. ☐ TDOT PROJECT SUPERVISOR
   c. ☐ TDOT PROJECT SUPERVISOR MANAGER
   d. ☐ CONTRACTOR PROJECT SUPERVISOR

   TDEC LEVEL II
   e. ☐ TDOT PROJECT SUPERVISOR MANAGER

10. TMDL INFORMATION REQUIRED

   a. ☐ Yes

   b. ☒ No

Index of SWPPP Revisions					
Revision #	Date	Revision Description	Revision on EC Sheet #	Signature of Contractor	Signature of TDOT Project Supervisor

State/US Route or Road Name: _____

TDOT Construction No.: _____ TDOT Contract No.: _____

TDOT EPSC Inspection Monthly Rainfall Data Log – _____

Date	Day of Week[1]	Predicted Precipitation (%)[2]	Rainfall Gauge 1 (in)	Rainfall Gauge 2 (in)	Rainfall Gauge 3 (in)	Rainfall Gauge 4 (in)	Rainfall Gauge 5 (in)	Rainfall Gauge 6 (in)	Duration (hr)

[1] Day of Week= Su,M,Tu,W,Th,F,Sa

[2] Predicted Precipitation Source: _____
Southern Regional Climate Center (SRCC); R = Gauge Removed

NOAA Atlas 14, Volume 2, Version 3
Location name: Harriman, Tennessee, US*
Latitude: 36.0085°, Longitude: -84.5156°
Elevation: 838 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.351** (0.322-0.385)	**0.416** (0.382-0.455)	**0.492** (0.453-0.539)	**0.557** (0.509-0.608)	**0.646** (0.586-0.705)	**0.719** (0.648-0.781)	**0.795** (0.711-0.863)	**0.875** (0.774-0.950)	**0.986** (0.860-1.07)	**1.08** (0.931-1.17)
10-min	**0.560** (0.515-0.615)	**0.665** (0.611-0.728)	**0.789** (0.725-0.863)	**0.891** (0.814-0.972)	**1.03** (0.934-1.12)	**1.14** (1.03-1.24)	**1.26** (1.13-1.37)	**1.39** (1.23-1.50)	**1.56** (1.36-1.69)	**1.70** (1.47-1.85)
15-min	**0.700** (0.644-0.769)	**0.836** (0.769-0.916)	**0.998** (0.917-1.09)	**1.13** (1.03-1.23)	**1.30** (1.18-1.42)	**1.45** (1.31-1.57)	**1.60** (1.43-1.73)	**1.75** (1.55-1.90)	**1.96** (1.71-2.13)	**2.13** (1.84-2.32)
30-min	**0.960** (0.882-1.05)	**1.16** (1.06-1.26)	**1.42** (1.30-1.55)	**1.63** (1.49-1.78)	**1.93** (1.75-2.11)	**2.18** (1.97-2.37)	**2.45** (2.19-2.65)	**2.72** (2.41-2.96)	**3.12** (2.73-3.39)	**3.45** (2.98-3.75)
60-min	**1.20** (1.10-1.31)	**1.45** (1.33-1.59)	**1.82** (1.67-1.99)	**2.13** (1.94-2.32)	**2.57** (2.34-2.81)	**2.96** (2.67-3.21)	**3.37** (3.01-3.66)	**3.82** (3.38-4.15)	**4.48** (3.91-4.87)	**5.04** (4.35-5.48)
2-hr	**1.41** (1.30-1.55)	**1.70** (1.56-1.86)	**2.13** (1.95-2.33)	**2.49** (2.27-2.72)	**3.02** (2.73-3.29)	**3.47** (3.12-3.78)	**3.96** (3.53-4.30)	**4.50** (3.97-4.88)	**5.29** (4.60-5.75)	**5.97** (5.12-6.49)
3-hr	**1.53** (1.41-1.68)	**1.84** (1.70-2.02)	**2.29** (2.10-2.50)	**2.67** (2.45-2.91)	**3.22** (2.93-3.50)	**3.69** (3.33-4.01)	**4.19** (3.75-4.55)	**4.74** (4.20-5.15)	**5.56** (4.84-6.04)	**6.24** (5.37-6.79)
6-hr	**1.92** (1.78-2.08)	**2.29** (2.12-2.49)	**2.80** (2.59-3.04)	**3.24** (2.99-3.52)	**3.87** (3.55-4.20)	**4.41** (4.01-4.77)	**4.98** (4.50-5.39)	**5.59** (5.01-6.05)	**6.48** (5.72-7.03)	**7.23** (6.31-7.85)
12-hr	**2.40** (2.23-2.59)	**2.87** (2.66-3.10)	**3.50** (3.24-3.77)	**4.02** (3.72-4.34)	**4.76** (4.39-5.14)	**5.38** (4.93-5.81)	**6.04** (5.49-6.51)	**6.74** (6.08-7.27)	**7.74** (6.90-8.37)	**8.57** (7.56-9.29)
24-hr	**2.93** (2.74-3.15)	**3.50** (3.28-3.76)	**4.27** (3.99-4.59)	**4.88** (4.56-5.24)	**5.73** (5.33-6.14)	**6.41** (5.94-6.87)	**7.11** (6.55-7.63)	**7.83** (7.18-8.42)	**8.83** (8.02-9.52)	**9.62** (8.67-10.4)
2-day	**3.61** (3.36-3.88)	**4.32** (4.02-4.64)	**5.27** (4.89-5.66)	**6.02** (5.58-6.46)	**7.05** (6.51-7.57)	**7.87** (7.24-8.46)	**8.72** (7.99-9.38)	**9.59** (8.73-10.3)	**10.8** (9.74-11.7)	**11.7** (10.5-12.7)
3-day	**3.86** (3.60-4.15)	**4.62** (4.31-4.96)	**5.62** (5.23-6.03)	**6.39** (5.94-6.86)	**7.43** (6.88-7.98)	**8.26** (7.62-8.87)	**9.09** (8.35-9.78)	**9.94** (9.09-10.7)	**11.1** (10.1-12.0)	**12.0** (10.8-13.0)
4-day	**4.12** (3.85-4.42)	**4.92** (4.60-5.28)	**5.96** (5.56-6.39)	**6.76** (6.30-7.25)	**7.82** (7.26-8.39)	**8.64** (7.99-9.28)	**9.46** (8.72-10.2)	**10.3** (9.44-11.1)	**11.4** (10.4-12.3)	**12.2** (11.1-13.3)
7-day	**5.00** (4.69-5.33)	**5.96** (5.59-6.37)	**7.16** (6.71-7.64)	**8.06** (7.55-8.60)	**9.23** (8.63-9.86)	**10.1** (9.44-10.8)	**11.0** (10.2-11.8)	**11.9** (11.0-12.7)	**13.0** (12.0-14.0)	**13.9** (12.7-15.0)
10-day	**5.69** (5.35-6.06)	**6.75** (6.36-7.18)	**8.04** (7.56-8.55)	**9.02** (8.48-9.59)	**10.3** (9.67-11.0)	**11.3** (10.6-12.0)	**12.3** (11.4-13.1)	**13.3** (12.3-14.1)	**14.5** (13.4-15.5)	**15.5** (14.2-16.6)
20-day	**7.86** (7.43-8.30)	**9.29** (8.78-9.81)	**10.8** (10.2-11.4)	**11.9** (11.2-12.6)	**13.3** (12.5-14.0)	**14.3** (13.5-15.1)	**15.2** (14.3-16.1)	**16.1** (15.1-17.1)	**17.2** (16.1-18.3)	**18.0** (16.7-19.1)
30-day	**9.68** (9.19-10.2)	**11.4** (10.8-12.0)	**13.0** (12.4-13.7)	**14.2** (13.5-14.9)	**15.6** (14.8-16.5)	**16.7** (15.8-17.6)	**17.6** (16.7-18.6)	**18.5** (17.5-19.5)	**19.5** (18.4-20.6)	**20.2** (19.0-21.4)
45-day	**12.2** (11.6-12.8)	**14.3** (13.6-15.0)	**16.2** (15.4-17.0)	**17.5** (16.7-18.4)	**19.2** (18.3-20.2)	**20.4** (19.4-21.5)	**21.5** (20.4-22.6)	**22.4** (21.3-23.7)	**23.6** (22.3-24.9)	**24.4** (23.0-25.8)
60-day	**14.6** (14.0-15.4)	**17.1** (16.3-18.0)	**19.4** (18.4-20.3)	**20.9** (19.9-22.0)	**22.8** (21.7-24.0)	**24.2** (23.0-25.4)	**25.4** (24.1-26.7)	**26.5** (25.1-27.9)	**27.7** (26.2-29.3)	**28.6** (27.0-30.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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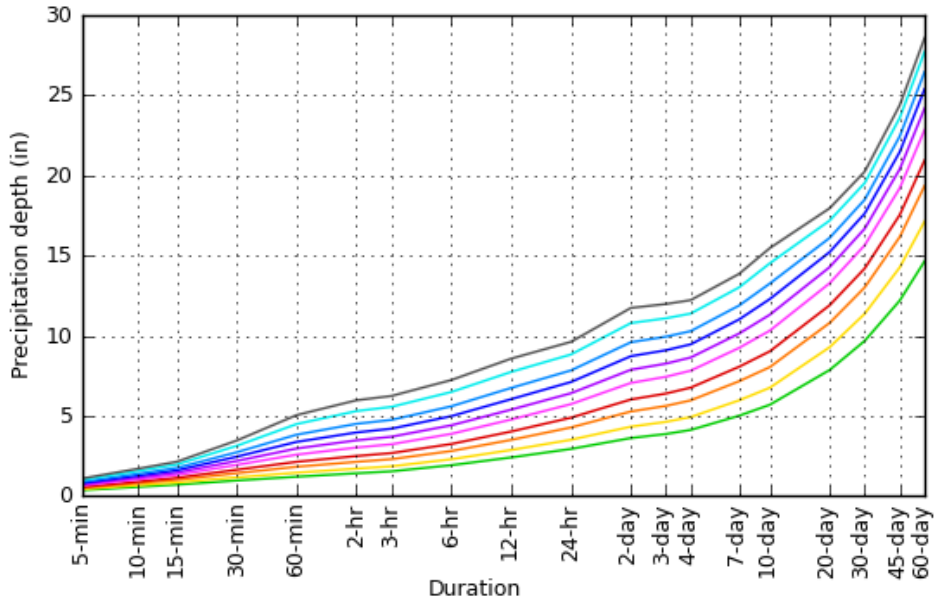
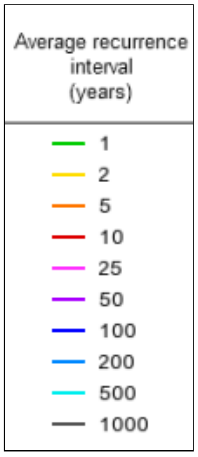
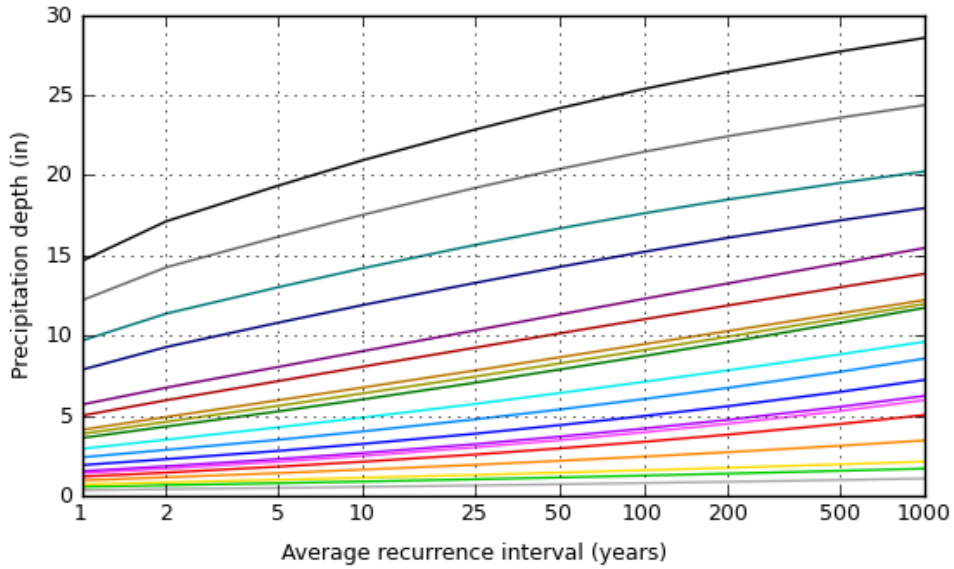
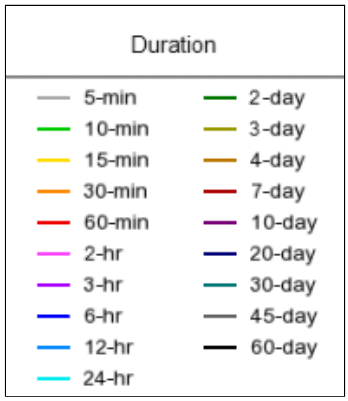
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 36.0085°, Longitude: -84.5156°









NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Sat May 9 15:28:37 2015

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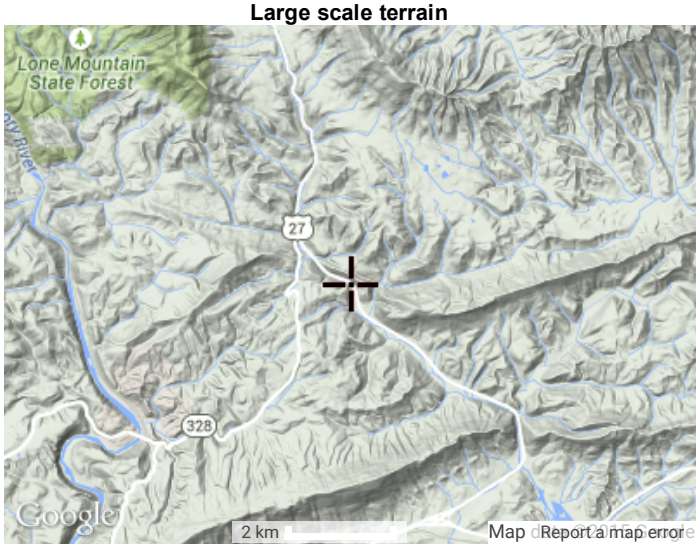
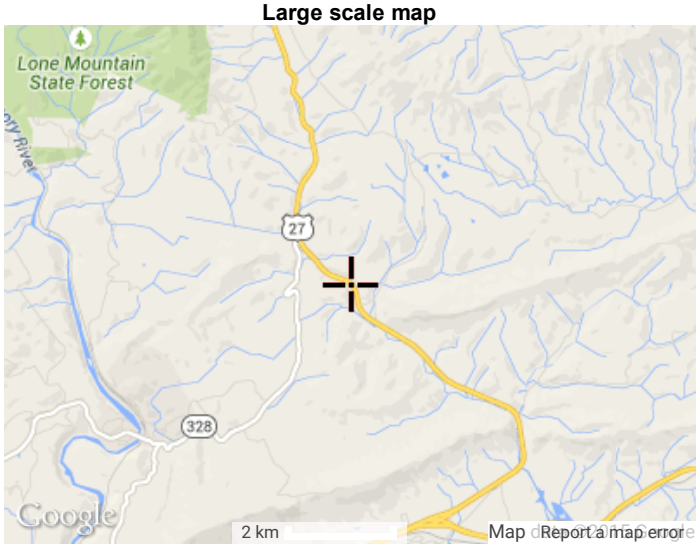
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map



Large scale aerial

CONSTRUCTION DIVISION
EPSC DELEGATION OF AUTHORITY

In accordance with Section 7.7.3 (Duly Authorized Representative) of the *Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities*, I _____ (print name of TDOT project supervisor), delegate the reporting responsibility of coordination with the erosion prevention and sediment control (EPSC) inspection services consultant for TDOT contract # _____ to:

Name: _____ (print name of TDOT delegate)

Title: _____

Address: _____

_____

_____

Phone No.: _____

Email Address: _____

I am providing delegation of authority as stated above and confirm that the TDOT delegate stated above has direct knowledge of the subject project and the ability to discuss the reports and recommendations from the EPSC inspection services consultant on the subject project directly to the contractor.

_____ (signature of TDOT Project Supervisor)

_____ (signature of TDOT delegate)

_____ (date)

The EPSC Delegation of Authority shall be submitted to the local TDEC WPC Environmental Field Office (EFO) address (see table below) for record keeping. A copy shall be placed within the on-site SWPPP Documentation and Permits Binder.

EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	8383 Wolf Lake Drive, Bartlett	38133	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305	Chattanooga	540 McCallie Avenue STE 550	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601

EPSC Chronological Log Sheet – Quarter 1 2 3 4 (Circle One)			
Date and Time	Type of Visit (Rainfall Event Visit, Weekly Inspection, QA/QC meeting, Construction meeting etc.)	Representative of EPSC inspection services consultant	TDOT Project Supervisor (or designee)

TENNESSEE DEPARTMENT OF TRANSPORTATION
EROSION PREVENTION & SEDIMENT CONTROL (EPSC) INSPECTION REPORT

EPSC Inspection Schedule (circle one): 1st Weekly or 2nd Weekly Date of Inspection:_____

Site or Project Name (State Route (SR) / US Route or Road Name and Description):			Are corrective actions required by this inspection report (Yes /No):			Current approximate disturbed acreage:
County(ies):	TDOT PIN:	NPDES Tracking Number: TNR	Number of New Corrective Actions/Deficiencies:	Number of Recurring Corrective Actions/Deficiencies:	Number of New Sediment Releases:	Number of Un-Corrected Sediment Releases:
TDOT Project No.:	TDOT Contract No.:	Contractor:				

Please check the box if the following items are on-site:

☐ Notice of Coverage (NOC) ☐ Stormwater Pollution Prevention Plan (SWPPP) ☐ Twice Weekly Inspection Documentation ☐ Site Contact Information ☐ Rain Gauge(s)

☐ Off-site Reference Rain Gauge Location:_____ Has daily rainfall been checked/documented on the TDOT Monthly Rainfall Log? ☐Yes ☐No

Best Management Practices (BMPs) **Are the Erosion Prevention and Sediment Controls (EPSCs) functioning correctly:** If "No," see attached page(s) for description.				TDOT/Contractor Agrees with EPSC Inspection Report: NO or YES. If No, Explain and initial comment:
1.	Are all applicable (EPSCs) installed and maintained per the SWPPP?	☐Yes	☐No	
2.	Are EPSC's functioning correctly at all disturbed areas/material storage areas per section 4.1.5 of the CGP?	☐Yes	☐No	
3.	Are EPSC's functioning correctly at outfall/discharge points such that there is no objectionable color contrast in the receiving stream, and no other water quality impacts per section 5.3.2 of the CGP?	☐Yes	☐No	
4.	Are EPSC's functioning correctly at ingress/egress points such that there is no evidence of track out?	☐Yes	☐No	
5.	If construction activity at any location on-site has temporarily/permanently ceased, was the area stabilized within 14 days per section 3.5.3.2 of the CGP? If, "No," refer to the attached page(s) for each location and measures taken to stabilize the area(s).	☐Yes	☐No	
6.	Have pollution prevention measures been installed, implemented, and maintained to minimize the discharge of pollutants from equipment and vehicle washing, wheel and wash water and other wash waters per section 4.1.5 of the CGP? If "No," refer to the attached page(s) for measures to be implemented to address deficiencies.	☐Yes	☐No	
7.	If applicable, have discharges from dewatering activities been managed by appropriate controls per Section 4.1.4 of the CGP? If "No," refer to the attached page(s) for measures to be implemented to address deficiencies.	☐N/A ☐Yes	☐No	
8.	If a concrete washout facility is located on site, is it clearly identified on the project and maintained? If "No," refer to the attached page(s) for measures to be implemented to address deficiencies.	☐N/A ☐Yes	☐No	(Additional pages may be attached, if needed)

Certification and Signature (must be signed by the certified inspector and the permittees per Sections 3.5.8.2 (g) and 7.7.2 of the CGP)

This document was prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated information presented. Based on my inquiry of the person(s) who manage the system, or those persons directly responsible for gathering the information, I certify that inspections of storm water discharge points (outfalls) and of erosion and sediment controls have been performed and recorded. I certify that erosion and sediment controls in the drainage area of the identified outfall were installed as planned and designed in working order as recorded in the table above. I certify, under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code annotated section 39-16-702(a) (4), this declaration is made under penalty of perjury.	EPSC Inspector Name, Title and Company (print or type): TN EPSC Certification No.:	Signature:	Date:
	Contractor (Secondary Permittee) Name and Title (print or type):	Signature:	Date:
	TDOT Project Supervisor or Designee (Primary Permittee) Name and Title (print or type):	Signature:	Date:

State/US Route or Road Name: _____ TDOT Project No.: _____ TDOT Contract No.: _____ Date of Inspection: _____

Outfall Name or Station No.	Rain Gauge No.	Approx. Station No. From/To	LT, RT, or CL	Date Last Disturbed	Date of Stabilization and Code T=Temporary P=Permanent	Existing EPSC Control Measures Codes *	Current Condition Codes *	Objectionable Color Contrast Discharge to Receiving Stream or Other Water Quality Impacts? Y, N, N/A	Corrective Action(s) or Comment(s)

EROSION PREVENTION AND SEDIMENT CONTROL MEASURE CODES

1. Temporary Silt Fence
2. Temporary Diversion Berm or Ditch
3. Temporary Slope Drain
4. Rock Check Dams
5. Brush Barrier
6. Sediment Removal
7. Rock Filter Ring / Rock Ring
8. Sand Bags
9. Sediment Trap / Basin
10. Temporary Sediment Filter Bag / Dewatering
11. Polyethylene Sheeting
12. Machined Rip Rap
13. Geotextile
14. Permanent Seeding with Mulch or Sod
15. Temporary Seeding with Mulch
16. Temporary Mulching
17. Erosion Control Blanket
18. Flexible Channel Liner
19. Catch Basin / Storm Inlet Protection
20. Riprap Outlet Structure
21. Riprap Energy / Velocity Dissipater
22. Curb, Gutter, or Storm Sewer Protection
23. Temporary Construction Exit / Entrance
24. Temporary Stream Crossing
25. Turbidity Barrier / Silt Boom
26. Temporary Stream Diversion
27. Preserve Natural Resource / Buffer Zone
28. Mineral Aggregate Base on Subgrade
29. Excess Dirt Removed from Rdwy. Daily
30. Haul Roads Dampened for Dust Control
31. Ditch Liner
32. Rock Silt Screen
33. Temporary Silt Fence with Backing
34. Enhanced Silt Fence
35. Sediment Tube
36. Sediment Dam
37. Concrete Washout, other pollution issues
38. Berm (soil, riprap, rock)
39. Gabion
40. Sheet Piling
41.
42.

CONDITION CODES

A Active (Under Construction)
C Cleaning Needed-Maintenance
FM Future Maintenance
FS Final Stabilized
I Increase Measures
R Repair and/or Replace-Maintenance
RO Repeat Occurrence
SR Sediment Release
S Stable (No Action Needed)
U Upgrade Needed (Failure Noted)
W Too Wet to Work Conditions
Other (#1): _____
Other (#2): _____
Other (#3): _____

CIRCULAR LETTER

SECTION: **209.01**
NUMBER: **209.01-04**
SUBJECT: **TDOT INSPECTION OF CONTRACTOR WASTE & BORROW SITES**
DATE: **MAY 1, 2012**

Effective with the June 18, 2010 Letting, Waste & Borrow Sites for TDOT projects will be subject to the requirements of the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects.

After the contractor has secured approval for use of an Exclusive waste and/or borrow site, he/she is responsible for performing twice weekly EPSC Inspections of that site. The contractor must have a certified EPSC inspector as required by the TDEC Construction General Permit (CGP). The certified EPSC inspector must document the inspections on the inspection form in the CGP or on TDOT's inspection report (see CL 209.01-02).

TDOT is responsible for ensuring that EPSC inspections are being performed by the contractor and shall perform a weekly review of the contractor's EPSC inspection reports. This review shall be documented using the attached form "TDOT Construction Exclusive Waste/Borrow Site Weekly EPSC Inspection Review Report" (Inspection Review Report). The TDOT EPSC representative will perform the weekly review, and shall sign a copy of the Inspection Review Report. The contractor's certified EPSC inspector shall sign a copy of the Inspection Review Report and shall be responsible for initiating and completing corrective actions for any deficiencies found during the review.

A copy of the completed Inspection Review Report shall be posted in the TDOT EPSC folder for the appropriate project on the TDOT VPN (see CL 209.01-02 for posting instructions).

TDOT Construction Exclusive Waste/Borrow Site
Weekly EPSC Inspection Review Report

Date of Review:	County :
TDOT Project Description:	
TDOT Contract Number:	Contractor:
Contractor's Waste/Borrow Area Name/Description:	
Waste/Borrow NPDES Number:	
Contractor's Certified EPSC Inspector:	Inspector's Certification Number:
Location of Contractor's Waste/Borrow Area Permits:	
Dates of Contractor's EPSC inspections (since last review):	
Name of TDOT Representative Completing Documentation Review:	

Instructions: This checklist covers the basic erosion prevention and sediment control and other stormwater construction requirements for Exclusive Waste/Borrow Areas used for TDOT projects. This report shall be completed weekly by the TDOT EPSC Representative verifying the documentation of the contractor's previous week's twice weekly EPSC inspection reports. Questions that are not applicable for the site must be marked as "N/A". Checks placed under the "No" column that indicate a deficiency requires a written explanation and/or a written corrective action and required completion date in the "TDOT EPSC Representative's Comments and Corrective Actions" section of this form. Both the TDOT EPSC Representative and the Contractor's Certified EPSC Inspector should sign the form immediately following each review.

General Information – Only need to complete during first review unless there are changes to report at subsequent reviews

	Yes	No	N/A	
1.	☐	☐	☐	Is the waste/borrow area exclusive to the above referenced TDOT project? (If not exclusive or if exempt exclusive, do not complete or answer any other questions.)
2.	☐	☐	☐	Is the NOC posted on site?
3.	☐	☐	☐	Are the SWPPP and other required CGP information available on site?
4.	☐	☐	☐	Are rain gages present and installed per requirements?
5.	☐	☐	☐	Are Streams/Wetlands/Sinkholes present on site?
6.	☐	☐	☐	If 5 is "Yes", have the applicable permits been obtained for the impacts (ARAP, USACE, TVA)?
7.	☐	☐	☐	If 5 is "Yes", are Streams/Wetlands/Sinkholes shown in the SWPPP with appropriate buffers noted?
8.	☐	☐	☐	Do the EPSC measures shown in the SWPPP and installed in the field appear adequate for the site?
9.	☐	☐	☐	Are outfall locations shown in the SWPPP? Are there outfalls in the field that aren't included in the SWPPP?
10.	☐	☐	☐	Are on-site outfall drainage areas included in the SWPPP?
11.	☐	☐	☐	Is a sediment basin required at any on-site outfalls per the TN CGP?
12.	☐	☐	☐	If 11 is "Yes", are a sediment basin and its calculations included in the SWPPP?
13.	☐	☐	☐	Does the SWPPP limit the disturbed area of the Waste/Borrow site to less than 50 acres at one time?
14.	☐	☐	☐	Does the SWPPP include at least two separate EPSC plan sheets (sites disturbing < 5 acres) or at least 3 separate EPSC plan sheets (sites disturbing > 5 acres) as required by TN CGP?

Site Specific Information – Complete during each review

	Yes	No	N/A	
15.	☐	☐	☐	Have EPSC inspections been documented twice weekly and at least 72 hours apart?
16.	☐	☐	☐	Do the EPSC inspection reports document daily rainfall for the site?
17.	☐	☐	☐	Do the EPSC inspection reports document that the project outfalls have been inspected?
18.	☐	☐	☐	Did the EPSC inspection report document sediment deposits off the permitted area?
19.	☐	☐	☐	If 18 is “Yes”, did the EPSC inspection report the sediment release was into a Stream or Wetland?
20.	☐	☐	☐	If 19 is “Yes”, did the EPSC inspection report document that contractor self-reported the sediment release to TDEC EFO?
21.	☐	☐	☐	If 19 is “No”, did the EPSC inspection report document that the off site sediment was removed or stabilized?
22.	☐	☐	☐	Have any new project outfalls been added according to the EPSC inspection reports?
23.	☐	☐	☐	If 22 is “Yes”, have new project outfalls been updated in the SWPPP?
24.	☐	☐	☐	Do the EPSC inspection reports document that EPSC measures have been installed per the SWPPP in all active areas?
25.	☐	☐	☐	Do the EPSC inspection reports document that the installed EPSC measures appear to be adequate for the site?
26.	☐	☐	☐	Do the EPSC inspection reports document that the EPSC measures are being maintained according to the SWPPP and the CGP?
27.	☐	☐	☐	Do the EPSC inspection reports document any new EPSC measures being installed?
28.	☐	☐	☐	If 27 is “Yes”, has the SWPPP been updated to reflect the new EPSC measures?
29.	☐	☐	☐	Have the dates of major grading activities been documented in accordance with the SWPPP?
30.	☐	☐	☐	Have the dates when construction activities temporarily or permanently ceased been documented in accordance with the SWPPP?
31.	☐	☐	☐	Do the EPSC inspection reports document that disturbed areas idle for more than 14 days have been temporarily or permanently stabilized?
32.	☐	☐	☐	Do the EPSC inspection reports document that temporary stabilization has been applied to any areas of the site?
33.	☐	☐	☐	Do the EPSC inspection reports document that permanent stabilization has been applied to any areas of the site?
34.	☐	☐	☐	Do the EPSC inspection reports document that steep slope areas have been stabilized in 7 days?
35.	☐	☐	☐	Do the inspection reports document the total disturbed acreage, including haul roads, stockpile areas, and other disturbances?

TDOT EPSC Representative’s Comments and Corrective Actions

Signatures - <u>Complete during each review</u>

I certify that I have completed the inspection review documented in this report.

TDOT EPSC Representative's Signature Date

I certify that any EPSC deficiency noted in the twice-weekly inspection report will be addressed in conformance with the requirements of the TN CGP. I also agree that items listed above are accurate and that any discrepancies to this report are listed below in the comments section.

Contractor's Certified Inspector Signature Date

Contractor's Certified Inspector's Comments

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Water Resources
William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, TN 37243
1-888-891-8332 (TDEC)

Notice of Intent (NOI) for General NPDES Permit for Stormwater Discharges from Construction Activities (TNR100000)

Site or Project Name: SR 29, From South of Whetstone Rd. to North of SR 328	**Existing NPDES Tracking Number: TNR**
Street Address or Location: Oakdale, TN (PIN 101411.05)	Start date: August 2015
	Estimated end date: August 2020
Site Activity Description: Widen 2.06 Miles of State Route 29	Latitude (dd.dddd): N 36.0085
	Longitude (dd.dddd): W 84.5156
County(ies): Morgan; MS4 Jurisdiction: T.D.O.T.	Acres Disturbed: 39.245
	Total Acres: 87.90

Does a topographic map show dotted or solid blue lines ■ and/or wetlands ☐ on or adjacent to the construction site?
If wetlands are located on-site and may be impacted, attach wetlands delineation report.
If an Aquatic Resource Alteration Permit has been obtained for this site, what is the permit number? ARAP permit No.: NRS 14.049

Receiving waters: Bitter Creek, Unnamed Tributaries to Bitter Creek, Forked Creek, Muddy Branch, Unnamed Tributaries to Muddy Branch

Attach the SWPPP with the NOI ■ SWPPP Attached | Attach a site location map ■ Map Attached

Site Owner/Developer Entity (*Primary Permittee*)**:** (person, company, or legal entity that has operational or design control over construction plans and specifications): Tennessee Department of Transportation

Site Owner/Developer Signatory (V.P. level/higher - signs certification below): (individual responsible for site): Jim Ozment		Signatory's Title or Position (V.P. level/higher - signs certification below): Director-Environmental Division	
Mailing Address: 900 James K. Polk Building 505 Deadrick St		City: Nashville	State: TN Zip: 37243-0334
Phone: (615) 741-5373	Fax: ( ) N/A	E-mail: Environmental.NPDES TDOT@tn.gov	
Optional Contact: DJ Wiseman		Title or Position: C.E. Manager I	
Mailing Address: 900 James K. Polk Building 505 Deadrick St		City: Nashville	State: TN Zip: 37243-0334
Phone: (615) 532-4554	Fax: ( ) N/A	E-mail: DJ.Wiseman@TN.gov	

Owner or Developer Certification (must be signed by president, vice-president or equivalent, or ranking elected official) (Primary Permittee)

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Owner or Developer Name; (print or type) Jim Ozment	Signature:	Date: June 2, 2015

Contractor(s) Certification (must be signed by president, vice-president or equivalent, or ranking elected official) (Secondary Permittee)

I certify under penalty of law that I have reviewed this document, any attachments, and the SWPPP referenced above. Based on my inquiry of the construction site owner/developer identified above and/or my inquiry of the person directly responsible for assembling this NOI and SWPPP, I believe the information submitted is accurate. I am aware that this NOI, if approved, makes the above-described construction activity subject to NPDES permit number TNR100000, and that certain of my activities on-site are thereby regulated.

Contractor company name (print or type):			
Contractor signatory (print/type): (V.P. level or higher)		Signature:	Date:
Mailing Address:		City: State:	Zip:
Phone: ( )	Fax: ( )	E-mail:	

Other Contractor company name (print or type):			
Other Contractor signatory (print/type): (V.P. level or higher)		Signature:	Date:
Mailing Address:		City: State:	Zip:
Phone: ( )	Fax: ( )	E-mail:	

OFFICIAL STATE USE ONLY

Received Date:	Reviewer:	Field Office:	Permit Number **TNR**	Exceptional TN Water:
Fee(s):	T & E Aquatic Flora and Fauna:		Impaired Receiving Stream:	Notice of Coverage Date:

Notice of Intent (NOI) for General NPDES Permit for Stormwater Discharges from Construction Activities (TNR100000)

Purpose of this form A completed notice of intent (NOI) must be submitted to obtain coverage under the Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activity (permit). **Requesting coverage under this permit means that an applicant has obtained and examined a copy of this permit, and thereby acknowledges applicant's claim of ability to be in compliance with permit terms and conditions.** This permit is required for stormwater discharge(s) from construction activities including clearing, grading, filling and excavating (including borrow pits) of one or more acres of land. This form should be submitted at least 30 days prior to the commencement of land disturbing activities, or no later than 48 hours prior to when a new operator assumes operational control over site specifications or commences work at the site.

Permit fee (see table below) must accompany the NOI and is based on total acreage to be disturbed by an entire project, including any associated construction support activities (e.g. equipment staging yards, material storage areas, excavated material disposal areas, borrow or waste sites).

Acres Disturbed	= or > 150 acres	= or > 50 < 150 acres	= or > 20 < 50 acres	= or > 5 < 20 acres	= or > 1 < 5 acres	Subsequent coverage*
Fee	$10,000	$6,000	$3,000	$1,000	$250	$100

* Subsequent Primary Operators seeking coverage under an actively covered larger common plan of development or sale

Who must submit the NOI form? Per Section 2 of the permit, all site operators must submit an NOI form. "Operator" for the purpose of this permit and in the context of stormwater associated with construction activity means any person associated with a construction project who meets either or both of the following two criteria: (1) The person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project (e.g. subsequent builder), or the person that is the current land owner of the construction site. This person is considered the primary permittee; or (2) The person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee, and is considered a secondary permittee.

Owners, developers and all contractors that meet the definition of the operator in subsection 2.2 of the permit shall apply for permit coverage on the same NOI, insofar as possible. After permit coverage has been granted to the primary permittee, any subsequent NOI submittals must include the site's previously assigned permit tracking number and the project name. The comprehensive site-specific SWPPP shall be prepared in accordance with the requirements of part 3 of the permit and must be submitted with the NOI unless the NOI being submitted is to only add a contractor (secondary permittee) to an existing coverage.

Notice of Coverage The division will review the NOI for completeness and accuracy and prepare a notice of coverage (NOC). Stormwater discharge from the construction site is authorized as of the effective date of the NOC.

Complete the form Type or print clearly, using ink and not markers or pencil. Answer each item or enter "NA," for not applicable, if a particular item does not fit the circumstances or characteristics of your construction site or activity. If you need additional space, attach a separate piece of paper to the NOI form. **The NOI will be considered incomplete without a permit fee, a map, and the SWPPP.**

Describe and locate the project Use the legal or official name of the construction site. If a construction site lacks street name or route number, give the most accurate geographic information available to describe the location (reference to adjacent highways, roads and structures; e.g. intersection of state highways 70 and 100). Latitude and longitude (expressed in decimal degrees) of the center of the site can be located on USGS quadrangle maps. The quadrangle maps can be obtained at the USGS World Wide Web site: http://www.usgs.gov/; latitude and longitude information can be found at numerous other web sites. Attach a copy of a portion of a 7.5 minute quad map, showing location of site, with boundaries at least one mile outside the site boundaries. Provide estimated starting date of clearing activities and completion date of the project, and an estimate of the number of acres of the site on which soil will be disturbed, including borrow areas, fill areas, stockpiles and the total acres. For linear projects, give location at each end of the construction area.

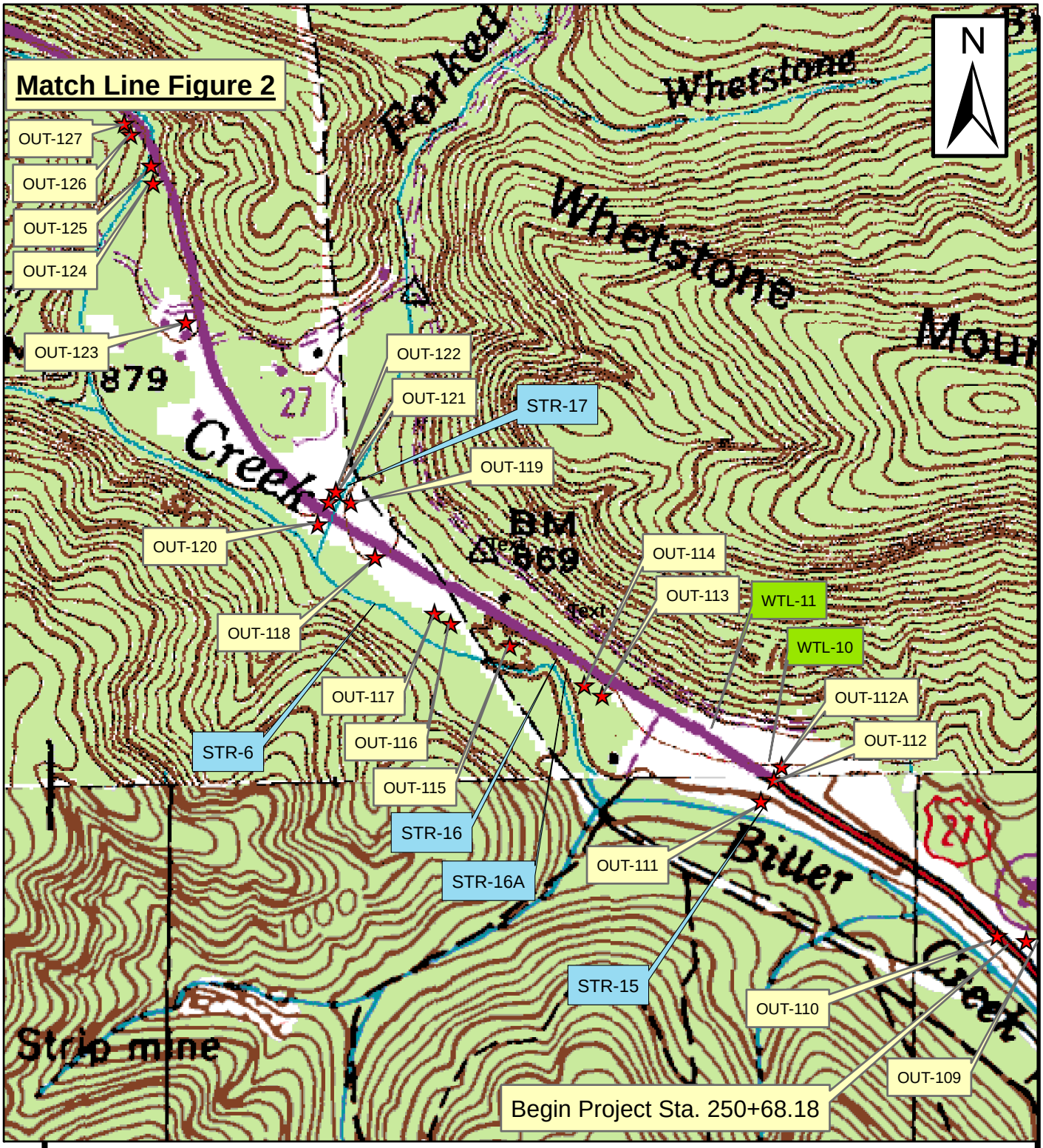
MS4 Jurisdiction: If this construction site is located within a Municipal Separate Storm Sewer System (MS4), please list name of MS4. A current list of MS4s in Tennessee may be found at http://www.state.tn.us/environment/water/water-quality_storm-water.shtml

Give name of the receiving waters Trace the route of stormwater runoff from the construction site and determine the name of the river(s), stream(s), creek(s), wetland(s), lake(s) or any other water course(s) into which the stormwater runoff drains. Note that the receiving water course may or may not be located on the construction site. If the first water body receiving construction site runoff is unnamed ("unnamed tributary"), determine the name of the water body that the unnamed tributary enters.

ARAP permit may be required **If your work will disturb or cause alterations of a stream or wetland, you must obtain an appropriate Aquatic Resource Alteration Permit (ARAP).** If you have a question about the ARAP program or permits, contact your local Environmental Field Office (EFO).

Submitting the form and obtaining more information Note that this form must be signed by the company President, Vice-President, or a ranking elected official in the case of a municipality, for details see subpart 2.5. For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC). Submit the completed NOI form (keep a copy for your records) to the appropriate EFO for the county(ies) where the construction activity is located, addressed to **Attention: Stormwater NOI Processing**.

EFO	**Street Address**	**Zip Code**	**EFO**	**Street Address**	**Zip Code**
Memphis	8383 Wolf Lake Drive, Bartlett	38133-4119	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305-4316	Chattanooga	1301 Riverfront Parkway, Suite 206	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601



Approx. Outfall Location

USGS TOPOGRAPHIC MAP

Source:
USGS Topographic Maps
Camp Austin and Harriman, Tennessee Quadrangle Map (1985)

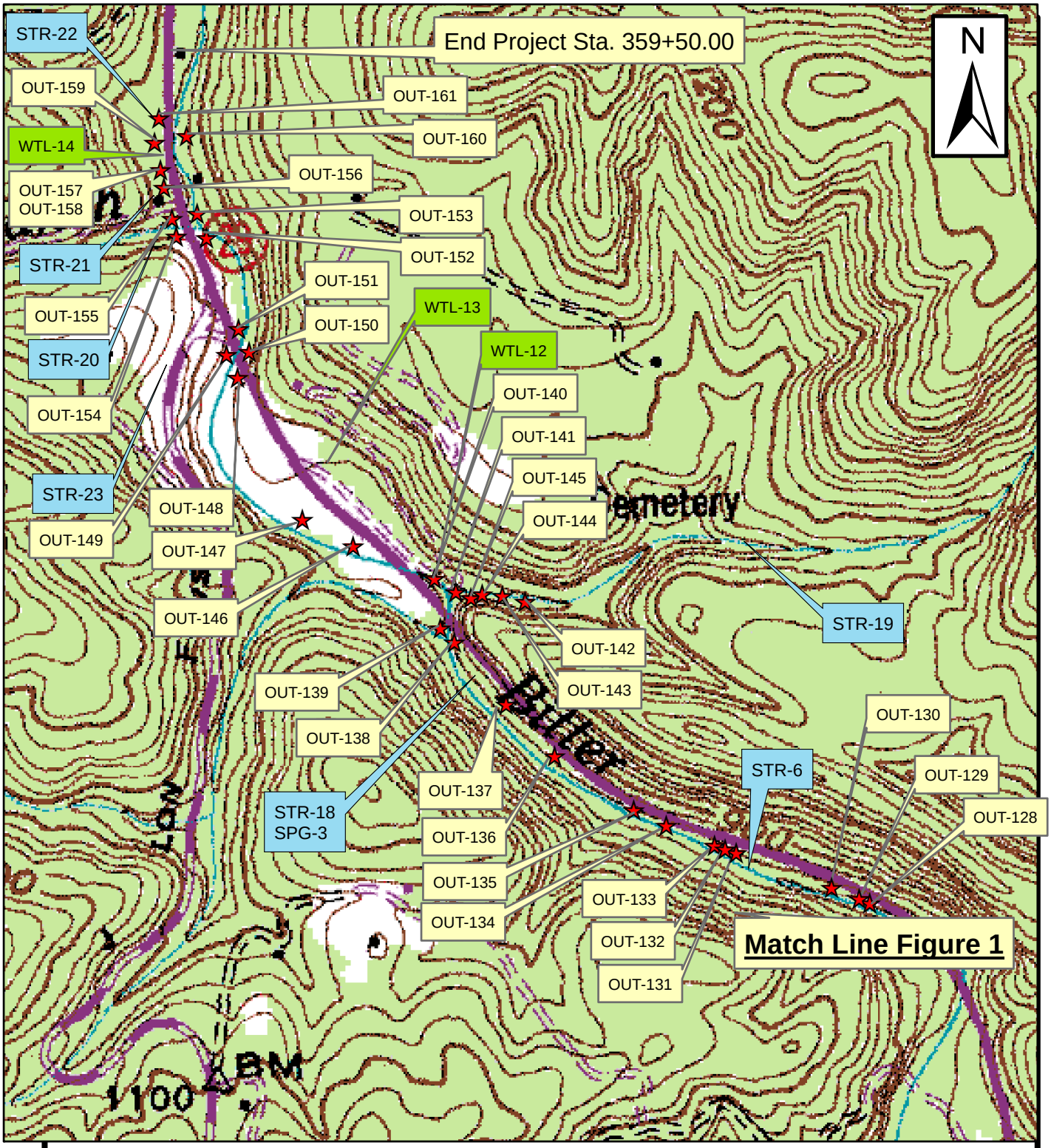
0 250 500 1,000 Feet

GRAPHIC SCALE

Stormwater Pollution Prevention Plan
SR-29(US-27): From South of Whetstone Rd
To North of SR-328
Morgan County, Tennessee

Proj. No. 65001-1256-14
PIN 101411.05

Figure 1



Approx. Outfall Location

USGS TOPOGRAPHIC MAP

0 250 500 1,000 Feet

GRAPHIC SCALE

Source:
USGS Topographic Maps
Camp Austin, Tennessee Quadrangle Map (1985)

Stormwater Pollution Prevention Plan
SR-29(US-27): From South of Whetstone Rd
To North of SR-328
Morgan County, Tennessee

Proj. No. 65001-1256-14
PIN 101411.05

Figure 2

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)
Division of Water Resources
William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243
1-888-891-TDEC (8332)

Notice of Termination (NOT) for General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)

This form is required to be submitted when requesting termination of coverage from the CGP. The purpose of this form is to notify the TDEC that either all stormwater discharges associated with construction activity from the portion of the identified facility where you, as an operator, have ceased or have been eliminated; or you are no longer an operator at the construction site. Submission of this form shall in no way relieve the permittee of permit obligations required prior to submission of this form. Please submit this form to the local DWR Environmental Field Office (EFO) address (see table below). For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC).

Type or print clearly, using ink.

Site or Project Name:	**NPDES Tracking Number: TNR**
Street Address or Location:	County(ies):

Name of Permittee Requesting Termination of Coverage:			
Permittee Contact Name:	Title or Position:		
Mailing Address:	City:	State:	Zip:
Phone:	E-mail:		

Check the reason(s) for termination of permit coverage:

☐	Stormwater discharge associated with construction activity is no longer occurring and the permitted area has a uniform 70% permanent vegetative cover OR has equivalent measures such as rip rap or geotextiles, in areas not covered with impervious surfaces.
☐	You are no longer the operator at the construction site (i.e., termination of site-wide, primary or secondary permittee coverage).

Certification and Signature: (must be signed by president, vice-president or equivalent ranking elected official)

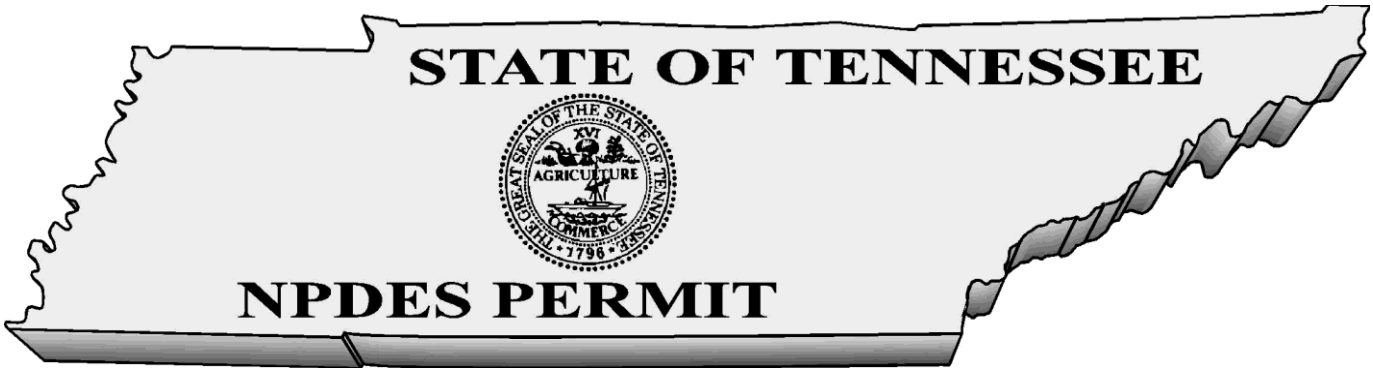
I certify under penalty of law that either: (a) all stormwater discharges associated with construction activity from the portion of the identified facility where I was an operator have ceased or have been eliminated or (b) I am no longer an operator at the construction site. I understand that by submitting this notice of termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

For the purposes of this certification, elimination of stormwater discharges associated with construction activity means that all stormwater discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have been eliminated from the portion of the construction site where the operator had control. Specifically, this means that all disturbed soils at the portion of the construction site where the operator had control have been finally stabilized, the temporary erosion and sediment control measures have been removed, and/or subsequent operators have obtained permit coverage for the site or portions of the site where the operator had control.

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Permittee name (print or type):	Signature:	Date:

EFO	**Street Address**	**Zip Code**	**EFO**	**Street Address**	**Zip Code**
Memphis	8383 Wolf Lake Drive, Bartlett, TN	38133	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305	Chattanooga	1301 Riverfront Parkway, Ste. 206	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601



GENERAL NPDES PERMIT
FOR DISCHARGES OF STORMWATER
ASSOCIATED WITH CONSTRUCTION ACTIVITIES

PERMIT NO. TNR100000

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the authorization by the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.) and the Water Quality Act of 1987, P.L. 100-4, including special requirements as provided in part 5.4 (Discharges into Impaired or Exceptional Tennessee Waters) of this general permit, operators of point source discharges of stormwater associated with construction activities into waters of the State of Tennessee, are authorized to discharge stormwater associated with construction activities in accordance with the following permit monitoring and reporting requirements, effluent limitations, and other provisions as set forth in parts 1 through 10 herein, from the subject outfalls to waters of the State of Tennessee.

This permit is issued on: **May 23, 2011**

This permit is effective on: **May 24, 2011**

This permit expires on: **May 23, 2016**

for Paul E. Davis, P.E., Director
Division of Water Pollution Control

CN-0759 RDAs 2352 and 2366

Tennessee General Permit No. TNR100000
Stormwater Discharges Associated with Construction Activities

Table of Contents

1. COVERAGE UNDER THIS GENERAL PERMIT

1.1. Permit Area

This construction general permit (CGP) covers all areas of the State of Tennessee.

1.2. Discharges Covered by this Permit

1.2.1. Stormwater discharges associated with construction activities

This permit authorizes point source discharges of stormwater from construction activities including clearing, grading, filling and excavating (including borrow pits and stockpile/material storage areas containing erodible material), or other similar construction activities that result in the disturbance of one acre or more of total land area. Projects or developments of less than one acre of land disturbance are required to obtain authorization under this permit if the construction activities at the site are part of a larger common plan of development or sale that comprise at least one acre of land disturbance. One or more site operators must maintain coverage under this permit for all portions of a site that have not been finally stabilized.

Projects or developments of less than one acre of total land disturbance may also be required to obtain authorization under this permit if:

a) the director has determined that the stormwater discharge from a site is causing, contributing to, or is likely to contribute to a violation of a state water quality standard;
b) the director has determined that the stormwater discharge is, or is likely to be a significant contributor of pollutants to waters of the state, or
c) changes in state or federal rules require sites of less than one acre that are not part of a larger common plan of development or sale to obtain a stormwater permit.

Note: Any discharge of stormwater or other fluid to an improved sinkhole or other injection well, as defined, must be authorized by permit or rule as a Class V underground injection well under the provisions of TDEC Rules, Chapter 1200-4-6.

1.2.2. Stormwater discharges associated with construction support activities

This permit also authorizes stormwater discharges from support activities associated with a permitted construction site (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided all of the following are met:

a) the support activity is primarily related to a construction site that is covered under this general permit;
b) the operator of the support activity is the same as the operator of the construction site;
c) the support activity is not a commercial operation serving multiple unrelated construction projects by different operators;
d) the support activity does not operate beyond the completion of the construction activity of the last construction project it supports; and

e) support activities are identified in the Notice of Intent (NOI) and the Stormwater Pollution Prevention Plan (SWPPP). The appropriate erosion prevention and sediment controls and measures applicable to the support activity shall be described in a comprehensive SWPPP covering the discharges from the support activity areas.

TDOT projects shall be addressed in the Waste and Borrow Manual per the Statewide Stormwater Management Plan (SSWMP). Stormwater discharges associated with support activities that have been issued a separate individual permit or an alternative general permit are not authorized by this general permit. This permit does not authorize any process wastewater discharges from support activities. Process wastewater discharges from support activities must be authorized by an individual permit or other appropriate general permit.

1.2.3. Non-stormwater discharges authorized by this permit

The following non-stormwater discharges from active construction sites are authorized by this permit provided the non-stormwater component of the discharge is in compliance with section 3.5.9 below (*Pollution prevention measures for non-stormwater discharges*):

a) dewatering of work areas of collected stormwater and ground water (filtering or chemical treatment may be necessary prior to discharge);
b) waters used to wash vehicles (of dust and soil, not process materials such as oils, asphalt or concrete) where detergents are not used and detention and/or filtering is provided before the water leaves site;
c) water used to control dust in accordance with section 3.5.5 below;
d) potable water sources including waterline flushings from which chlorine has been removed to the maximum extent practicable;
e) routine external building washdown that does not use detergents or other chemicals;
f) uncontaminated groundwater or spring water; and
g) foundation or footing drains where flows are not contaminated with pollutants (process materials such as solvents, heavy metals, etc.).

All non-stormwater discharges authorized by this permit must be free of sediment or other solids and must not cause erosion of soil or the stream bank, or result in sediment impacts to the receiving stream.

1.2.4. Other NPDES-permitted discharges

Discharges of stormwater or wastewater authorized by and in compliance with a different NPDES permit (other than this permit) may be mixed with discharges authorized by this permit.

1.3. Limitations on Coverage

Except for discharges from support activities, as described in section 1.2.2 above and certain non-stormwater discharges listed in section 1.2.3 above, all discharges covered by this permit shall be composed entirely of stormwater. This permit does not authorize the following discharges:

a) Post-Construction Discharges (Permanent Stormwater Management) - Stormwater discharges associated with construction activity that originate from the construction site

after construction activities have been completed, the site has undergone final stabilization, and the coverage under this permit has been terminated.

b) Discharges Mixed with Non-Stormwater - Discharges that are mixed with sources of non-stormwater, other than discharges which are identified in section 1.2.4 above (*Other NPDES-permitted discharges*) and in compliance with section 3.5.9 below (*Pollution prevention measures for non-stormwater discharges*) of this permit.

c) Discharges Covered by Another Permit - Stormwater discharges associated with construction activity that have been issued an individual permit in accordance with subpart 7.12 below (*Requiring an Individual Permit*).

d) Discharges Threatening Water Quality - Stormwater discharges from construction sites, that the director determines will cause, have the reasonable potential to cause, or contribute to violations of water quality standards. Where such determination has been made, the discharger will be notified by the director in writing that an individual permit application is necessary as described in subpart 7.12 below (*Requiring an Individual Permit*). However, the division may authorize coverage under this permit after appropriate controls and implementation procedures have been included in the SWPPP that are designed to bring the discharge into compliance with water quality standards.

e) Discharges into Impaired Streams – This permit does not authorize discharges that would add loadings of a pollutant that is identified as causing or contributing to the impairment of a water body on the list of impaired waters. Impaired waters means any segment of surface waters that has been identified by the division as failing to support its designated classified uses. Compliance with the additional requirements set forth in sub-part 5.4 is not considered as contributing to loadings to impaired waters or degradation unless the division determines upon review of the SWPPP that there is a reason to limit coverage as set forth in paragraph d) above and the SWPPP cannot be modified to bring the site into compliance.

f) Discharges into Outstanding National Resource Waters - The director shall not grant coverage under this permit for discharges into waters that are designated by the Water Quality Control Board as Outstanding National Resource Waters (ONRWs). Designation of ONRWs are made according to TDEC Rules, Chapter 1200-4-3-.06.

g) Discharges into Exceptional Quality Waters - The director shall not grant coverage under this permit for potential discharges of pollutants which would cause degradation to waters designated by TDEC as exceptional quality waters (see sub-part 5.4 (Discharges into Impaired or Exceptional Tennessee Waters for additional permit requirements). Compliance with the additional requirements set forth in sub-part 5.4 is not considered as contributing to loadings to exceptional quality waters or degradation unless the division determines upon review of the SWPPP that there is a reason to limit coverage as set forth in paragraph d) above and the SWPPP cannot be modified to bring the site into compliance. Identification of exceptional quality waters is made according to TDEC Rules, Chapter 1200-4-3-.06.

h) Discharges Not Protective of Federal or State listed Threatened and Endangered Species, Species Deemed in Need of Management or Special Concern Species - Stormwater discharges and stormwater discharge-related activities that are not protective of legally protected listed or proposed threatened or endangered aquatic fauna or flora (or species proposed for such protection) in the receiving stream(s); or discharges or activities that would result in a "take" of a state or federal listed endangered or threatened aquatic or wildlife species deemed in need of management or special concern species, or such species' habitat. If the division finds that stormwater discharges or stormwater related activities are likely to result in any of the above effects, the director will deny the

coverage under this general permit unless and until project plans are changed to adequately protect the species.

i) Discharges from a New or Proposed Mining Operation - This permit does not cover discharges from a new or proposed mining operation.

j) Discharges Negatively Affecting a Property on the National Historic Register - Stormwater discharges that would negatively affect a property that is listed or is eligible for listing in the National Historic Register maintained by the Secretary of Interior.

k) Discharging into Receiving Waters With an Approved Total Maximum Daily Load Analysis - Discharges of pollutants of concern to waters for which there is an EPA-approved total maximum daily load (TMDL) for the same pollutant are not covered by this permit unless measures or controls that are consistent with the assumptions and requirements of such TMDL are incorporated into the SWPPP. If a specific wasteload allocation has been established that would apply to the discharge, that allocation must be incorporated into the SWPPP and steps necessary to meet that allocation must be implemented. In a situation where an EPA-approved or established TMDL has specified a general wasteload allocation applicable to construction stormwater discharges, but no specific requirements for construction sites have been identified, the permittee should consult with the division to confirm that adherence to a SWPPP that meets the requirements of this permit will be consistent with the approved TMDL. Where an EPA-approved or established TMDL has not specified a wasteload allocation applicable to construction stormwater discharges, but has not specifically excluded these discharges, adherence to a SWPPP that meets the requirements of the CGP will generally be assumed to be consistent with the approved TMDL. If the EPA-approved or established TMDL specifically precludes construction stormwater discharges, the operator is not eligible for coverage under the CGP.

1.4. Obtaining Permit Coverage

Submitting a complete NOI, a SWPPP and an appropriate permitting application fee are required to obtain coverage under this general permit. Requesting coverage under this permit means that an applicant has obtained and examined a copy of this permit, and thereby acknowledges applicant's claim of ability to comply with permit terms and conditions. Upon completing NOI review, the division will:

a) issue a notice of coverage (NOC) to the operator identified as a primary permittee on the NOI form (see subpart 1.5 below - *Effective Date of Coverage*); or
b) notify the applicant of needed changes to their NOI submittal (see section 2.6.3 below - *Application completeness*); or
c) deny coverage under this general permit (see subpart 7.12 below - *Requiring an Individual Permit*).

1.4.1. Notice of Intent (NOI)

Operators wishing to obtain coverage under this permit must submit a completed NOI in accordance with requirements of part 2 below, using the NOI form provided in Appendix A of this permit (or a copy thereof). The division will review NOIs for completeness and accuracy and, when deemed necessary, investigate the proposed project for potential impacts to the waters of the state.

1.4.2. Stormwater Pollution Prevention Plan (SWPPP)

Operators wishing to obtain coverage under this permit must develop and submit a site-specific SWPPP with the NOI. The initial, comprehensive SWPPP, developed and submitted by the site-wide permittee (typically owner/developer who applied for coverage at project commencement[1]), should address all construction-related activities from the date construction commences to the date of termination of permit coverage, to the maximum extent practicable. The SWPPP must be developed, implemented and updated according to the requirements in part 3 below (*SWPPP Requirements*) and subpart 2.3 below (*Responsibilities of Operators*). The SWPPP must be implemented prior to commencement of construction activities.

If the initial, comprehensive SWPPP does not address all activities until final stabilization of the site, an updated SWPPP or addendums to the plan addressing all aspects of current site disturbance must be prepared. An active, updated SWPPP must be in place for all disturbed portions of a site until each portion has been completed and finally stabilized.

Preparation and implementation of the comprehensive SWPPP may be a cooperative effort with all operators at a site. New operators with design and operational control of their portion of the construction site are expected to adopt, modify, update and implement a comprehensive SWPPP. Primary permittees at the site may develop a SWPPP addressing only their portion of the project, as long as the proposed Best Management Practices (BMPs) are compatible with the comprehensive SWPPP and complying with conditions of this general permit.

1.4.3. Permit application fees

The permit application fee should accompany the site-wide permittee's NOI form. The fee is based on the total acreage planned to be disturbed by an entire construction project for which the site-wide permittee is requesting coverage, including any associated construction support activities (see section 1.2.2 above). *The disturbed area* means the total area presented as part of the development (and/or of a larger common plan of development) subject to being cleared, graded, or excavated during the life of the development. The area cannot be limited to only the portion of the total area that the site-wide owner/developer initially disturbs through the process of various land clearing activities and/or in the construction of roadways, sewers and water utilities, stormwater drainage structures, etc., to make the property marketable. The site-wide owner/developer may present documentation of common areas in the project that will not be subject to disturbance at anytime during the life of the project and have these areas excluded from the fee calculation.

The application fees shall be as specified in the TDEC Rules, Chapter 1200-4-11. The application will be deemed incomplete until the appropriate application fee is paid in full. Checks for the appropriate fee should be made payable to "Treasurer, State of Tennessee." There is no additional fee for subsequent owner/operator to obtain permit coverage (see section 2.4.3 below - *New operator*), as long as the site-wide primary permittee has active permit coverage at the time of receipt of the subsequent operator's application, because the site-wide primary permittee paid the appropriate fee for the entire area of site disturbance. If a project was previously permitted, but permit coverage was terminated (see section 8.1.1 below - Termination process for primary permittees), and subsequent site disturbance or re-development occurs, the new operator must obtain coverage and pay the appropriate fee for the disturbed acreage.

[1] See sub-part 2.1 on page 7 for a definition of an site-wide permittee.

1.4.4. Submittal of a copy of the NOC and NOT to the local MS4

Permittees who discharge stormwater through an NPDES-permitted municipal separate storm sewer system (MS4) who are not exempted in section 1.4.5 below (*Permit Coverage through Qualifying Local Program*) must submit a courtesy copy of the notice of coverage (NOC), and at project completion, a copy of the signed notice of termination (NOT) to the MS4 upon their request. Permitting status of all permittees covered (or previously covered) under this general permit as well as the most current list of all MS4 permits is available at the division's DataViewer web site[2].

1.4.5. Permit Coverage through Qualifying Local Program

Coverage equivalent to coverage under this general permit may be obtained from a qualifying local erosion prevention and sediment control Municipal Separate Storm Sewer System (MS4) program. A qualifying local program (QLP) is a municipal stormwater program for stormwater discharges associated with construction activity that has been formally approved by the division. More information about Tennessee's QLP program and MS4 participants can be found at: http://tn.gov/environment/wpc/stormh2o/qlp.shtml.

If a construction site is within the jurisdiction of and has obtained a notice of coverage from a QLP, the operator of the construction activity is authorized to discharge stormwater associated with construction activity under this general permit without the submittal of an NOI to the division. The permittee is also not required to submit a SWPPP, a notice of termination or a permit fee to the division. At the time of issuance of this permit, there were no qualifying local erosion prevention and sediment control MS4 programs in Tennessee. Permitting of stormwater runoff from construction sites from federal or state agencies (including, but not limited to the Tennessee Department of Transportation (TDOT) and Tennessee Valley Authority (TVA)) and the local MS4 program itself will remain solely under the authority of TDEC.

The division may require any owner/developer or operator located within the jurisdiction of a QLP to obtain permit coverage directly from the division. The operator shall be notified in writing by the division that coverage by the QLP is no longer applicable, and how to obtain coverage under this permit.

1.5. Effective Date of Coverage

1.5.1. Notice of Coverage (NOC)

The NOC is a notice from the division to the primary permittee, which informs the primary permittee that the NOI, the SWPPP and the appropriate fee were received and accepted, and stormwater discharges from a specified area of a construction activity have been approved under this general permit. The permittee is authorized to discharge stormwater associated with construction activity as of the effective date listed on the NOC.

Assigning a permit tracking number by the division to a proposed discharge from a construction site does not confirm or imply an authorization to discharge under this permit. Correspondence

[2] http://www.tn.gov/environment/wpc/dataviewer/

with the permittee is maintained through the Site Owner or Developer listed in the NOI, not the optional contact or the secondary permittee.

If any Aquatic Resource Alteration Permits (ARAP) are required for a site in areas proposed for active construction, the NOC will not be issued until ARAP application(s) are submitted and deemed by TDEC to be complete. The treatment and disposal of wastewater (including, but not limited to sanitary wastewater) generated during and after the construction must be also addressed. The issuance of the NOC may be delayed until adequate wastewater treatment and accompanying permits are issued.

1.5.2. Permit tracking numbers

Construction sites covered under this permit will be assigned permit tracking numbers in the sequence TNR100001, TNR100002, etc. An operator presently permitted under a previous construction general permit shall be granted coverage under this new general permit. Permit tracking numbers assigned under a previous construction general permit will be retained (see section 2.4.1 below). An operator receiving new permit coverage will be assigned a new permit tracking number (see section 2.4.2 below).

2. NOTICE OF INTENT (NOI) REQUIREMENTS

2.1. Who Must Submit an NOI?

All site operators must submit an NOI form. "Operator" for the purpose of this permit and in the context of stormwater associated with construction activity means any person associated with a construction project who meets either or both of the following two criteria:

a) The person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project (e.g. subsequent builder), or the person that is the current land owner of the construction site. This person is considered the primary permittee; or
b) The person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee, and is considered a secondary permittee.

The site-wide permittee is the first primary permittee to apply for coverage at the site. There may be other primary permittees for a project, but there is only one site-wide permittee. Where there are multiple operators associated with the same project, all operators are required to obtain permit coverage. Once covered by a permit, all such operators are to be considered as co-permittees if their involvement in the construction activities affects the same project site, and are held jointly and severally responsible for complying with the permit.

2.2. Typical Construction Site Operators

2.2.1. Owner/Developer

An owner or developer(s) of a project is a primary permittee. This person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person may include, but is not limited to a developer, landowner, realtor, commercial builder, homebuilder, etc. An owner or developer's responsibility to comply with requirements of this permit extends until permit coverage is terminated in accordance with requirements of part 8 below.

2.2.2. Commercial builders

A commercial builder can be a primary or secondary permittee at a construction site.

A commercial builder who purchases one or more lots from an owner/developer (site-wide permittee) for the purpose of constructing and selling a structure (e.g., residential house, non-residential structure, commercial building, industrial facility, etc.) and has design or operational control over construction plans and specifications is a primary permittee for that portion of the site. A commercial builder may also be hired by the end user (e.g., a lot owner who may not be a permittee). In either case the commercial builder is considered a new operator and must submit a new NOI following requirements in section 2.4.3 below.

The commercial builder may also be hired by the primary permittee or a lot owner to build a structure. In this case, the commercial builder signs the primary permittee's NOI and SWPPP as a contractor (see section 2.2.3 below) and is considered a secondary permittee.

2.2.3. Contractors

A contractor is considered a secondary permittee. This person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., contractor is authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

A contractor may be, but is not limited to a general contractor, grading contractor, erosion control contractor, sub-contractor responsible for any land disturbing activities and/or erosion prevention and sediment control (EPSC) implementation/maintenance, commercial builder hired by the owner/developer, etc. The contractor may need to include in their contract with the party that hired them specific details for the contractor's responsibilities concerning EPSC measures. This includes the ability of the contractor to make EPSC modifications. The contractor should sign the NOI and SWPPP associated with the construction project at which they will be an operator.

2.3. Responsibilities of Operators

A permittee may meet one or more of the operational control components in the definition of "operator" found in subpart 2.1 above. Either section 2.3.1 or 2.3.2 below, or both, will apply depending on the type of operational control exerted by an individual permittee.

2.3.1. Permittee(s) with design control (owner/developer)

Permittee(s) with design control (i.e., operational control over construction plans and specifications) at the construction site, including the ability to make modifications to those plans and specifications (e.g., owner/developer) must:

a) Ensure the project specifications they develop meet the minimum requirements of part 3 below (stormwater pollution prevention plan - SWPPP) and all other applicable conditions;
b) Ensure that the SWPPP indicates the areas of the project where they have design control (including the ability to make modifications in specifications), and ensure all other permittees implementing and maintaining portions of the SWPPP impacted by any changes they make to the plan are notified of such modifications in a timely manner;
c) Ensure that all common facilities (i.e., sediment treatment basin and drainage structures) that are necessary for the prevention of erosion or control of sediment are maintained and effective until all construction is complete and all disturbed areas in the entire project are stabilized, unless permit coverage has been obtained and responsibility has been taken over by a new (replacement) owner/operator.
d) If parties with day-to-day operational control of the construction site have not been identified at the time the comprehensive SWPPP is initially developed, the permittee with design control shall be considered to be the responsible person until such time the supplemental NOI is submitted, identifying the new operator(s) (see section 2.4.3 below). These new operators (e.g., general contractor, utilities contractors, sub-contractors, erosion control contractors, hired commercial builders) are considered secondary permittees. The SWPPP must be updated to reflect the addition of new operators as needed to reflect operational or design control.
e) Ensure that all operators on the site have permit coverage, if required, and are complying with the SWPPP.

2.3.2. Permittee(s) with day-to-day operational control (contractor – secondary permittee)

Permittee(s) with day-to-day operational control of those activities at a project which are necessary to ensure compliance with the SWPPP for the site or other permit conditions (e.g., general contractor, utilities contractors, sub-contractors, erosion control contractors, hired commercial builders) must:

a) Ensure that the SWPPP for portions of the project where they are operators meets the minimum requirements of part 3 below (*SWPPP Requirements*) and identifies the parties responsible for implementation of control measures identified in the plan;
b) Ensure that the SWPPP indicates areas of the project where they have operational control over day-to-day activities;
c) Ensure that measures in the SWPPP are adequate to prevent erosion and control any sediment that may result from their earth disturbing activity;
d) Permittees with operational control over only a portion of a larger construction project are responsible for compliance with all applicable terms and conditions of this permit as it relates to their activities on their portion of the construction site. This includes, but is not limited to, implementation of Best Management Practices (BMPs) and other controls required by the SWPPP. Permittees shall ensure either directly or through coordination with other permittees, that their activities do not render another person's pollution control ineffective. All permittees must implement their portions of a comprehensive SWPPP.

2.4. NOI Submittal

2.4.1. Existing site

An operator presently permitted under the 2005 construction general permit shall be granted coverage under this new general permit. There will be no additional fees associated with an extension of coverage for existing sites under the new permit. The division may, at its discretion, require permittees to confirm their intent to be covered under this new general permit following its effective date through submission of an updated NOI. Should the confirmation be required and is not received, coverage under the new general permit will be terminated. Should a site with terminated coverage be unstable or construction continues, a new NOI, SWPPP and an appropriate fee must be submitted.

2.4.2. Application for new permit coverage

Except as provided in section 2.4.3 below, operators must submit a complete NOI, SWPPP and an appropriate fee in accordance with the requirements described in subpart 1.4 above. The complete application should be submitted at least 30 days prior to commencement of construction activities. The permittee is authorized to discharge stormwater associated with construction activity as of the effective date listed on the NOC. The land disturbing activities shall not start until a NOC is prepared and written approval by the division staff is obtained according to subpart 1.5 above.

2.4.3. New operator

For stormwater discharges from construction sites or portions of the sites where the operator changes (new owner), or projects where an operator is added (new contractor) after the initial NOI and comprehensive SWPPP have been submitted, the supplemental (submitted by a new contractor) or additional (submitted by a new owner) NOI should be submitted as soon as practicable, and always before the new operator commences work at the site. The supplemental NOI must reference the project name and tracking number assigned to the primary permittee's NOI.

If the site under the control of the new owner is inactive and all areas disturbed are completely stabilized, the NOI may not need to be submitted immediately upon assuming operational control. However, the division should be notified if a new operator obtains operational control at a site, but commencement of construction under the direction of the operator at the site is going to be delayed.

If upon the sale or transfer of the site's ownership does not change the signatory requirements for the NOI (see section 7.7.1 below), but the site's owner or developer's company name has changed, a new, updated NOI should be submitted to the division within 30 days of the name change. If the new operator agrees to comply with an existing comprehensive SWPPP already implemented at the site, a copy of the supplemental or modified SWPPP does not have to be submitted with the NOI. There will be no additional fees associated with the sale or transfer of ownership for existing permitted sites.

If the transfer of ownership is due to foreclosure or a permittee filing for bankruptcy proceedings, the new owner (including but not limited to a lending institution) must obtain permit coverage if the property is inactive, but is not stabilized sufficiently. If the property is sufficiently stabilized permit coverage may not be necessary, unless and until construction activity at the site resumes.

2.4.4. Late NOIs

Dischargers are not prohibited from submitting late NOIs. When a late NOI is submitted, and if the division authorizes coverage under this permit, such authorization is only for future discharges; any prior, unpermitted, discharges or permit noncompliances are subject to penalties as described in section 7.1.2 below.

2.5. Who Must Sign the NOI?

All construction site operators as defined in subsection 2.2 above (*Typical Construction Site Operators*) must sign the NOI form. Signatory requirements for a NOI are described in section 7.7.1 below. All signatures must be original. An NOI that does not bear an original signature will be deemed incomplete. The division recommends that signatures be in blue ink.

2.6. NOI Form

2.6.1. Contents of the NOI form

NOI for construction projects shall be submitted on the form provided in Appendix A of this permit, or on a copy thereof. This form and its instructions set forth the required content of the NOI. The NOI form must be filled in completely. If sections of the NOI are left blank, a narrative explaining the omission must be provided as an attachment.

Owners, developers and all contractors that meet the definition of the operator in subsection 2.2 above (*Typical Construction Site Operators*) shall apply for permit coverage on the same NOI, insofar as possible. The NOI is designed for more than one contractor (secondary permittee). The division may accept separate NOI forms from different operators for the same construction site when warranted.

After permit coverage has been granted to the primary permittee, any subsequent NOI submittals must include the site's previously assigned permit tracking number and the project name. The comprehensive site-specific SWPPP shall be prepared in accordance with the requirements of part 3 below, and must be submitted with the NOI unless the NOI being submitted is to only add a contractor (secondary permittee) to an existing coverage.

2.6.2. Construction site map

An excerpt (8 ½" by 11" or 11" by 17") from the appropriate 7.5 minute United States Geological Survey (USGS) topographic map, with the proposed construction site centered, must be included with the NOI. The entire proposed construction area must be clearly identified (outlined) on this map. The total area to be disturbed (in acres) should be included on the map. The map should outline the boundaries of projects, developments and the construction site in relation to major roads, streams or other landmarks. All outfalls where runoff will leave the property should be identified. Stream(s) receiving the discharge, and storm sewer system(s)

conveying the discharge from all site outfalls should be clearly identified and marked on the map. The map should also list and indicate the location of EPSCs that will be used at the construction site. NOIs for linear projects must specify the location of each end of the construction area and all areas to be disturbed. Commercial builders that develop separate SWPPPs that cover only their portion of the project shall also submit a site or plat map that clearly indicates the lots which they purchased and for which they are applying for permit coverage and the location of EPSCs that will be used at each lot.

2.6.3. Application completeness

Based on a review of the NOI or other available information, the division shall:

1. prepare a notice of coverage (NOC) for the construction site (see subpart 1.5 above); or
2. prepare a deficiency letter stating additional information must be provided before the NOC can be issued; or
3. deny coverage under this general permit and require the discharger to obtain coverage under an individual NPDES permit (see subpart 7.12 below).

2.7. Where to Submit the NOI, SWPPP and Permitting Fee?

The applicant shall submit the NOI, SWPPP and permitting fee to the appropriate TDEC Environmental Field Office (EFO) for the county(ies) where the construction activity is located and where stormwater discharges enters waters of the state. If a site straddles a county line of counties that are in areas of different EFOs, the operators shall send NOIs to each EFO. The permitting fee should be submitted to the EFO that provides coverage for the majority of the proposed construction activity.

A list of counties and the corresponding EFOs is provided in subpart 2.8 below. The division's Nashville Central Office will serve as a processing office for NOIs submitted by federal or state agencies (including, but not limited to the Tennessee Department of Transportation (TDOT), Tennessee Valley Authority (TVA) and the local MS4 programs).

2.8. List of the TDEC Environmental Field Offices (EFOs) and Corresponding Counties

EFO Name	List of Counties
Chattanooga	Bledsoe, Bradley, Grundy, Hamilton, Marion, McMinn, Meigs, Polk, Rhea, Sequatchie
Columbia	Bedford, Coffee, Franklin, Giles, Hickman, Lawrence, Lewis, Lincoln, Marshall, Maury, Moore, Perry, Wayne
Cookeville	Cannon, Clay, Cumberland, De Kalb, Fentress, Jackson, Macon, Overton, Pickett, Putnam, Smith, Van Buren, Warren, White
Jackson	Benton, Carroll, Chester, Crockett, Decatur, Dyer, Gibson, Hardeman, Hardin, Haywood, Henderson, Henry, Lake, Lauderdale, Madison, McNairy, Obion, Weakley
Johnson City	Carter, Greene, Hancock, Hawkins, Johnson, Sullivan, Unicoi, Washington
Knoxville	Anderson, Blount, Campbell, Claiborne, Cocke, Grainger, Hamblen, Jefferson, Knox, Loudon, Monroe, Morgan, Roane, Scott, Sevier, Union
Memphis	Fayette, Shelby, Tipton
Nashville	Cheatham, Davidson, Dickson, Houston, Humphreys, Montgomery, Robertson, Rutherford, Stewart, Sumner, Trousdale, Williamson, Wilson

TDEC may be reached by telephone at the toll-free number 1-888-891-8332 (TDEC). Local EFOs may be reached directly when calling this number from the construction site, using a land line.

3. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS

3.1. The General Purpose of the SWPPP

A comprehensive SWPPP must be prepared and submitted along with the NOI as required in section 1.4.2 above. The primary permittee must implement the SWPPP as written from commencement of construction activity until final stabilization is complete, or until the permittee does not have design or operational control of any portion of the construction site. Requirements for termination of site coverage are provided in part 8 below.

A site-specific SWPPP must be developed for each construction project or site covered by this permit. The design, inspection and maintenance of Best Management Practices (BMPs) described in SWPPP must be prepared in accordance with good engineering practices. At a minimum, BMPs shall be consistent with the requirements and recommendations contained in the current edition of the Tennessee Erosion and Sediment Control Handbook (the handbook). The handbook is designed to provide information to planners, developers, engineers, and contractors on the proper selection, installation, and maintenance of BMPs. This permit allows the use of innovative or alternative BMPs, whose performance has been documented to be equivalent or superior to conventional BMPs as certified by the SWPPP designer.

Once a definable area has been finally stabilized, the permittee may identify this area on the site-specific SWPPP. No further SWPPP or inspection requirements apply to that portion of the site (e.g., earth-disturbing activities around one of three buildings in a complex are done and the area is finally stabilized, one mile of a roadway or pipeline project is done and finally stabilized, etc).

For more effective coordination of BMPs a cooperative effort by the different operators at a site to prepare and participate in a comprehensive SWPPP is expected. Primary permittees at a site may develop separate SWPPPs that cover only their portion of the project. In instances where there is more than one SWPPP for a site, the permittees must ensure the stormwater discharge controls and other measures are compatible with one another and do not prevent another operator from complying with permit conditions. The comprehensive SWPPP developed and submitted by the primary permittee must assign responsibilities to subsequent (secondary) permittees and coordinate all BMPs at the construction site. Assignment and coordination can be done by name or by job title.

3.1.1. Registered engineer or landscape architect requirement

The narrative portion of the SWPPP may be prepared by an individual that has a working knowledge of erosion prevention and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC) or a person that successfully completed the "Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites" course. Plans and specifications for any building or structure, including the design of sediment basins or other sediment controls involving structural, hydraulic, hydrologic or other engineering calculations shall be prepared by a licensed professional engineer or landscape architect and

stamped and certified in accordance with the Tennessee Code Annotated, Title 62, Chapter 2 (see part 10 below) and the rules of the Tennessee Board of Architectural and Engineering Examiners. Engineering design of sediment basins and other sediment controls must be included in SWPPPs for construction sites involving drainage to an outfall totaling 10 or more acres (see subsection 3.5.3.3 below) or 5 or more acres if draining to an impaired or exceptional quality waters (see subsection 5.4.1 below).

3.1.2. Site Assessment

Quality assurance of erosion prevention and sediment controls shall be done by performing site assessment at a construction site. The site assessment shall be conducted at each outfall involving drainage totaling 10 or more acres (see subsection 3.5.3.3 below) or 5 or more acres if draining to an impaired or exceptional quality waters (see subsection 5.4.1 below), within a month of construction commencing at each portion of the site that drains the qualifying acreage of such portion of the site. The site assessment shall be performed by individuals with following qualifications:

- a licensed professional engineer or landscape architect;
- a Certified Professional in Erosion and Sediment Control (CPESC) or
- a person that successfully completed the "Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites" course.

As a minimum, site assessment should be performed to verify the installation, functionality and performance of the EPSC measures described in the SWPPP. The site assessment should be performed with the inspector (as defined in part 10 below – Definitions), and should include a review and update (if applicable) of the SWPPP. Modifications of plans and specifications for any building or structure, including the design of sediment basins or other sediment controls involving structural, hydraulic, hydrologic or other engineering calculations shall be prepared by a licensed professional engineer or landscape architect and stamped and certified in accordance with the Tennessee Code Annotated, Title 62, Chapter 2 (see part 10 below) and the rules of the Tennessee Board of Architectural and Engineering Examiners.

The site assessment findings shall be documented and the documentation kept with the SWPPP at the site. At a minimum, the documentation shall include information included in the inspection form provided in Appendix C of this permit. The documentation must contain the printed name and signature of the individual performing the site assessment and the following certification:

> *"I certify under penalty of law that this report and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

The site assessment can take the place of one of the twice weekly inspections requirement from subsection 3.5.8.2 below.

The division may require additional site assessment(s) to be performed if site inspection by division's personnel reveals site conditions that have potential of causing pollution to the waters of the state.

3.2. SWPPP Preparation and Compliance

3.2.1. Existing site

Operator(s) of an existing site presently permitted under the division's previous construction general permit shall maintain full compliance with the current SWPPP. The current SWPPP should be modified, if necessary, to meet requirements of this new general permit, and the SWPPP changes implemented no later than 12 months following the new permit effective date (**Error! Reference source not found.**), excluding the buffer zone requirements as stated in section 4.1.2 below. The permittee shall make the updated SWPPP available for the division's review upon request.

3.2.2. New site

For construction stormwater discharges not authorized under an NPDES permit as of the effective date of this permit, a SWPPP that meets the requirements of subpart 3.5 below of this permit shall be prepared and submitted along with the NOI and an appropriate fee for coverage under this permit.

3.3. Signature Requirements, Plan Review and Making Plans Available

3.3.1. Signature Requirements for a SWPPP

The SWPPP shall be signed by the operator(s) in accordance with subpart 7.7 below, and if applicable, certified according to requirements in section 3.1.1 above. All signatures must be original. A SWPPP that does not bear an original signature will be deemed incomplete. The division recommends that signatures be in blue ink.

3.3.2. SWPPP Review

The permittee shall make updated plans and inspection reports available upon request to the director, local agency approving erosion prevention and sediment control plan, grading plans, land disturbance plans, or stormwater management plans, or the operator of an MS4.

3.3.3. Making plans available

A copy of the SWPPP shall be retained on-site at the location which generates the stormwater discharge in accordance with part 6 below of this permit. If the site is inactive or does not have an onsite location adequate to store the SWPPP, the location of the SWPPP, along with a contact phone number, shall be posted on-site. If the SWPPP is located offsite, reasonable local access to the plan, during normal working hours, must be provided.

3.4. Keeping Plans Current

3.4.1. SWPPP modifications

The permittee must modify and update the SWPPP if any of the following are met:

a) whenever there is a change in the scope of the project, which would be expected to have a significant effect on the discharge of pollutants to the waters of the state and which has not otherwise been addressed in the SWPPP. If applicable, the SWPPP must be modified or updated whenever there is a change in chemical treatment methods, including the use of different treatment chemical, different dosage or application rate, or different area of application;
b) whenever inspections or investigations by site operators, local, state or federal officials indicate the SWPPP is proving ineffective in eliminating or significantly minimizing pollutants from sources identified under section 3.5.2 below of this permit, or is otherwise not achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity. Where local, state or federal officials determine that the SWPPP is ineffective in eliminating or significantly minimizing pollutant sources, a copy of any correspondence to that effect must be retained in the SWPPP;
c) to identify any new operator (typically contractor and/or subcontractor) as needed to reflect operational or design control that will implement a measure of the SWPPP (see subparts 2.1 and 2.2 above for further description of which operators must be identified); and
d) to include measures necessary to prevent a negative impact to legally protected state or federally listed fauna or flora (or species proposed for such protection – see subpart 1.3 above). Amendments to the SWPPP may be reviewed by the division, a local MS4, the EPA or an authorized regulatory agency; and
e) a TMDL is developed for the receiving waters for a pollutant of concern (siltation and/or habitat alteration).

3.5. Components of the SWPPP

The SWPPP shall include the following items, as described in sections 3.5.1 to 3.5.10 below: site description, description of stormwater runoff controls, erosion prevention and sediment controls, stormwater management, description of other items needing control, approved local government sediment and erosion control requirements, maintenance, inspections, pollution prevention measures for non-stormwater discharges, and documentation of permit eligibility related to Total Maximum Daily Loads (TMDL). The SWPPP must:

a) identify all potential sources of pollution which are likely to affect the quality of stormwater discharges from the construction site;
b) describe practices to be used to reduce pollutants in stormwater discharges from the construction site; and
c) assure compliance with the terms and conditions of this permit.

3.5.1. Site description

Each plan shall provide a description of pollutant sources and other information as indicated below:

a) a description of all construction activities at the site (not just grading and street construction);
b) the intended sequence of major activities which disturb soils for major portions of the site (e.g., grubbing, excavation, grading, utilities and infrastructure installation, etc.);
c) estimates of the total area of the site and the total area that is expected to be disturbed by excavation, grading, filling, or other construction activities;
d) a description of the topography of the site including an estimation of the percent slope and the variation in percent slope found on the site; such estimation should be on a basis of a drainage area serving each outfall, rather than an entire project;
e) any data describing the soil (data may be referenced or summarized) and how the soil type will dictate the needed control measures and how the soil may affect the expected quality of runoff from the site;
f) an estimate of the runoff coefficient of the site after construction activities are completed and how the runoff will be handled to prevent erosion at the permanent outfall and receiving stream, as well as the estimate of the percentage of impervious area before and after construction;
g) an erosion prevention and sediment control plan of the site with the proposed construction area clearly outlined. The plan should indicate the boundaries of the permitted area, drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, an outline of areas which are not to be disturbed, the location of major structural and nonstructural controls identified in the SWPPP, the location of areas where stabilization practices are expected to occur, surface waters including wetlands, sinkholes, and careful identification on the site plan of outfall points intended for coverage under the general permit for stormwater discharges from the site. The erosion control plan must meet requirements stated in section 3.5.2 below;
h) a description of any discharge associated with industrial activity other than construction stormwater that originates on site and the location of that activity and its permit number;
i) identification of any stream or wetland on or adjacent to the project, a description of any anticipated alteration of these waters and the permit number or the tracking number of the Aquatic Resources Alteration Permit (ARAP) or Section 401 Certification issued for the alteration;
j) the name of the receiving water(s), and approximate size and location of affected wetland acreage at the site;
k) if applicable, clearly identify and outline the buffer zones established to protect waters of the state located within the boundaries of the project;
l) some construction projects, such as residential or commercial subdivisions and/or developments or industrial parks are subdivided. Subdivided lots are sometimes sold to new owners prior to completion of construction. The site-wide developer/owner must describe EPSC measures implemented at those lots. Once the property is sold, the new operator must obtain coverage under this permit;
m) for projects of more than 50 acres, the construction phases must be described (see subsection 3.5.3.1 below); and
n) if only a portion of the total acreage of the construction site is to be disturbed, then the protections employed to limit the disturbance must be discussed, i.e., caution fence, stream side buffer zones, etc. Limits of disturbance shall be clearly marked in the

SWPPP and areas to be undisturbed clearly marked in the field before construction activities begin.

3.5.2. Description of stormwater runoff controls

The SWPPP shall include a description of appropriate erosion prevention and sediment controls and other Best Management Practices (BMPs) that will be implemented at the construction site. The SWPPP must clearly describe each major activity which disturbs soils for major portions of the site (e.g., grubbing, excavation, grading, utilities and infrastructure installation, etc.):

a) appropriate control measures and the general timing for the measures to be implemented during construction activities; and
b) which permittee is responsible for implementation of which controls.

The SWPPP must include erosion prevention and sediment control (EPSC) plans showing the approximate location of each control measure along with a description of the timing during the construction process for implementing each measure (e.g., prior to the start of earth disturbance, as the slopes are altered and after major grading is finished). The different stages of construction (initial/major grading, installation of infrastructure, final contours, etc.) and the erosion preventions and sediment control measures that will be utilized during each stage should be depicted on multiple plan sheets (see paragraphs below). Half sheets are acceptable. One sheet showing all EPSCs that will be used during the life of the multi-phase project implementing different EPSC controls at each stage will not be considered complete.

For site disturbances less than 5 acres, at least two separate EPSC plan sheets shall be developed. At least two stages shall be identified, with associated EPSC measures addressed. The plan stages shall be addressed separately in plan sheets, with each stage reflecting the conditions and EPSC measures necessary to manage stormwater runoff, erosion and sediment during the initial land disturbance (initial grading) and the conditions and EPSC measures necessary to manage stormwater, erosion and sediment at final grading.

For site disturbances more than 5 acres, at least 3 separate EPSC plan sheets shall be developed. Three stages shall be identified. The first plan sheet should reflect the conditions and EPSC measures necessary to manage stormwater runoff, during the initial land disturbance (initial grading). The second plan sheet shall reflect the conditions and the EPSC measures necessary to manage stormwater runoff from interim land disturbance activities. The third plan sheet shall reflect the conditions and EPSC measures necessary to manage stormwater runoff, erosion and sediment at final grading.

The description and implementation of controls shall address the following minimum components, as described in sections 3.5.3, 3.5.4 and 3.5.5 below. Additional controls may be necessary to comply with section 5.3.2 below.

3.5.3. Erosion prevention and sediment controls

3.5.3.1. General criteria and requirements

a) The construction-phase erosion prevention controls shall be designed to eliminate (or minimize if complete elimination is not possible) the dislodging and suspension of soil in

water. Sediment controls shall be designed to retain mobilized sediment on site to the maximum extent practicable.

b) The design, inspection and maintenance of Best Management Practices (BMPs) described in SWPPP must be prepared in accordance with good engineering practices and, at a minimum, shall be consistent with the requirements and recommendations contained in the current edition of the Tennessee Erosion and Sediment Control Handbook. In addition, all control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications (where applicable). All control measures selected must be able to slow runoff so that rill and gully formation is prevented. When steep slopes and/or fine particle soils are present at the site, additional physical or chemical treatment of stormwater runoff may be required. Proposed physical and/or chemical treatment must be researched and applied according to the manufacturer's guidelines and fully described in the SWPPP. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permittee must replace or modify the control for relevant site situations.

c) If permanent or temporary vegetation is to be used as a control measure, then the timing of the planting of the vegetation cover must be discussed in the SWPPP. Planning for planting cover vegetation during winter months or dry months should be avoided.

d) If sediment escapes the permitted area, off-site accumulations of sediment that have not reached a stream must be removed at a frequency sufficient to minimize offsite impacts (e.g., fugitive sediment that has escaped the construction site and has collected in a street must be removed so that it is not subsequently washed into storm sewers and streams by the next rain and/or so that it does not pose a safety hazard to users of public streets). Permittees shall not initiate remediation/restoration of a stream without consulting the division first. This permit does not authorize access to private property. Arrangements concerning removal of sediment on adjoining property must be settled by the permittee with the adjoining landowner.

e) Sediment should be removed from sediment traps, silt fences, sedimentation ponds, and other sediment controls as recommended in the Tennessee Erosion and Sediment Control Handbook, and must be removed when design capacity has been reduced by 50%.

f) Litter, construction debris, and construction chemicals exposed to stormwater shall be picked up prior to anticipated storm events or before being carried off of the site by wind (e.g., forecasted by local weather reports), or otherwise prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, daily pick-up, etc.). After use, materials used for erosion prevention and sediment control (such as silt fence) should be removed or otherwise prevented from becoming a pollutant source for stormwater discharges.

g) Erodible material storage areas (including but not limited to overburden and stockpiles of soil etc.) and borrow pits used primarily for the permitted project and which are contiguous to the site are considered a part of the site and shall be identified on the NOI, addressed in the SWPPP and included in the fee calculation. TDOT projects shall be addressed in the Waste and Borrow Manual per the Statewide Stormwater Management Plan (SSWMP).

h) Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than 15 days prior to grading or earth moving unless the area is seeded and/or mulched or other temporary cover is installed.

i) Clearing and grubbing must be held to the minimum necessary for grading and equipment operation. Existing vegetation at the site should be preserved to the maximum extent practicable.

j) Construction must be sequenced to minimize the exposure time of graded or denuded areas.
k) Construction phasing is required on all projects regardless of size as a major practice for minimizing erosion and limiting sedimentation. Construction must be phased to keep the total disturbed area less than 50 acres at any one time. Areas of the completed phase must be stabilized within 15 days (see subsection 3.5.3.2 below). No more than 50 acres of active soil disturbance is allowed at any time during the construction project. This includes off-site borrow or disposal areas that meet the conditions of section 1.2.2 above of this general permit.

   The 50 acre limitation does not apply to linear construction projects (such as roadway, pipeline, and other infrastructure construction activities) if the following conditions are met:

   - Where no one area of active soil disturbance is greater than 50 acres and the various areas of disturbance have distinct receiving waters; or
   - Where contiguous disturbances amount to greater than 50 acres, but no one distinct water is receiving run off from more than 50 disturbed acres; or
   - With the department's written concurrence, where more than 50 acres of disturbance is to occur and where one receiving water will receive run-off from more than 50 acres; or
   - Where no one area of active soil disturbance is greater than 50 acres and the various areas of disturbance are more than 5 miles apart.

   In order for a linear project to take advantage of the 50 acre rule exemption outlined in this paragraph, the contractor shall conduct monthly site assessments as described in section 3.1.2 above until the site is permanently stabilized.

l) Erosion prevention and sediment control measures must be in place and functional before earth moving operations begin, and must be constructed and maintained throughout the construction period. Temporary measures may be removed at the beginning of the workday, but must be replaced at the end of the workday.
m) The following records shall be maintained on or near site: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; the dates when stabilization measures are initiated; inspection records and rainfall records.
n) Off-site vehicle tracking of sediments and the generation of dust shall be minimized. A stabilized construction access (a point of entrance/exit to a construction site) shall be described and implemented, as needed, to reduce the tracking of mud and dirt onto public roads by construction vehicles.
o) Permittees shall maintain a rain gauge and daily rainfall records at the site, or use a reference site for a record of daily amount of precipitation.

3.5.3.2. Stabilization practices

The SWPPP shall include a description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Site plans should comply with buffer zone requirements (see sections 4.1.2

and 5.4.2 below), if applicable, in which construction activities, borrow and/or fill are prohibited. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Use of impervious surfaces for final stabilization in lieu of a permanent vegetative cover should be avoided where practicable. No stabilization, erosion prevention and sediment control measures are to be installed in a stream without obtaining a Section 404 permit and an Aquatic Resources Alteration Permit (ARAP), if such permits are required and appropriate.

Stabilization measures shall be initiated as soon as possible in portions of the site where construction activities have temporarily or permanently ceased. Temporary or permanent soil stabilization at the construction site (or a phase of the project) must be completed no later than 15 days after the construction activity in that portion of the site has temporarily or permanently ceased. In the following situations, temporary stabilization measures are not required:

a) where the initiation of stabilization measures is precluded by snow cover or frozen ground conditions or adverse soggy ground conditions, stabilization measures shall be initiated as soon as practicable; or
b) where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 15 days.

Steep slopes shall be temporarily stabilized not later than 7 days after construction activity on the slope has temporarily or permanently ceased.

Permanent stabilization with perennial vegetation (using native herbaceous and woody plants where practicable) or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable. Unpacked gravel containing fines (silt and clay sized particles) or crusher runs will not be considered a non-eroding surface.

3.5.3.3. Structural practices

The SWPPP shall include a description of structural practices to divert flows from exposed soils, store flows or otherwise limit runoff and discharge of pollutants from exposed areas of the site. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Structural controls shall not be placed in streams or wetlands except as authorized by a section 404 permit and/or Aquatic Resources Alteration Permit (ARAP).

Erosion prevention and sediment control measures must be prepared in accordance with good engineering practices and the latest edition of the Tennessee Erosion and Sediment Control Handbook. In addition, erosion prevention and sediment controls shall be designed to minimize erosion and maximize sediment removal resulting from a 2-year, 24-hour storm (the design storm – see part 10 below: “2-year and 5-year design storm depths and intensities”), as a minimum, either from total rainfall in the designated period or the equivalent intensity as specified on the following website http://hdsc.nws.noaa.gov/hdsc/pfds/orb/tn_pfds.html. When clay and other fine particle soils are present at the construction site, chemical treatment may be used to minimize amount of sediment being discharged.

For an on-site outfall which receives drainage from 10 or more acres, a minimum sediment basin volume that will provide treatment for a calculated volume of runoff from a 2 year, 24 hour storm and runoff from each acre drained, or equivalent control measures as specified in the Tennessee Erosion and Sediment Control Handbook, shall be provided until final stabilization of the site. A drainage area of 10 or more acres includes both disturbed and undisturbed portions of the site or areas adjacent to the site, all draining through the common outfall. Where an equivalent control measure is substituted for a sediment retention basin, the equivalency must be justified to the division. Runoff from any undisturbed acreage should be diverted around the disturbed area and the sediment basin. Diverted runoff can be omitted from the volume calculation. Sediment storage expected from the disturbed areas must be included.

All calculations of drainage areas, runoff coefficients and basin volumes must be provided in the SWPPP. The discharge structure from a sediment basin must be designed to retain sediment during the lower flows. Muddy water to be pumped from excavation and work areas must be held in settling basins or filtered or chemically treated prior to its discharge into surface waters. Water must be discharged through a pipe, well-grassed or lined channel or other equivalent means so that the discharge does not cause erosion and sedimentation. Discharged water must not cause an objectionable color contrast with the receiving stream.

3.5.4. Stormwater management

The SWPPP shall include a description of any measures that will be installed during the construction process to control pollutants in stormwater discharges that will occur after construction operations have been completed.

For projects discharging to waters considered impaired by sediment or habitat alteration due to in-channel erosion, the SWPPP shall include a description of measures that will be installed during the construction process to control pollutants and any increase in the volume of stormwater discharges that will occur after construction operations have been completed. For steep slope sites, the SWPPP shall also include a description of measures that will be installed to dissipate the volume and energy of the stormwater runoff to pre-development levels.

This permit only addresses the installation of stormwater management measures, and not the ultimate operation and maintenance of such structures after the construction activities have been completed, the site has undergone final stabilization, and the permit coverage has been terminated. Permittees are only responsible for the installation and maintenance of stormwater management measures prior to final stabilization of the site, and are not responsible for maintenance after stormwater discharges associated with construction activity have been eliminated from the site. All permittees are encouraged to limit the amount of post construction runoff, if not required by local building regulations or local MS4 program requirements, in order to minimize in-stream channel erosion in the receiving stream.

Construction stormwater runoff management practices may include: stormwater detention structures (including ponds with a permanent pool); stormwater retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices).

Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel to provide a non-erosive velocity flow from the structure to the receiving stream so that the natural physical and biological characteristics and functions of the stream are

maintained and protected (e.g., there should be no significant changes in the hydrological regime of the receiving water). The SWPPP shall include an explanation of the technical basis used to select the velocity dissipation devices to control pollution where flows exceed pre-development levels. The Tennessee Erosion and Sediment Control Handbook provides measures that can be incorporated into the design or implemented on site to decrease erosive velocities. An Aquatic Resources Alteration Permit (ARAP) may be required if such velocity dissipation devices installed would alter the receiving stream and/or its banks.

3.5.5. Other items needing control

a) No solid materials, including building materials, shall be placed in waters of the state, except as authorized by a section 404 permit and/or Aquatic Resources Alteration Permit (ARAP)(see part 9 below).
b) For installation of any waste disposal systems on site, or sanitary sewer or septic system, the SWPPP shall identify these systems and provide for the necessary EPSC controls. Permittees must also comply with applicable state and/or local waste disposal, sanitary sewer or septic system regulations for such systems to the extent these are located within the permitted area.
c) The SWPPP shall include a description of construction and waste materials expected to be stored on-site. The SWPPP shall also include a description of controls used to reduce pollutants from materials stored on site, including storage practices to minimize exposure of the materials to stormwater, and spill prevention and response.
d) A description of stormwater sources from areas other than construction and a description of controls and measures that will be implemented at those sites.
e) A description of measures necessary to prevent "taking" of legally protected state or federal listed threatened or endangered aquatic fauna and/or critical habitat (if applicable). The permittee must describe and implement such measures to maintain eligibility for coverage under this permit.

3.5.6. Approved local government sediment and erosion control requirements

Permittees must comply with any additional erosion prevention, sediment controls and stormwater management measures required by a local municipality or permitted MS4 program.

3.5.7. Maintenance

The SWPPP shall describe procedures to ensure that vegetation, erosion and sediment control measures, buffer zones, and other protective measures identified in the site plan are kept in good and effective operating condition. Maintenance needs identified in inspections or by other means shall be accomplished before the next storm event, but in no case more than 7 days after the need is identified.

3.5.8. Inspections

3.5.8.1. Inspector training and certification

Inspectors performing the required twice weekly inspections must have an active certification by completing the "Fundamentals of Erosion Prevention and Sediment Control Level I" course. A copy of the certification or training record for inspector certification should be kept on site.

3.5.8.2. Schedule of inspections

a) Inspections described in paragraphs b, c and d below, shall be performed at least twice every calendar week. Inspections shall be performed at least 72 hours apart. Where sites or portion(s) of construction sites have been temporarily stabilized, or runoff is unlikely due to winter conditions (e.g., site covered with snow or ice) or due to extreme drought, such inspection only has to be conducted once per month until thawing or precipitation results in runoff or construction activity resumes. Inspection requirements do not apply to definable areas that have been finally stabilized, as described in subpart 3.1 above. Written notification of the intent to change the inspection frequency and the justification for such request must be submitted to the local Environmental Field Office, or the division's Nashville Central Office for projects of the Tennessee Department of Transportation (TDOT) and the Tennessee Valley Authority (TVA). Should the division discover that monthly inspections of the site are not appropriate due to insufficient stabilization measures or otherwise, twice weekly inspections shall resume. The division may inspect the site to confirm or deny the notification to conduct monthly inspections.
b) Qualified personnel, as defined in section 3.5.8.1 above (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, locations where vehicles enter or exit the site, and each outfall.
c) Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the site's drainage system. Erosion prevention and sediment control measures shall be observed to ensure that they are operating correctly.
d) Outfall points (where discharges leave the site and/or enter waters of the state) shall be inspected to determine whether erosion prevention and sediment control measures are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.
e) Based on the results of the inspection, any inadequate control measures or control measures in disrepair shall be replaced or modified, or repaired as necessary, before the next rain event, but in no case more than 7 days after the need is identified.
f) Based on the results of the inspection, the site description identified in the SWPPP in accordance with section 3.5.1 above and pollution prevention measures identified in the SWPPP in accordance with section 3.5.2 above shall be revised as appropriate, but in no case later than 7 days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP, but in no case later than 14 days following the inspection.
g) All inspections shall be documented on the Construction Stormwater Inspection Certification form provided in Appendix C of this permit for all construction sites. An alternative inspection form may be used as long as the form contents and the inspection certification language are, at a minimum, equivalent to the division's form (Appendix C) and the permittee has obtained a written approval from the division to use the alternative form. Inspection documentation will be maintained on site and made available to the division upon request. Inspection reports must be submitted to the division within 10 days of the request. If the division requests the Construction Stormwater Inspection Certification form to be submitted, the submitted form must contain the printed name and

signature of the trained certified inspector and the person who meets the signatory requirements of section 7.7.2 below of this permit.

h) Trained certified inspectors shall complete inspection documentation to the best of their ability. Falsifying inspection records or other documentation or failure to complete inspection documentation shall result in a violation of this permit and any other applicable acts or rules.

i) Subsequent operator(s) (primary permittees) who have obtained coverage under this permit should conduct twice weekly inspections, unless their portion(s) of the site has been temporarily stabilized, or runoff is unlikely due to winter conditions or due to extreme drought as stated in paragraph a) above. The primary permittee (such as a developer) is no longer required to conduct inspections of portions of the site that are covered by a subsequent primary permittee (such as a home builder).

3.5.9. Pollution prevention measures for non-stormwater discharges

Sources of non-stormwater listed in section 1.2.3 above of this permit that are combined with stormwater discharges associated with construction activity must be identified in the SWPPP. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Any non-stormwater must be discharged through stable discharge structures. Estimated volume of the non-stormwater component(s) of the discharge must be included in the design of all impacted control measures.

3.5.10. Documentation of permit eligibility related to Total Maximum Daily Loads (TMDL)

The SWPPP must include documentation supporting a determination of permit eligibility with regard to waters that have an approved TMDL for a pollutant of concern, including:

a) identification of whether the discharge is identified, either specifically or generally, in an approved TMDL and any associated wasteload allocations, site-specific requirements, and assumptions identified for the construction stormwater discharge;

b) summaries of consultation with the division on consistency of SWPPP conditions with the approved TMDL, and

c) measures taken to ensure that the discharge of TMDL identified pollutants from the site is consistent with the assumptions and requirements of the approved TMDL, including any specific wasteload allocation that has been established that would apply to the construction stormwater discharge.

4. CONSTRUCTION AND DEVELOPMENT EFFLUENT GUIDELINES

4.1. Non-Numeric Effluent Limitations

Any point source authorized by this general permit must achieve, at a minimum, the effluent limitations representing the degree of effluent reduction attainable by application of best practicable control technology (BPT) currently available and is described in sections 4.1.1 through 4.1.7 below.

4.1.1. Erosion Prevention and Sediment Controls

Design, install and maintain effective erosion prevention and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:

(1) Control stormwater volume and velocity within the site to minimize soil erosion;
(2) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;
(3) Minimize the amount of soil exposed during construction activity;
(4) Minimize the disturbance of steep slopes;
(5) Eliminate (or minimize if complete elimination is not possible) sediment discharges from the site. The design, installation and maintenance of erosion prevention and sediment controls must address factors such as the design storm (see sub-section 3.5.3.3 above) and soil characteristics, including the range of soil particle sizes expected to be present on the site;
(6) Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible (see section 4.1.2 below); and
(7) Minimize soil compaction and, unless infeasible, preserve topsoil.

4.1.2. Buffer zone requirements

Buffer zone requirements in this section apply to all streams adjacent to construction sites, with an exception for streams designated as impaired or Exceptional Tennessee waters (see section 5.4.2 below). A 30-foot natural riparian buffer zone adjacent to all streams at the construction site shall be preserved, to the maximum extent practicable, during construction activities at the site. The water quality buffer zone is required to protect waters of the state (e.g., perennial and intermittent streams, rivers, lakes, wetlands) located within or immediately adjacent to the boundaries of the project, as identified using methodology from Standard Operating Procedures for Hydrologic Determinations (see rules to implement a certification program for Qualified Hydrologic Professionals, TN Rules Chapter 0400-40-17). Buffer zones are not primary sediment control measures and should not be relied on as such. Rehabilitation and enhancement of a natural buffer zone is allowed, if necessary, for improvement of its effectiveness of protection of the waters of the state. The buffer zone requirement only applies to new construction sites, as described in section 2.4.2 above.

The riparian buffer zone should be preserved between the top of stream bank and the disturbed construction area. The 30-feet criterion for the width of the buffer zone can be established on an average width basis at a project, as long as the minimum width of the buffer zone is more than 15 feet at any measured location.

Every attempt should be made for construction activities not to take place within the buffer zone. BMPs providing equivalent protection to a receiving stream as a natural riparian zone may be used at a construction site. Such equivalent BMPs shall be designed to be as effective in protecting the receiving stream from effects of stormwater runoff as a natural riparian zone. A justification for use and a design of equivalent BMPs shall be included in the SWPPP. Such equivalent BMPs are expected to be routinely used at construction projects typically located adjacent to surface waters. These projects include, but are not limited to: sewer line construction,

roadway construction, utility line or equipment installation, greenway construction, construction of a permanent outfall or a velocity dissipating structure, etc.

This requirement does not apply to any valid Aquatic Resources Alteration Permit (ARAP), or equivalent permits issued by federal authorities. Additional buffer zone requirements may be established by the local MS4 program.

4.1.2.1. Buffer zone exemption based on existing uses

Buffer zones as described in section 4.1.2 above shall not be required to portions of the buffer where certain land uses exist and are to remain in place according to the following:

1. A use shall be considered existing if it was present within the buffer zone as of the date of the Notice of Intent for coverage under the CGP. Existing uses shall include, but not be limited to, buildings, parking lots, roadways, utility lines and on-site sanitary sewage systems. Only the portion of the buffer zone that contains the footprint of the existing land use is exempt from buffer zones. Activities necessary to maintain uses are allowed provided that no additional vegetation is removed from the buffer zone.

2. If an area with an existing land use is proposed to be converted to another use or the impervious surfaces located within the buffer area are being removed buffer zone requirements shall apply.

4.1.2.2. Pre-Approved Sites

Construction activity at sites that have been pre-approved before February 1, 2010, are exempt from the buffer requirements of section 4.1.2 above. Evidence of pre-approval for highway projects shall be a final right-of-way plan and for other construction projects, the final design drawings with attached dated, written approval by the local, state or federal agency with authority to approve such design drawings for construction.

4.1.3. Soil stabilization

Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have temporarily or permanently ceased on any portion of the site, and will not resume for a period exceeding 14 calendar days. Soil stabilization (temporary or permanent) of those of disturbed areas must be completed as soon as possible, but not later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures (such as, but not limited to: properly anchored mulch, soil binders, matting) must be employed.

4.1.4. Dewatering

Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls. Appropriate controls include, but are not limited to: weir tank, dewatering tank, gravity bag filter, sand media particulate filter, pressurized bag filter, cartridge filter or other control units providing the level of treatment necessary to comply with permit requirements.

4.1.5. Pollution prevention measures

The permittee must design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

(1) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
(2) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and
(3) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

4.1.6. Prohibited discharges

The following discharges are prohibited:

(1) Wastewater from washout of concrete, unless managed by an appropriate control;
(2) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
(3) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
(4) Soaps or solvents used in vehicle and equipment washing.

4.1.7. Surface outlets

When discharging from basins and impoundments, utilize outlet structures that only withdraw water from near the surface of the basin or impoundment, unless infeasible.

5. SPECIAL CONDITIONS, MANAGEMENT PRACTICES, AND OTHER NON-NUMERIC LIMITATIONS

5.1. Releases in Excess of Reportable Quantities

The discharge of hazardous substances or oil in the stormwater discharge(s) from a facility shall be prevented or minimized in accordance with the applicable stormwater pollution prevention plan for the facility. This permit does not relieve the permittee of the reporting requirements of 40 CFR 117 and 40 CFR 302. Where a release containing a hazardous substance in an amount

equal to or in excess of a reportable quantity established under either 40 CFR 117 or 40 CFR 302 occurs during a 24 hour period:

a) the permittee is required to notify the National Response Center (NRC) (800-424-8802) and the Tennessee Emergency Management Agency (emergencies: 800-262-3300; non-emergencies: 800-262-3400) in accordance with the requirements of 40 CFR 117 or 40 CFR 302 as soon as he or she has knowledge of the discharge;
b) the permittee shall submit, within 14 days of knowledge of the release, a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, what actions were taken to mitigate effects of the release, and steps to be taken to minimize the chance of future occurrences, to the appropriate Environmental Field Office (see subpart 2.8 above); and
c) the SWPPP required under part 3 above of this permit must be updated within 14 days of knowledge of the release: to provide a description of the release, the circumstances leading to the release, and the date of the release. This can be accomplished by including a copy of a written description of the release as described in the paragraph b) above. In addition, the SWPPP must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

5.2. Spills

This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill.

5.3. Discharge Compliance with State Water Quality Standards

5.3.1. Violation of Water Quality Standards

This permit does not authorize stormwater or other discharges that would result in a violation of a state water quality standard (the TDEC Rules, Chapters 1200-4-3, 1200-4-4). Such discharges constitute a violation of this permit.

Where a discharge is already authorized under this permit and the division determines the discharge to cause or contribute to the violation of applicable state water quality standards, the division will notify the operator of such violation(s). The permittee shall take all necessary actions to ensure future discharges do not cause or contribute to the violation of a water quality standard and shall document these actions in the SWPPP.

5.3.2. Discharge quality

a) The construction activity shall be carried out in such a manner that will prevent violations of water quality criteria as stated in the TDEC Rules, Chapter 1200-4-3-.03. This includes but is not limited to the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of waters of the state for any of the uses designated for that water body by TDEC Rules, Chapter 1200-4-4. Construction activity carried out in the manner required by this permit shall be considered compliance with the TDEC Rules, Chapter 1200-4-3-.03.
b) There shall be no distinctly visible floating scum, oil or other matter contained in the stormwater discharge.
c) The stormwater discharge must not cause an objectionable color contrast in the receiving stream.
d) The stormwater discharge must result in no materials in concentrations sufficient to be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream. This provision includes species covered under subpart 1.3 above.

5.4. Discharges into Impaired or Exceptional Tennessee Waters

5.4.1. Additional SWPPP/BMP Requirements for discharges into impaired or exceptional TN Waters

Discharges that would add loadings of a pollutant that is identified as causing or contributing to an impairment of a water body on the list of impaired waters, or which would cause degradation to waters designated by TDEC as Exceptional Tennessee waters are not authorized by this permit (see subpart 1.3 above). To be eligible to obtain and maintain coverage under this permit, the operator must satisfy, at a minimum, the following additional requirements for discharges into waters impaired by siltation (or discharges upstream of such waters and because of the proximity to the impaired segment and the nature of the discharge is likely to contribute pollutants of concern in amounts measurable in the impaired segment that may affect the impaired waters) and for discharges to waters identified by TDEC as Exceptional Tennessee waters (or discharges upstream of such waters and because of the proximity to the exceptional segment and the nature of the discharge is likely to contribute pollutants of concern in amounts measurable in the exceptional segment that may affect the Exceptional Tennessee waters):

a) The SWPPP must certify that erosion prevention and sediment controls used at the site are designed to control storm runoff generated by a 5-year, 24-hour storm event (the design storm - see part 10 below: “2-year and 5-year design storm depths and intensities”), as a minimum, either from total rainfall in the designated period or the equivalent intensity as specified on the following website http://hdsc.nws.noaa.gov/hdsc/pfds/orb/tn_pfds.html. When clay and other fine particle soils are found on sites, additional physical or chemical treatment of stormwater runoff may be used.
b) The SWPPP must be prepared by a person who, at a minimum, has completed the department’s Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites course. This requirement goes in effect 24 months following the new permit effective date. A copy of the certification or training record for inspector certification should be included with the SWPPP.

c) The permittee shall perform inspections described in section 3.5.8 above at least twice every calendar week. Inspections shall be performed at least 72 hours apart.
d) The permittee must certify on the form provided in Appendix C of this permit whether or not all planned and designed erosion prevention and sediment controls are installed and in working order. The form must contain the printed name and signature of the inspector and the certification must be executed by a person who meets the signatory requirements of section 7.7.2 below of this permit. The record of inspections must be kept at the construction site with a copy of the SWPPP. For record retention requirements, see part 6 below.
e) In the event the division finds that a discharger is complying with the SWPPP, but contributing to the impairment of receiving stream, then the discharger will be notified by the director in writing that the discharge is no longer eligible for coverage under the general permit. The permittee may update the SWPPP and implement the necessary changes designed to eliminate further impairment of the receiving stream. If the permittee does not implement the SWPPP changes within 7 days of receipt of notification, the permittee will be notified in writing that continued discharges must be covered by an individual permit (see subpart 7.12 below). To obtain the individual permit, the operator must file an individual permit application (EPA Forms 1 and 2F). The project must be stabilized immediately until the SWPPP is updated and the individual permit is issued. Only discharges from earth disturbing activities necessary for stabilization are authorized to continue until the individual permit is issued.
f) For an on-site outfall in a drainage area of a total of 5 or more acres, a minimum temporary (or permanent) sediment basin volume that will provide treatment for a calculated volume of runoff from a 5 year, 24 hour storm and runoff from each acre drained, or equivalent control measures as specified in the Tennessee Erosion and Sediment Control Handbook, shall be provided until final stabilization of the site. A drainage area of 5 or more acres includes both disturbed and undisturbed portions of the site or areas adjacent to the site, all draining through the common outfall. Where an equivalent control measure is substituted for a sediment retention basin, the equivalency must be justified. Runoff from any undisturbed acreage should be diverted around the disturbed area and the sediment basin and, if so, can be omitted from the volume calculation. Sediment storage expected from the disturbed areas must be included and a marker installed signifying a cleanout need.
g) The director may require revisions to the SWPPP necessary to prevent a negative impact to legally protected state or federally listed aquatic fauna, their habitat, or the receiving waters.

5.4.2. Buffer zone requirements for discharges into impaired or exceptional TN waters

For sites that contain and/or are adjacent to a receiving stream designated as impaired or Exceptional Tennessee waters a 60-foot natural riparian buffer zone adjacent to the receiving stream shall be preserved, to the maximum extent practicable, during construction activities at the site. The water quality buffer zone is required to protect waters of the state (e.g., perennial and intermittent streams, rivers, lakes, wetlands) located within or immediately adjacent to the boundaries of the project, as identified using methodology from Standard Operating Procedures for Hydrologic Determinations (see rules to implement a certification program for Qualified Hydrologic Professionals , TN Rules Chapter 0400-40-17). Buffer zones are not primary sediment control measures and should not be relied on as such. Rehabilitation and enhancement of a natural buffer zone is allowed, if necessary, for improvement of its effectiveness of

protection of the waters of the state. The buffer zone requirement only applies to new construction sites, as described in section 2.4.2 above.

The natural buffer zone should be established between the top of stream bank and the disturbed construction area. The 60-feet criterion for the width of the buffer zone can be established on an average width basis at a project, as long as the minimum width of the buffer zone is more than 30 feet at any measured location.

Every attempt should be made for construction activities not to take place within the buffer zone. BMPs providing equivalent protection to a receiving stream as a natural riparian zone may be used at a construction site. Such equivalent BMPs shall be designed to be as effective in protecting the receiving stream from effects of stormwater runoff as a natural buffer zone. A justification for use and a design of equivalent BMPs shall be included in the SWPPP. Such equivalent BMPs are expected to be routinely used at construction projects typically located adjacent to surface waters. These projects include, but are not limited to: sewer line construction, roadway construction, utility line or equipment installation, greenway construction, construction of a permanent outfall or a velocity dissipating structure, etc.

This requirement does not apply to an area that is being altered under the authorization of a valid Aquatic Resources Alteration Permit (ARAP), or equivalent permits issued by federal authorities. Additional natural buffer zone requirements may be established by the local MS4 program.

5.4.2.1. Buffer zone exemption based on existing uses

Buffer zones as described in section 5.4.2 above shall not be required to portions of the buffer where certain land uses exist and are to remain in place according to the following:

1. A use shall be considered existing if it was present within the buffer zone as of the date of the Notice of Intent for coverage under the CGP. Existing uses shall include, but not be limited to, buildings, parking lots, roadways, utility lines and on-site sanitary sewage systems. Only the portion of the buffer zone that contains the footprint of the existing land use is exempt from buffer zones. Activities necessary to maintain uses are allowed provided that no additional vegetation is removed from the buffer zone.

2. If an area with an existing land use is proposed to be converted to another use or the impervious surfaces located within the buffer area are being removed buffer zone requirements shall apply.

5.4.3. Pre-Approved sites

Construction activity at sites that have been pre-approved before June 16, 2005, are exempt from the design storm requirements of section 5.4.1 a) and e) above and the buffer requirements of section 5.4.2 above. Evidence of pre-approval for highway projects shall be a final right-of-way plan and for other construction projects, the final design drawings with attached dated, written approval by the local, state or federal agency with authority to approve such design drawings for construction.

6. RETENTION, ACCESSIBILITY AND SUBMISSION OF RECORDS

6.1. Documents

The permittee shall retain copies of stormwater pollution prevention plans and all reports required by this permit, and records of all data used to complete the NOI and the NOT to be covered by this permit, for a period of at least three years from the date the notice of termination is submitted. This period may be extended by written request of the director.

6.2. Accessibility and Retention of Records

The permittee shall retain a copy of the SWPPP required by this permit (including a copy of the permit) at the construction site (or other local location accessible to the director and the public) from the date construction commences to the date of termination of permit coverage. Permittees with day-to-day operational control over pollution prevention plan implementation shall have a copy of the SWPPP available at a central location onsite for the use of all operators and those identified as having responsibilities under the plan whenever they are on the construction site. Once coverage is terminated, the permittee shall maintain a copy of all records for a period of three years.

6.2.1. Posting information at the construction site

The permittee shall post a notice near the main entrance of the construction site accessible to the public with the following information:

a) a copy of the NOC with the NPDES permit tracking number for the construction project;
b) name, company name, E-mail address (if available), telephone number and address of the project site owner/operator or a local contact person;
c) a brief description of the project; and
d) the location of the SWPPP (see section 3.3.3 above).

The notice must be maintained in a legible condition. If posting this information near a main entrance is infeasible due to safety concerns, or not accessible to the public, the notice shall be posted in a local public building. If the construction project is a linear construction project (e.g., pipeline, highway, etc.), the notice must be placed in a publicly accessible location near where construction is actively underway and moved as necessary. This permit does not provide the public with any right to trespass on a construction site for any reason, including inspection of a site. This permit does not require that permittees allow members of the public access to a construction site.

The permittee shall also retain following items/information in an appropriate location on-site:

a) a rain gauge;
b) a copy of twice weekly inspection reports;
c) a documentation of quality assurance site assessments, if applicable (see section 3.1.2 above); and
d) a copy of the site inspector's Fundamentals of Erosion Prevention and Sediment Control Level 1 certification.

6.3. Electronic Submission of NOIs, NOTs and Reports

If the division notifies dischargers (directly by mail or E-mail, by public notice, or by making information available on the world wide web) of electronic forms or other report options that become available at a later date (e.g., electronic submission of forms), the operators may take advantage of those options to satisfy the NOI, NOT and other report notification requirements.

7. STANDARD PERMIT CONDITIONS

7.1. Duty to Comply

7.1.1. Permittee's duty to comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Tennessee Water Quality Control Act (TWQCA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

7.1.2. Penalties for violations of permit conditions

Pursuant to T.C.A. § 69-3-115 of The Tennessee Water Quality Control Act of 1977, as amended:

a) any person who violates an effluent standard or limitation or a water quality standard established under this part (T.C.A. § 69-3-101, et. seq.); violates the terms or conditions of this permit; fails to complete a filing requirement; fails to allow or perform an entry, inspection, monitoring or reporting requirement; violates a final determination or order of the board, panel or commissioner; or violates any other provision of this part or any rule or regulation promulgated by the board, is subject to a civil penalty of up to ten thousand dollars ($10,000) per day for each day during which the act or omission continues or occurs;
b) any person unlawfully polluting the waters of the state or violating or failing, neglecting, or refusing to comply with any of the provisions of this part (T.C.A. § 69-3-101, et. seq.) commits a Class C misdemeanor. Each day upon which such violation occurs constitutes a separate offense;
c) any person who willfully and knowingly falsifies any records, information, plans, specifications, or other data required by the board or the commissioner, or who willfully and knowingly pollutes the waters of the state, or willfully fails, neglects or refuses to comply with any of the provisions of this part (T.C.A. § 69-3-101, et. seq.) commits a Class E felony and shall be punished by a fine of not more than twenty-five thousand dollars ($25,000) or incarceration, or both.

7.1.3. Civil and criminal liability

Nothing in this permit shall be construed to relieve the discharger from civil or criminal penalties for noncompliance. Notwithstanding this permit, the discharger shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge to any surface or subsurface waters. Additionally, notwithstanding this permit, it shall be the responsibility of the discharger to

conduct stormwater discharge activities in a manner such that public or private nuisances or health hazards will not be created. Furthermore, nothing in this permit shall be construed to preclude the State of Tennessee from any legal action or relieve the discharger from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or the Federal Water Pollution Control Act.

7.1.4. Liability under state law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable local, state or federal law.

7.2. Continuation of the Expired General Permit

Permittees shall maintain coverage under this general permit until a new general permit is issued. Permittees who choose not to maintain coverage under the expired general permit, or are required to obtain an individual permit, must submit an application (U.S. EPA NPDES Forms 1 and 2F and any other applicable forms) at least 180 days prior to expiration of this general permit. Permittees who are eligible and choose to be covered by the new general permit must submit an NOI by the date specified in that permit. Facilities that have not obtained coverage under this permit by the permit expiration date cannot become authorized to discharge under the continued permit.

Operator(s) of an existing site permitted under the division's 2005 construction general permit shall maintain full compliance with the existing SWPPP. The existing SWPPP should be modified, if necessary, to meet requirements of this new general permit, and the SWPPP changes implemented no later than 12 months following the new permit effective date. The permittee shall make the updated SWPPP available for the division's review upon request.

7.3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

7.4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

7.5. Duty to Provide Information

The permittee shall furnish to the division or an authorized representative of the division, within a time specified by the division, any information that the division may request to determine compliance with this permit or other information relevant to the protection of the waters of the state. The permittee shall also furnish to the division, upon request, copies of records required to be kept by this permit.

7.6. Other Information

When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the director, he or she shall promptly submit such facts or information.

7.7. Signatory Requirements

All Notices of Intent (NOIs), stormwater pollution prevention plans (SWPPPs), requests for termination of permit coverage (NOTs), Construction Stormwater Inspection Certifications, Construction Stormwater Monitoring Report forms, reports, certifications or information either submitted to the director or the operator of a large or medium municipal separate storm sewer system and/or any other information either submitted to the division, or that this permit requires be maintained by the permittee, shall be signed as described in sections 7.7.1 and 7.7.2 below and dated.

7.7.1. Signatory requirements for a Notice of Intent (NOI)[3]

NOI shall be signed as follows:

a) For a corporation, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or
(ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated site including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

NOTE: The division does not require specific assignments or delegations of authority to responsible corporate officers. The division will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the director to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

b) For a partnership or sole proprietorship, by a general partner or the proprietor, respectively.

[3] As specified in 40 CFR 122.22(a)(1)-(3) [48 FR 14153, Apr. 1, 1983, as amended at 48 FR 39619, Sept. 1, 1983; 49 FR 38047, Sept. 29, 1984; 50 FR 6941, Feb. 19, 1985; 55 FR 48063, Nov. 16, 1990; 65 FR 30907, May 15, 2000]

c) For a municipality, state, federal, or other public agency, by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(i) the chief executive officer of the agency, or
(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

7.7.2. Signatory requirements for reports and other items

SWPPPs, Construction Stormwater Inspection Certification forms, reports, certifications or other information submittals required by the permit and other information requested by the division, including but not limited to Notice of Violation responses, shall be signed by a person described in section 7.7.1 above, or by a duly authorized representative of that person.

7.7.3. Duly authorized representative

For a purpose of satisfying signatory requirements for reports (see section 7.7.2 above), a person is a duly authorized representative only if:

a) the authorization is made in writing by a person described in section 7.7.1 above;
b) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated site or activity such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company; a duly authorized representative may thus be either a named individual or any individual occupying a named position and,
c) the written authorization is submitted to the director or an appropriate EFO (see section 2.8 above). The written authorization shall be a written document including the name of the newly authorized person and the contact information (title, mailing address, phone number, fax number and E-mail address) for the authorized person. The written authorization shall be signed by the newly authorized person accepting responsibility and by the person described in section 7.7.1 above delegating the authority.

7.7.4. Changes to authorization

If an authorization under sections 7.7.1 above or 7.7.3 above is no longer accurate because a different individual or position has responsibility as the primary or secondary permittee, but the company name (permittee name) remains the same, a new NOI and SWPPP certification shall be submitted to an appropriate EFO (see section 2.8 above) and signed by the new party who meets signatory authority satisfying the requirements of sections 7.7.1 above or 7.7.3 above . The NOI shall include the new individual’s information (title, mailing address, phone number, fax number and E-mail address), the existing tracking number and the project name.

7.7.5. Signatory requirements for primary permittees

Primary permittees required to sign an NOI and SWPPP because they meet the definition of an operator (see subpart 2.2 above) shall sign the following certification statement on the NOI and SWPPP:

> "*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*"

7.7.6. Signatory requirements for secondary permittees

Secondary permittees (typically construction contractors) required to sign an NOI and SWPPP because they meet the definition of an operator but who are not primarily responsible for preparing an NOI and SWPPP, shall sign the following certification statement on the NOI and SWPPP:

> *"I certify under penalty of law that I have reviewed this document, any attachments, and the SWPPP referenced above. Based on my inquiry of the construction site owner/developer identified above and/or my inquiry of the person directly responsible for assembling this NOI and SWPPP, I believe the information submitted is accurate. I am aware that this NOI, if approved, makes the above-described construction activity subject to NPDES permit number TNR100000, and that certain of my activities on-site are thereby regulated. I am aware that there are significant penalties, including the possibility of fine and imprisonment for knowing violations, and for failure to comply with these permit requirements."*

7.8. Penalties for Falsification of Reports

Knowingly making any false statement on any report or form required by this permit may result in the imposition of criminal penalties as provided for in Section 309 of the Clean Water Act and in T.C.A. §69-3-115 of the Tennessee Water Quality Control Act.

7.9. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to Section 311 of the Clean Water Act or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

7.10. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. The issuance of this permit does not authorize trespassing or discharges of stormwater or non-stormwater across private property.

7.11. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

7.12. Requiring an Individual Permit

7.12.1. Director can require a site to obtain an individual permit

The director may require any person authorized by this permit to apply for and/or obtain an individual NPDES permit in order to obtain adequate protection of designated uses of a receiving stream. Any interested person may petition the director in writing to take action under this paragraph, but must include in their petition the justification for such an action. Where the director requires a discharger authorized to discharge under this permit to apply for an individual NPDES permit, the director shall notify the discharger in writing that an individual permit application is required. This notification will include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that coverage under this general permit shall terminate upon the effective date of an individual NPDES permit or denial of coverage under an individual permit. The notification may require stabilization of the site and suspend coverage under this general permit until the individual permit is issued. Individual permit applications shall be submitted to the appropriate Environmental Field Office of the division as indicated in subpart 2.8 above of this permit. The director may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual NPDES permit application as required by the director under this paragraph, then the applicability of this permit to the discharger will be terminated at the end of the day specified by the director for application submittal.

If the decision to require an individual NPDES permit precedes the issuance of coverage under this general permit, earth disturbing activities cannot begin until the individual permit is issued.

7.12.2. Permittee may request individual permit instead of coverage under this general permit

Any discharger authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. Any discharger that knowingly cannot abide by the terms and conditions of this permit must apply for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the appropriate division's Environmental Field Office. The request may be granted by issuance of an individual permit, or alternative general permit, if the reasons cited by the permittee are adequate to support the request.

7.12.3. Individual permit terminates general permit

When an individual NPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an alternative NPDES general permit, the applicability of this permit to the discharger is terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to an owner or operator otherwise subject to this permit, or the owner or operator is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is terminated on the date of such denial, unless otherwise specified by the director. Coverage under the Tennessee Multi-Sector General Permit for the Discharge of Stormwater from an Industrial Activity (TMSP) will not be considered as an alternative general permit under this section without being specified by the director.

7.13. Other, Non-Stormwater, Program Requirements

No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

7.14. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related equipment) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of stormwater pollution prevention plans.

Proper operation and maintenance also includes adequate laboratory quality assurance and quality control procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee, when determined by the permittee or the division to be necessary to achieve compliance with the conditions of the permit.

7.15. Inspection and Entry

The permittee shall allow authorized representatives of the Environmental Protection Agency, the director or an authorized representative of the commissioner of TDEC, or, in the case of a construction site which discharges through a municipal separate storm sewer, an authorized representative of the MS4 receiving the discharge, upon the presentation of credentials and other documents as may be required by law:

a) to enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;
b) to have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and
c) to inspect any facilities or equipment (including monitoring and control equipment).

7.16. Permit Actions

This permit may be issued, modified, revoked, reissued or terminated for cause in accordance with this permit and the applicable requirements of T.C.A. § 69-3-108. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

8.1.1. Termination of builder and contractor coverage

8. REQUIREMENTS FOR TERMINATION OF COVERAGE

8.1. Termination of Developer and Builder Coverage

8.1.1. Termination process for primary permittees

Primary permittees wishing to terminate coverage under this permit must submit a completed notice of termination (NOT) form, provided in Appendix B of this permit (or copy thereof). Primary permittees who abandon the site and fail to submit the NOT will be in violation of this permit. Signs notifying the public of the construction activity shall be in place until the NOT form has been submitted. Primary permittees may terminate permit coverage only if the conditions described in items 1, 2 or 3 below occur at the site:

1. All earth-disturbing activities at the site are completed and, if applicable, construction support activities permitted under section 1.2.2 above, and the following requirements are met:

   (a) For any areas that
   - were disturbed during construction,
   - are not covered over by permanent structures, and
   - over which the permittee had control during the construction activities

   the requirements for final vegetative or non-vegetative stabilization described in sub-section 3.5.3.2 above are met;

   (b) The permittee has removed and properly disposed of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use following termination of permit coverage;

   (c) The permittee has removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following termination of permit coverage;

(d) The permittee has removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following termination of permit coverage; and

(e) The permittee must identify who is responsible for ongoing maintenance of any stormwater controls left on the site for long-term use following termination of permit coverage; or

2. The permittee has transferred control of all areas of the site for which he is responsible (including, but not limited to, infrastructure, common areas, stormwater drainage structures, sediment control basin, etc.) under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit; or

3. The permittee obtains coverage under an individual or alternative general NPDES permit.

8.1.2. NOT review

The division will review NOTs for completeness and accuracy and, when necessary, investigate the proposed site for which the NOT was submitted. Upon completing the NOT review, the division will:

1) prepare and transmit a notification that a NOT form was received;
2) notify the applicant of needed changes to their NOT submittal; or
3) deny a request for termination of coverage under this general permit.

The division retains the right to deny termination of coverage under this general permit upon receipt of the NOT. If the local Environmental Field Office has information indicating that the permit coverage is not eligible for termination, written notification will be provided that permit coverage has not been terminated. The notification will include a summary of existing deficiencies. When the site meets the termination criteria, the NOT should be re-submitted.

If any permittee files for bankruptcy or the site is foreclosed on by the lender, the permittee should notify the division of the situation so that the division may assess the site to determine if permit coverage should be obtained by any other person or whether other action is needed.

8.2. Termination of Builder and Contractor Coverage

8.2.1. Termination process for secondary permittees

Secondary permittees (builders/contractors) must request termination of coverage under this permit by submitting an NOT when they are no longer an operator at the construction site. Secondary permittees receive coverage under this permit, but are not normally mailed a Notice of Coverage. Consequently, the division may, but is not required to, notify secondary permittees that their notice of termination has been received. If the division has reason to believe that the secondary permittee's NOT should not have been submitted, the division will deny the secondary permittee's NOT in writing, with specific reasons as to why the NOT should not have been submitted.

8.3. NOT certification

The NOT and the following certification must be signed in accordance with subpart 7.7 above (Signatory Requirements) of this permit:

> *"I certify under penalty of law that either: (a) all stormwater discharges associated with construction activity from the portion of the identified facility where I was an operator have ceased or have been eliminated or (b) I am no longer an operator at the construction site. I understand that by submitting this notice of termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act."*

8.4. Where to Submit a Notice of Termination (NOT)?

The NOT shall be submitted to the Environmental Field Office (EFO) which issued the NOC to the primary permittee. A list of counties and the corresponding EFOs is provided in subpart 2.8 above. The appropriate permit tracking number must be clearly printed on the form.

9. Aquatic Resource Alteration Permits (ARAP)

Alterations to channels or waterbodies (stream, wetland and/or other waters of the state) that are contained on, traverse through or are adjacent to the construction site, may require an Aquatic Resources Alteration Permit (ARAP) (http://www.tn.gov/environment/permits/arap.shtml). It is the responsibility of the developer to provide a determination of the water's status[4]. This determination must be conducted using methodology from Standard Operating Procedures for Hydrologic Determinations (see rules to implement a certification program for Qualified Hydrologic Professionals , TN Rules Chapter 0400-40-17). The permittee can make an assumption that streams/wetlands are present at the site in order to expedite the permit process. In some cases, issuance of coverage under the CGP may be delayed or withheld if the appropriate ARAP has not been obtained. At a minimum, any delay in obtaining an ARAP for water body alteration associated with the proposed project must be adequately addressed in the SWPPP prior to issuance of an NOC**.** Failure to obtain an ARAP prior to any actual alteration may result in enforcement action for the unauthorized alteration.

10. DEFINITIONS

"**2-year and 5-year design storm depths and intensities**" The estimated design rainfall amounts, for any return period interval (i.e., 2-yr, 5-yr, 25-yr, etc,) in terms of either 24-hour depths or intensities for any duration, can be found by accessing the following NOAA National Weather Service Atlas 14 data for Tennessee:

[4] The EPA considers inventorying a site's natural features is a technique called fingerprinting. More info can be found in EPA's document - EPA's Developing Your SWPPP – A Guide for Construction Sites (EPA-833-R-06-004 May 2007)

http://hdsc.nws.noaa.gov/hdsc/pfds/orb/tn_pfds.html. Other data sources may be acceptable with prior written approval by TDEC Water Pollution Control.

"Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the state. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Borrow Pit" is an excavation from which erodible material (typically soil) is removed to be fill for another site. There is no processing or separation of erodible material conducted at the site. Given the nature of activity and pollutants present at such excavation, a borrow pit is considered a construction activity for the purpose of this permit.

"**Buffer Zone**" is a strip of dense undisturbed perennial native vegetation, either original or re-established, that borders streams and rivers, ponds and lakes, wetlands, and seeps. Buffer zones are established for the purposes of slowing water runoff, enhancing water infiltration, and minimizing the risk of any potential nutrients or pollutants from leaving the upland area and reaching surface waters. Buffer zones are most effective when stormwater runoff is flowing into and through the buffer zone as shallow sheet flow, rather than in concentrated form such as in channels, gullies, or wet weather conveyances. Therefore, it is critical that the design of any development include management practices, to the maximum extent practical, that will result in stormwater runoff flowing into and through the buffer zone as shallow sheet flow. Buffer zones are established for the primary purpose of protecting water quality and maintaining a healthy aquatic ecosystem in receiving waters.

"Clearing" in the definition of discharges associated with construction activity, typically refers to removal of vegetation and disturbance of soil prior to grading or excavation in anticipation of construction activities. Clearing may also refer to wide area land disturbance in anticipation of non-construction activities; for instance, clearing forested land in order to convert forestland to pasture for wildlife management purposes. Clearing, grading and excavation do not refer to clearing of vegetation along existing or new roadways, highways, dams or power lines for sight distance or other maintenance and/or safety concerns, or cold planing, milling, and/or removal of concrete and/or bituminous asphalt roadway pavement surfaces. The clearing of land for agricultural purposes is exempt from federal stormwater NPDES permitting in accordance with Section 401(1)(1) of the 1987 Water Quality Act and state stormwater NPDES permitting in accordance with the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.).

"Commencement of construction" The initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

"Common plan of development or sale" is broadly defined as any announcement or documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot. A common plan of development or sale identifies a situation in which multiple areas of disturbance are occurring on contiguous areas. This applies because the activities may take place at different times, on different schedules, by different operators.

"Control measure" As used in this permit, refers to any Best Management Practice (BMP) or other method used to prevent or reduce the discharge of pollutants to waters of the state.

"CWA" means the Clean Water Act of 1977 or the Federal Water Pollution Control Act (33 U.S.C. 1251, et seq.)

"**Department**" means the Department of Environment and Conservation.

"Director" means the director, or authorized representative, of the Division of Water Pollution Control of the State of Tennessee, Department of Environment and Conservation.

"Discharge of stormwater associated with construction activity" As used in this permit, refers to stormwater point source discharges from areas where soil disturbing activities (e.g., clearing, grading, excavation, etc.), or construction materials or equipment storage or maintenance (e.g., earth fill piles, fueling, waste material etc.) are located.

"**Division**" means the Division of Water Pollution Control of the State of Tennessee, Department of Environment and Conservation.

"**Final Stabilization**" means that all soil disturbing activities at the site have been completed and one of the three following criteria is met:

a. A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a uniform density of at least 70 percent of the (preferably) native vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, and all slopes and channels have been permanently stabilized against erosion, or

b. Equivalent permanent stabilization measures (such as the use of riprap; permanent geotextiles, hardened surface materials including concrete, asphalt, gabion baskets, or Reno mattresses) have been employed, or

c. For construction projects on land used for agricultural or silvicultural purposes, final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural or silvicultural use.

"Exceptional Tennessee waters" are surface waters of the State of Tennessee that satisfy characteristics of exceptional Tennessee waters as listed Chapter 1200-4-3-.06 of the official compilation - Rules and Regulations of the State of Tennessee. Characteristics include waters designated by the Water Quality Control Board as Outstanding National Resource Waters (ONRW); waters that provide habitat for ecologically significant populations of certain aquatic or semi-aquatic plants or animals; waters that provide specialized recreational opportunities; waters that possess outstanding scenic or geologic values; or waters where existing conditions are better than water quality standards.

"**Impaired waters**" (unavailable conditions waters) means any segment of surface waters that has been identified by the division as failing to support one or more classified uses. For the purpose of this permit, pollutants of concern include, but are not limited to: siltation (silt/sediment) and habitat alterations. Based on the most recent assessment information available

to staff, the division will notify applicants and permittees if their discharge is into, or is affecting, impaired waters. Resources to be used in making this determination include biennial compilations of impaired waters, databases of assessment information, updated GIS coverages (http://tnmap.tn.gov/wpc/), and the results of recent field surveys. GIS coverages of the streams and lakes not meeting water quality standards, plus the biennial list of impaired waters, can be found at http://tn.gov/environment/wpc.

"Improved sinkhole" is a natural surface depression that has been altered in order to direct fluids into the hole opening. Improved sinkhole is a type of injection well regulated under the Underground Injection Control (UIC) program. Underground injection constitutes an intentional disposal of waste waters in natural depressions, open fractures, and crevices (such as those commonly associated with weathering of limestone).

"Inspector" An inspector is a person that has successfully completed (has a valid certification from) the "Fundamentals of Erosion Prevention and Sediment Control Level I" course or equivalent course. An inspector performs and documents the required inspections, paying particular attention to time-sensitive permit requirements such as stabilization and maintenance activities. An inspector may also have the following responsibilities:

a) oversee the requirements of other construction-related permits, such as Aquatic Resources Alteration Permit (ARAP) or Corps of Engineers permit for construction activities in or around waters of the state;
b) update field SWPPPs;
c) conduct pre-construction inspection to verify that undisturbed areas have been properly marked and initial measures have been installed; and
d) inform the permit holder of activities that may be necessary to gain or remain in compliance with the CGP and other environmental permits.

"Linear Project" – is a land disturbing activity as conducted by an underground/overhead utility or highway department, including but not limited to any cable line or wire for the transmission of electrical energy; any conveyance pipeline for transportation of gaseous or liquid substance; any cable line or wire for communications; or any other energy resource transmission ROW or utility infrastructure, e.g., roads and highways. Activities include the construction and installation of these utilities within a corridor. Linear project activities also include the construction of access roads, staging areas, and borrow/spoil sites associated with the linear project. Land disturbance specific to the development of a residential and/or commercial subdivision or high-rise structures is not considered a linear project.

"Monthly" refers to calendar months.

"**Municipal Separate Storm Sewer System**" or "**MS4**" is defined at 40 CFR §122.26(b)(8) to mean a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

2. Designed or used for collecting or conveying stormwater;
3. Which is not a combined sewer; and
4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

"NOI" means notice of intent to be covered by this permit (see part 2 above of this permit.)

"NOT" means notice of termination (see part 8 above of this permit).

"**Operator**" for the purpose of this permit and in the context of stormwater associated with construction activity, means any person associated with a construction project that meets either of the following two criteria:

a) This person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project, and is considered the primary permittee; or

b) This person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee, and is considered a secondary permittee.

It is anticipated that at different phases of a construction project, different types of parties may satisfy the definition of "operator."

"Point source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include introduction of pollutants from non point-source agricultural and silvicultural activities, including stormwater runoff from orchards, cultivated crops, pastures, range lands, and forest lands or return flows from irrigated agriculture or agricultural stormwater runoff.

"**Qualifying State, Tribal, or local erosion and sediment control program**" is one that includes, as defined in 40 CFR 122.44(s):

(i) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;
(ii) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;
(iii) Requirements for construction site operators to develop and implement a stormwater pollution prevention plan. (A stormwater pollution prevention plan includes site descriptions, descriptions of appropriate control measures, copies of approved State, Tribal or local requirements, maintenance procedures, inspection procedures, and identification of non-stormwater discharges); and
(iv) Requirements to submit a site plan for review that incorporates consideration of potential water quality impacts.

"**Quality Assurance Site Assessment**" means documented site inspection to verify the functionality and performance of the SWPPP and for determining if construction, operation and maintenance accurately comply with permit requirements, as presented in the narrative, engineering specifications; maps, plans and drawings; and details for erosion prevention, sediment control and stormwater management.

"**Registered Engineer**" and "**Registered Landscape Architect**" An engineer or landscape architect certified and registered by the State Board of Architectural and Engineer Examiners pursuant to Section 62-202, Tennessee Code Annotated, to practice in Tennessee.

"Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff. Runoff coefficient is also defined as the ratio of the amount of water that is NOT absorbed by the surface to the total amount of water that falls during a rainstorm.

"**Sediment**" means solid material, both inorganic (mineral) and organic, that is in suspension, is being transported, or has been moved from the site of origin by wind, water, gravity, or ice as a product of erosion.

"Sediment basin" A temporary basin consisting of an embankment constructed across a wet weather conveyance, or an excavation that creates a basin or by a combination of both. A sediment basin typically consists of a forebay cell, dam, impoundment, permanent pool, primary spillway, secondary or emergency spillway, and surface dewatering device. The size and shape of the basin depends on the location, size of drainage area, incoming runoff volume and peak flow, soil type and particle size, land cover, and receiving stream classification (i.e., impaired, HQ, or unimpaired).

"**Sedimentation**" means the action or process of forming or depositing sediment.

"**Significant contributor of pollutants to waters of the state**" means any discharge containing pollutants that are reasonably expected to cause or contribute to an impairment of receiving stream water quality or designated uses.

"**Soil**" means the unconsolidated mineral and organic material on the immediate surface of the earth that serves as a natural medium for the growth of plants.

"**Steep Slope**" A natural or created slope of 35% grade or greater. Designers of sites with steep slopes must pay attention to stormwater management in the SWPPP to engineer runoff non-erosively around or over a steep slope. In addition, site managers should focus on erosion prevention on the slope(s) and stabilize the slope(s) as soon as practicable to prevent slope failure and/or sediment discharges from the project.

"Stormwater" means rainfall runoff, snow melt runoff, and surface runoff and drainage.

"Stormwater associated with industrial activity" is defined at 40 CFR 122.26(b)(14) and incorporated here by reference. Most relevant to this permit is 40 CFR 122.26(b)(14)(x), which relates to construction activity including clearing, grading, filling and excavation activities (including borrow pits containing erodible material). Disturbance of soil for the purpose of crop production is exempted from permit requirements, but stormwater discharges from agriculture-

related activities which involve construction of structures (e.g., barn construction, road construction, pond construction, etc.) are considered associated with industrial activity. Maintenance performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility, e.g. re-clearing, minor excavation performed around an existing structure necessary for maintenance or repair, and repaving of an existing road, is not considered a construction activity for the purpose of this permit.

"Stormwater discharge-related activities" include: activities which cause, contribute to, or result in point source stormwater pollutant discharges, including but not limited to: excavation, site development, grading and other surface disturbance activities; and measures to control stormwater including the siting, construction and operation of best management practices (BMPs) to control, reduce or prevent stormwater pollution.

"**Stormwater Pollution Prevention Plan"**(SWPPP): A written plan required by this permit that includes site map(s), an identification of construction/contractor activities that could cause pollutants in the stormwater, and a description of measures or practices to control these pollutants. It must be prepared and approved before construction begins. In order to effectively reduce erosion and sedimentation impacts, Best Management Practices (BMPs) must be designed, installed, and maintained during land disturbing activities. The SWPPP should be prepared in accordance with the Tennessee Erosion and Sediment Control Handbook. The handbook is designed to provide information to planners, developers, engineers, and contractors on the proper selection, installation, and maintenance of BMPs. The handbook is intended for use during the design and construction of projects that require erosion and sediment controls to protect waters of the state. It also aids in the development of SWPPPs and other reports, plans, or specifications required when participating in Tennessee's water quality regulations.

"Take" of an endangered species means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct.

"**Temporary stabilization**" is achieved when vegetation and/or a non-erodible surface have been established on the area of disturbance and construction activity has temporarily ceased. Under certain conditions, temporary stabilization is required when construction activities temporarily cease. However, if future construction activity is planned, permit coverage continues.

"**Total maximum daily load**" (TMDL) The sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background (40 CFR 130.2(I)). TMDL is a study that: quantifies the amount of a pollutant in a stream, identifies the sources of the pollutant, and recommends regulatory or other actions that may need to be taken in order for the stream to cease being polluted. Some of the actions that might be taken are:

1.) Re-allocation of limits on the sources of pollutants documented as impacting streams. It might be necessary to lower the amount of pollutants being discharged under NPDES permits or to require the installation of other control measures, if necessary, to ensure that water quality standards will be met.
2.) For sources over which the division does not have regulatory authority, such as ordinary agricultural or forestry activities, provide information and technical assistance to other state and federal agencies that work directly with these groups to install appropriate Best Management Practices (BMPs).

Even for impacted streams, TMDL development is not considered appropriate for all bodies of water: if enforcement has already been taken and a compliance schedule has been developed; or if best management practices have already been installed for non-regulated activities, the TMDL is considered not applicable. In cases involving pollution sources in other states, the recommendation may be that another state or EPA perform the TMDL . TMDLs can also be described by the following equation:

TMDL = sum of non point sources (LA)+ sum of point sources (WLA)+ margin of safety

A list of completed TMDLs that have been approved by EPA cab found at our web site: http://tn.gov/environment/wpc/tmdl/approved.shtml

"Turbidity" is the cloudiness or haziness of a fluid caused by individual particles (suspended solids) that are generally invisible to the naked eye, similar to smoke in air.

"**Waters**" or "**waters of the state**" means any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through, or border upon Tennessee or any portion thereof except those bodies of water confined to and retained within the limits of private property in single ownership which do not combine or effect a junction with natural surface or underground waters.

"**Waste site**" is an area where material from a construction site is disposed of. When the material is erodible, such as soil, the site must be treated as a construction site.

"**Wet weather conveyances**" are man-made or natural watercourses, including natural watercourses that have been modified by channelization that flow only in direct response to precipitation runoff in their immediate locality; whose channels are at all times above the ground water table; that are not suitable for drinking water supplies; and in which hydrological and biological analyses indicate that, under normal weather conditions, due to naturally occurring ephemeral or low flow there is not sufficient water to support fish or multiple populations of obligate lotic aquatic organisms whose life cycle includes an aquatic phage of at least two months. (Rules and Regulations of the State of Tennessee, Chapter 1200-4-3-.04(3)).

11. LIST OF ACRONYMS

ARAP	Aquatic Resource Alteration Permit
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CGP	Construction General Permit
CWA	Clean Water Act
EFO	Environmental Field Office
EPA	(U.S.) Environmental Protection Agency
EPSC	Erosion Prevention and Sediment Control
MS4	Municipal Separate Storm Sewer System
NOC	Notice of Coverage
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
ONRW	Outstanding National Resource Waters

POTW	Publicly Owned Treatment Works
SWPPP	Stormwater Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation
TMDL	Total Maximum Daily Load
TMSP	Tennessee Multi-Sector General Permit for the Discharge of Stormwater from an Industrial Activity
TVA	Tennessee Valley Authority
TWQCA	Tennessee Water Quality Control Act
UIC	Underground Injection Control
USGS	United States Geological Survey

(End of body of permit; appendices follow.)

APPENDIX A – Notice of Intent (NOI) Form
(next page)

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Water Pollution Control
6th Floor Annex, L&C Tower, 401 Church Street, Nashville, Tennessee 37243
1-888-891-8332 (TDEC)

Notice of Intent (NOI) for General NPDES Permit for Stormwater Discharges from Construction Activities (TNR100000)

Site or Project Name:		**NPDES Tracking Number: TNR**
Street Address or Location:		Construction Start Date:
		Estimated End Date:
Site Description:		Latitude (dd.dddd):
		Longitude (-dd.dddd):
County(ies):	MS4 Jurisdiction:	Acres Disturbed:
		Total Acres:

Does a topographic map show dotted or solid blue lines ☐ and/or wetlands ☐ on or adjacent to the construction site?
If wetlands are located on-site and may be impacted, attach wetlands delineation report.
If an Aquatic Resource Alteration Permit has been obtained for this site, what is the permit number? ARAP Number:

Receiving waters:

Attach the SWPPP with the NOI ☐ SWPPP Attached	Attach a site location map ☐ Map Attached

Name of Site Owner or Developer (Site-Wide Permittee): (person, company, or legal entity that has operational or design control over construction plans and specifications)

Site Owner or Developer Contact Name: (individual responsible for site)		Title or Position: (the party who signs the certification below):		
Mailing Address:		City:	State:	Zip:
Phone: ( )	Fax: ( )	E-mail:		

Optional Contact:		Title or Position:		
Mailing Address:		City:	State:	Zip:
Phone: ( )	Fax: ( )	E-mail:		

Owner or Developer Certification: (must be signed by president, vice-president or equivalent, or ranking elected official) (Primary Permittee)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner or Developer Name: (print or type)	Signature:	Date:

Contractor(s) Certification: (must be signed by president, vice-president or equivalent, or ranking elected official) (Secondary Permittee)

I certify under penalty of law that I have reviewed this document, any attachments, and the SWPPP referenced above. Based on my inquiry of the construction site owner/developer identified above and/or my inquiry of the person directly responsible for assembling this NOI and SWPPP, I believe the information submitted is accurate. I am aware that this NOI, if approved, makes the above-described construction activity subject to NPDES permit number TNR100000, and that certain of my activities on-site are thereby regulated. I am aware that there are significant penalties, including the possibility of fine and imprisonment for knowing violations, and for failure to comply with these permit requirements.

Primary contractor name and address: (print or type)	Signature:	Date:
Other contractor name and address: (print or type)	Signature:	Date:
Other contractor name and address: (print or type)	Signature:	Date:

OFFICIAL STATE USE ONLY

Received Date:	Reviewer:	Field Office:	Permit Number **TNR**	Exceptional TN Water:
Fee(s):	T & E Aquatic Flora and Fauna:		Impaired Receiving Stream:	Notice of Coverage Date:

APPENDIX A

CONSTRUCTION ACTIVITY – STORMWATER DISCHARGES
NOTICE OF INTENT (NOI) - INSTRUCTIONS

Notice of Intent (NOI) for General NPDES Permit for Stormwater Discharges from Construction Activities (TNR100000)

Purpose of this form A completed notice of intent (NOI) must be submitted to obtain coverage under the Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activity (permit). **Requesting coverage under this permit means that an applicant has obtained and examined a copy of this permit, and thereby acknowledges applicant's claim of ability to be in compliance with permit terms and conditions.** This permit is required for stormwater discharge(s) from construction activities including clearing, grading, filling and excavating (including borrow pits) of one or more acres of land. This form should be submitted at least 30 days prior to the commencement of land disturbing activities, or no later than 48 hours prior to when a new operator assumes operational control over site specifications or commences work at the site.

Permit fee (see table below) must accompany the NOI and is based on total acreage to be disturbed by an entire project, including any associated construction support activities (e.g. equipment staging yards, material storage areas, excavated material disposal areas, borrow or waste sites). There is no fee for sites less than 1 acre.

Acres Disturbed	= or > 150 acres	= or > 50 < 150 acres	= or > 5 < 50 acres	= or > 1 < 5 acres
Fee	$7,500	$4,000	$1,000	$250

Who must submit the NOI form? Per Section 2 of the permit, all site operators must submit an NOI form. "Operator" for the purpose of this permit and in the context of stormwater associated with construction activity means any person associated with a construction project who meets either or both of the following two criteria: (1) The person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project (e.g. subsequent builder), or the person that is the current land owner of the construction site. This person is considered the primary permittee; or (2) The person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee, and is considered a secondary permittee.

Owners, developers and all contractors that meet the definition of the operator in subsection 2.2 of the permit shall apply for permit coverage on the same NOI, insofar as possible. After permit coverage has been granted to the primary permittee, any subsequent NOI submittals must include the site's previously assigned permit tracking number and the project name. The comprehensive site-specific SWPPP shall be prepared in accordance with the requirements of part 3 of the permit and must be submitted with the NOI unless the NOI being submitted is to only add a contractor (secondary permittee) to an existing coverage.

Notice of Coverage The division will review the NOI for completeness and accuracy and prepare a notice of coverage (NOC). Stormwater discharge from the construction site is authorized as of the effective date of the NOC.

Complete the form Type or print clearly, using ink and not markers or pencil. Answer each item or enter "NA," for not applicable, if a particular item does not fit the circumstances or characteristics of your construction site or activity. If you need additional space, attach a separate piece of paper to the NOI form. **The NOI will be considered incomplete without a permit fee, a map, and the SWPPP.**

Describe and locate the project Use the legal or official name of the construction site. If a construction site lacks street name or route number, give the most accurate geographic information available to describe the location (reference to adjacent highways, roads and structures; e.g. intersection of state highways 70 and 100). Latitude and longitude (expressed in decimal degrees) of the center of the site can be located on USGS quadrangle maps. The quadrangle maps can be obtained at the USGS World Wide Web site: http://www.usgs.gov/; latitude and longitude information can be found at numerous other web sites. Attach a copy of a portion of a 7.5 minute quad map, showing location of site, with boundaries at least one mile outside the site boundaries. Provide estimated starting date of clearing activities and completion date of the project, and an estimate of the number of acres of the site on which soil will be disturbed, including borrow areas, fill areas, stockpiles and the total acres. For linear projects, give location at each end of the construction area.

Give name of the receiving waters Trace the route of stormwater runoff from the construction site and determine the name of the river(s), stream(s), creek(s), wetland(s), lake(s) or any other water course(s) into which the stormwater runoff drains. Note that the receiving water course may or may not be located on the construction site. If the first water body receiving construction site runoff is unnamed ("unnamed tributary"), determine the name of the water body that the unnamed tributary enters.

ARAP permit may be required **If your work will disturb or cause alterations of a stream or wetland, you must obtain an appropriate Aquatic Resource Alteration Permit (ARAP).** If you have a question about the ARAP program or permits, contact your local Environmental Field Office (EFO).

Submitting the form and obtaining more information Note that this form must be signed by the company President, Vice-President, or a ranking elected official in the case of a municipality, for details see subpart 2.5. For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC). Submit the completed NOI form (keep a copy for your records) to the appropriate EFO for the county(ies) where the construction activity is located, addressed to **Attention: Stormwater NOI Processing**.

EFO	**Street Address**	**Zip Code**	**EFO**	**Street Address**	**Zip Code**
Memphis	8383 Wolf Lake Drive, Bartlett	38133-4119	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305-4316	Chattanooga	540 McCallie Avenue STE 550	37402-2013
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601

APPENDIX A

APPENDIX B – Notice of Termination (NOT) Form

(next page)

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)
Division of Water Pollution Control (WPC)
6th Floor Annex, L&C Tower, 401 Church Street, Nashville, Tennessee 37243
1-888-891-TDEC (8332)

Notice of Termination (NOT) for General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)

This form is required to be submitted when requesting termination of coverage from the CGP. The purpose of this form is to notify the TDEC that either all stormwater discharges associated with construction activity from the portion of the identified facility where you, as an operator, have ceased or have been eliminated; or you are no longer an operator at the construction site. Submission of this form shall in no way relieve the permittee of permit obligations required prior to submission of this form. Please submit this form to the local WPC Environmental Field Office (EFO) address (see table below). For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC).

Type or print clearly, using ink and not markers or pencil.

Site or Project Name:	**NPDES Tracking Number: TNR**
Street Address or Location:	County(ies):

Name of Permittee Requesting Termination of Coverage:			
Permittee Contact Name :	Title or Position:		
Mailing Address:	City:	State:	Zip:
Phone: ( )	E-mail:		

Check the reason(s) for termination of permit coverage:

☐	Stormwater discharge associated with construction activity is no longer occurring and the permitted area has a uniform 70% permanent vegetative cover OR has equivalent measures such as rip rap or geotextiles, in areas not covered with impervious surfaces.
☐	You are no longer the operator at the construction site (i.e., termination of site-wide, primary or secondary permittee coverage).

Certification and Signature: (must be signed by president, vice-president or equivalent ranking elected official)

I certify under penalty of law that either: (a) all stormwater discharges associated with construction activity from the portion of the identified facility where I was an operator have ceased or have been eliminated or (b) I am no longer an operator at the construction site. I understand that by submitting this notice of termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

For the purposes of this certification, elimination of stormwater discharges associated with construction activity means that all disturbed soils at the portion of the construction site where the operator had control have been finally stabilized, the temporary erosion and sediment control measures have been removed, and/or the site or portions of the site have obtained permit coverage by subsequent operators or that all stormwater discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have otherwise been eliminated from the portion of the construction site where the operator had control.

Permittee name (print or type):	Signature:	Date:

EFO	**Street Address**	**Zip Code**	**EFO**	**Street Address**	**Zip Code**
Memphis	8383 Wolf Lake Drive, Bartlett, TN	38133	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305	Chattanooga	540 McCallie Avenue STE 550	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601

APPENDIX C – Twice-Weekly Inspection Report Form
(next page)

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)
Division of Water Pollution Control (WPC)
6th Floor Annex, L&C Tower, 401 Church Street, Nashville, Tennessee 37243
1-888-891-8332 (TDEC)

General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)

CGP Inspection Worksheet for Twice-Weekly Inspections of Erosion Prevention and Sediment Controls

Site or Project Name:		**NPDES Tracking Number: TNR**
Primary Permittee Name:		Date of Inspection:
Current approximate disturbed acreage:	Has daily rainfall been documented? ☐Yes ☐ No	Name of Inspector:
Current weather/site conditions:		Inspector's TNEPSC Certification Number:

Please check the box if the following items are on-site:

☐ Notice of Coverage (NOC) ☐ Stormwater Pollution Prevention Plan (SWPPP) ☐ Twice weekly inspection documentation

☐ Site contact information ☐ Rain Gage ☐ Off-site Reference Rain Gage Location: _____

Best Management Practices (BMPs):

Are the Erosion Prevention and Sediment Controls (EPSCs) functioning correctly in the following locations:			
1.	Disturbed areas/material storage areas	☐Yes	☐No
2.	Outfall points (or nearest accessible downstream point if an outfall is inaccessible)	☐Yes	☐No
3.	Construction ingress/egress points	☐Yes	☐No

If the answer is "No" for any of the above, please describe the problem and corrective actions to be taken. Otherwise, describe any pertinent observations:

4.	Are (EPSCs) installed and maintained in the field per SWPPP? If "No", describe below.	☐Yes	☐No
5.	Have site discharges caused an objectionable color contrast in the receiving stream (Permit section 5.3.2)? If "Yes", describe below the measures implemented to eliminate contrast.	☐Yes	☐No
6.	Have discharges from dewatering activities been managed by appropriate controls per Section 4.1.4 of the Permit? If "No", describe below the measures to be implemented to achieve compliance.	☐Yes	☐No
7.	If construction activity at any location on-site has temporarily/permanently ceased, was the area stabilized within 15 days per Section 3.5.3.2? If, "No", describe below each location and measures taken to stabilize the area(s).	☐Yes	☐No
8.	Are non-stormwater discharges (per Section 1.2.3) and housekeeping measures such as storing chemicals, construction related debris litter, oils, fuels, building products, truck wash (per Section 3.5.3.1 (f) and (g)) being properly managed? If "No", describe below the measures to be implemented to achieve compliance.	☐Yes	☐No
9.	If a concrete washout facility is located on site, is it clearly identified on the project and maintained? If "No", describe below the measures to be implemented to achieve compliance. ☐ N/A	☐Yes	☐No
10.	Have all previous deficiencies been addressed? If not, describe the remaining deficiencies. ☐ Check if deficiencies/corrective measures have been reported on a previous form.	☐Yes	☐No

Certification and Signature (must be signed by the certified inspector and the permittee per Sections 3.5.8.2 (g) and 7.7.2 of the CGP)

I certify under penalty of law that this report and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Inspector Name and Title (print or type):	Signature:	Date:
Permittee Name and Title (print or type):	Signature:	Date:

CGP Inspection Worksheet for Twice-Weekly Inspections of Erosion Prevention and Sediment Controls

Purpose of this form/ Instructions

An inspection, as described in section 3.5.8.2.of the General Permit for Stormwater Discharges from Construction Activities ("Permit"), shall be performed at least twice every calendar week and documented on this form. Inspections shall be performed at least 72 hours apart. Where sites or portion(s) of construction sites have been temporarily stabilized, or runoff is unlikely due to winter conditions (e.g., site covered with snow or ice), such inspection only has to be conducted once per month until thawing results in runoff or construction activity resumes.

Inspectors performing the required twice weekly inspections must have an active certification by completing the "Fundamentals of Erosion Prevention and Sediment Control Level I" course. (http://www.tnepsc.org/). A copy of the certification or training record for inspector certification should be kept on site.

Qualified personnel, as defined in section 3.5.8.1 of the Permit (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, locations where vehicles enter or exit the site, and each outfall.

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the site's drainage system. Erosion prevention and sediment control measures shall be observed to ensure that they are operating correctly.

Outfall points (where discharges leave the site and/or enter waters of the state) shall be inspected to determine whether erosion prevention and sediment control measures are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

Based on the results of the inspection, any inadequate control measures or control measures in disrepair shall be replaced or modified, or repaired as necessary, before the next rain event if possible, but in no case more than 7 days after the need is identified.

Based on the results of the inspection, the site description identified in the SWPPP in accordance with section 3.5.1 of the Permit and pollution prevention measures identified in the SWPPP in accordance with section 3.5.2 of the Permit, shall be revised as appropriate, but in no case later than 7 days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP, but in no case later than 14 days following the inspection.

All inspections shall be documented on this Construction Stormwater Inspection Certification form. Alternative inspection forms may be used as long as the form contents and the inspection certification language are, at a minimum, equivalent to the division's form and the permittee has obtained a written approval from the division to use the alternative form. Inspection documentation will be maintained on site and made available to the division upon request. Inspection reports must be submitted to the division within 10 days of the request. If the division requests the Construction Stormwater Inspection Certification form to be submitted, the submitted form must contain the printed name and signature of the trained certified inspector and the person who meets the signatory requirements of section 7.7.2 of the Permit.

Trained certified inspectors shall complete inspection documentation to the best of their ability. Falsifying inspection records or other documentation or failure to complete inspection documentation shall result in a violation of this permit and any other applicable acts or rules.

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STATE OF TENNESSEE
TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11TH Floor
Nashville, Tennessee 37243-1102

July 2, 2014

Ms. Melanie Bumpus
Tennessee Department of Transportation
Environmental Division
Suite 900, James K. Polk Bldg.
505 Deaderick St.
Nashville, TN 37243

Subject: Aquatic Resource Alteration Permit **NRS 14.049.**
TDOT 65001-1256-14 PIN101411.05 SR29, Harriman, Morgan County (Lat: 36.0002/ Lon: -84.5060)

Dear Ms. Bumpus:

We have reviewed your application for the proposed stream alterations in support of the widening of SR-29 from south of Whetstone Road to North of SR-328 near Harriman in Morgan County. Pursuant to the *Tennessee Water Quality Control Act of 1977* (T. C. A. § 69-3-101 et seq.) and supporting regulations, the Division of Water Resources is required to determine whether the activity proposed will violate applicable water quality standards.

Subject to conformance with accepted plans, specifications and other information submitted in support of application NRS 14.049, the state of Tennessee hereby issues an aquatic resources alteration permit (enclosed). Failure to comply with the terms of this permit or other violations of the *Tennessee Water Control Act of 1977* is subject to penalty in accordance with T.C.A. § 69-3-115.

It is the responsibility of the permittee to ensure that all contractors involved with this project have read and understood the permit conditions before the project begins. If you need additional information or clarification, please contact Brian Canada at 615-532-0660 or by e-mail brian.canada@tn.gov.

Sincerely,

Brian Canada, M.S., Q.H.P.
Natural Resources Unit

Cc: Knoxville Environmental Field Office
U.S. Army Corps of Engineers, Nashville District
file copy

NRS14.049

Pursuant to §401 of *The Federal Clean Water Act* (33 U.S.C. 1341), the State of Tennessee is required to certify whether the activity described below will violate applicable water quality standards. Accordingly, the Division of Water Reources requires reasonable assurance that the activity will not violate provisions of *The Tennessee Water Quality Control Act of 1977* (T.C.A. §69-3-101 et seq.) or provisions of §§301, 302, 303, 306 or 307 of *The Clean Water Act*.

Subject to conformance with accepted plans, specifications and other information submitted in support of the application, pursuant to 33 U.S.C. 1341 the State of Tennessee hereby certifies the activity described below. This shall serve as authorization under T.C.A. §69-3-101 et seq.

PERMITTEE Tennessee Department of Transportation

AUTHORIZED WORK: 563 ft. of stream encapsulation and permanent impact to 0.53 acre of wetlands required to construct 2.023 miles of State Route 29 from South of Whetstone Road to North of SR-328.

LOCATION: Bitter Creek and unnamed tributaries, State Route 29 in Morgan County County (Lat: 36.0002/ Lon: -84.5060)

EFFECTIVE DATE: July 2, 2014

EXPIRATION DATE: July 1, 2019

Sandra Dudley, Ph.D., P.E.
Director

Table of Contents

PART I

Specific Impacts:

Impact 1: Latitude: 36.0156 Longitude: -84.5255
Bitter Creek (STR-6) Station 342+85
Existing 176 ft. of 3@ 12X9 ft. slab bridge and 99 ft. of open stream. The slab bridge shall be extended by 38 ft. at the inlet and 42 ft. at the outlet plus 19 ft. of class C riprap. Associated with this impact are storm water outfalls and overhead telephone pole installations.

Impact 2: Latitude: 36.0120 Longitude: 36.0120
Unnamed tributary to Bitter Creek (STR-18) Station 324+59+/-
Install a 12" water line.

Impact 3: Latitude: 36.0127 Longitude: -84.5225
Unnamed tributary to Bitter Creek (STR-19) Station 328+39 to 328+79
Existing open stream 161 ft. and 117 ft. of 8X6 RCBC. Twenty feet of existing culvert shall be removed and the remaining 97 ft. shall be extended by 126 ft. at the inlet and 17 ft. at the outlet and 15 ft. of riprap lined channel. Associated with this impact are storm water outfalls at Hanging Rock Road and replacement of an existing 10" water line with a 12" water line.

Impact 4: Latitude: 36.0125 Longitude: -84.5225
Wetland (WTL-12) Station 328+62 to 330+33
Permanent impact (fill) to 0.18 acre wetlands. Remove existing 10" water line.

Impact 5: Latitude: 36.0135 Longitude: -84.5233
Wetland (WTL-13) Station 333+00 to 335+14
Permanent impact to 0.02 and temporary impact to 0.18 acre wetlands.

Impact 6: Latitude: 36.0156 Longitude: -84.5255
Bitter Creek (STR-6) Station 342+85 to 354+79
Replace an existing 10" water line with a 12" water line and a ¾" service line and water meter assembly.

Impact 7: Latitude: 36.0135 Longitude: -84.5233
Muddy Branch (STR-20) Station 349+20
Existing open stream 25 ft. and 102 ft. of 2@15X8 ft. slab bridge. Existing bridge shall be extended 20 ft. at the inlet and 5 ft. at the outlet plus 10 ft. of Class B riprap.

Impact 8: Latitude: 36.0171 Longitude: -84.5263
Muddy Branch (STR-20) Station 349+20
Replace an existing 10" water line with a 12" water line.

Impact 9: Latitude: 36.0178 Longitude: -84.5268
Unnamed tributary to Muddy Branch (STR-21) Station 350+55 to 357+00
Existing open stream 275 ft., 33 ft. of 10X4 RCBC (to be removed) and 20 ft. of 30" CMP (to be removed). Relocate 275 ft. of open stream in kind and install 33 ft. of 10X4 ft. RCBC.

Impact 10: Latitude: 36.0188 Longitude: -84.5270
Unnamed tributary to Muddy Branch (STR-22) Station 349+25 to 356+94
Existing 571ft. of open stream shall be relocated into 504 ft. of open stream and 100 ft. 30" RCP with 11 ft. u-shaped end wall at inlet and 5 ft. u-shaped end wall at the outlet. Associated with this impact is an overhead telephone pole relocation and replace an existing 10" water line with a 12" water line.

Impact 11: Latitude: 36.0183 Longitude: -84.5271
Wetland (WTL-14) Station 350+76 to 357+16
Permanent impact (fill) to 0.33 acre wetlands and replace an existing 10" water line with a 12" water line.

General Conditions:

a. It is the responsibility of the applicant to convey all terms and conditions of this permit to all contractors. A copy of this permit, approved plans and any other documentation pertinent to the activities authorized by this permit shall be maintained on site at all times during periods of construction activity.

b. Work shall not commence until the applicant has received the federal §404 permit from the U. S. Army Corps of Engineers, a §26a permit from the Tennessee Valley Authority or authorization under a Tennessee NPDES Storm Water Construction Permit where necessary. The applicant is responsible for obtaining these permits.

c. The work shall be accomplished in conformance with the accepted plans, specifications, data and other information submitted in support of application NRS14.049 and the limitations, requirements and conditions set forth herein.

d. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Rule 0400-40-03-.03 of the Rules of the Tennessee Department of Environment and Conservation. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of waters of the state for any of the uses designated by Rule 0400-40-04. These uses include fish and aquatic life (including trout streams and naturally reproducing trout streams), livestock watering and wildlife, recreation, irrigation, industrial water supply, domestic water supply, and navigation.

e. Impacts to waters of the state other than those specifically addressed in the plans and this permit are prohibited. All streams, springs and wetlands shall be fully protected prior, during and after construction until the area is stabilized. Any questions, problems or concerns that arise regarding any stream, spring or wetland either before or during construction, shall be addressed to the Division of Water Resource's Knoxville Environmental Field Office (865-594-6035), or the permit coordinator in the division's Natural Resources Section (615-532-0660).

f. Adverse impact to formally listed state or federal threatened or endangered species or their critical habitat is prohibited.

g. This permit does not authorize adverse impacts to cultural, historical or archeological features or sites.

PART II

Mitigation Requirements and Monitoring Procedures

Please change this to TMF instead of Walls Wetland Mitigation Site.

Required Mitigation Act

The permittee shall provi rmanent impact to 0.53 acre of wetlands by debiting, at a 2:1 ratio, 1. dit from the Wall Wetland Mitigation Site. Temproary impacts to wetlands shall be mitigated by removal and stockpiling of the existing topsoil. Upon completion of construction activities, all temporary wetland impact areas shall be restored to pre-construction contours and the stockpiled wetland topsoil spread to restore these areas to preconstruction elevation.

The 563 ft. of stream encapsulation shall be mitigated by purchasing 563 ft.of available credits from the Tennessee Stream Mitigation Program Upper Tennessee Service Area. Payment shall be made to TSMP with proof of purchase submitted to the Division within 90 days of the effective date of this permit. Relocated channels shall be replaced in kind with natural bottoms u ns shall be diverted into the new channel and t or 48 hours to allow aquatic organisms time to ls greater than 200 feet shall be constructed to m flow characteristics of the regional reference ble. Vegetated buffer strips should be maintai ; exclusion signage placed at beginning and end

We request that this language be changed to long-established policy regarding in-lieu fee payments to TSMP, `TDOT shall make payment to TSMP within 90 days of receiving the invoice for this project.' TDOT does not control when we are invoiced by TSMP for any particular project, so it is not appropriate to make this a permit condition.

Monitoring Requirements and Procedures

a. Monitoring shall be required for all relocations and restored temporary wetland impacts.

b. Qualitative Habitat Assessment - The RBP (Rapid Bioassessment Protocols) Habitat Assessment score for the mitigation project must be greater than 75% of the regional habitat assessment guideline score as found in the 2011 TDEC standard operating procedure for macroinvertebrate stream surveys.

c. Vegetation - Vegetative species must be on approved native species planting list.

d. Morphology - The monitored morphology success criteria values for the restored reach shall not deviate from the actual as-built values by more than 20% in any monitoring year.

e. Stability - A Channel Stability Rating (CSR) of at least "Good" must be achieved during every monitoring year.

f. Hydrology – Each year of monitoring the applicant shall perform a Hydrologic Determination (HD) using the Division of Water Resources HD methodology (between February and April) to ensure that the relocated channels score as streams.

Recording of Results

a. For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

    1. The exact place, date and time of sampling;

2. The exact person(s) collecting samples;
3. The dates and times the analyses were performed;
4. The person(s) or laboratory who performed the analyses;
5. The analytical techniques or methods used;
6. The results of all required analyses;
7. Narrative descriptions, photo-documentation, riparian vegetation surveys, channel morphology surveys, stability assessments, and hydrology surveys/documentation, and;
8. A habitat assessment using EPA Rapid Bioassessment Protocol will be conducted and submitted in Year 5.

b. In the event any portion or aspect of the mitigation project does not meet the specified success criteria based on reporting and/or additional visual observations in a monitoring year, the nature and cause(s) of the resulting condition shall be investigated and documented. If it is determined that corrective actions are not warranted at the time, the rationale for the decision shall be stated. Continued monitoring of the condition or area using more detailed methodology may be appropriate and must be documented. In instances where corrective actions are necessary, a plan shall be prepared that includes proposed actions, a time schedule for activities, and revised monitoring plan.

Submission of Monitoring Results

a. The permittee shall submit the following monitoring information on an annual basis, for a term of five years (5 years).

b. All monitoring reports and information shall be submitted in report-form to the division's Natural Resources Unit, located in the Willaim R. Snodgrass – Tennessee Tower, 11th Floor, 312 Rosa L. Parks, Nashville, Tennessee 37243-1102. Copies shall also be provided to the appropriate Water Resources Environmental Field Office, and the U.S. Army Corps of Engineers District Office.

c. The monitoring reports shall be due by October 31st of each monitoring year.

Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation shall be retained for a minimum of five (5) years, or longer, if requested by the Division of Water Resources.

Falsifying Results and/or Reports

Knowingly making any false statement on any report required by this permit or falsifying any result may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Water Pollution Control Act, as amended, and in Section 69-3-115 of the Tennessee Water Quality Control Act.

Monitoring Closeout

The applicant shall notify the agencies in writing when the monitoring period is complete. Following receipt of the final report, the agencies will contact the applicant (or agent) as soon

as possible to schedule a site visit to confirm the completion of the compensatory mitigation site. The compensatory mitigation shall not be considered complete without an on-site inspection by regulatory staff and written confirmation that the site is functioning as proposed.

PART III

Duty to Reapply

Permittee is not authorized to discharge after the expiration date of this permit. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit such information and forms as are required to the Director of Water Resources. Such applications must be properly signed and certified.

Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

Other Information

If the permittee becomes aware that he/she failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, then he/she shall promptly submit such facts or information.

Changes Affecting the Permit

Transfer/Change of Ownership

a. This permit may be transferred to another party, provided there are no activity or project modifications, no pending enforcement actions, or any other changes which might affect the permit conditions contained in the permit, by the permittee if:

b. The permittee notifies the Director of the proposed transfer at least 30 days in advance of the proposed transfer date;

c. The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage, and contractual liability between them; and

d. The Director does not notify the current permittee and the new permittee, within 30 days, of his intent to modify, revoke, reissue, or terminate the permit, or require that a new application be filed rather than agreeing to the transfer of the permit.

e. The permittee must provide the following information to the division in their formal notice of intent to transfer ownership:

1. the permit number of the subject permit;
2. the effective date of the proposed transfer;
3. the name and address of the transferor;
4. the name and address of the transferee;

5. the names of the responsible parties for both the transferor and transferee;
6. a statement that the transferee assumes responsibility for the subject permit;
7. a statement that the transferor relinquishes responsibility for the subject permit;
8. the signatures of the responsible parties for both the transferor and transferee, and;
9. a statement regarding any proposed modifications to the permitted activities or project, its operations, or any other changes which might affect the permit conditions contained in the permit.

Change of Mailing Address

The permittee shall promptly provide to the Director written notice of any change of mailing address. In the absence of such notice the original address of the permittee will be assumed to be correct.

Noncompliance

Effect of Noncompliance

All discharges shall be consistent with the terms and conditions of this permit. Any permit noncompliance constitutes a violation of applicable State and Federal laws and is grounds for enforcement action, permit termination, permit modification, or denial of permit reissuance.

Reporting of Noncompliance

24-Hour Reporting

a. In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Resources in the appropriate Environmental Field Office within 24-hours from the time the permittee becomes aware of the circumstances. (The Environmental Field Office should be contacted for names and phone numbers of environmental response personnel).

b. A written submission must be provided within five (5) days of the time the permittee becomes aware of the circumstances unless this requirement is waived by the Director on a case-by-case basis. The permittee shall provide the Director with the following information:

    1. A description of the discharge and cause of noncompliance;
    2. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and
    3. The steps being taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph a. above, the permittee shall report the noncompliance by contacting the permit coordinator,

and provide all information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including but not limited to, accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

Liabilities

Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of pollutants to any surface or subsurface waters. Additionally, notwithstanding this Permit, it shall be the responsibility of the permittee to conduct its discharge activities in a manner such that public or private nuisances or health hazards will not be created.

Liability under State Law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or the Federal Water Pollution Control Act, as amended.

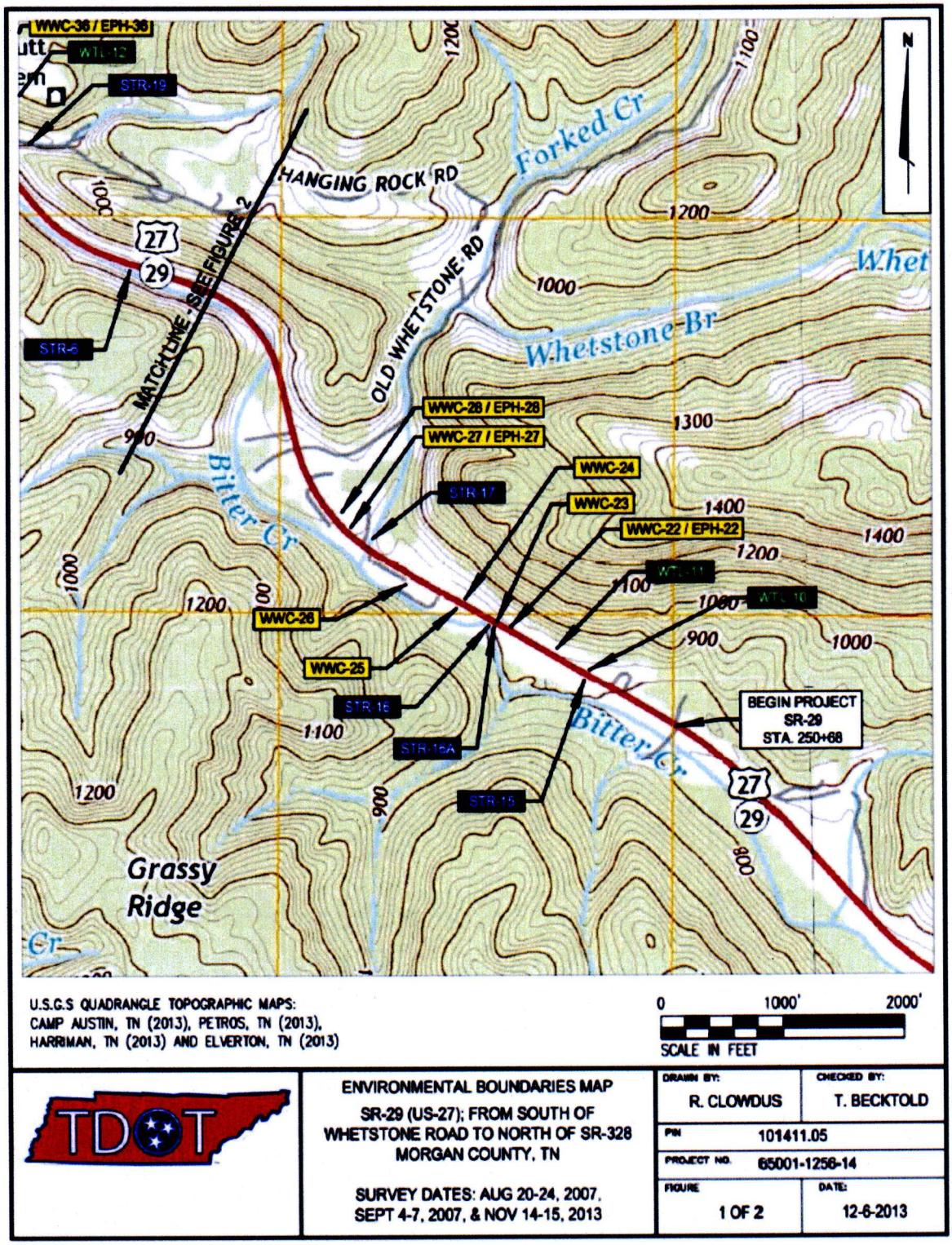
This permit does not preclude requirements of other federal, state or local laws. This permit also serves as a State of Tennessee Aquatic Resource Alteration Permit (ARAP) pursuant to the Tennessee Water Quality Control Act of 1977 (T.C.A. §69-3-101 et seq.).

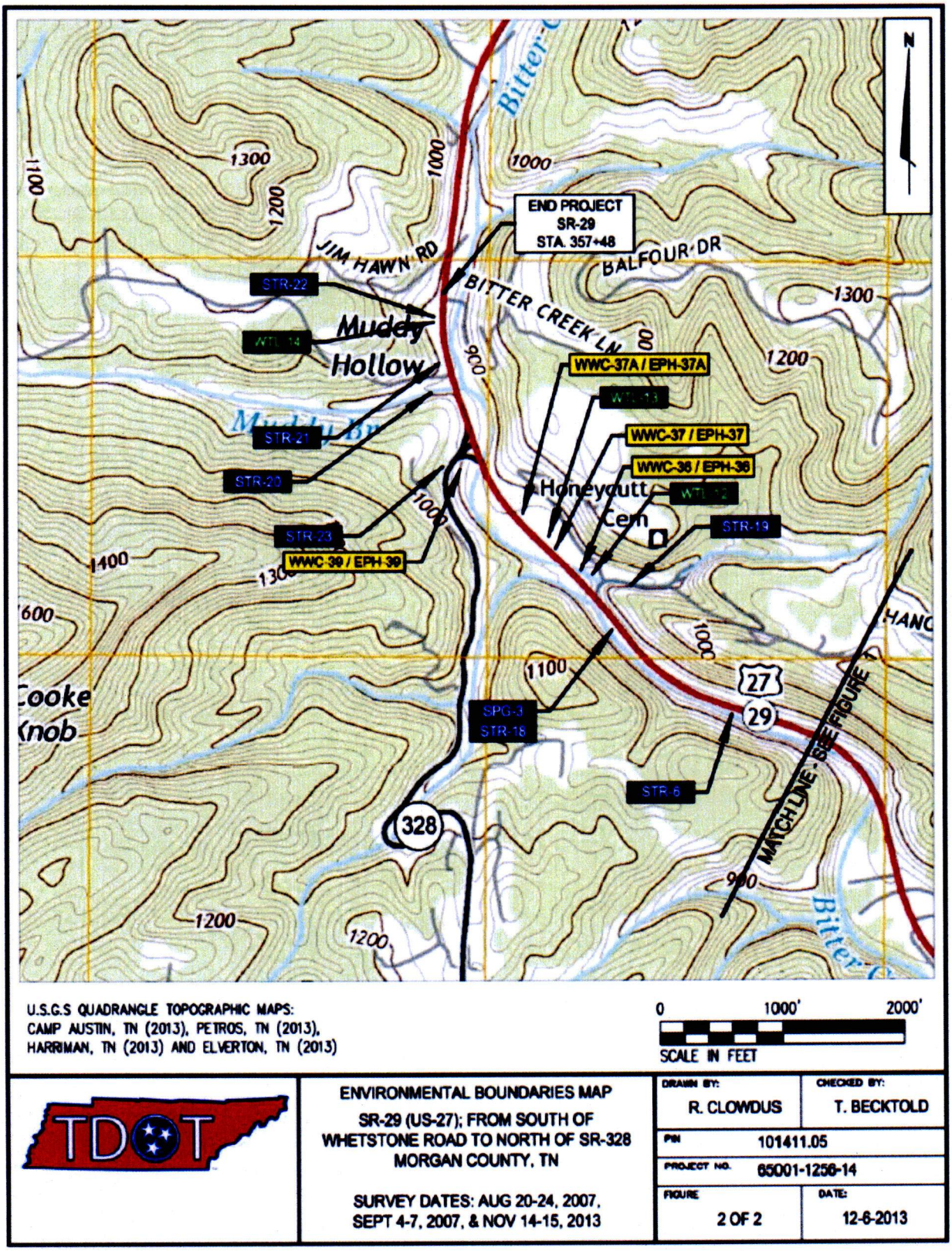
The State of Tennessee may modify, suspend or revoke this permit or seek modification or revocation should the state determine that the activity results in more than an insignificant violation of applicable water quality standards or violation of the act. Failure to comply with permit terms may result in penalty in accordance with T.C.A. §69-3-115.

An appeal of this action may be made as provided in T.C.A. §69-3-105(i) and Rule 0400-40-03-.12 by submitting a petition for appeal. This petition must be filed within THIRTY (30) DAYS after public notice of the issuance of the permit. The petition must specify what provisions are being appealed and the basis for the appeal. It should be addressed to the technical secretary of the Tennessee Board of Water Quality, Oil and Gas at the following address: Dr. Sandra Dudley, Director, Division of Water Resources, 11th Floor William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Ave., Nashville, Tennessee 37243. Any hearing would be in accordance with T.C.A. §§69-3-110 and 4-5-301 et seq.

APPENDIX I

Topographic Maps




N
END PROJECT
SR-29
STA. 357+48
JIM HAWN RD
BALFOUR DR
BITTER CREEK LN
Muddy
Hollow
STR-22
WTL-14
STR-21
STR-20
STR-23
WWC-39 / EPH-39
WWC-37A / EPH-37A
WTL-13
WWC-37 / EPH-37
WWC-36 / EPH-36
WTL-12
STR-19
Honeycutt
Cem
SPG-3
STR-18
STR-6
27
29
328
MATCH LINE - SEE FIGURE 1
Cooke
Knob
1300
1200
1100
1000
900
1400
1600
U.S.G.S QUADRANGLE TOPOGRAPHIC MAPS:
CAMP AUSTIN, TN (2013), PETROS, TN (2013),
HARRIMAN, TN (2013) AND ELVERTON, TN (2013)
0
1000'
2000'
SCALE IN FEET
TDOT
ENVIRONMENTAL BOUNDARIES MAP
SR-29 (US-27); FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF SR-328
MORGAN COUNTY, TN
SURVEY DATES: AUG 20-24, 2007,
SEPT 4-7, 2007, & NOV 14-15, 2013
DRAWN BY: R. CLOWDUS
CHECKED BY: T. BECKTOLD
PIN 101411.05
PROJECT NO. 65001-1256-14
FIGURE 2 OF 2
DATE: 12-6-2013

TENNESSEE STREAM
TSMP
MITIGATION PROGRAM
5000 Linbar Drive, Suite 275
Nashville, TN 37211

February 13, 2014

Ms. D.J. Wiseman
Transportation Project Specialist
TDOT Environmental Permits Office Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, Tennessee 37243-0334

RE: Preliminary Authorization and Credit Availability Request – TSMP PI 14-009; TDOT PIN 101411.05

Dear Ms. Wiseman:

Thank you for your recent submittal of a Preliminary Authorization and Credit Availability Request to the TSMP. This request is used to determine if the TSMP has credits available and is able to accept the legal liability for providing mitigation in a specific service area. This request is for approximately **539** credits in the **Upper Tennessee Service Area** for proposed impacts to unnamed tributaries to Bitter Creek.

At this time, the TSMP has credits available to satisfy this request and is providing this letter so that you may include it with your permit applications to the appropriate regulatory agencies.

It is understood that the U. S. Army Corps of Engineers and/or the Tennessee Department of Environment and Conservation will determine actual credit requirements and it may vary from what is currently being requested. Payment for any credits is not required until applicable permits have been issued and the TSMP has provided you with an invoice.

These credits will be reserved for a period of 240 days from the date of this letter. If you have any questions or concerns, please feel free to call or email me at any time.

Sincerely,

Eric Chance

Eric Chance, Operations Manager
Tennessee Stream Mitigation Program

Stream	In Kind Stream Replacement	Total Encapsulation	Encapsulation to be Mitigated	Length Losses	Total @ 1.0 Ratio	In Lieu Fee @ 1.0 Ratio	Credits Generated - used	Rip rap	Total * 0.75 Ratio	In Lieu Fee @ 0.75 Ratio	Total In Lieu Fee
STR-15	**0**	**114**									
STR-16	118	0	0	0	0	$ -					$ -
STR-16A	0	0	0	36	36	$ 8,640.00					$ 8,640.00
STR-17	0	146	0	0	0	$ -					$ -
STR-6	0	256	256	0	256	$ 61,440.00					$ 61,440.00
STR-19	0	240	211	23	234	$ 56,160.00	-29				$ 56,160.00
STR-20	0	127	0	0	0	$ -					$ -
STR-21	275	33	0	20	0	$ -	-20				$ -
STR-22	504	116	0	0	0	$ -	49				$ -
Total	**897**	**918**	**467**	**79**	**526**	**$ 126,240.00**		**0**	**0**	**$ -**	**$ 126,240.00**

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
REGULATORY BRANCH
3701 BELL ROAD
NASHVILLE, TENNESSEE 37214

October 9, 2014

SUBJECT: File No. 2014-00088; To expand and modify road alignments along 2.023 miles of State Route 29, including waterline replacement in Morgan County, TN

Ms. Melanie Bumpus
Tennessee Department of Transportation
Environmental Division
Suite 900, James K. Polk Bldg.
505 Deaderick St.
Nashville, TN 37243

Dear Permittee:

This refers to your recent application for a Department of the Army (DA) permit for the subject work. Please refer to the file number 2014-00088 in reference to this letter.

Based upon the information submitted to this office, we have determined your proposed work including: 0.18 acre of permanent impact to Wetland 12, 0.02 acre of permanent wetland impact and 0.18 acre of temporary wetland impact to Wetland 13, and 0.33 acre of permanent impact to Wetland 14 meets the criteria of DA Nationwide Permit (NWP) #14, *(Linear Transportation Projects)* ,which became effective March 19, 2012 [77 FR 10184]. The proposed work must be constructed in accordance with the enclosed plans and NWP Conditions. In addition, mitigation for the impacts associated with this activity is required. For the permanent impacts to 0.51 acres of wetlands, the permittee shall purchase 1.02 mitigation credits from the Tennessee Wetland Fund ILF (LRN-2011-00206).

This verification is valid until March 18, 2017, unless the NWP authorization is modified, suspended, or revoked. If the work has not been completed by that date, you should contact this office to obtain another permit determination in accordance with the rules and regulations in effect at that time.

In addition to the impacts stated above, the following impacts do not require pre-construction notification and the permitee has not requested verification of these activities under NWP 12 and 14: the placement of 226 LF of riprap and 80 LF of additional culvert (slab bridge) within Stream 6; 15 LF of riprap and 143 LF of additional culvert within Stream 19; 25 LF of additional culvert within Stream 20; 308 LF of stream relocation and 20 LF of stream loss associated with Stream 21; 504 LF of stream relocation and 116 LF of culvert associated with Stream 22; and 20 LF of temporary impacts associated with waterline installation within Stream 18. This work will only qualify for NWP 12 and 14 until March 18, 2017, unless the NWPs are modified, suspended, or revoked. If the work has not been completed by that date, you should reevaluate

the applicability of the non-reporting NWPs and ensure the work remains compliant with the rules and regulations in effect at that time.

Before you begin construction, you may also need to obtain approval from the Tennessee Valley Authority. In addition, you are also responsible for obtaining any other federal, state, and/or local permits, approvals, or authorizations.

The State of Tennessee Department of Environment and Conservation has issued/issued a conditional 401 certification for the NWP. You must comply with the General Conditions specified in the certification, copy attached.

If changes in the location or approved plans are necessary, revised plans shall be submitted promptly to this office for review and approval. NWP General Condition #30 requires that you submit a signed certification. **Please sign and return the enclosed "Compliance Certification" form upon completion of the proposed activity and any required mitigation.** If you have any questions, please contact Josh Frost at the above address or telephone *(615) 369-7512.*

Sincerely,

Eric Reusch
Chief, Regulatory Section
Operations Division

Enclosures

Copy Furnished:

TDEC - Brian.Canada@TN.gov

TVA - mshigdon@tva.gov

US Army Corps
of Engineers ®
Nashville District

Nationwide Permit

No. 14, Linear Transportation Projects

Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than ½-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than ⅓-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The loss of waters of the United States exceeds $^{1}/_{10}$-acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 31.)

(Sections 10 and 404)

Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

US Army Corps of Engineers ®
Nashville District

Nationwide Permit General Conditions

The following General Conditions must be followed in order for any authorization by NWP to be valid:

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation. (b) Any safety lights and signals prescribed by the US Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the US. (c) The permittee understands and agrees that, if future operations by the US require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the US. No claim shall be made against the US on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the US that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the US during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, US Forest Service, US Fish and Wildlife Service).

17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed. (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the NWP activity, or whether additional ESA consultation is necessary. (c) Non-federal permittees must submit a pre-construction notification (PCN) to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the

district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the PCN must include the name(s) of the endangered or threatened species that might be affected by the proposed work or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete PCN. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from Corps. (d) As a result of formal or informal consultation with the USFWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs. (e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the USFWS or the NMFS, The Endangered Species Act prohibits any person subject to the jurisdiction of the US to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. (f) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS and NMFS at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.noaa.gov/fisheries.html respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for obtaining any "take" permits required under the USFWS's regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the USFWS to determine if such "take" permits are required for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied. (b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary. (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties on which the activity may have the potential to cause effects and notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA is complete. (d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps. (e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment. (a) Discharges of dredged or fill material into waters of the US are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. (b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 31, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal: (a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the US to the maximum extent practicable at the project site (i.e., on site). (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal. (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this

requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332. (1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment. (2) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered. (3) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) – (14) must be approved by the district engineer before the permittee begins work in waters of the US, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). (4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided. (5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan. (d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, to ensure that the activity results in minimal adverse effects on the aquatic environment. (e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the US, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs. (f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses. (g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management. (h) Where certain functions and services of waters of the US are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or USEPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the US authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the US for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature: "When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

_____ _____

Transferee Date

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include: (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions; (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification

must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and (c) The signature of the permittee certifying the completion of the work and mitigation.

31. Pre-Construction Notification (PCN). (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a PCN as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either: (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2). (b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information: (1) Name, address and telephone numbers of the prospective permittee; (2) Location of the proposed project; (3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the US expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans); (4) The PCN must include a delineation of wetlands, other special aquatic sites, and waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the US. The 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate; (5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan. (6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and (7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act. (c) Form of PCN Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used. (d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level. (2) For all NWP activities that require PCN notification and result in the loss of greater than 1/2-acre of waters of the US, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require PCN notification and will result in the loss of greater than 300 linear feet of intermittent and ephemeral stream bed, and for all NWP 48 activities that require PCN notification, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (USFWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the PCN notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each PCN notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5. (3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act. (4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of PCN notifications to expedite agency coordination.

Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project.

NATIONWIDE PERMIT SPECIAL CONDITIONS

1. Permit Drawings: The work must be completed in accordance with the plans and information submitted in support of the proposed work, as attached (sheets 3 through 71, titled SR-311, PIN 107386.01).

2. Fill Material: The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, debris, asphalt, construction materials, concrete block with exposed reinforcement bars, and soils contaminated with any toxic substance, in toxic amounts in accordance with Section 307 of the Clean Water Act.

3. Erosion Control: Prior to the initiation of any work authorized by this permit, the Permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the work area. Immediately after completion of the final grading of the land surface, all slopes, land surfaces, and filled areas shall be stabilized using sod, degradable mats, barriers, or a combination of similar stabilizing materials to prevent erosion. The erosion control measures shall remain in place and be maintained until all authorized work has been completed and the site has been stabilized.

4. Temporary Wetland Impacts: Within 30 days from the date of completing the authorized work the Permittee shall restore 0.18 acre of temporary wetland impacts (as detailed on Drawing 5 of 24) to pre-existing contours, elevations, vegetation, habitat type, and hydrology. The following shall be monitored to ensure Temporary Wetland Impacts are restored:

a. Temporary Wetland Impacts: Wetland 13 - At the end of the monitoring period (5 years) the temporary wetland impact sites shall have a predominance of wetland vegetation and shall meet the definition of a wetland as outlined in the 1987 US Army Corps of Engineers Wetland Delineation Manual and the Eastern Mountains and Piedmont Region supplement (1987 Manual and Regional Supplement).

b. Reporting: Perform a time-zero, year 3, and year 5 monitoring event of the temporary wetland impact areas. Post-construction monitoring reports shall include collecting data on the vegetation, soils, and indicators of wetland hydrology associated with wetland 13 in accordance with the 1987 Manual and Regional Supplement.

5. In-Lieu Fee Credit Purchase: Wetland ILF Credit Purchase: Prior to impacts to waters of the United States, the Permittee shall provide verification to the Corps that 1.02 federal ILF credits have been purchased from the Tennessee Wetland Fund ILF (LRN-2011-00206). The required verification shall reference this project's permit number (LRN-2014-00088).

6. Endangered Species Act: The Section 7 Endangered Species Act effects determination for this project was based on the negative survey results for the Indiana bat and northern long-eared bat. The survey results are valid for a period of two years. If the

project has not completed tree clearing by April 1, 2016, the Permittee is required to reinitiate consultation under Section 7 of the Endangered Species Act.

7. **Acid Producing Rock:** During and post-construction, the Permittee shall follow the "Adaptive Management and APR Water Quality Monitoring Plan for SR-29 (US-27) From SR-61 Near Harriman in Roane County to South of Whetstone Road in Morgan County PIN 101411.04; Project No. 65001-3266-14, 73008-3243-14; and Adaptive Management and APR Water Quality Monitoring Plan for SR-29 (US-27) From South of Whetstone Road to North of SR-328 in Morgan County PIN 101411.05; Project No. 65001-3268-14".

COMPLIANCE CERTIFICATION

YOU ARE REQUIRED TO SUBMIT THIS SIGNED CERTIFICATION REGARDING THE COMPLETED ACTIVITY AND ANY REQUIRED MITIGATION

I hereby certify that the work authorized by **Permit No. 2014-00088,** and any required mitigation was done in accordance with the Corps authorization, including any general or special conditions.

_____
Permittee Signature

_____
Date

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative.

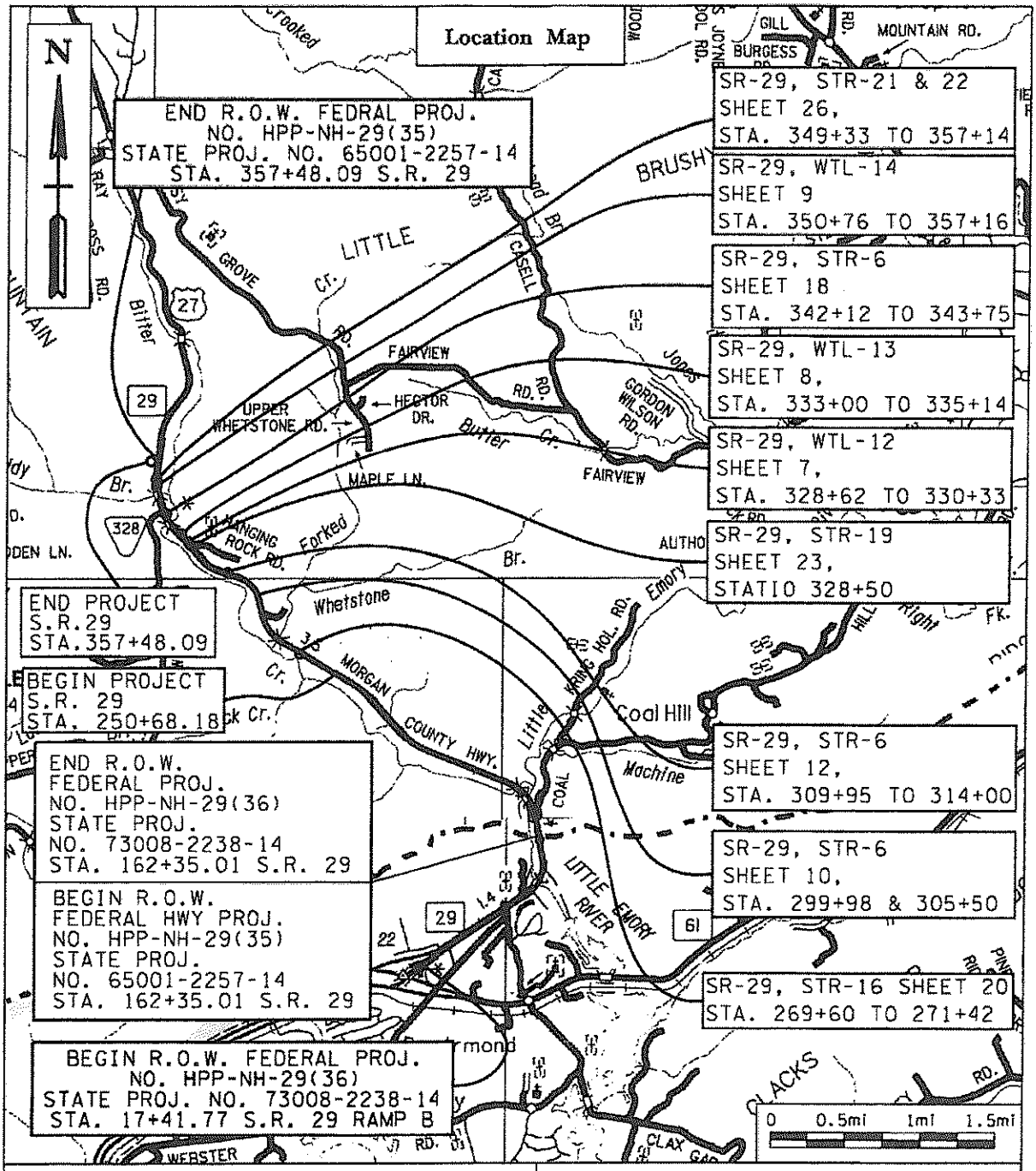
Submit this signed certification to the address checked below:

☑ U.S. Army Corps of Engineers
Regulatory Branch
3701 Bell Road
Nashville, TN 37214

☐ Eastern Regulatory Field Office
501 Adesa Blvd
Suite 250
Lenoir City, Tennessee 37771

☐ Western Regulatory Field Office
2042 Beltline Road, Southwest
Building C, Suite 415
Decatur, AL 35601

_____
Project Manager

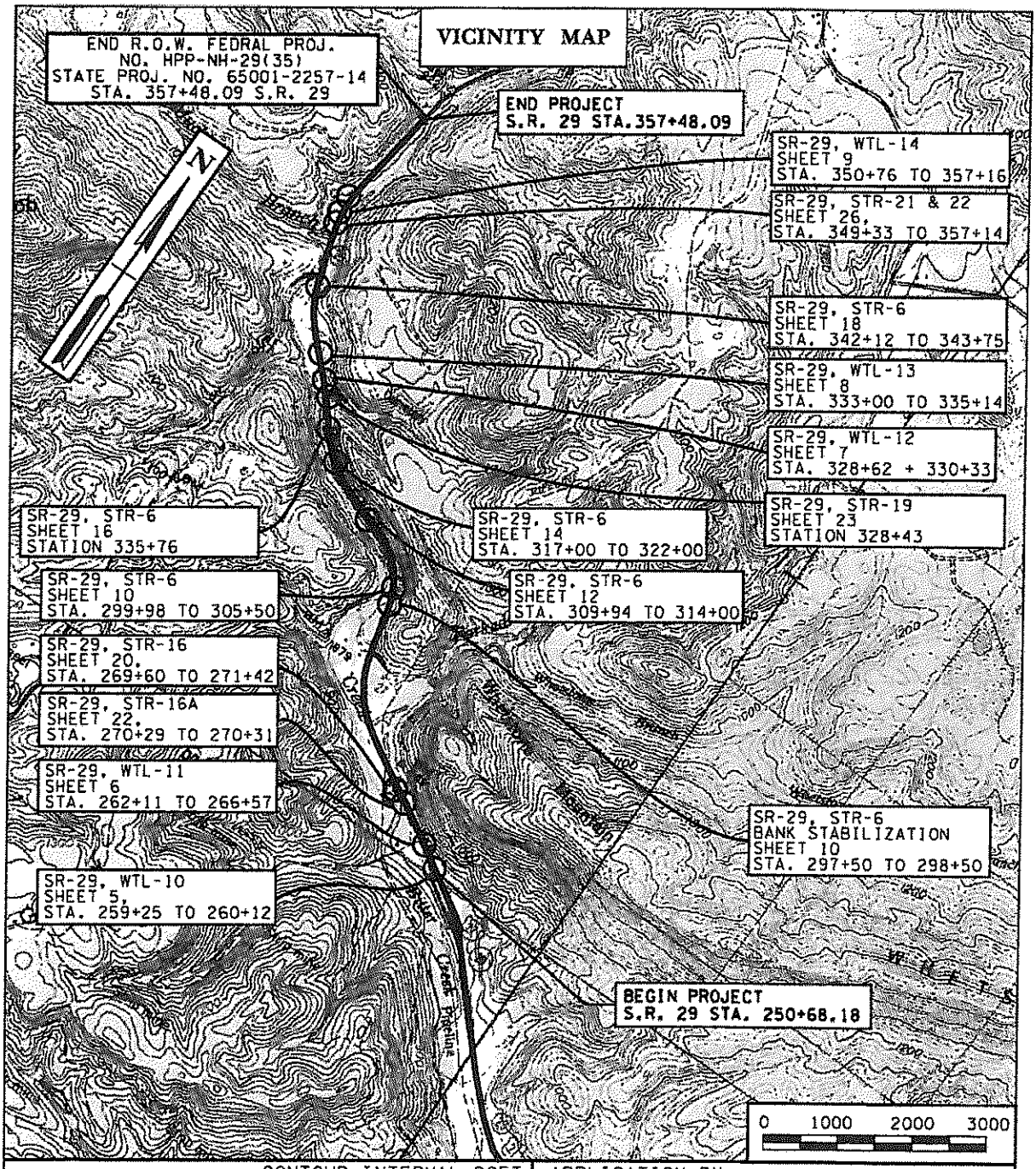


APPLICATION BY:

TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN

DATE: 11/20/2013 REVISED: / /

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
Morgan County, TN
Sheet 1 of 24

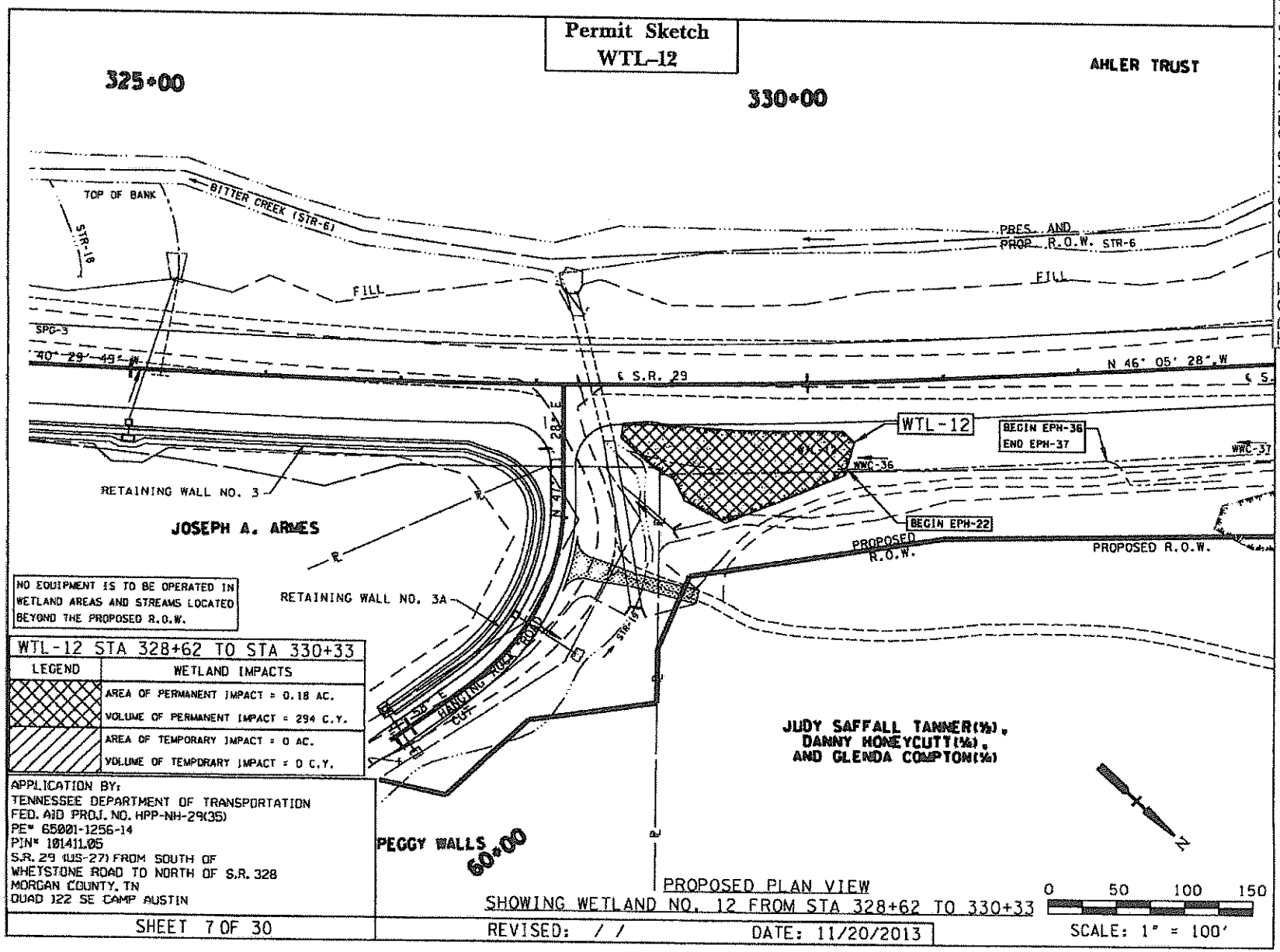


APPLICATION BY:

TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUADS

DATE: 11/20/2013 REVISED: / /

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
Morgan County, TN
Sheet 2 of 24



TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
Morgan County, TN
Sheet 3 of 24

Water line crossing. Road impacts do not exist at this crossing
WATER RELOCATION
TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
Morgan County, TN
Sheet 4 of 24

FOR WETLAND MITIGATION

TOPSOIL IS TO BE REMOVED FROM ALL AREAS OF TEMPORARY WETLAND IMPACTS AND STOCKPILED PRIOR TO CONSTRUCTION. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, TEMPORARY HAUL ROADS ARE TO BE REMOVED. EXCAVATED MATERIAL FROM THE HAUL ROADS IS TO BE DISPOSED OF AS DIRECTED BY THE ENGINEER. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, ALL TEMPORARY WETLAND IMPACT AREAS ARE TO BE RESTORED TO PRE-CONSTRUCTION CONTOURS AND THE STOCKPILED WETLAND TOPSOIL SPREAD TO RESTORE THESE AREAS TO PRE-CONSTRUCTION ELEVATION.

THE AREA OF TEMPORARY WETLAND IMPACT SHALL BE RESTORED TO PRECONSTRUCTION ELEVATION AND RESEEDED AS SOON AS POSSIBLE FOLLOWING THE COMPLETION OF CONSTRUCTION ACTIVITIES.

NO SUBSTITUTION FOR ANY OF THESE SPECIES WILL BE ACCEPTED WITHOUT PERMISSION FROM TDOT ENVIRONMENTAL DIVISION. NO CLONES OR COLTIVARS WILL BE ACCEPTED. ANY TREES FOUND TO BE INCORRECT SPECIES, IMPROPERLY PLANTED, OR WHICH DO NOT SURVIVE, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT, SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE. STAKES AND WIRES WILL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION.

ESTIMATED TREE QUANTITIES - WTL-13

ITEM NO.		DESCRIPTION	SPACING (FT)	QUANTITY
802-11.02	1	RED MAPLE (ACER RUBRUM)	10	33
802-11.45	2	AMERICAN HORNBEAM (CARPINUS CAROLINIANA)	10	33
802-12.18	3	SWEETGUM (LIQUIDAMBAR STYRACIFLUA)	10	33
802-13.07	4	AMERICAN HOLLY (ILEX OPACA)	10	33
802-11.06	5	PAWPAW (ASIMINA TRILOBA)	10	33

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PROPOSED R.O.W.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT PORTIONS OF WTL-13 LOCATED OUTSIDE OF THE R.O.W. WILL NOT BE DISTURBED AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

WTL-13 STA 333+00 TO STA 335+14

LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.017 AC.
	VOLUME OF PERMANENT IMPACT = 28 C.Y.
	AREA OF TEMPORARY IMPACT = 0.18 AC.
	VOLUME OF TEMPORARY IMPACT = 289 C.Y.

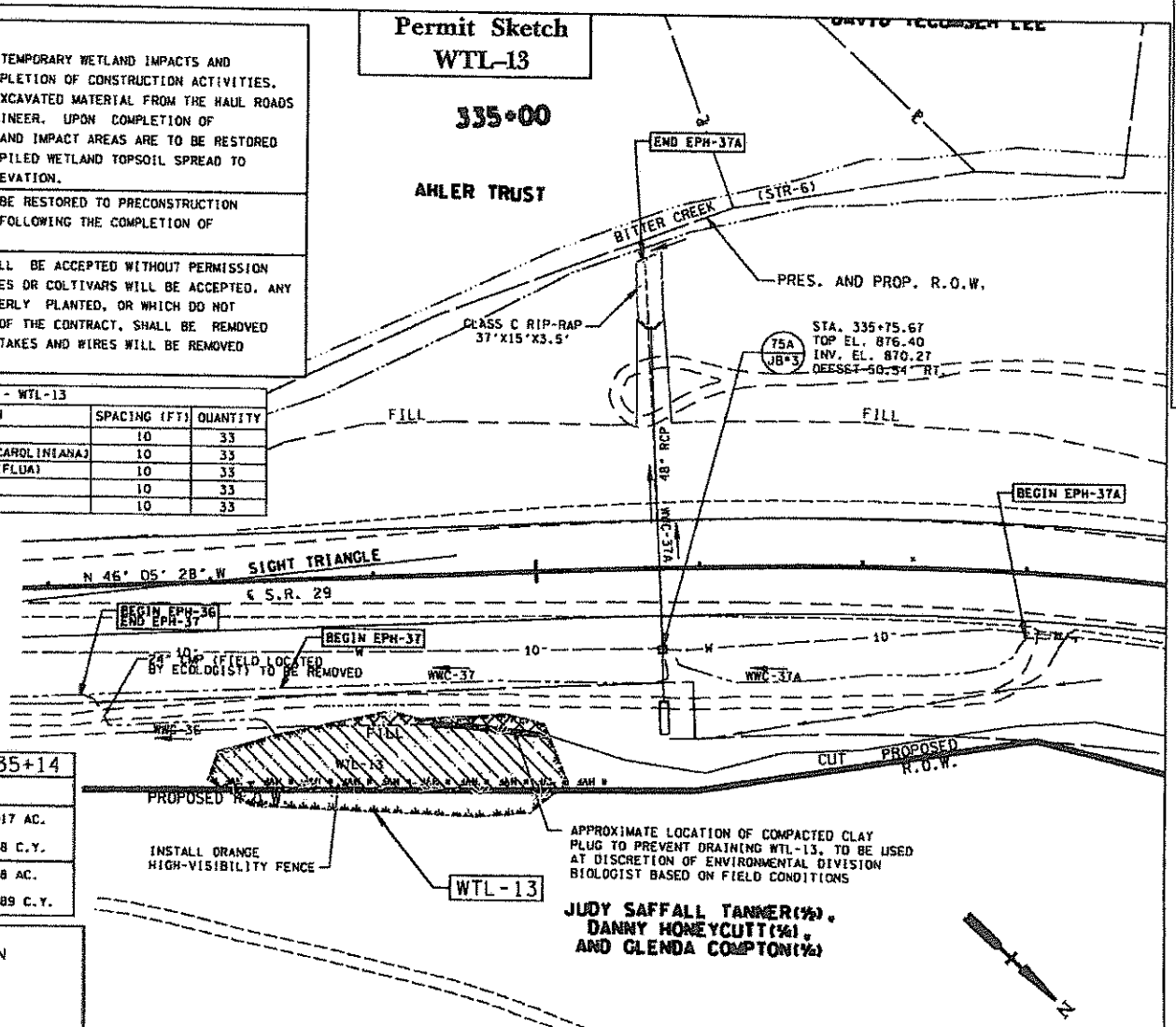
APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

SHEET 8 OF 30

Permit Sketch
WTL-13

335+00

AHLER TRUST

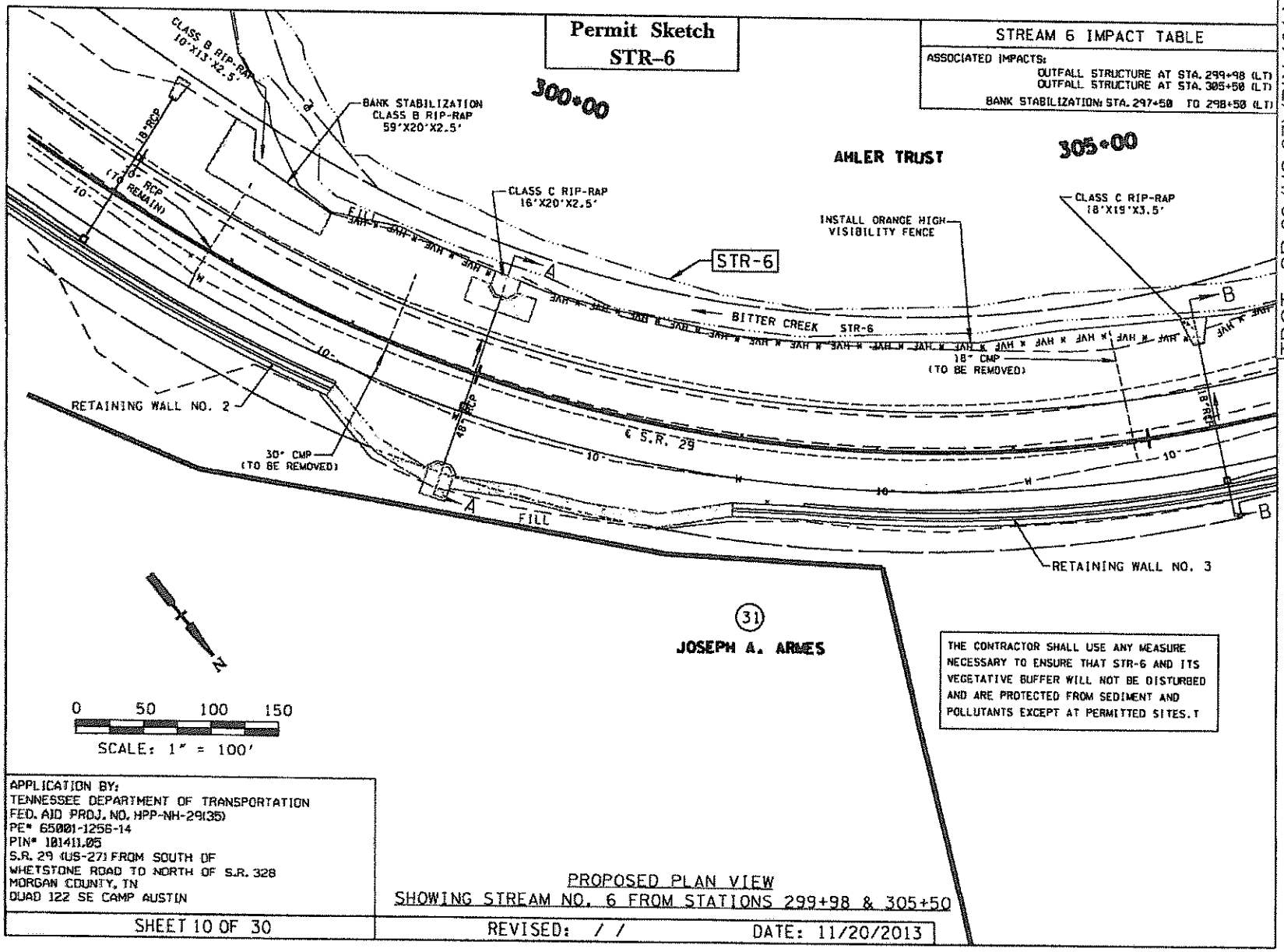


PROPOSED PLAN VIEW
SHOWING WETLAND NO. 13 FROM STA 333+00 TO 335+14

0 50 100 150
SCALE: 1" = 100'

REVISED: / /

DATE: 11/20/2013



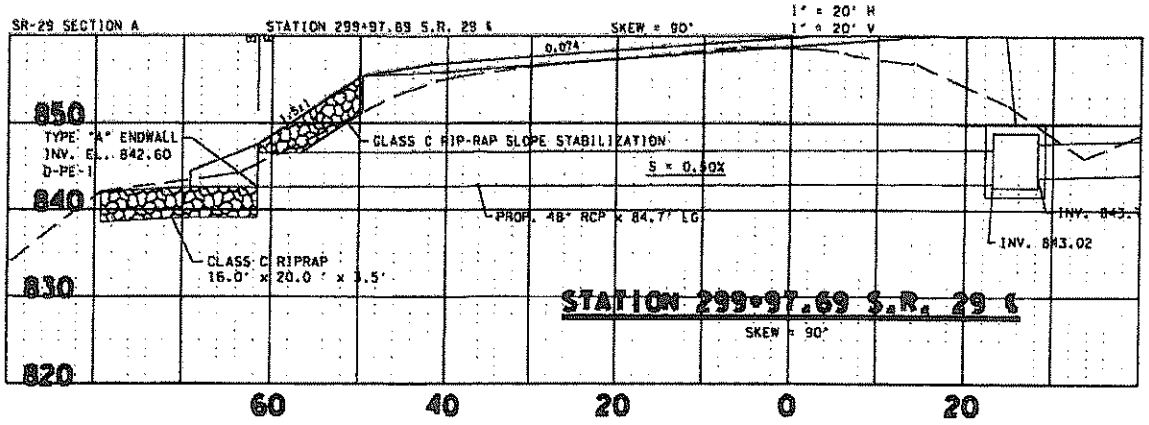
APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

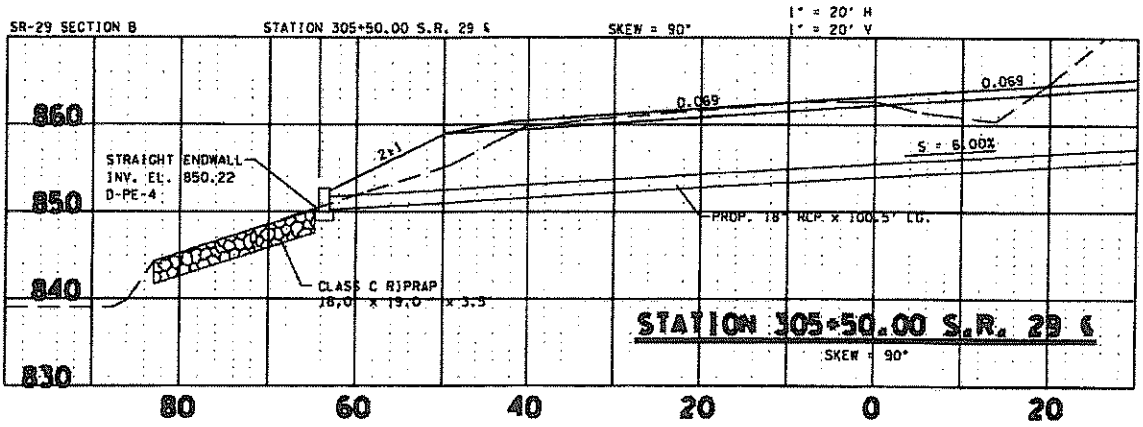
PROPOSED PLAN VIEW
SHOWING STREAM NO. 6 FROM STATIONS 299+98 & 305+50

SHEET 10 OF 30 | REVISED: / / | DATE: 11/20/2013

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
Morgan County, TN
Sheet 6 of 24

Permit Sketch
STR-6





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S.R. 29 (US-27) FROM SOUTH OF
WHEISTONE ROAD TO NORTH OF S.R. 328

DATE: 11/20/2013 REVISED: / /

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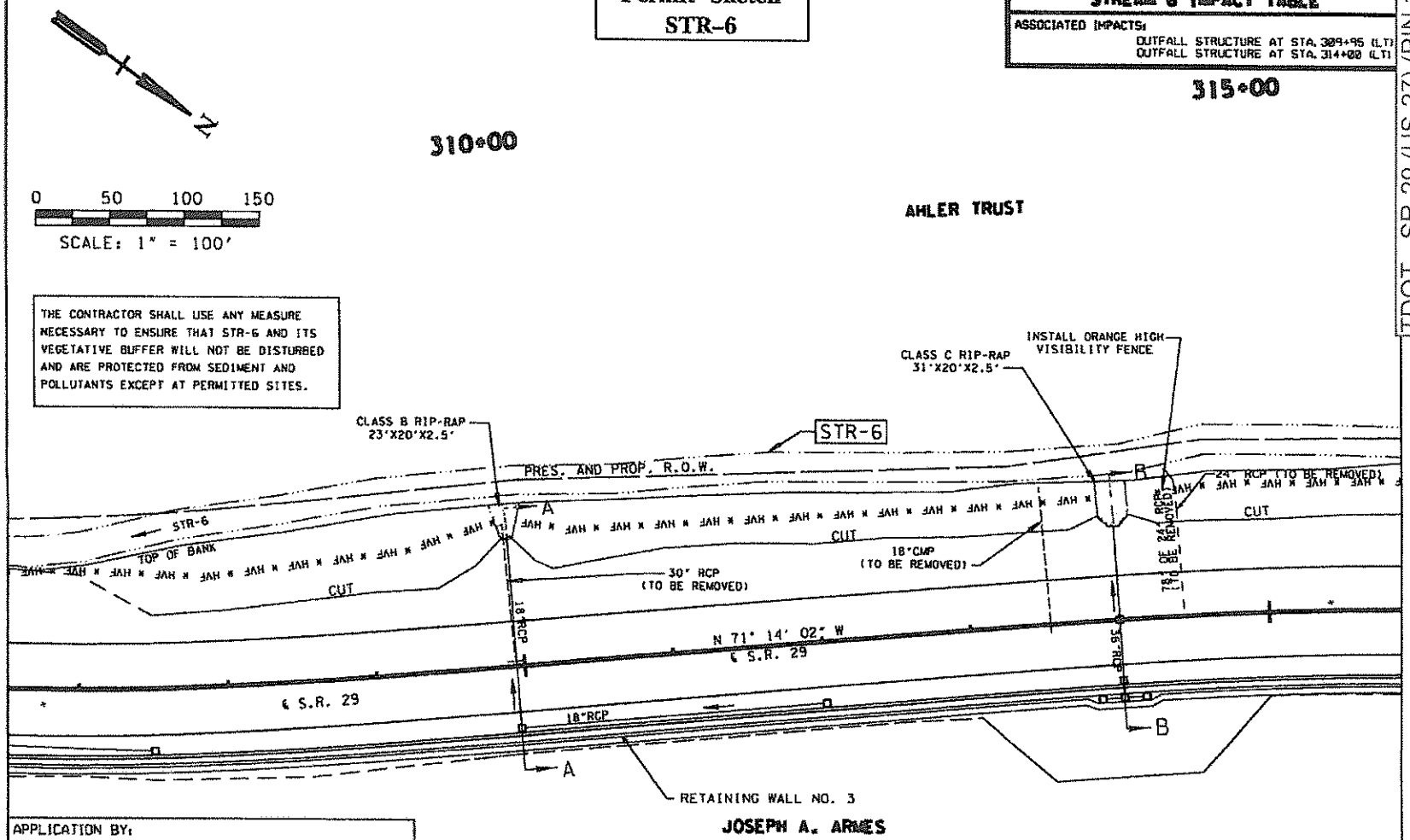
STR-6

STREAM 6 IMPACT TABLE	
ASSOCIATED IMPACTS:	
	OUTFALL STRUCTURE AT STA. 309+95 (LT)
	OUTFALL STRUCTURE AT STA. 314+00 (LT)



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MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

PROPOSED PLAN VIEW
SHOWING STREAM NO. 6 STATION 309+95 & 314+00

SHEET 12 OF 30	REVISED: / /	DATE: 11/20/2013

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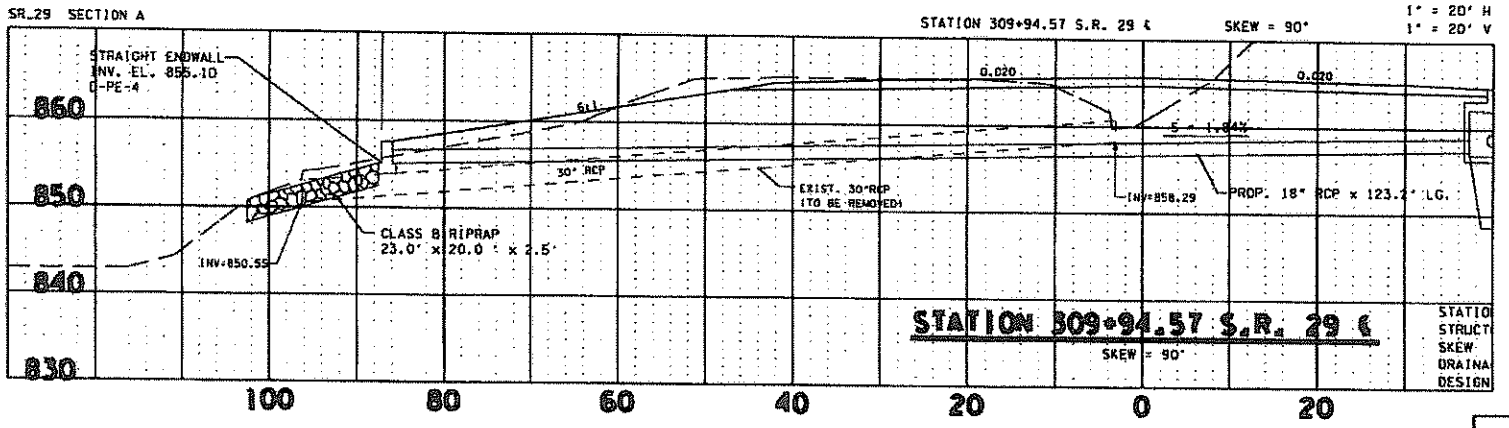

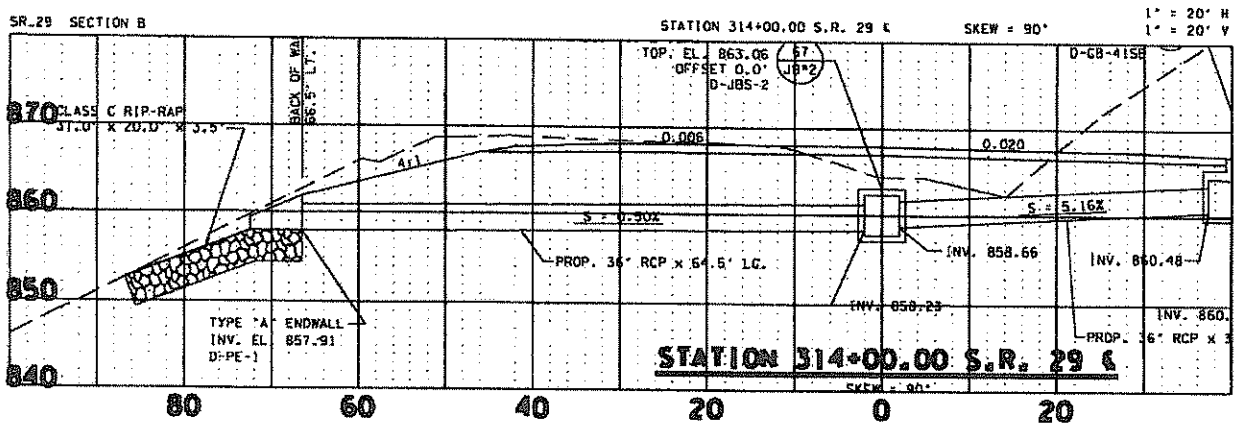

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MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

DATE: 11/20/2013 REVISED: / /

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Permit Sketch
STR-6

PROPOSED PLAN VIEW
SHOWING STREAM NO. 6 STATION 317+00 TO 322+00

STREAM 6 IMPACT TABLE
ASSOCIATED IMPACTS:
OUTFALL STRUCTURE AT STA. 317+00 (LT)
OUTFALL STRUCTURE AT STA. 319+32 (LT)
OUTFALL STRUCTURE AT STA. 322+00 (LT)

315+00

320+00

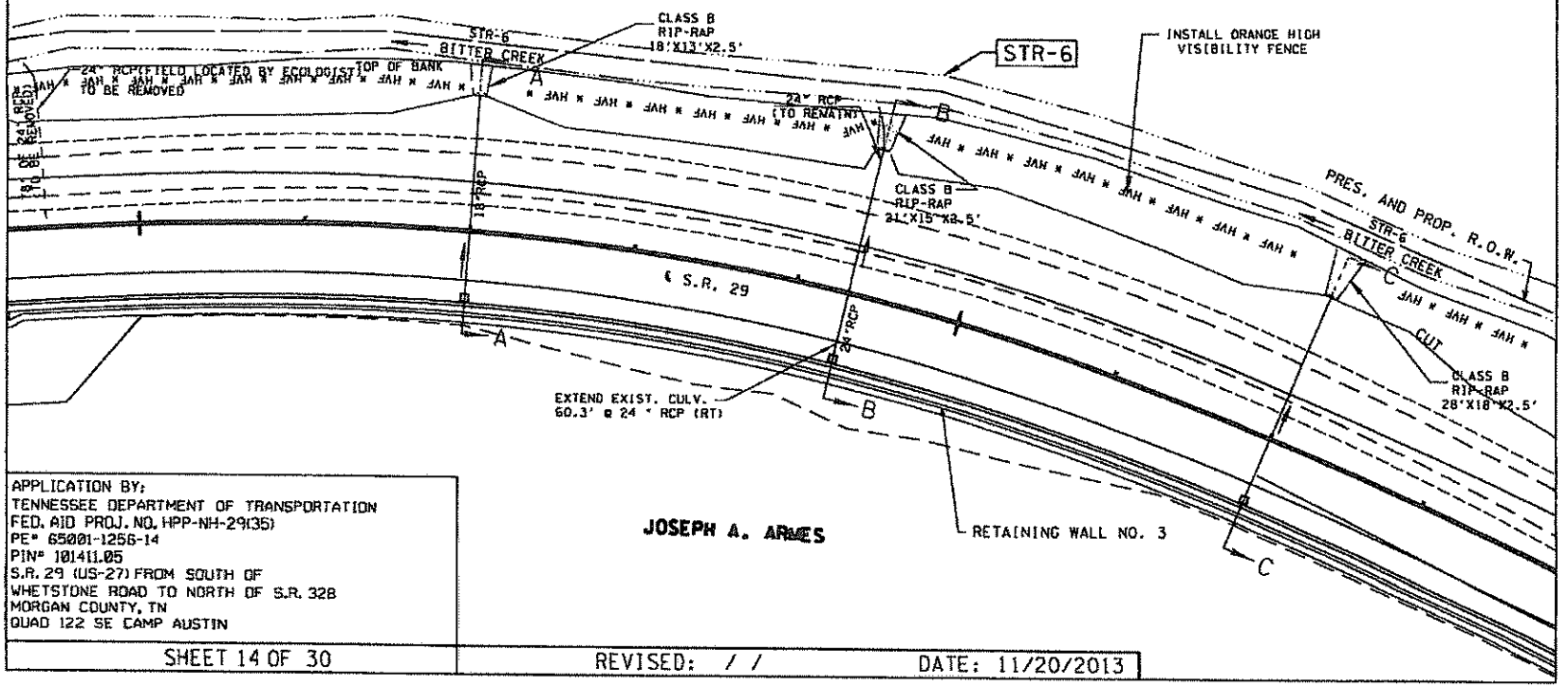
N

0 50 100 150

SCALE: 1" = 100'

AHLER TRUST

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6 AND ITS VEGETATIVE BUFFER WILL NOT BE DISTURBED AND ARE PROTECTED FROM SEDIMENT AND POLLUTANTS EXCEPT AT PERMITTED SITES.T



JOSEPH A. ARMES

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
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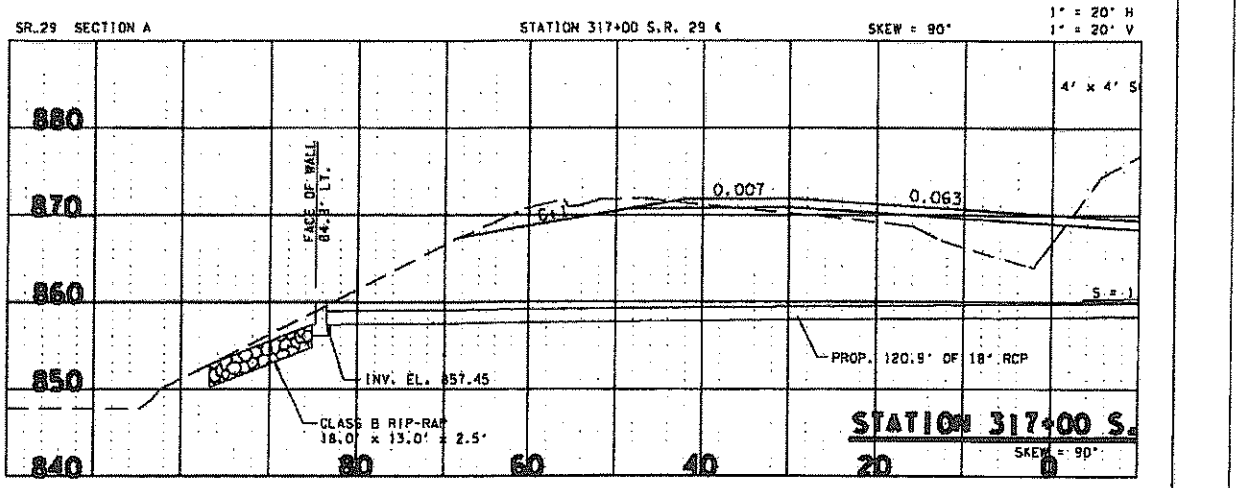
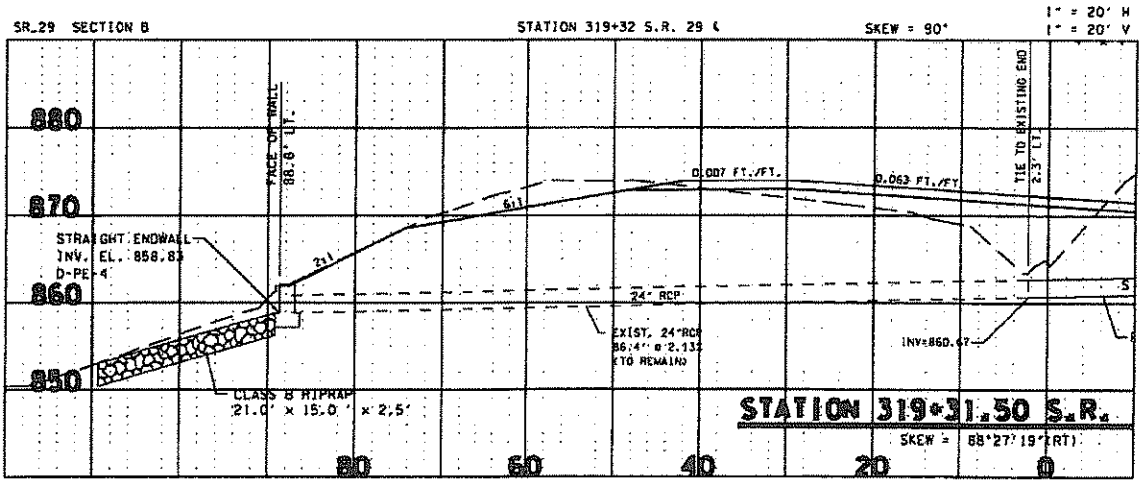
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

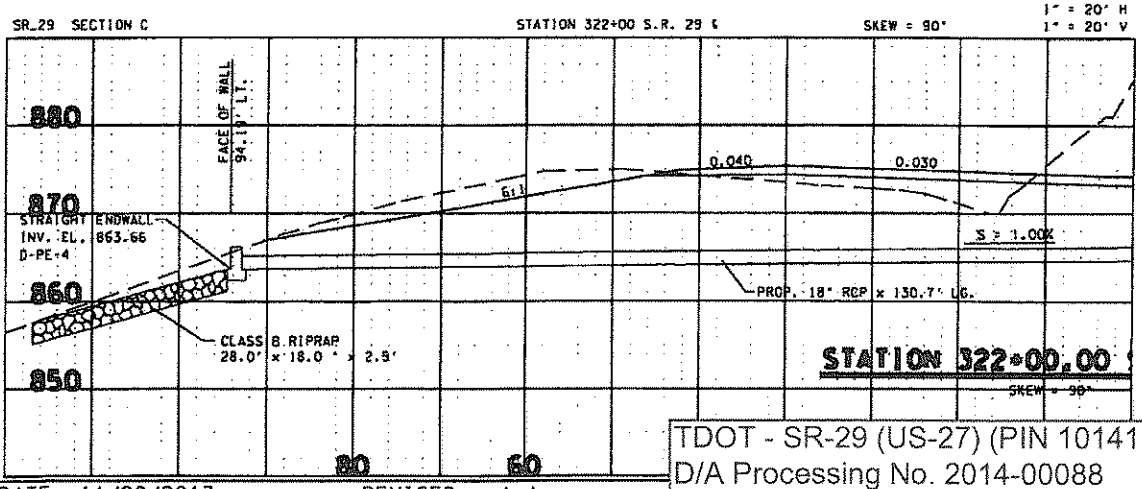
SHEET 14 OF 30 | REVISED: / / | DATE: 11/20/2013

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
Morgan County, TN
Sheet 10 of 24

Permit Sketch
STR-6







DATE: 11/20/2013 REVISED: / /

TDOT - SR-29 (US-27) (PIN 101411.05)
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Morgan County, TN
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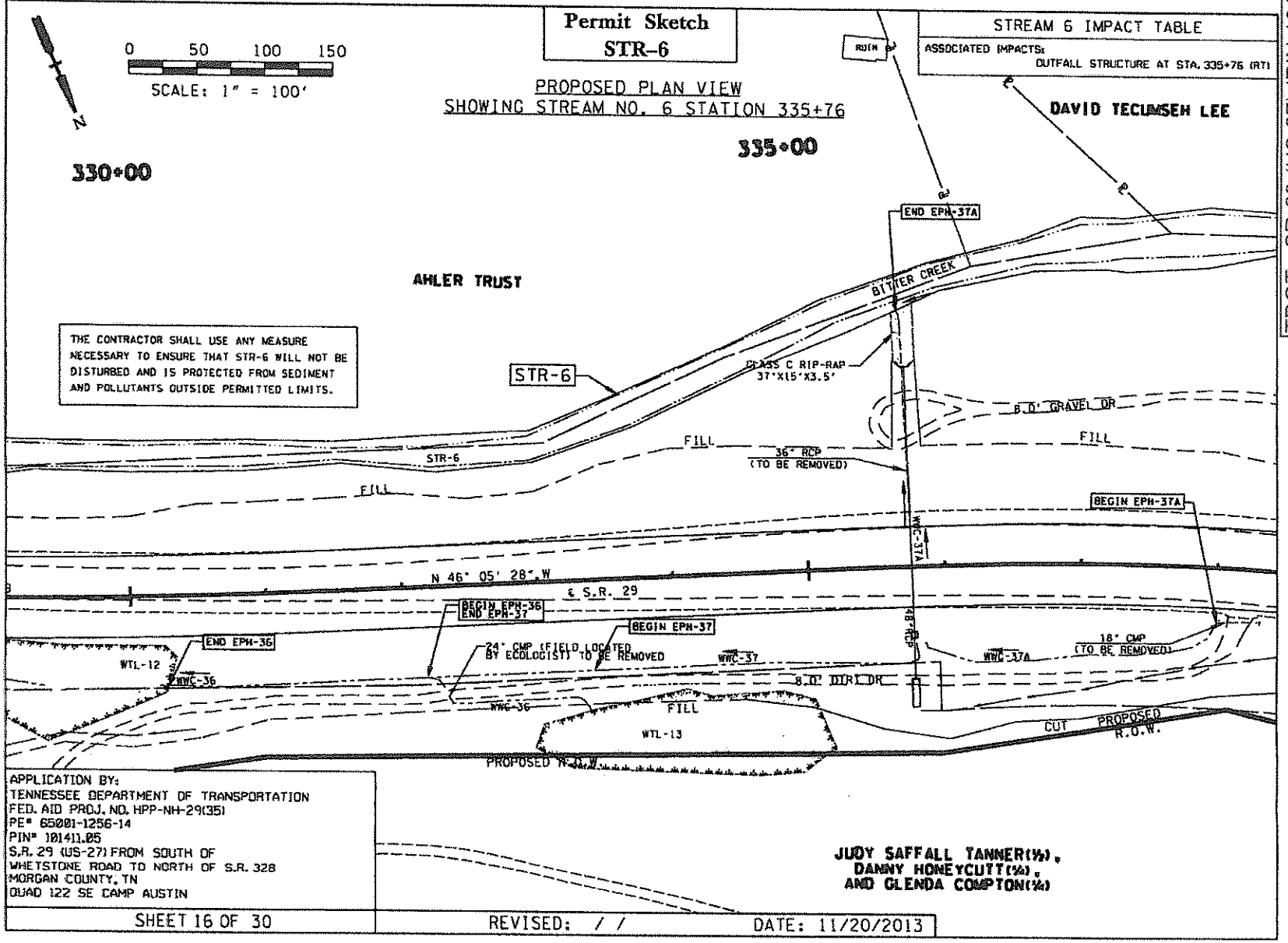

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
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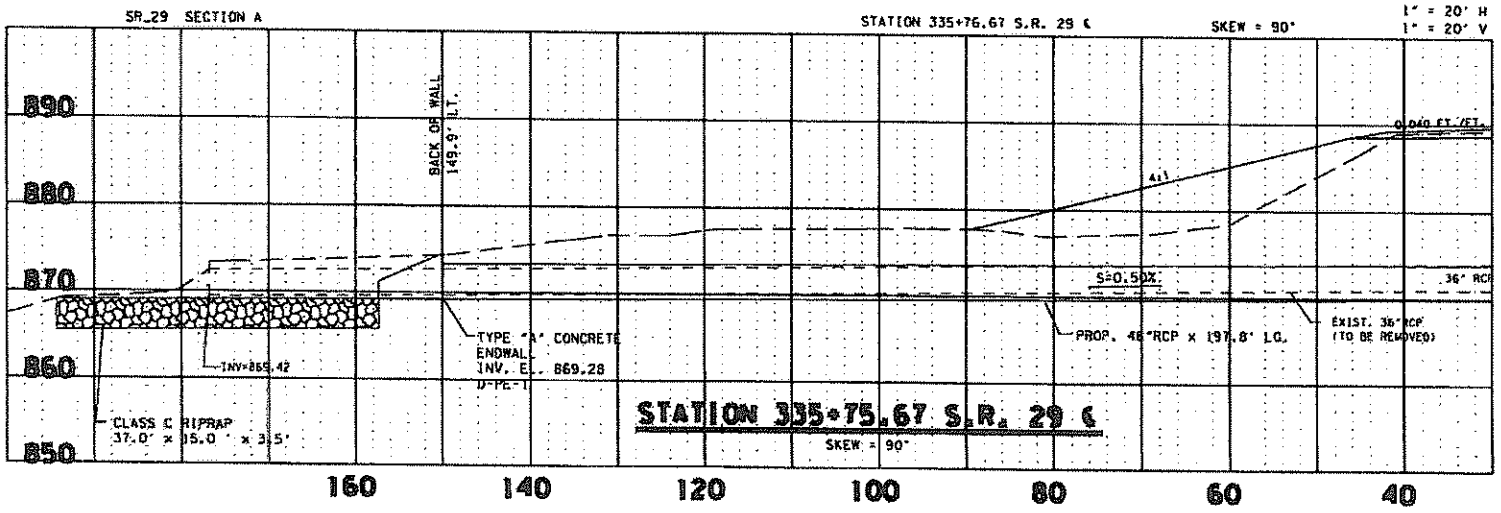
Permit Sketch
STR-6



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PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

SHEET 17 OF 30 | REVISED: / / | DATE: 11/20/2013

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
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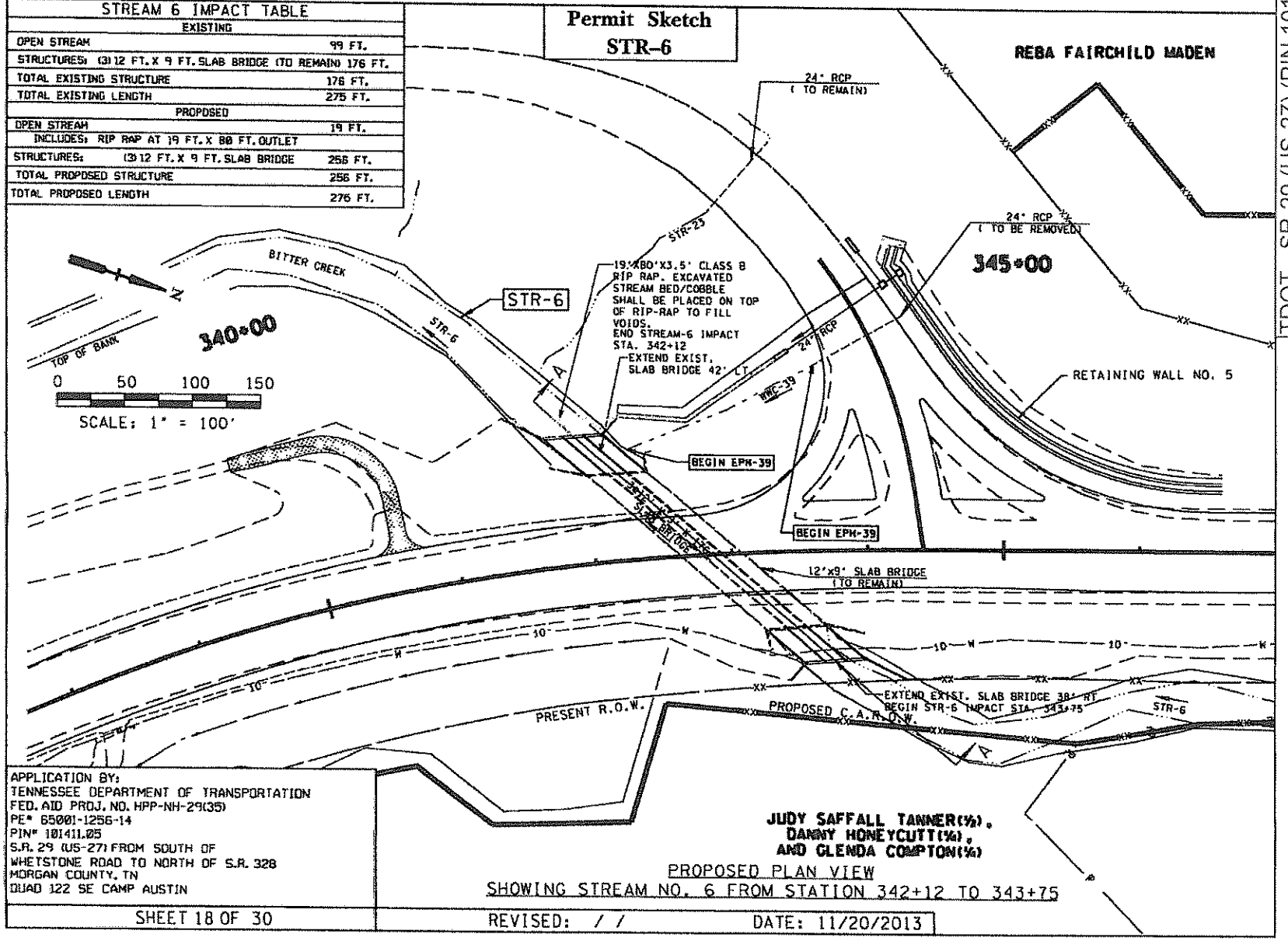
STREAM 6 IMPACT TABLE	
EXISTING	
OPEN STREAM	99 FT.
STRUCTURES: (3) 12 FT. X 9 FT. SLAB BRIDGE (TO REMAIN)	176 FT.
TOTAL EXISTING STRUCTURE	176 FT.
TOTAL EXISTING LENGTH	275 FT.
PROPOSED	
OPEN STREAM	19 FT.
INCLUDES: RIP RAP AT 19 FT. X 80 FT. OUTLET	
STRUCTURES: (3) 12 FT. X 9 FT. SLAB BRIDGE	256 FT.
TOTAL PROPOSED STRUCTURE	256 FT.
TOTAL PROPOSED LENGTH	276 FT.

Permit Sketch
STR-6



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PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

JUDY SAFFALL TANNER(½),
DANNY HONEYCUTT(¼),
AND GLENDA COMPTON(¼)

PROPOSED PLAN VIEW
SHOWING STREAM NO. 6 FROM STATION 342+12 TO 343+75

SHEET 18 OF 30

REVISED: / /

DATE: 11/20/2013

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
Morgan County, TN
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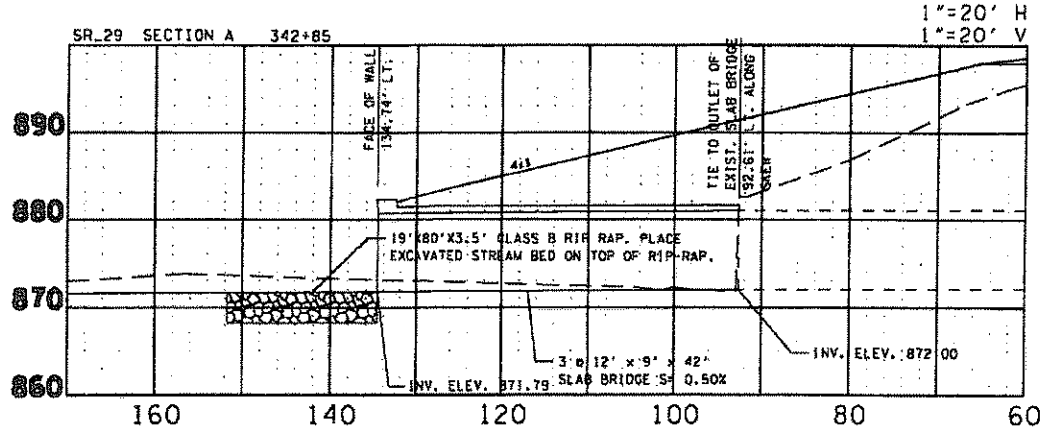
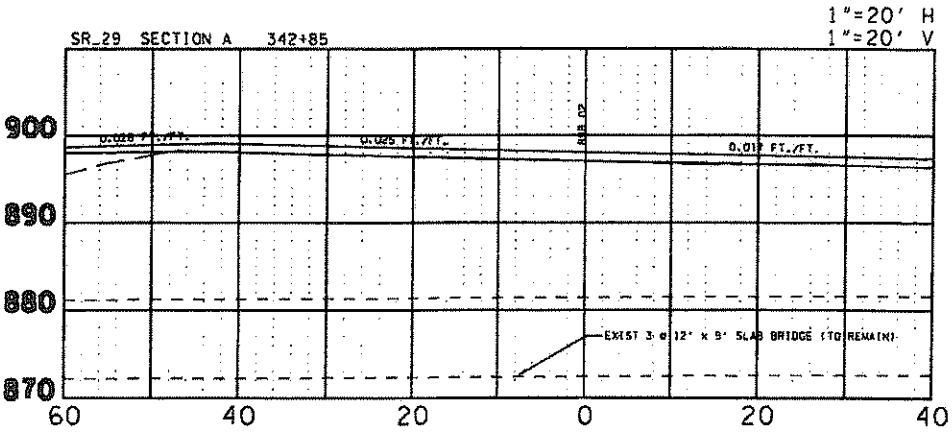
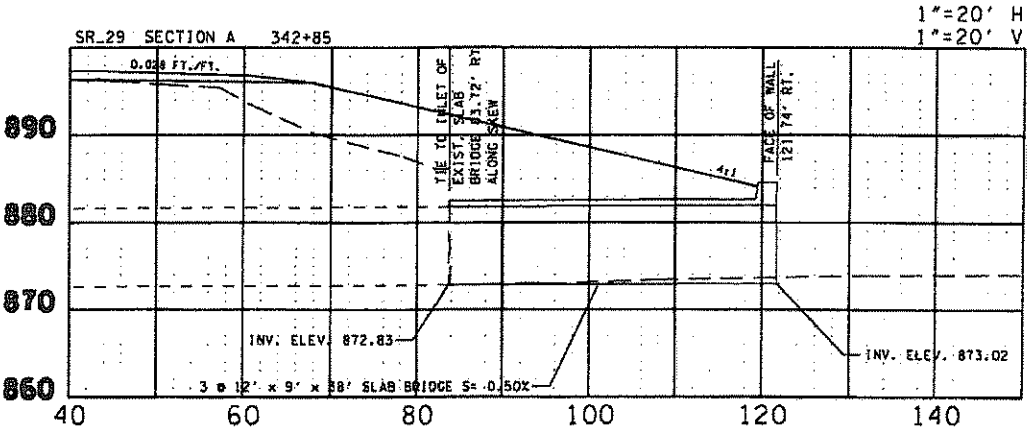
Permit Sketch
STR–6







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PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
[illegible]

DATE: 11/20/2013 REVISED: / /

TDOT - SR-29 (US-27) (PIN 101411.05)
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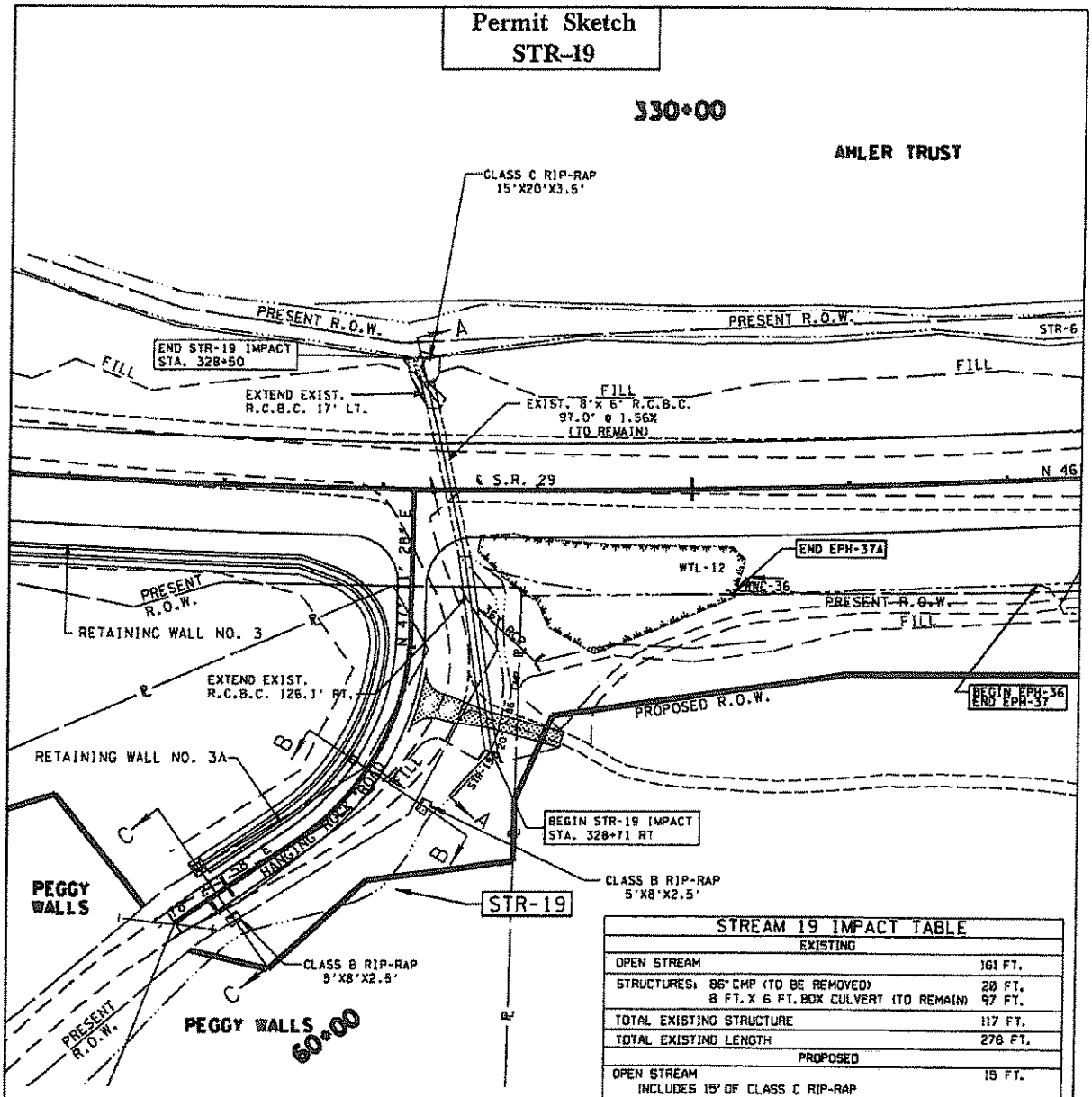
Permit Sketch
STR-19



STREAM 19 IMPACT TABLE	
EXISTING	
OPEN STREAM	161 FT.
STRUCTURES: 86" CMP (TO BE REMOVED)	20 FT.
8 FT. X 6 FT. BOX CULVERT (TO REMAIN)	97 FT.
TOTAL EXISTING STRUCTURE	117 FT.
TOTAL EXISTING LENGTH	278 FT.
PROPOSED	
OPEN STREAM INCLUDES 15' OF CLASS C RIP-RAP	15 FT.
STRUCTURES: 8 FT. X 6 FT. BOX CULVERT	240.1 FT.
ASSOCIATED IMPACTS: OUTFALL STRUCTURE AT HANGING ROCK ROAD STA. 56+83 (RT) OUTFALL STRUCTURE AT HANGING ROCK ROAD STA. 60+08 (RT)	
TOTAL PROPOSED STRUCTURE	240 FT.
TOTAL PROPOSED LENGTH	255 FT.

PROPOSED PLAN VIEW
SHOWING STREAM NO. 19 AT STATION 328+43

N

0 50 100 150

SCALE: 1" = 100'

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF

DATE: 11/20/2013 REVISED: / /

TDOT - SR-29 (US-27) (PIN 101411.05)
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Morgan County, TN
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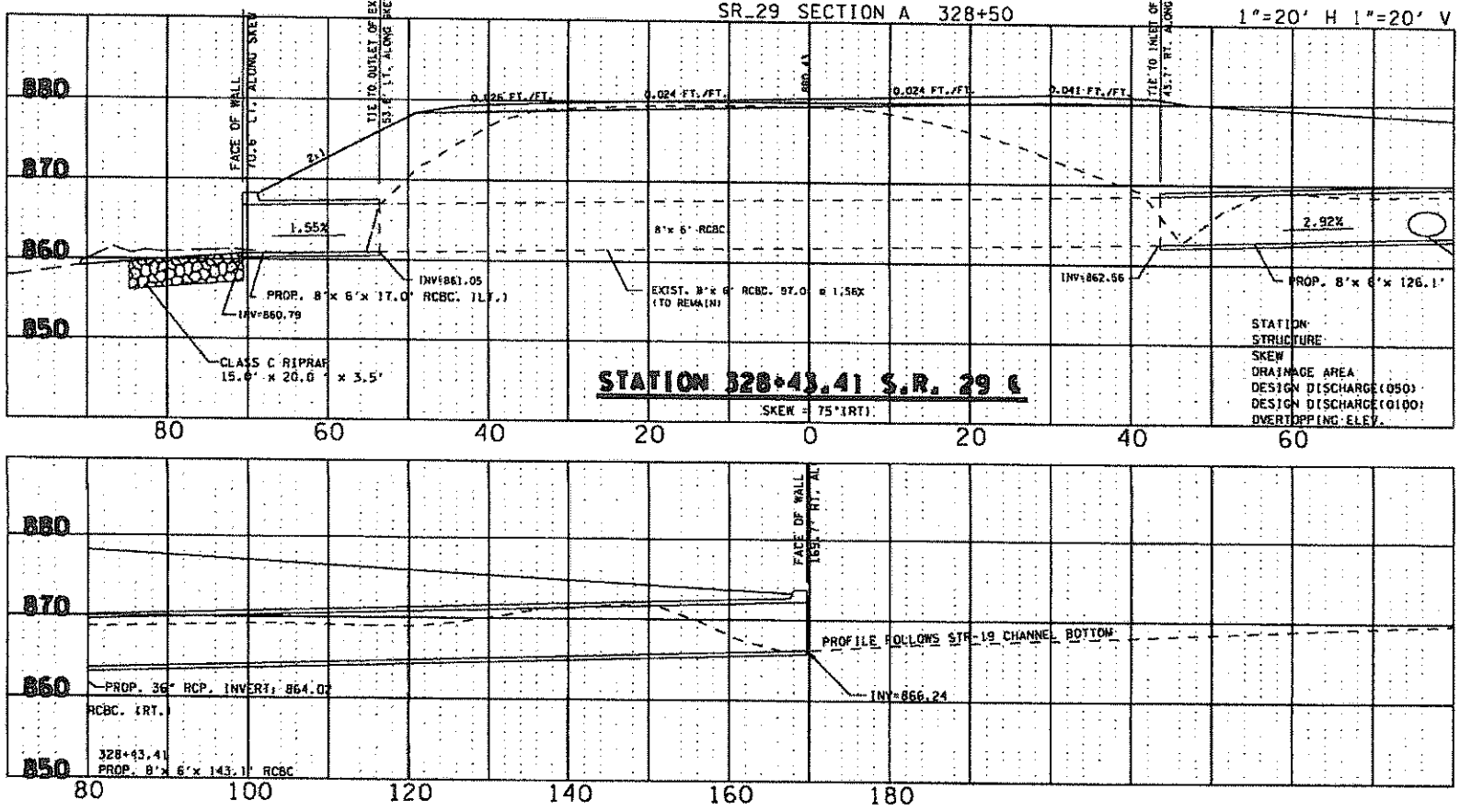
Permit Sketch
STR-19



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Morgan County, TN
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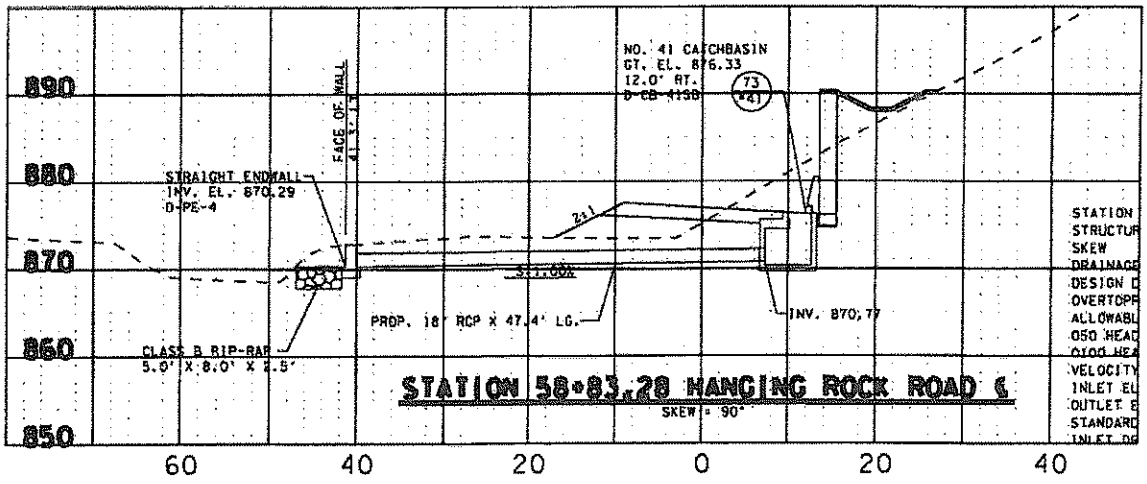
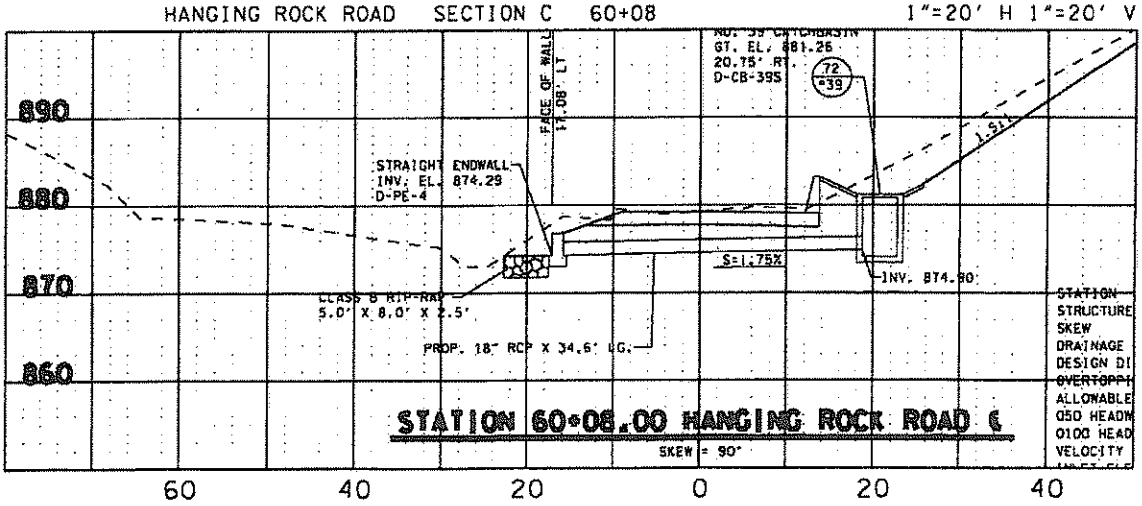
Permit Sketch
STR-19

HANGING ROCK ROAD SECTION B 58+83.28 1"=20' H 1"=20' V



HANGING ROCK ROAD SECTION C 60+08 1"=20' H 1"=20' V



DATE: 11/20/2013 REVISED: / /

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
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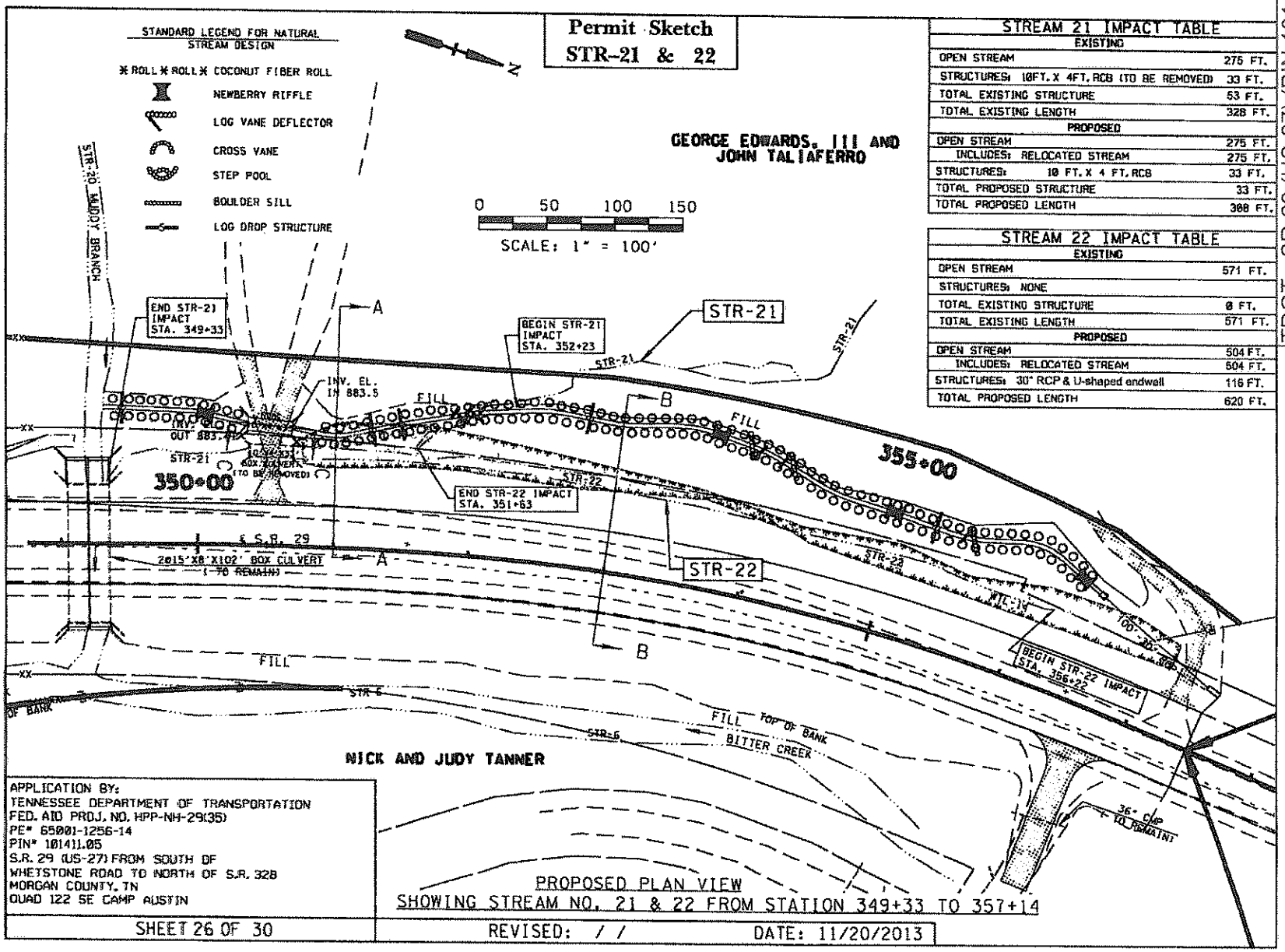
Permit Sketch
STR-21 & 22



STREAM 21 IMPACT TABLE	
EXISTING	
OPEN STREAM	275 FT.
STRUCTURES: 10FT. X 4FT. RCB (TO BE REMOVED)	33 FT.
TOTAL EXISTING STRUCTURE	53 FT.
TOTAL EXISTING LENGTH	328 FT.
PROPOSED	
OPEN STREAM	275 FT.
INCLUDES: RELOCATED STREAM	275 FT.
STRUCTURES: 10 FT. X 4 FT. RCB	33 FT.
TOTAL PROPOSED STRUCTURE	33 FT.
TOTAL PROPOSED LENGTH	308 FT.

STREAM 22 IMPACT TABLE	
EXISTING	
OPEN STREAM	571 FT.
STRUCTURES: NONE	
TOTAL EXISTING STRUCTURE	0 FT.
TOTAL EXISTING LENGTH	571 FT.
PROPOSED	
OPEN STREAM	504 FT.
INCLUDES: RELOCATED STREAM	504 FT.
STRUCTURES: 30" RCP & U-shaped endwall	116 FT.
TOTAL PROPOSED LENGTH	620 FT.

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S.R. 29 (US-27) FROM SOUTH OF WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

PROPOSED PLAN VIEW
SHOWING STREAM NO. 21 & 22 FROM STATION 349+33 TO 357+14

SHEET 26 OF 30 | REVISED: / / | DATE: 11/20/2013

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
Morgan County, TN
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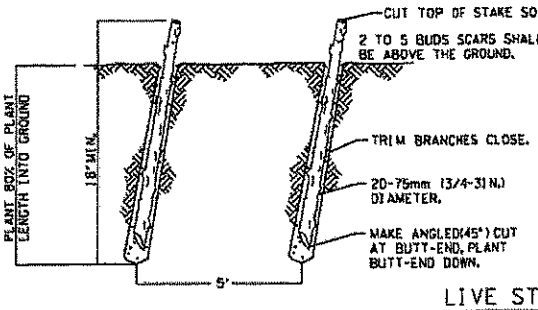
Permit Sketch
STR-21 & 22



LIVE STAKES
N.T.S.

DETAIL:
LIVE STOUT STAKES SHOULD BE LONG ENOUGH TO REACH BELOW THE GROUNDWATER TABLE. (GENERALLY, A LENGTH OF 2 TO 3 FEET) ADDITIONALLY, THE STAKES SHOULD HAVE A DIAMETER IN THE RANGE OF 0.75 TO 3.0 INCHES.

NOTES:
1. HARVEST AND PLANT STAKES DURING THE DORMANT SEASON.
2. USE HEALTHY, STRAIGHT AND LIVE WOOD AT LEAST 1 YEAR OLD.
3. MAKE CLEAN CUTS AND DO NOT DAMAGE STAKES OR SPLIT ENDS DURING INSTALLATION; USE AN IRON BAR AND PILOT HOLE IN FIRM SOILS.
4. SOAK CUTTINGS FOR AT LEAST 24 HOURS PRIOR TO INSTALLATION. SOAK FOR 5-7 DAYS FOR BEST RESULTS.
5. PLANT STAKE AT THE BREAK POINT OF THE BANKFULL BENCH AND CHANNEL BED SLOPE.
6. TAMP THE SOIL AROUND THE STAKE.

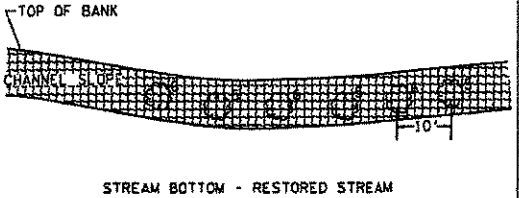
ESTIMATED QUANTITIES - STR-21 & 22 MORGAN COUNTY

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	802-02.01	5 ALNUS SERRULATA (HAZEL ALDER), 18-24 INCH BARE ROOT SEEDLINGS	EACH	80
	802-02.02	6 ASIMINA TRILOBA (PAWPAW) 18-24 INCH BARE ROOT SEEDLINGS	EACH	80
	209-03.35	STREAM MITIGATION - LOG DROP STRUCTURES	EACH	5
	209-03.36	STREAM MITIGATION - STEP POOL	EACH	0
	209-03.55	STREAM MITIGATION - BOULDER SILL	EACH	1
	209-03.34	STREAM MITIGATION - SINGLE LOG VANE DEFLECTOR	EACH	3
	209-03.44	STREAM MITIGATION - WILLOW POLES (ELDERBERRY & SILKY DOGWOOD)	EACH	300
	709-05.81	STREAM MITIGATION - ROCK RIFFLE	EACH	4
	209-03.37	STREAM MITIGATION - CROSS VANE STRUCTURE	EACH	0
	209-03.31	STREAM MITIGATION - COCONUT FIBER ROLLS	LF	650
	209-08.02	TEMPORARY SILT FENCE (WITH BACKING) FOR OLD CHANNEL	LF	650
	209-65.01	TEMPORARY STREAM DIVERSION (PUMP AROUND)	LS	1
	209-65.02	TEMPORARY STREAM DIVERSION (PIPE AROUND)	LS	1
	209-65.14	TEMPORARY STREAM DIVERSION (IN CHANNEL)	LS	1
①	801-01.34	GRASS SEED MIX (RPNZN/FLPL)	UNIT	28.5
①	801-01.30	COVER CROP SEED MIX (RIPZN/FLPL) W/MULCH	UNIT	65.5
	805-12.04	EROSION CONTROL BLANKET (TYPE IV)	SY	533

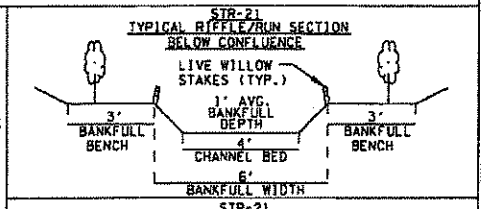
FOOTNOTE:

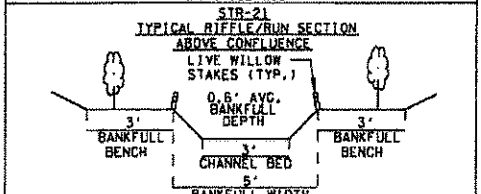
① PLANTING RATE FOR ITEM NO. 801-01.34 IS 40lbs/ac.
PLANTING. RATE FOR ITEM NO. 801-01.30 IS 100lbs/ac.

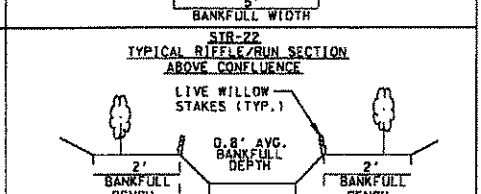
TYPICAL CHANNEL RESTORATION & TREE PLANTING DETAIL FOR STREAM RELOCATIONS



PLAN VIEW







NOTES:

NO SUBSTITUTION FOR ANY OF THESE SPECIES WILL BE ACCEPTED WITHOUT PERMISSION FROM TDOT ENVIRONMENTAL PLANNING AND PERMITS DIVISION. NO CLONES OR COLTIVARS WILL BE ACCEPTED. ANY TREES FOUND TO BE INCORRECT SPECIES, IMPROPERLY PLANTED, OR WHICH DO NOT SURVIVE, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT, SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENCE. STAKES AND WIRES WILL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION.

DATE: 11/20/2013 REVISED: / /

TDOT - SR-29 (US-27) (PIN 101411.05)
D/A Processing No. 2014-00088
Morgan County, TN
Sheet 20 of 24

Permit Sketch
STR-21 & 22

STRUCTURE BY STATION - STR-21 & 22		
STATION	STRUCTURE	DESCRIPTION
349+53	2	LOG DROP STRUCTURE
350+18	5	NEWBERRY RIFFLE
351+34	2	LOG DROP STRUCTURE
351+54	2	LOG DROP STRUCTURE
351+98	6	BOULDER SILL
352+84	2	LOG DROP STRUCTURE
353+72	5	NEWBERRY RIFFLE
354+01	3	LOG VANE DEFLECTOR
354+24	3	LOG VANE DEFLECTOR
355+09	5	NEWBERRY RIFFLE
355+35	2	LOG DROP STRUCTURE
355+60	3	LOG VANE DEFLECTOR
356+45	5	NEWBERRY RIFFLE

PROPOSED MORPHOLOGY FOR STREAM 22
(STA 352+50 – 356+50)

PARAMETER	STREAM 21	
	MIN	MAX
MEAN DEPTH @ BANKFULL (BKF)[1] (FT)	0.44	
RUN LENGTH @ BKF (FT)	15	70
RUN WIDTH @ BKF (FT)	5	
RUN DEPTH @ BKF (FT)	0.6	
SLOPE RUN (FT/FT)	0.29%	1%
RIFFLE LENGTH @ BKF (FT)	5	10
RIFFLE WIDTH @ BKF (FT)	6	
RIFFLE DEPTH @ BKF (FT)	0.6	
SLOPE RIFFLE (FT/FT)	4%	7%
RIFFLE DMIN, D50[2], DMAX (IN)	1, 2, 3	
AVG DROP FOR CROSS VANE, LOG DROPS, AND SINGLE LOG VANE (FT)	0.5	

[1] AVERAGE DEPTH ACROSS SECTION AT BANKFULL
[2] D50 IS THE AVERAGE SUBSTRATE SIZE OBSERVED AT FEATURE (I.E., RIFFLE, RUN, POOL) IN EXISTING CHANNEL PROPOSED CHANNEL FEATURES SHOULD BE CONSTRUCTED WITH SUBSTRATE FROM THE EXISTING CHANNEL. PROPOSED NEWBURY RIFFLES MAY BE ALSO CONSTRUCTED USING CLASS A1 RIPRAP. HOWEVER CONTRACTOR SHOULD BE CAREFUL WHEN SELECTING APPROPRIATE SUBSTRATE DIAMETER SIZES.

PROPOSED MORPHOLOGY FOR STREAM 21
(STA 349+25 – STA 352+50)

PARAMETER	STREAM 1	
	MIN	MAX
MEAN DEPTH @ BANKFULL (BKF)[1] (FT)	0.63	
RUN LENGTH @ BKF (FT)	15	70
RUN WIDTH @ BKF (FT)	8	
RUN DEPTH @ BKF (FT)	1	
SLOPE RUN (FT/FT)	0.29%	1%
RIFFLE LENGTH @ BKF (FT)	7	12
RIFFLE WIDTH @ BKF (FT)	8	
RIFFLE DEPTH @ BKF (FT)	1	
SLOPE RIFFLE (FT/FT)	4%	7%
RIFFLE DMIN, D50[2], DMAX (IN)	1, 2 5, 4	
AVG DROP FOR CROSS VANE, LOG DROPS, AND SINGLE LOG VANE (FT)	0.5	

[1] AVERAGE DEPTH ACROSS SECTION AT BANKFULL
[2] D50 IS THE AVERAGE SUBSTRATE SIZE OBSERVED AT FEATURE (I.E., RIFFLE, RUN, POOL) IN EXISTING CHANNEL PROPOSED CHANNEL FEATURES SHOULD BE CONSTRUCTED WITH SUBSTRATE FROM THE EXISTING CHANNEL. PROPOSED NEWBURY RIFFLES MAY BE ALSO CONSTRUCTED USING CLASS A1 RIPRAP. HOWEVER, CONTRACTOR SHOULD BE CAREFUL WHEN SELECTING APPROPRIATE SUBSTRATE DIAMETER SIZES

ENVIRONMENTAL - ECOLOGY

1. THE NEW CHANNEL MUST BE CONSTRUCTED TO ALLOW NATIVE STONE (BOULDERS, COBBLES, ETC.) FROM THE EXISTING CHANNEL TO BE HARVESTED FOR PLACEMENT IN THE NEW CHANNEL.

2. THE FOLLOWING IS THE RECOMMENDED CONSTRUCTION SEQUENCE:

   A. FLAG EDGE OF THE NEW CHANNEL TOP BANK PRIOR TO CLEARING. DO NOT CLEAR LARGE TREES IN POSITION TO SHADE THE NEW CHANNEL. LEAVE AS MANY TREES AND SHRUBS AS POSSIBLE AS A STREAM BUFFER.
   B. EXCAVATE CHANNEL "IN THE DRY" LEAVING AREAS OF UNDISTURBED EARTH AT BOTH ENDS.
   C. INSTALL GRAVITY BYPASS PIPE FOR EXISTING STR-21 & 22.
   D. SHAPE CHANNEL TO SPECIFICATIONS SHOWN. REMOVE LOOSE SOILS AND DEBRIS.
   E. IF SUFFICIENT NATIVE STONE (AS APPROVED BY ENGINEER) IS NOT ENCOUNTERED WITHIN THE NEW CHANNEL EXCAVATION, THEN EXCAVATE NATIVE STONE FROM EXISTING STR-1.
   F. PLACE TOPSOIL, SEED & EROSION CONTROL BLANKET AS SPECIFIED.
   G. REMOVE DIVERSION BERMS, BEGINNING WITH THE MOST DOWNSTREAM BERM. BANKS AND BOTTOM ELEVATION OF THE OLD CHANNEL SHOULD TRANSITION SMOOTHLY INTO THE NEW CHANNEL. THE ELEVATIONS OF THE NEW CHANNEL BOTTOM AT EACH END OF THE RELOCATION SEQUENCE SHOULD MATCH THE ELEVATIONS OF THE EXISTING CHANNEL, AND A STEADY PERCENT SLOPE SHOULD BE MAINTAINED THROUGHOUT THE RELOCATED CHANNEL CENTERLINE OR AS SPECIFIED.
   H. INSTALL TREES ACCORDING TO DETAIL.

3. CONTRACTOR IS ENCOURAGED TO EXCAVATE THE MAIN PROFILE OF THE NEW CHANNEL FIRST, THEN, AS DROP STRUCTURES ARE CONSTRUCTED WITHIN THE NEW CHANNEL, POOLS CAN BE EXCAVATED ACCORDING TO THE TYPICAL PROFILE FOR THE GIVEN REACH (UPPER, MIDDLE, OR LOWER).

4. STABILIZE THE BANKS OF THE NEW CHANNEL WITH SEED AND COIR EROSION CONTROL BLANKET

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STR-21 & 22

5. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. LIVE STAKES, BIOENGINEERING MEASURES, SEEDING, AND SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW-WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.

6. REQUESTS BY ANY AGENCY THAT WOULD REQUIRE THE MODIFICATION OF CHANNELS, DITCHES, ELEVATIONS, RIP-RAP OR ANY OTHER STREAM MITIGATION ITEMS ASSOCIATED WITH THE CHANNEL RELOCATIONS SHALL BE REFERRED TO THE PROJECT ENGINEER.

SPECIAL NOTES

1. THIS IS A STREAM RELOCATION PROJECT THAT IS TO BE DONE IN ACCORDANCE WITH 404/401 WATER QUALITY CERTIFICATION.

2. ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE WITH SEED/STRAW MULCH OR HYDROSEED UNLESS OTHERWISE NOTED IN THE PLANS OR BY THE ENGINEER.

TREES:

NO SUBSTITUTIONS OF TREE SPECIES OR SIZES SHALL - BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER/LANDSCAPE ARCHITECT. CONCERNING STREAM MITIGATION. TREES SHALL BE OF THE VARIETY REQUESTED. BARE ROOT (ROOTS MUST BE KEPT MOIST AT ALL TIMES), AND FIRST QUALITY. ANY FOUND TO BE INCORRECT SPECIES, OR IMPROPERLY PLANTED, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. STAKES AND WIRES SHALL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER.

SHRUB SPECIES SHOULD BE 1-GALLON CONTAINER GROWN OR BALL AND BURLAP STOCK. SHRUBS SHOULD BE PLACED ON 10-FOOT CENTERS.

LIVE STAKE ELDERBERRY AND SILKY DOGWOODS WILL ALSO BE USED ALONG THE STREAMBANK. CONSTRUCTION SPECIFICATIONS FOR LIVE STAKES.

1. HARVESTING:

A. LIVE STAKES MAY CONSIST OF A COMBINATION OF SILKY DOGWOOD AND ELDERBERRY.

B. STAKES SHOULD BE HARVESTED AND PLANTED WHEN THE WILLOWS OR OTHER CHOSEN SPECIES ARE DORMANT. THIS PERIOD IS GENERALLY FROM LATE FALL TO EARLY SPRING, OR BEFORE THE BUDS START TO BREAK.

C. WHEN HARVESTING CUTTINGS, SELECT HEALTHY, LIVE WOOD THAT IS REASONABLY STRAIGHT.

D. USE LIVE WOOD AT LEAST 1 YEAR OLD OR OLDER. THE BEST WOOD IS 2 TO 5 YEARS OLD WITH SMOOTH BARK THAT IS NOT DEEPLY FURROWED.

E. MAKE CLEAN CUTS WITH UNSPLIT ENDS. TRIM BRANCHES FROM CUTTING AS CLOSE AS POSSIBLE. CUT THE BUTT END OF THE CUTTING AT AN ANGLE (~45 DEGREES) AND THE TOP END SQUARE.

F. THE TOP (SQUARE CUT END) SHOULD BE PAINTED AND SEALED BY DIPPING THE TOP 1-INCH TO 2-INCHES INTO A 50-50 MIX OF LIGHT COLORED LATEX PAINT AND WATER. THIS REDUCES THE POSSIBILITY OF DESICCATION AND DISEASE CAUSING MORTALITY AND MAKES THEM MORE VISIBLE FOR SUBSEQUENT PLANTING EVALUATIONS. ASSURE THE STAKES ARE PLANTED WITH THE TOP UP.

G. CUTTINGS SHOULD GENERALLY BE BETWEEN 0.5-INCHES TO 2-INCHES IN DIAMETER BUT CAN BE LARGER DEPENDING ON THE SPECIES. HIGHEST SURVIVAL RATES ARE OBTAINED FROM USING CUTTINGS 2-INCHES TO 3-INCHES IN DIAMETER. LARGER DIAMETER CUTTINGS ARE NEEDED FOR PLANTING INTO ROCK RIPRAP.

H. CUTTINGS, OF SMALL DIAMETER (UP TO 1.5-INCHES) SHOULD BE 18 INCHES LONG MINIMUM. THICKER CUTTINGS SHOULD BE LONGER.

I. STAKES SHOULD BE CUT SO A TERMINAL BUD SCAR IS WITHIN 1-INCH TO 4-INCHES OF THE TOP. AT LEAST TWO BUDS AND/OR BUD SCARS SHOULD BE ABOVE THE GROUND AFTER PLANTING.

2. INSTALLATION:

A. STAKES MUST BE PLANTED WITH BUTT-ENDS INTO THE GROUND. LEAF BUD SCARS OR EMERGING BUDS SHOULD ALWAYS POINT UP.

B. STAKES MUST NOT BE ALLOWED TO DRY OUT. THE CUTTINGS NOT PLANTED THE DAY THEY ARE HARVESTED SHOULD BE SOAKED IN WATER FOR A MINIMUM OF 24 HOURS AS SOAKING SIGNIFICANTLY INCREASES THE SURVIVAL RATE OF THE CUTTINGS.

C. PLANT STAKE AT THE BREAK POINT OF THE BANKFULL BENCH AND CHANNEL BED SLOPE.

D. PLANT STAKES 5 FEET APART AND ALTERNATE SPECIES.

E. SET THE STAKE AS DEEP AS POSSIBLE INTO THE SOIL, PREFERABLY WITH 80 PERCENT OF ITS LENGTH BURIED BUT NO LESS THAN ONE-HALF OF THE TOTAL LENGTH BURIED.

F. TAMP THE SOIL AROUND THE CUTTING.

USE AN IRON STAKE OR BAR TO MAKE A PILOT HOLE IN FIRM SOIL OR BETWEEN RIPRAP. DRIVE LIVE STAKES INTO THE SOIL WITH A RUBBER MALLET OR DEAD-BLOW HAMMER.

MULCHING OF SEEDED AREAS

ALL SEEDED AREAS ARE TO BE COVERED BY STRAW MULCH. HYDROSEEDING IN WHICH SEED, TACKIFIER, AND MULCH IS IN THE MIX MAY BE USED IN LIEU OF STRAW MULCH.

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STANDARD STREAM MITIGATION

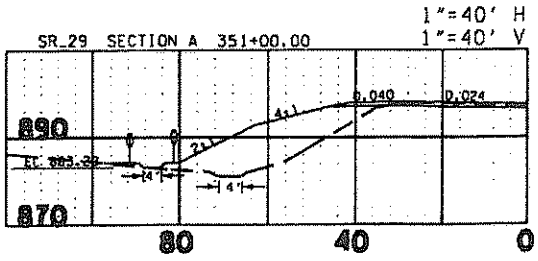
1. CHANNEL LENGTH PLACED IN SPRING-BOXES OR CULVERTS COUNTS AS PART OF THE NEW CHANNEL LENGTH (BUT MAY REQUIRE OFF-SITE COMPENSATORY MITIGATION THAT WOULD NOT BE REQUIRED FOR AN OPEN CHANNEL).
2. THE USE OF RIP-RAP SHOULD BE AVOIDED IF POSSIBLE. IF RIP-RAP IS REQUIRED, THE RIP-RAP SHOULD BE IMBEDDED INTO THE SOIL SO THE TOP OF THE RIP-RAP IS FLUSH WITH THE BOTTOM AND SIDES OF THE CHANNEL.
3. PLANT ONE ALTERNATING ROW OF TREE OR SHRUB SPECIES ON EACH SIDE OF THE NEW CHANNEL; THE ROW SHALL BE BARE ROOT SEEDLINGS THAT ARE PLANTED ON THE CHANNEL SLOPE, CENTERED ON THE MIDPOINT OF THE SLOPE.
4. RIP-RAP, IF REQUIRED, SHOULD BE LIMITED TO ENDS OF CULVERTS.
5. ALL RELOCATED CHANNELS AND THEIR ACCOMPANYING MITIGATION FEATURES, INCLUDING TREES, ARE TO BE PLACED IN RIGHT-OF-WAY RATHER THAN EASEMENTS.

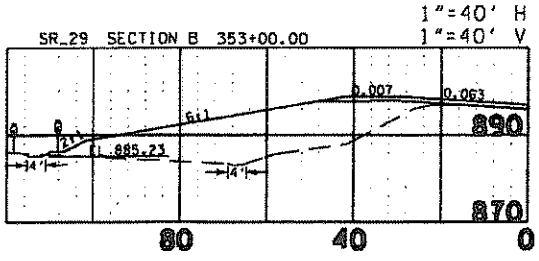
CHANNEL RELOCATION SEQUENCE AND IMPELEMENTATION NOTES FOR RELOCATED STREAM CHANNELS (IGNORE REFERENCES TO ITEMS NOT SPECIFIED)

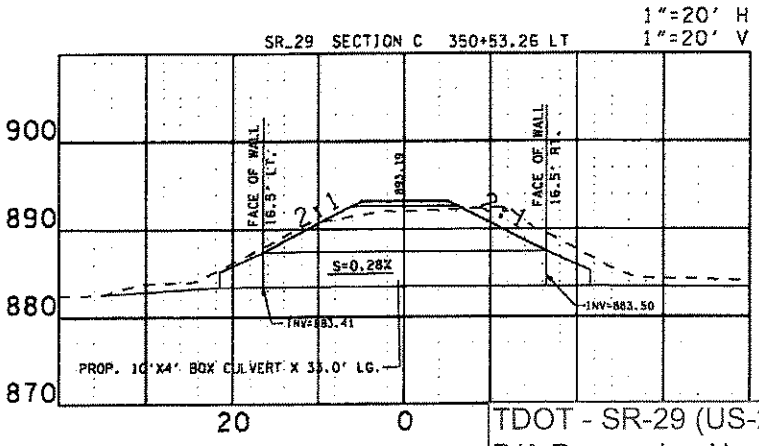
1. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. RIP-RAP (ONLY AS SHOWN ON PLANS), SEEDING, AND SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW-WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.
2. CHANNEL RELOCATION SEQUENCE:
   A. FLAG EDGE OF THE NEW CHANNEL TOP BANK PRIOR TO CLEARING. DO NOT CLEAR LARGE TREES IN POSITION TO SHADE THE NEW CHANNEL. LEAVE AS MANY TREES AND SHRUBS AS POSSIBLE BETWEEN THE TOE OF THE NEW HIGHWAY SLOPE AND THE STREAM.
   B. EXCAVATE THE NEW CHANNEL "IN THE DRY" BY LEAVING AREA S OF UNDISTURBED EARTH (DIVERSION BER MS) IN PLACE AT BOTH ENDS.
   C. SHAPE CHANNEL TO SPECIFICATIONS SHOWN. REMOVE LOOSE SOILS AND DEBRIS.
   D. PLACE TOPSOIL, EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER , SEED AND SOD AS SPECIFIED
   E. REMOVE DIVERSION BERMS, BEGINNING WITH THE MOST DOWNSTREAM, BANKS AND BOTTOM ELEVATION OF THE OLD CHANNEL SHOULD TRANSITION SMOOTHLY INTO THE NEW CHANNEL. THE ELEVATIONS OF THE NEW CHANNEL BOTTOM AT EACH END OF THE RELOCATION SEQUENCE SHOULD MATCH THE ELEVATIONS OF THE EXISTING CHANNEL, AND A STEADY PERCENT SLOPE SHOULD BE MAINTAINED THROUGHOUT THE RELOCATED CHANNEL CENTERLINE OR AS SPECIFIED.
   F. INSTALL TREES ACCORDING TO STANDARD SPECIFICATIONS SECTION 802.
3. ONLY RIP-RAP SHOWN ON PLANS SHOULD BE USED IN THE RELOCATED CHANNEL REACH. ANY OTHER PROPOSED RIP-RAP SHOULD BE COORDINATED WITH THE ENVIRONMENTAL DIVISION THROUGH THE TDOT HEADQUARTERS CONSTRUCTION OFFICE.
4. REQUESTS BY ANY AGENCY THAT WOULD REQUIRE THE MODIFICATION OF CHANNELS, DITCHES, ELEVATIONS, RIP-RAP OR ANY OTHER STREAM MITIGATION ITEMS ASSOCIATED WITH THE CHANNEL RELOCATIONS SHALL BE REFERRED TO THE TDOT ENVIRONMENTAL DIVISION VIA THE HEADQUARTERS CONSTRUCTION OFFICE FOR COORDINATION WITH ALL INVOLVED AGENCIES AND TDOT DIVISIONS.

TREES

1. NO SUBSTITUTIONS OF TREE SPECIES OR SIZES SHALL BE ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE TDOT ENVIRONMENTAL DIVISION. CONCERNING STREAM MITIGATION, TREES SHALL BE OF THE VARIETY REQUESTED, AND FIRST QUALITY. CONCERNING TEMPORARY WETLAND MITIGATION, TREES SHALL BE OF THE VARIETY REQUESTED, WELL BRANCHED, BARE ROOT (ROOTS MUST BE KEPT MOIST AN ALL TIMES), AND FIRST QUALITY. NO CLONES OR CULTIVARS WILL BE ACCEPTED. ANY FOUND TO BE INCORRECT SPECIES, OR IMPROPERLY PLANTED, AT ANY TIME PRIOR TO TERMINATION OF THE CONTR ACT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. STAKES AND WIRES SHALL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION, UNLESS OTHER WISE DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHOULD ARRANGE SEVERAL MONTHS AHEAD OF TIME TO OBTAIN THE CORRECT TREE SPECIES, AS SOME MAY REQUIRE SOME TIME TO LOCATE.
3. ALL TREES PLANTED SHALL BE WRAPPED AS PER SECTION 802.07 OF TDOT STANDARD SPECIFICATIONS FOR THE ROAD AND BRIDGE CONSTRUCTION.
4. TREES SHALL BE WATERED AS REQUIRED THROUGH THE PERIOD OF ESTABLISHMENT TO ENSURE SURVIVAL.







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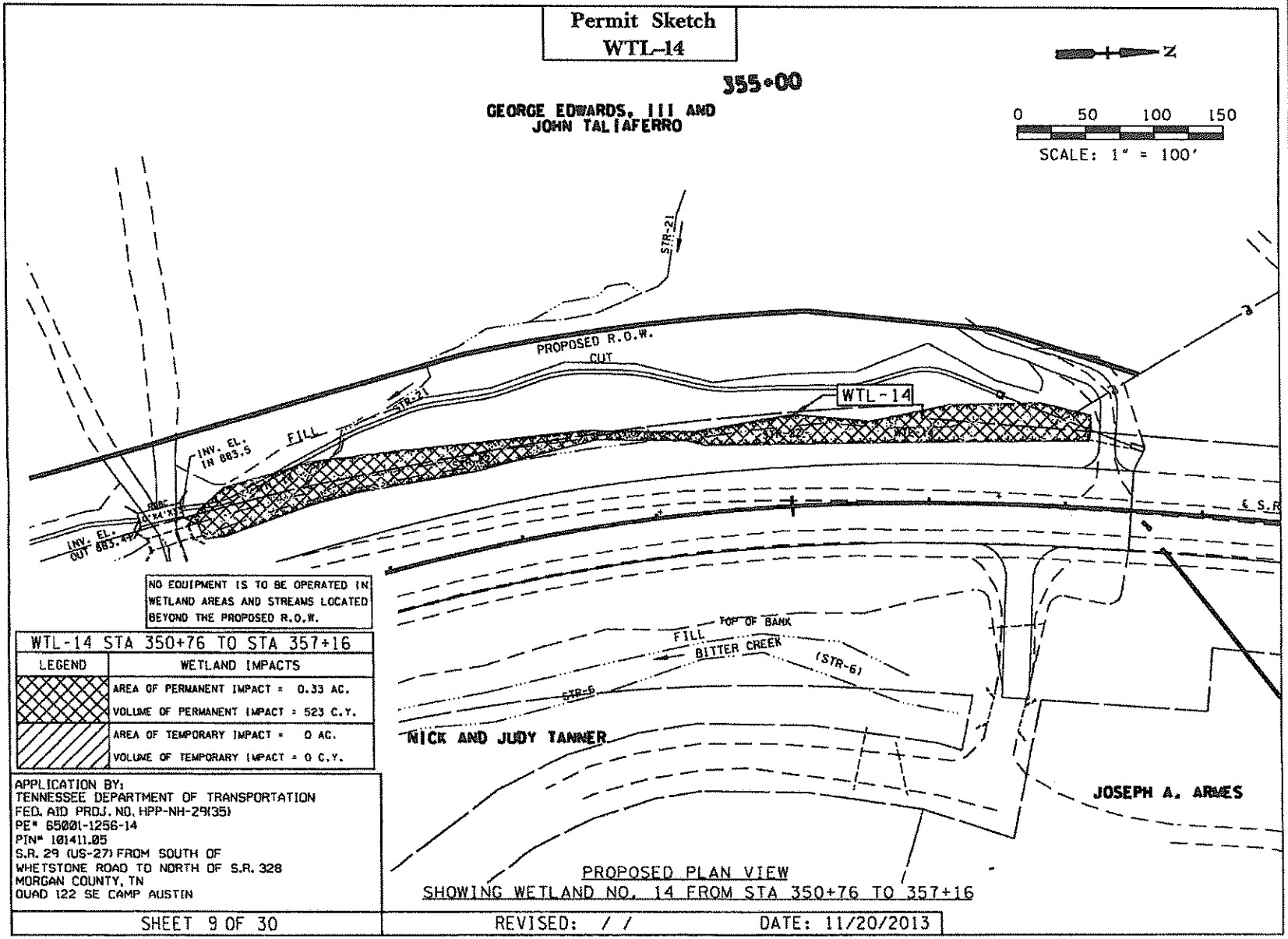

PROPOSED PLAN VIEW
SHOWING WETLAND NO. 14 FROM STA 350+76 TO 357+16

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PROPOSED R.O.W.

WTL-14 STA 350+76 TO STA 357+16	
LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.33 AC.
	VOLUME OF PERMANENT IMPACT = 523 C.Y.
	AREA OF TEMPORARY IMPACT = 0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

SHEET 9 OF 30 | REVISED: / / | DATE: 11/20/2013

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PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): 11-Jul-14

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:
TDOT
505 Deadrick Street, Suite 900
JK Polk Bdg
Nashville, TN 37243

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:
Nashville District, File Name: LRN-2014-00239 TDOT SR 29 PIN 101411.05

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: Unnamed Tributaries and Wetlands of Bitter Creek Mile 1.7, Little Emory River Mile 4.5L, Emory River Mile 5.1L, Morgan County, Tennessee (SR-29; PIN 101411.05)
(SEE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES)
State: TN County/parish/borough: Morgan City: Oliver Springs
Center coordinates of site (lat/long in degree decimal format):
Lat. 36.0098° **N**, Long. -84.5177° **W**.
Universal Transverse Mercator: NAD83
Name of nearest waterbody: Bitter Creek
Identify (estimate) amount of waters in the review area:
Non-wetland waters: linear feet: width (ft) and/or acres.
Cowardin Class:
Stream Flow:
Wetlands:
Cowardin Class:

Name of any water bodies on the site that have been identified as Section 10 waters:
Tidal: N/A
Non-Tidal: N/A

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: 11-Jul-14
☒ Field Determination. Date(s): 25-Nov-13

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

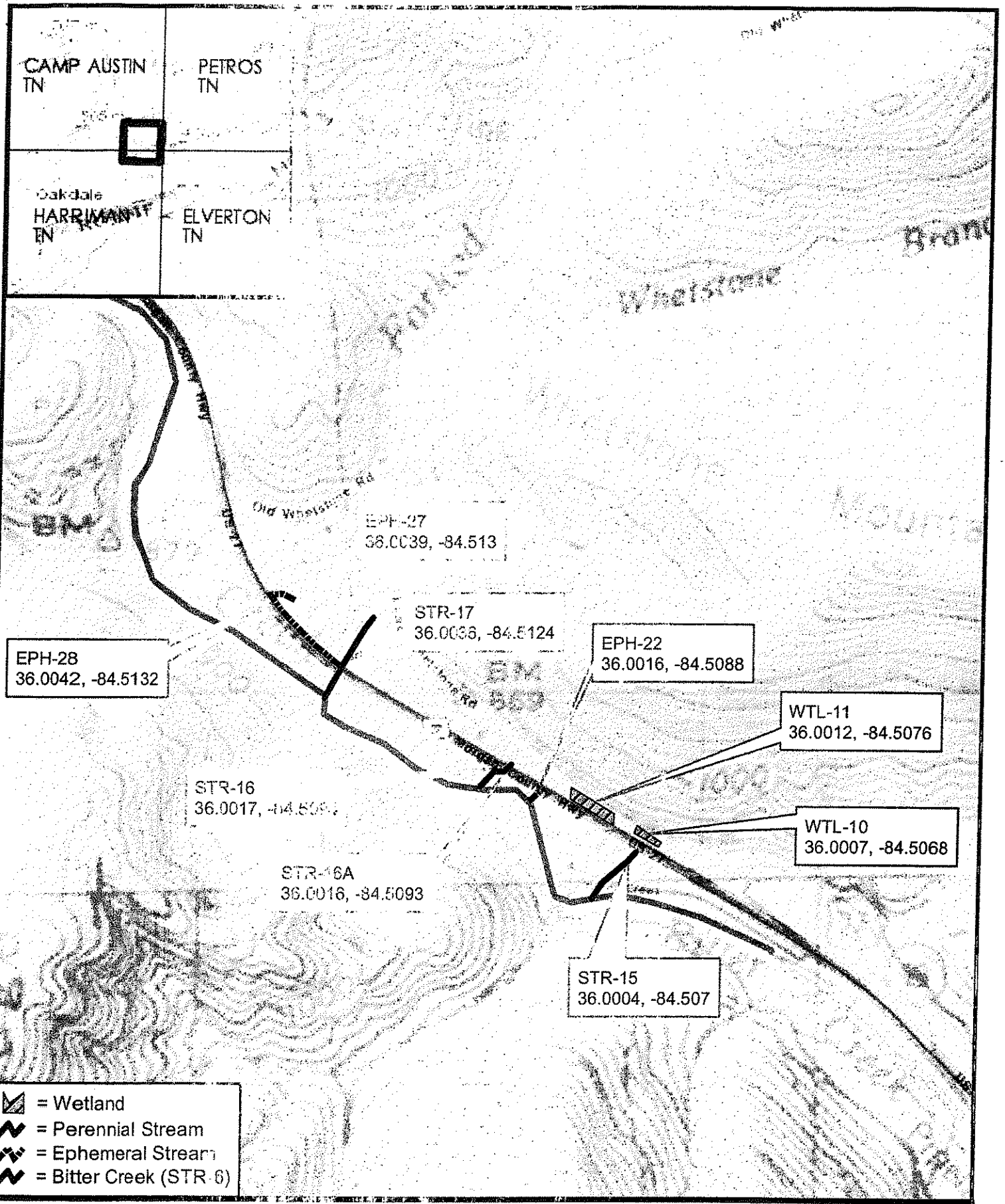
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Delineation/ Survey received 20-Nov-13 & 11-Mar-13.
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  ☒ Office concurs with data sheets/delineation report.
  ☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☒ Corps navigable waters' study: Bitter Creek is a 2nd order tributary to Emory River, a Navigable waters as listed in Nashville District Public Notice #86-23, dated 8 May 1986 .
☒ U.S. Geological Survey Hydrologic Atlas: .
  ☐ USGS NHD data.
  ☒ USGS 8 and 12 digit HUC maps. 60102080405, Little Emory River
☒ U.S. Geological Survey map(s). Cite scale & quad name: Camp Austin 1:24,000
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/ accessed [11-Jul-2014].
☐ National wetlands inventory map(s). Cite name:.
☐ State/Local wetland inventory map(s):.
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date):NAIP 1m 2012.
  or ☒ Other (Name & Date): Taken by TDOT March 2013
☐ Previous determination(s). File no. and date of response letter:.
☐ Other information (please specify):.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Eric G Reusch
Chief, Eastern Regulatory Section

Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining the
signature is impracticable)

Site number	Latitude	Longitude	Cowardin Class	Estimated amount of aquatic resource in review area	Class of aquatic resource
WTL-11	36.0012	-84.5076	PEM	0.075 a	404- Wetland
ESTR-22	36.0016	-84.5088	Ephemeral	110'	404- Stream
STR-16	36.0017	-84.5093	Perennial	118'	404- Stream
STR-16A	36.0016	-84.5083	Intermittent	36'	404- Stream
STR-17	36.0036	-84.5124	Perennial	290'	404- Stream
ESTR-27	36.0039	-84.513	Ephemeral	1280'	404- Stream
ESTR-28	36.0042	-84.5132	Ephemeral	155'	404- Stream
STR-6 (Bitter Creek)	36.01	-84.5188	Perennial	5280'	404- Stream
STR-18 (SPR-3)	36.012	-84.522	Intermittent	35'	404- Stream
STR-19	36.013	-84.5214	Perennial	571'	404- Stream
WTL-12	36.0132	-84.5225	PSS	0.18 a	404- Wetland
ESTR-36	36.0133	-84.5228	Ephemeral	566'	404- Stream
ESTR-37	36.0139	-84.5235	Ephemeral	418'	404- Stream
ESTR-37A	36.0146	-84.5244	Ephemeral	306'	404- Stream
WTL-13	36.0141	-84.5238	PFO	0.251 a	404- Wetland
STR-23	36.0157	-84.5266	Perennial	291'	404- Wetland
ESTR-39	36.0157	-84.526	Ephemeral	153'	404- Stream
STR-20 (Muddy Branch)	36.0174	-84.5268	Perennial	268'	404- Stream
STR-21	36.0181	-84.5265	Perennial	580'	404- Stream
WTL-14	36.019	-84.5267	PSS	0.33 a	404- Wetland
STR-22	36.0191	-84.5266	Intermittent	574'	404- Stream

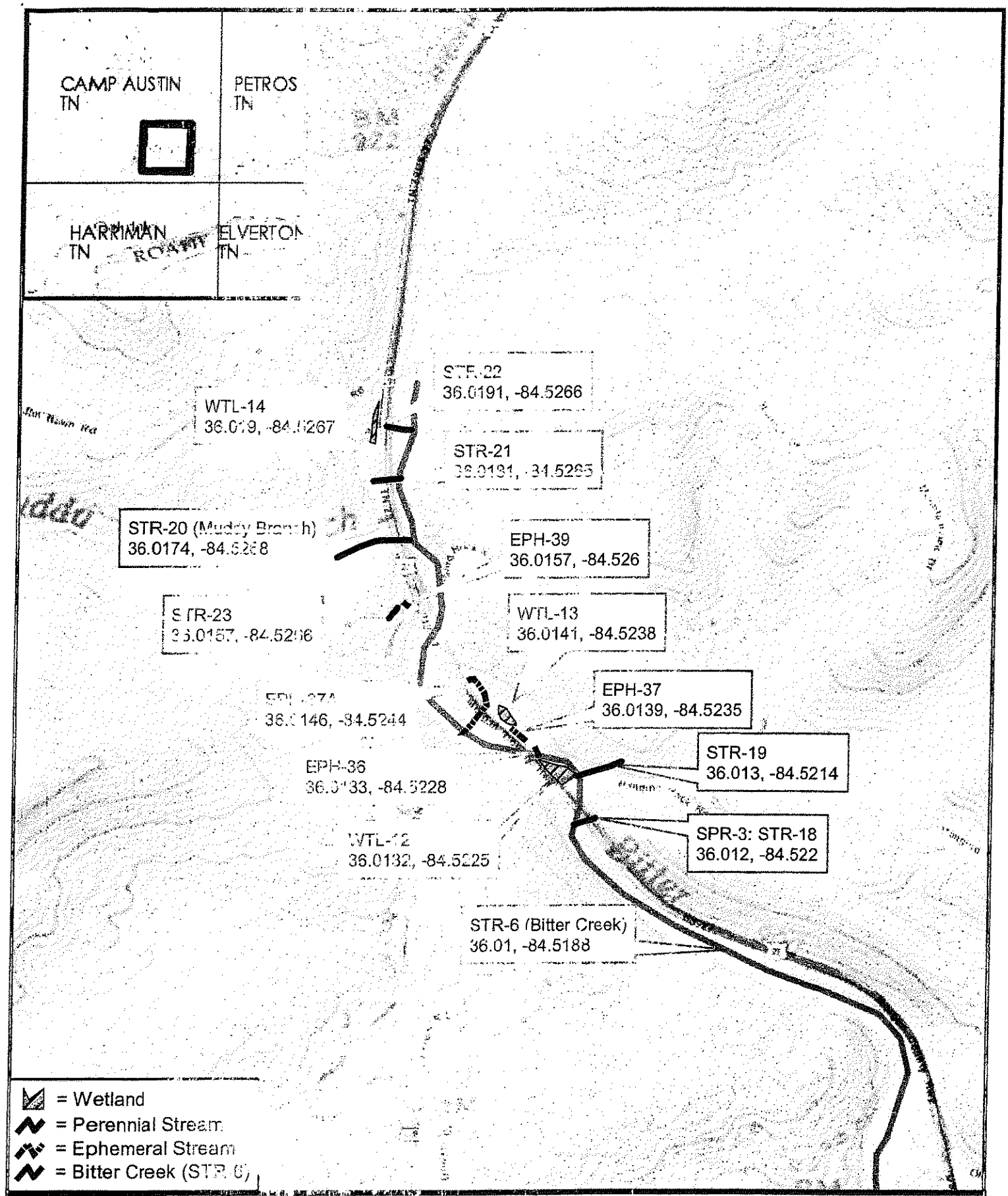


LRN-2014-00239
TDOT SR-29
PIN 101411.05
Tributaries and Wetlands of Bitter Creek Mile 1.7, Little Emory River Mile 4.5L, Emory River Mile 5.1L

0 220 440 660 880 Feet

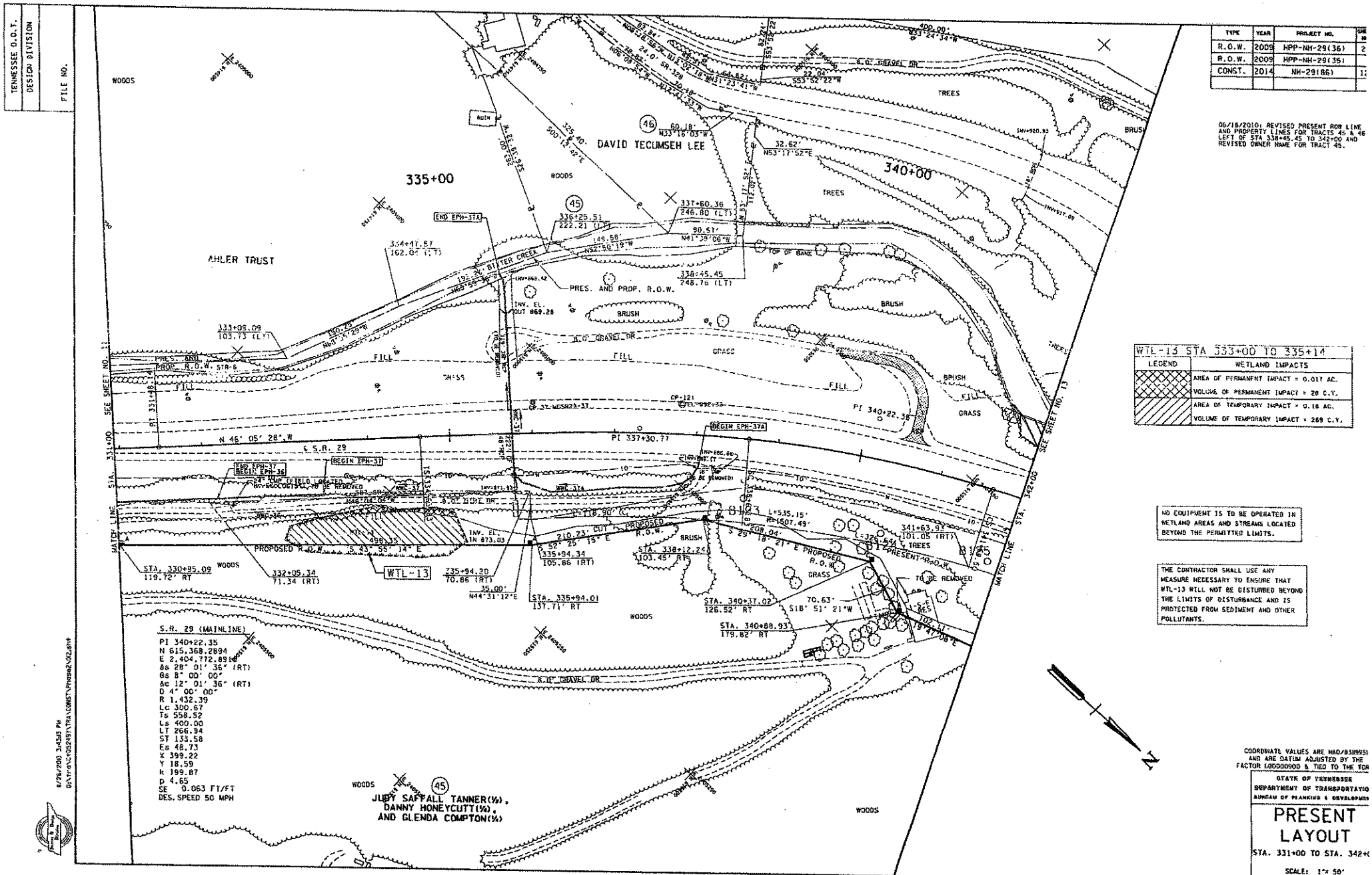
N

US Army Corps of Engineers
Nashville District

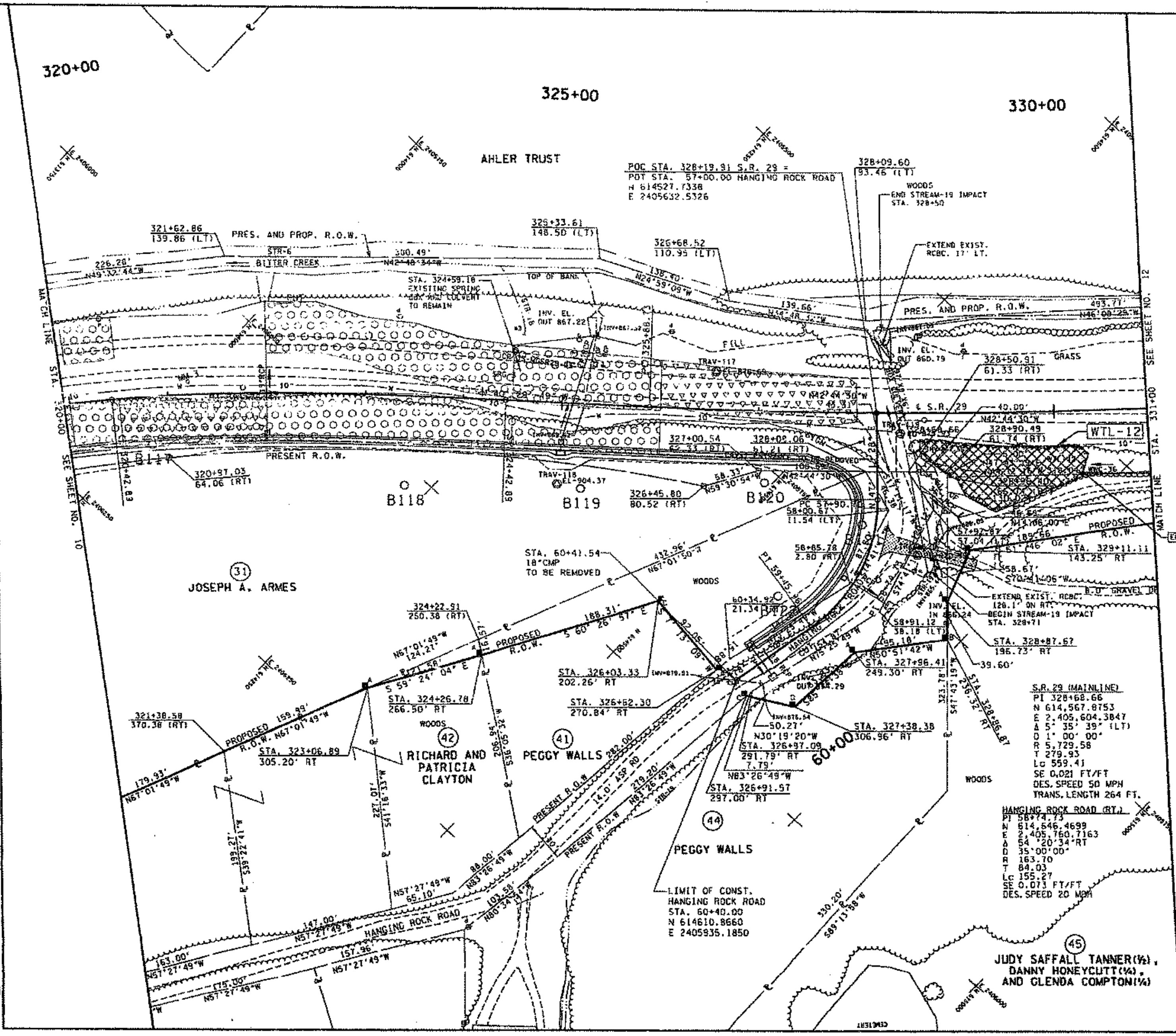


LRN-2014-00239
TDOT SR-29
PIN 101411.05
Tributaries and Wetlands of Bitter Creek Mile 1.7, Little Emory River Mile 4.5L, Emory River Mile 5.1L

US Army Corps of Engineers
Nashville District


TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.
WOODS
TREES
BRUSH
335+00
340+00
DAVID TECUMSEH LEE
AHLER TRUST
BITTER CREEK
PRES. AND PROP. R.O.W.
TOP OF BANK
INV. EL. OUT 869.28
FILL
GRASS
C.O. GRAVEL DR
S.R. 29
N 46° 05' 28" W
PI 337+30.77
PI 340+22.38
PROPOSED R.O.W
PRESENT R.O.W.
TO BE REMOVED
WTL-13
JUDY SAFFALL TANNER(½), DANNY HONEYCUTT(½), AND GLENDA COMPTON(½)
SEE SHEET NO. 11
SEE SHEET NO. 13
MATCH LINE STA. 331+00
MATCH LINE STA. 342+00
S.R. 29 (MAINLINE)
PI 340+22.35
N 615,368.2894
E 2,404,772.8916
Δs 28° 01' 36" (RT)
θs 8° 00' 00"
Δc 12° 01' 36" (RT)
D 4° 00' 00"
R 1,432.39
Lc 300.67
Ts 558.52
Ls 400.00
LT 266.94
ST 133.58
Es 48.73
x 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH
TYPE | YEAR | PROJECT NO.
R.O.W. | 2009 | HPP-NH-29(36)
R.O.W. | 2009 | HPP-NH-29(35)
CONST. | 2014 | NH-29(86)
06/18/2010: REVISED PRESENT ROW LINE AND PROPERTY LINES FOR TRACTS 45 & 46 LEFT OF STA 338+65.45 TO 342+00 AND REVISED OWNER NAME FOR TRACT 45.
WTL-13 STA 333+00 TO 335+14
LEGEND
WETLAND IMPACTS
AREA OF PERMANENT IMPACT = 0.017 AC.
VOLUME OF PERMANENT IMPACT = 28 C.Y.
AREA OF TEMPORARY IMPACT = 0.18 AC.
VOLUME OF TEMPORARY IMPACT = 269 C.Y.
NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.
THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT WTL-13 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.
COORDINATE VALUES ARE NAD/83(1998) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TCR
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT
PRESENT LAYOUT
STA. 331+00 TO STA. 342+00
SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.



TYPE	YEAR	PROJECT NO.	SH. NO.
R.O.W.	2009	HPP-NH-29(36)	2
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	1

06/18/2010: REVISED OWNER NAME FOR TRACT 45

1/26/2011: ADDED PRESENT R.O.W. LABEL (STA 326+97.09 291.79' RT). REVISED BEARING NEAR STA. 328+50.91 61.33 RT. REMOVED PRESENT R.O.W. DIMENSION LABEL (162.59') NEAR STATION 326+91.57 297.00' RT

2/21/2012: INCREASED WIDTH OF THE PROPOSED DRIVEWAY OFF OF HANGING ROCK ROAD.

WTL-12 STA 328+62 TO 330+33	
LEGEND	WETLAND IMPACTS
(cross-hatch)	AREA OF PERMANENT IMPACT = 0.18 AC.
	VOLUME OF PERMANENT IMPACT = 294 C.Y.
(diagonal hatch)	AREA OF TEMPORARY IMPACT = 0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

- APR - Encapsulation Required
- APR - Encapsulation or Partial Blending Required
- APR - Blending Required

SEE SHEET 9 FOR ESTIMATED APR MATERIAL QUANTITIES FOR THIS SHEET

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6 & STR-19 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR L00000900 & TIED TO THE TGR

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 320+00 TO STA. 331+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

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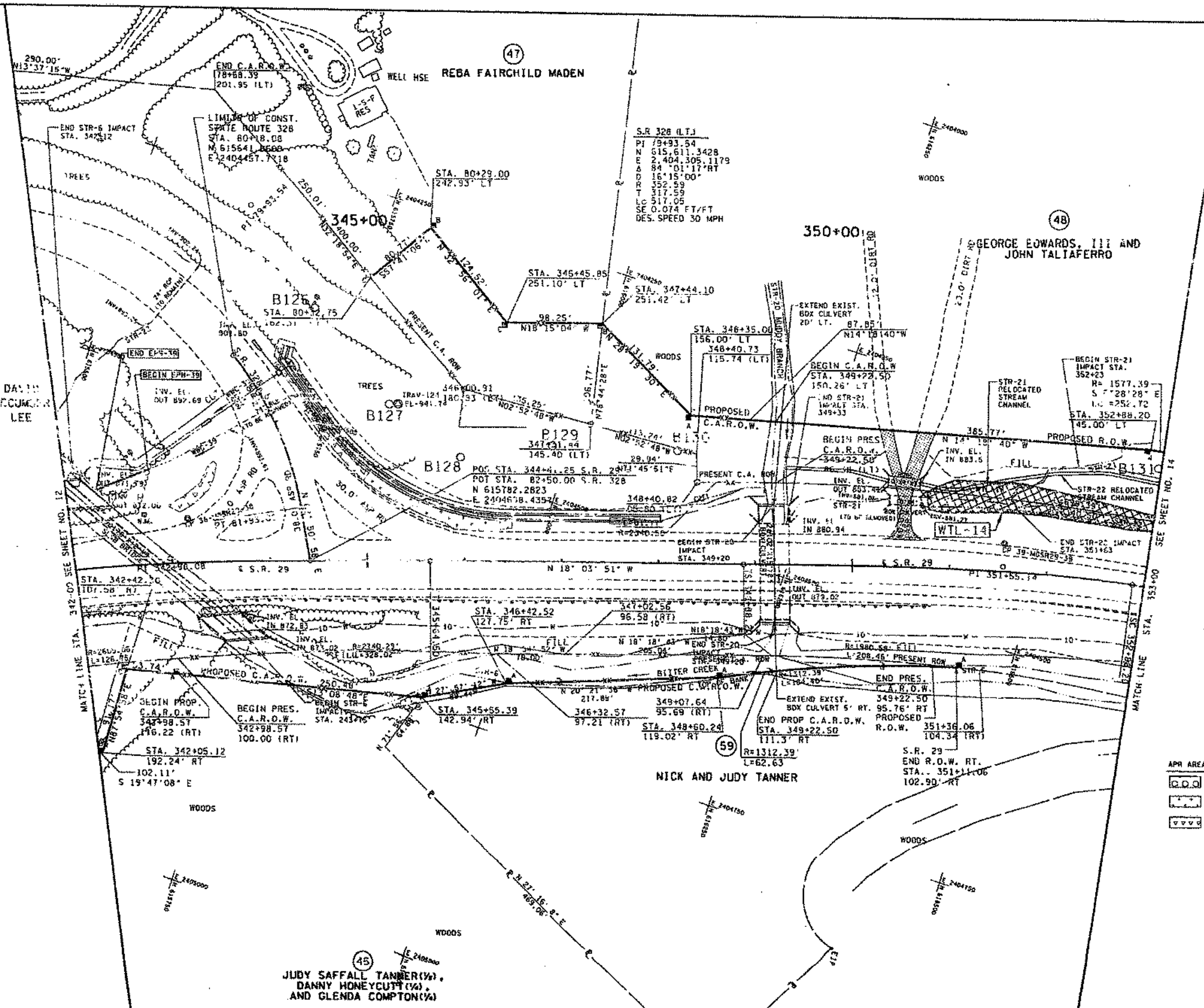
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	2
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	1

06/18/2010: REVISED PRESENT ROW FROM STA 342+00 TO THE INTERSECTION OF SR-328, OWNERS NAME FOR TRACT 45 AND PROPERTY LINES FOR TRACTS 45 AND 59, AND NOTED CONTROLLED ACCESS R.O.W.

1/26/2011: REVISED PRESENT AND PROPOSED C.A.R.O.W. BEGIN AND END STATION AND ADDED PROPERTY DIMENSIONS ACCORDINGLY.

12/16/2011: REVISED EXISTING R.O.W. DISTANCE BETWEEN STA. 349+22.50 AND STA. 351+11.06 TO 104.51'. REVISED OFFSET DIMENSION FOR BEGIN PRES. C.A. R.O.W. ON TRACT 48.



WTL-14 STA 350+76 TO 357+16	
LEGEND	WETLAND IMPACTS
(crosshatch)	AREA OF PERMANENT IMPACT = 0.33 AC.
	VOLUME OF PERMANENT IMPACT = 523 C.Y.
(hatch)	AREA OF TEMPORARY IMPACT = 0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6, STR-20, STR-21 AND STR-22 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

APR AREAS	ESTIMATED VOLUMES (CUYD) STA. 304+32 - 328+00 SR 29.
APR - Encapsulation Required	100
APR - Encapsulation or Partial Blending Required	500
APR - Blending Required	400

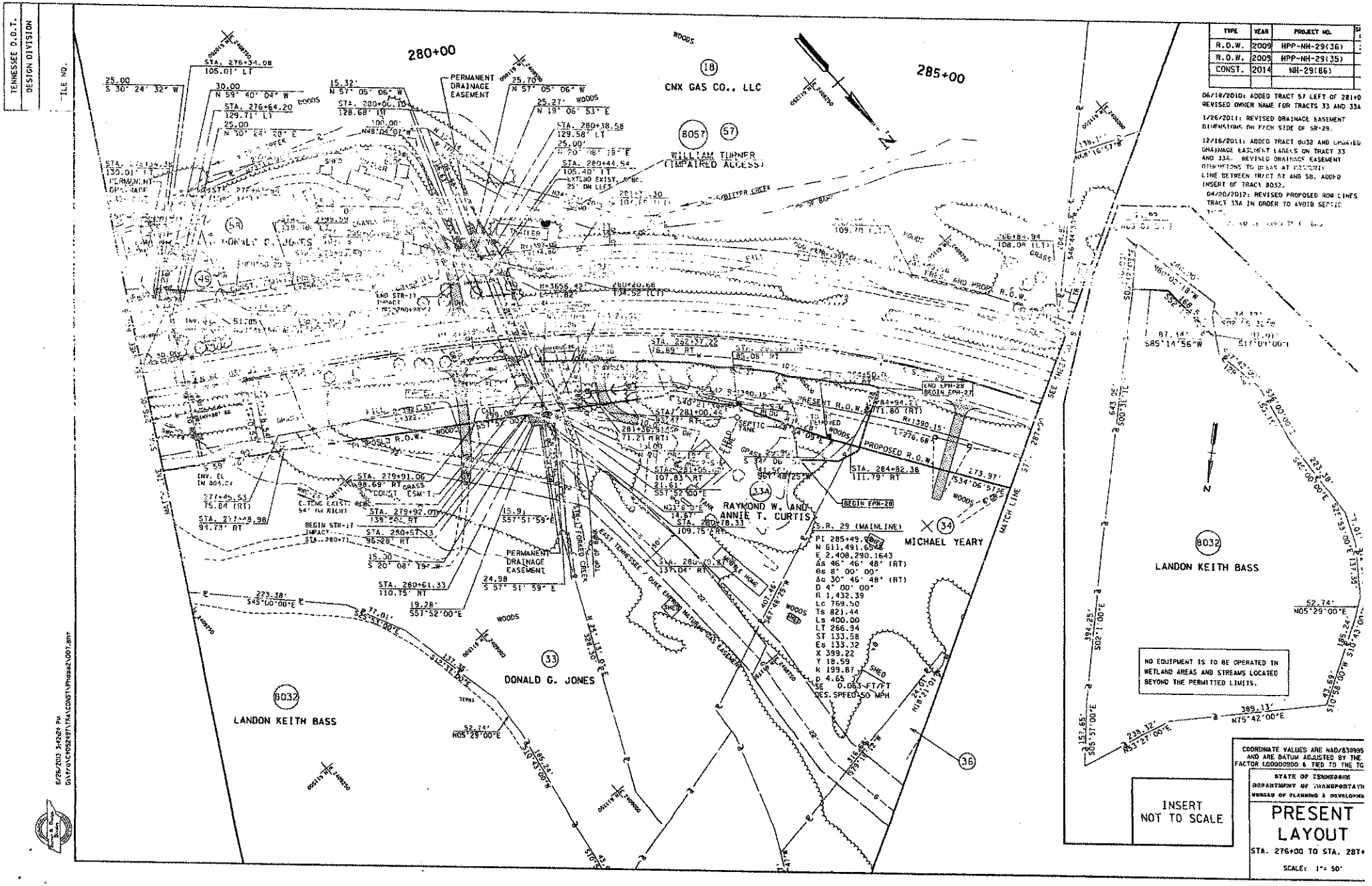
COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TCR

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 342+00 TO STA. 353+00

SCALE: 1"= 50'



TYPE	YEAR	PROJECT NO.
R.O.W.	2009	HPP-NH-29(36)
R.O.W.	2005	HPP-NH-29(35)
CONST.	2014	NH-29(86)

06/18/2010: ADDED TRACT 57 LEFT OF 281+0
REVISED OWNER NAME FOR TRACTS 33 AND 33A

1/26/2011: REVISED DRAINAGE EASEMENT DIMENSIONS ON EACH SIDE OF SR-29.

12/16/2011: ADDED TRACT 8032 AND UPDATED DRAINAGE EASEMENT LABELS ON TRACT 33 AND 33A. REVISED DRAINAGE EASEMENT DIMENSIONS TO BREAK AT PROPERTY LINE BETWEEN TRACT 8Y AND 5B, ADDED INSERT OF TRACT 8032.

04/20/2012: REVISED PROPOSED ROW LINES TRACT 33A IN ORDER TO AVOID SEPTIC

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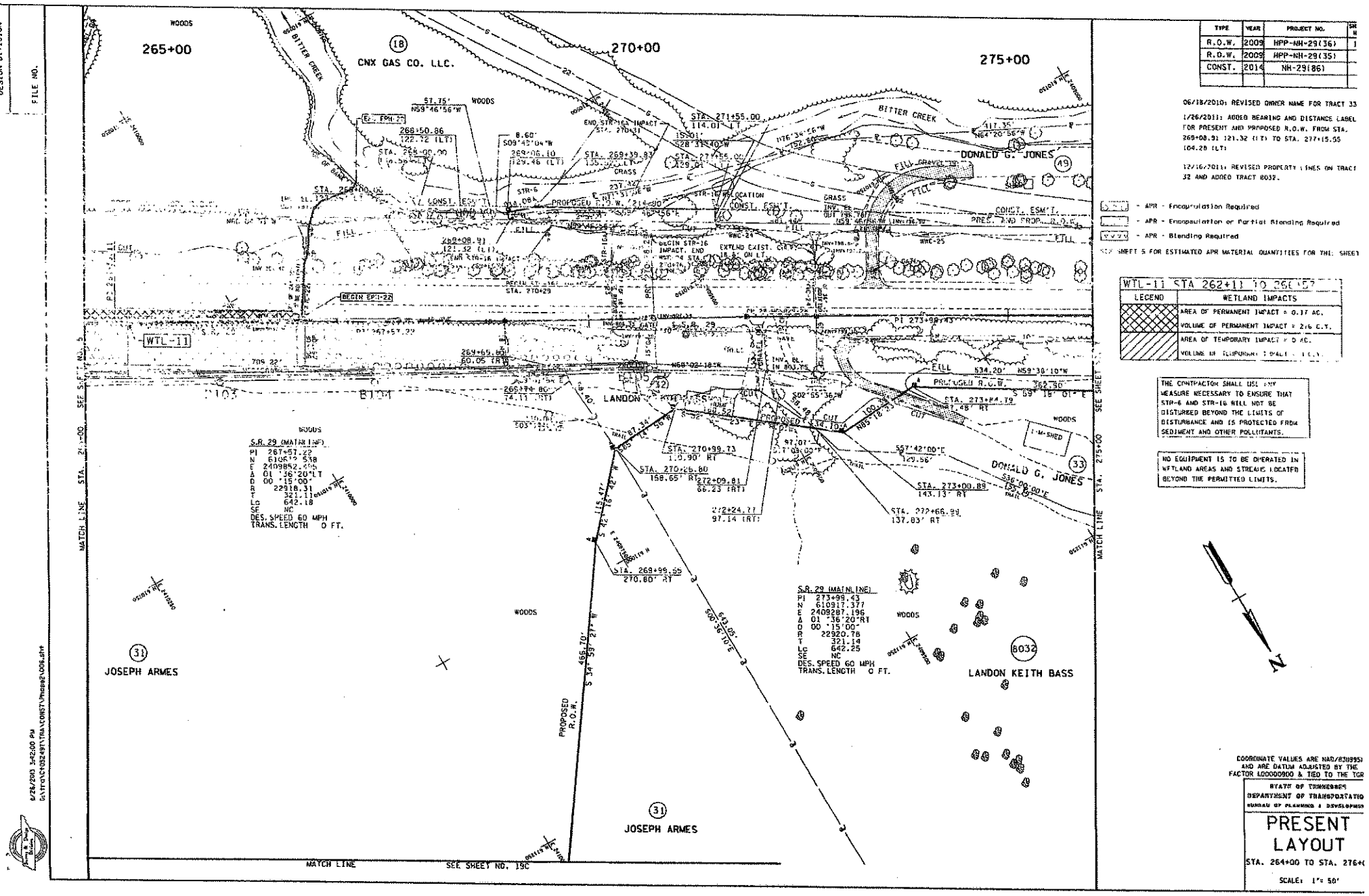

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.
265+00
270+00
275+00
CNX GAS CO. LLC.
DONALD G. JONES
LANDON
JOSEPH ARMES
LANDON KEITH BASS
BITTER CREEK
WOODS
WTL-11
BEGIN EP-1-22
PROPOSED R.O.W.
CONST. ESM'T.
MATCH LINE
SEE SHEET NO. 19C
S.R. 29 (MAIN LINE)
PI 267+57.22
N 610579.538
E 2409852.405
Δ 01°36'20"LT
D 00°15'00"
R 22918.31
T 321.11
Lc 642.18
SE NC
DES. SPEED 60 MPH
TRANS. LENGTH 0 FT.
S.R. 29 (MAIN LINE)
PI 273+99.43
N 610917.377
E 2409287.196
Δ 01°36'20"RT
D 00°15'00"
R 22920.78
T 321.14
Lc 642.25
SE NC
DES. SPEED 60 MPH
TRANS. LENGTH 0 FT.
TYPE | YEAR | PROJECT NO.
R.O.W. | 2009 | HPP-NH-29(36)
R.O.W. | 2009 | HPP-NH-29(35)
CONST. | 2014 | NH-29(86)
06/18/2010: REVISED OWNER NAME FOR TRACT 33
1/26/2011: ADDED BEARING AND DISTANCE LABEL FOR PRESENT AND PROPOSED R.O.W. FROM STA. 269+08.91 121.32 (LT) TO STA. 277+15.55 104.28 (LT)
12/16/2011: REVISED PROPERTY LINES ON TRACT 32 AND ADDED TRACT 8032.
= APR - Encapsulation Required
= APR - Encapsulation or Partial Blending Required
= APR - Blending Required
SEE SHEET 5 FOR ESTIMATED APR MATERIAL QUANTITIES FOR THIS SHEET
WTL-11 STA 262+11 TO 266+57
LEGEND | WETLAND IMPACTS
AREA OF PERMANENT IMPACT = 0.17 AC.
VOLUME OF PERMANENT IMPACT = 216 C.Y.
AREA OF TEMPORARY IMPACT = 0 AC.
VOLUME OF TEMPORARY IMPACT = 0 C.Y.
THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6 AND STR-16 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.
NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.
COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGR
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT
PRESENT LAYOUT
STA. 264+00 TO STA. 276+(
SCALE: 1"= 50'
8/28/2003 3:42:00 PM

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
REGULATORY BRANCH
3701 BELL ROAD
NASHVILLE, TENNESSEE 37214

October 24, 2014

SUBJECT: File No: LRN-2013-00712; Permanently impact 1.86 acres of wetland, temporarily impact 0.10 acre of wetland, permanently fill 559 linear feet of perennial stream, temporarily impact 80 linear feet of perennial stream, permanently fill 5,026 linear feet of intermittent stream, temporarily impact 320 linear feet of intermittent stream, permanently fill 2,591 linear feet of ephemeral stream, and temporarily impact 220 linear feet of ephemeral stream in order to widen and modify alignments along State Route (SR) 29 (US-27) from SR 61 to Whetstone Road in Morgan County, Tennessee.

Attn: Ms. D.J. Wiseman
Tennessee Department of Transportation
505 Deaderick Street, Suite 900
Nashville, TN 37243

Dear Ms. Wiseman:

Enclosed is a Department of the Army permit authorizing you to perform the work. If changes in the location or plans of the proposed work are necessary for any reason, revised plans should be submitted promptly to this office. No deviations should be made in the approved plans without first obtaining approval from this office.

If you have any questions or comments, please contact Mr. Joshua Frost at (615) 369-7512 or Joshua.w.frost@usace.army.mil. For additional information about our Regulatory Program, please visit our web site at www.lrn.usace.army.mil.

Sincerely,

Eric Reusch
Chief, Eastern Regulatory Section
Operations Division

Enclosures

DEPARTMENT OF THE ARMY PERMIT

Permittee: Tennessee Department of Transportation

Permit No: LRN-2013-00712

Issuing Office: Nashville District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: Permanently fill 1.86 acres of wetland, temporarily impact 0.10 acre of wetland, permanently fill 559 linear feet of perennial stream, temporarily impact 80 linear feet of perennial stream, permanently fill 5,026 linear feet of intermittent stream, temporarily impact 320 linear feet of intermittent stream, permanently fill 2,591 linear feet of ephemeral stream, and temporarily impact 220 linear feet of ephemeral stream in order to widen and modify alignments along State Route (SR) 29 (US-27) from SR 61 to Whetstone Road in Morgan County, Tennessee.

Project Location: In wetlands and streams located along approximately 3.7 miles of SR-29 (ADP-40). from SR 61 to Whetstone Road in Morgan County, Tennessee. The project begins at Latitude N35.9717° W-84.4955° (Station 10+00.00, Ramp B) and ends at Latitude N36.00551° W-84.51407° (Station 295+00).

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on October 24, 2019. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 6 months before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the

Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions: (SEE CONTINUATION SHEET 1, SPECIAL CONDITIONS)

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data. The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

D Q Wiseman — October 24, 2014

Tennessee Department of Transportation **(DATE)**

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

John L. Hudson, P.E.
LIEUTENANT COLONEL
DISTRICT COMMANDER

BY: _____ 10/24/14
Eric Reusch
Chief, Eastern Regulatory Section
Operations Division

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

_____ _____
(TRANSFEREE) (DATE)

CONTINUATION SHEET 1
SPECIAL CONDITIONS

1. **Permit Drawings:** The work must be completed in accordance with the plans and information submitted in support of the proposed work, as attached (sheets 1 through 79, titled SR-29, PIN 101411.04).

2. **Fill Material**: The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, debris, asphalt, construction materials, concrete block with exposed reinforcement bars, and soils contaminated with any toxic substance, in toxic amounts in accordance with Section 307 of the Clean Water Act.

3. **Erosion Control:** Prior to the initiation of any work authorized by this permit, the Permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the work area. Immediately after completion of the final grading of the land surface, all slopes, land surfaces, and filled areas shall be stabilized using sod, degradable mats, barriers, or a combination of similar stabilizing materials to prevent erosion. The erosion control measures shall remain in place and be maintained until all authorized work has been completed and the site has been stabilized.

4. **Acid Producing Rock:** During and post-construction, the Permittee shall follow the "Adaptive Management and APR Water Quality Monitoring Plan for SR-29 (US-27) From SR-61 Near Harriman in Roane County to South of Whetstone Road in Morgan County PIN 101411.04; Project No. 65001-3266-14, 73008-3243-14; and Adaptive Management and APR Water Quality Monitoring Plan for SR-29 (US-27) From South of Whetstone Road to North of SR-328 in Morgan County PIN 101411.05; Project No. 65001-3268-14".

5. **Temporary Stream Impacts:** Within 14days from the date of completing the authorized work the Permittee shall restore all temporary stream impacts to pre-existing contours, elevations, vegetation, habitat type, and hydrology.

6. **Temporary Wetland Impacts**: Within 14 days from the date of completing the authorized work the Permittee shall restore 0.13 acre of temporary wetland impacts (as detailed on Drawings 26, 27, 28, and, 41 of 71) to pre-existing contours, elevations, vegetation, habitat type, and hydrology. The following shall be monitored to ensure Temporary Wetland Impacts are restored:

a. Temporary Wetland Impacts: Wetland 6 and 8 - At the end of the monitoring period (5 years) the temporary wetland impact sites shall have a predominance of wetland vegetation and shall meet the definition of a wetland as outlined in the 1987 US Army Corps of Engineers Wetland Delineation Manual and the Eastern Mountains and Piedmont Region supplement (1987 Manual and Regional Supplement).

b. Reporting: Perform a year 1, year 3, and year 5 monitoring event of the temporary wetland impact areas. Post-construction monitoring reports shall include collecting data on the vegetation, soils, and indicators of wetland hydrology associated with wetlands 6 and 8 in accordance with the 1987 Manual and Regional Supplement. The reports shall be submitted at the same time as the stream compensatory mitigation reporting.

7. **In-Lieu Fee Credit Purchase:** a. In-Lieu Fee Program (ILF) Credit Purchase: Prior to impacting waters of the United States, the Permittee shall provide verification to the Corps that 4,052 federal ILF credits have been purchased from the Tennessee Stream Mitigation Program ILF (LRN-2011-00711). The required verification shall reference this project's permit number (LRN-2013-00712).

8. **Compensatory Mitigation:** a. The Permittee shall complete the relocations of streams 1, 7, 10, and 16 following the compensatory mitigation plan titled "Compensatory Mitigation and Monitoring Plan – SR-29" dated September 10, 2014. For the relocation of streams 1, 7, 10, and 16 the stream channel shall be constructed as detailed on attached Sheets 15-23, 31-33, 36-41, and 55-56 of 79.

b. The Permittee shall provide written documentation to this office from Mr. Lynn Bumgardner, WETT LLC, that you have purchased 3.72 acres of restored wetlands at the Walls Mitigation Site in Morgan County, Tennessee. You shall also provide a survey indicating the specific 3.72 acre portion of the Walls Mitigation site that is compensating for 1.86 acres of wetland impacts associated with this project. GPS coordinates, in NAD 83 Lat/Long format must be submitted showing the corners of the purchased area. This confirmation shall be provided prior to any wetland impacts associated with this permit. The Permittee shall remain responsible for ensuring the 3.72-acre mitigation area complies with the approved compensatory mitigation plan.

9. **Performance Standards: Stream 1 and 10** - To meet the objectives of the approved compensatory mitigation plan, the Permittee shall achieve the following performance standards:

a. Vegetation: At the end of the monitoring period all stream planting areas shall have a minimum of 300 stems per acre. Native volunteer species can also be counted towards meeting the vegetative performance standard.

b. Cover of invasive exotic plant species, pursuant to the most current list established by Tennessee Exotic Pest Plant Council shall total less than 5 percent relative aerial coverage of the mitigation area and no contiguous areas greater than 200 square feet shall be vegetated with more than 50% relative aerial coverage of invasive species at the end of the 5-year monitoring period.

c. Channel stability shall be visually assessed and photo documented annually. The channel shall be stable and not actively eroding at the end of monitoring. A stable channel would not show evidence of significant bank erosion, head cutting, or other signs of instability. The Pfankuch stability rating for the stream channels shall be classified as "good" during each monitoring year.

d. Streams 1 and 10 shall have channel hydrology consistent with existing preconstruction conditions.

e. Bankfull events shall occur at a minimum of 2 of the 5 years of monitoring.

f. Stream 1 and 10 channel dimensions must fall within target ranges specified in the success criteria for each stream as shown in Appendix A of the Compensatory Mitigation and Monitoring Plan – SR-29, dated September 10, 2014.

g. The RBP (Rapid Bioassessment Protocols) habitat assessment score for the mitigation project by year 5 of monitoring must be greater than 75% of the regional habitat assessment guideline score as found in the 2011 TDEC standard operating procedure for macroinvertebrate stream surveys.

Streams 7 and 16 (*reduced monitoring requirement due to limited size of stream replacements (60' and 18')*):

a. Vegetation: At the end of the monitoring period all stream planting areas shall have a minimum of 300 stems per acre. Native volunteer species can also be counted towards meeting the vegetative performance standard.

b. Cover of invasive exotic plant species, pursuant to the most current list established by Tennessee Exotic Pest Plant Council shall total less than 5 percent relative aerial coverage of the mitigation area and no contiguous areas greater than 200 square feet shall be vegetated with more than 50% relative aerial coverage of invasive species at the end of the 5-year monitoring period.

c. Channel stability shall be visually assessed and photo documented annually. The channel shall be stable and not actively eroding at the end of monitoring. A stable channel would not show evidence of significant bank erosion, head cutting, or other signs of instability. The Pfankuch stability rating for the stream channels shall be classified as "good" during each monitoring year.

d. Streams 7 and 16 shall have channel hydrology consistent with existing preconstruction conditions.

e. The RBP (Rapid Bioassessment Protocols) habitat assessment score for the mitigation project by year 5 of monitoring must be greater than 75% of the regional habitat assessment guideline score as found in the 2011 TDEC standard operating procedure for macroinvertebrate stream surveys.

Walls Mitigation Site:

a. Monitoring of the permittee responsible offsite mitigation at the Walls site shall be performed annually for a minimum of 2 years to ensure mitigation site success as referenced in the Compensatory Mitigation and Monitoring Plan, dated September 10, 2014. The final monitoring report to be prepared during the 2nd year of monitoring shall include a wetland delineation and a survey of the delineated area to determine wetland success and final acreage. The Permittee shall remain responsible for ensuring the 3.72-acre mitigation area complies with these monitoring requirements.

The Permittee shall achieve all performance standards by the end of the 5-year monitoring period. In the event that the above performance standards have not been achieved, the Permittee shall undertake adaptive management approved by the Corps in accordance with the **Adaptive Management** Special Condition of this permit.

10. **Monitoring and Reporting Timeframes:** To show compliance with the performance standards the Permittee shall complete the following:

a. Perform a time-zero monitoring event of the stream relocation areas. This information shall be provided to the Corps by October 31st of the year the mitigation work is completed, as identified in the **Compensatory Mitigation** Special Condition of this permit.

b. Submit the time-zero report to the Corps by October 31st of the year the monitoring event is completed. The report would include at least one paragraph depicting baseline conditions of the mitigation site(s) prior to initiation of the compensatory mitigation objectives and a detailed plan view drawing of all created, enhanced and/or restored mitigation areas.

c. Subsequent to completion of the compensatory mitigation, perform 5 years of annual monitoring.

d. Submit annual monitoring reports to the Corps by October 31st of each monitoring year.

e. Monitor the mitigation area(s) and submit annual monitoring reports to the Corps until released in accordance with the **Mitigation Release** Special Condition of this permit.

11. **Reporting Format:** Annual monitoring reports shall follow a 10-page maximum report format for assessing compensatory mitigation sites. The Permittee shall submit all documentation to the Corps on 8½-inch by 11-inch paper, and include the following:

a. Project Overview (1 Page):

(1) Department of the Army Permit Number

(2) Name and contact information of Permittee and consultant

(3) Name of party responsible for conducting the monitoring and the date(s) the inspection was conducted

(4) A brief paragraph describing the purpose of the approved project, acreage and type of aquatic resources impacted, and mitigation acreage and type of aquatic resources authorized to compensate for the aquatic impacts.

(5) Written description of the location, any identifiable landmarks of the compensatory mitigation project including information to locate the site perimeter(s), and coordinates of the mitigation site (expressed as latitude, longitudes, UTMs, state plane coordinate system, etc.).

(6) Dates compensatory mitigation commenced and/or was completed

(7) Short statement on whether the performance standards are being met

(8) Dates of any recent corrective or maintenance activities conducted since the previous report submission

(9) Specific recommendations for any additional corrective or remedial actions.

b. Requirements (1 page): List the monitoring requirements and performance standards, as specified in the approved mitigation plan and special conditions of this permit, and evaluate whether the compensatory mitigation project site is successfully achieving the approved performance standards or trending towards success. A table is a recommended option for comparing the performance standards to the conditions and status of the developing mitigation site.

c. Summary Data (maximum of 4 pages): Summary data should be provided to substantiate the success and/or potential challenges associated with the compensatory mitigation project. Photo documentation may be provided to support the findings and recommendations referenced in the monitoring report and to assist the Corps in assessing whether the compensatory mitigation project is meeting applicable performance standards for that monitoring period. Submitted photos should be formatted to print on a standard 8 ½" x 11" piece of paper, dated, and clearly labeled with the direction from which the photo

was taken. The photo location points should also be identified on the appropriate maps. The summary data shall include the following:

(1) Planting survival data, invasive exotic plant relative aerial coverage, channel hydrology, visual assessment of channel stability, Pfankuch stability rating, stream channel morphological assessment (Streams 1 and 10), and RBP scores.

d. Maps and Plans (maximum of 3 pages): Maps shall be provided to show the location of the compensatory mitigation site relative to other landscape features, habitat types, locations of photographic reference points, transects, sampling data points, and/or other features pertinent to the mitigation plan. In addition, the submitted maps and plans should clearly delineate the mitigation site perimeter(s). Each map or diagram should be formatted to print on a standard 8 ½" x 11" piece of paper and include a legend and the location of any photos submitted for review. As-built plans may be included.

e. Conclusions (1 page): A general statement shall be included that describes the conditions of the compensatory mitigation project. If performance standards are not being met, a brief explanation of the difficulties and potential remedial actions proposed by the Permittee or sponsor, including a timetable, shall be provided. The Corps would ultimately determine if the mitigation site is successful for a given monitoring period.

12. **Adaptive Management:** If the compensatory mitigation fails to meet the performance standards 5 years after completion of the compensatory mitigation objectives, the compensatory mitigation would be deemed unsuccessful. Within 60 days of notification by the Corps that the compensatory mitigation is unsuccessful, the Permittee shall submit to the Corps an alternate compensatory mitigation proposal sufficient to create the functional lift required under this permit. The alternate compensatory mitigation proposal may be required to include additional mitigation to compensate for the stream function associated with the unsuccessful compensatory mitigation activities. Alternate compensatory mitigation may require the purchase of Mitigation Bank or In-Lieu Fee Program credits. The Corps reserves the right to fully evaluate, amend, and approve or reject the alternate compensatory mitigation proposal. Within 120 days of Corps approval, the Permittee would complete the alternate compensatory mitigation proposal.

13. **Mitigation Release:** The Permittee's responsibility to complete the required compensatory mitigation, as set forth in the **Compensatory Mitigation** Special Condition of this permit would not be considered fulfilled until mitigation success has been demonstrated and written verification has been provided by the Corps. A mitigation area which has been released would require no further monitoring or reporting by the Permittee; however the Permittee, Successors and subsequent Transferees remain perpetually responsible to ensure that the mitigation area(s) remain in a condition appropriate to offset the authorized impacts in accordance with General Condition 6 of this permit.

14. **Perpetual Conservation**: The Permittee shall maintain the areas referenced in the **Compensatory Mitigation** Special Condition in their natural state in perpetuity. The Permittee agrees that the only future utilization of these areas would be as a purely natural area and the following uses and/or activities would be prohibited except as required or authorized by this permit:

a. Construction or placing buildings, roads, signs, billboards or other advertising, utilities or other structures on or above the ground. Elevated boardwalks, hiking trails and camping areas would be permitted as long as they do not involve any of the other prohibited uses listed below:

b. Dumping or placing soil or other substance or material as landfill or dumping or placing of trash, waste or unsightly or offensive material.

c. Removal or destruction of trees, shrubs, or other vegetation.

d. Excavation, dredging or removal of loam, peat, gravel, soil, rock, or other material substance in such a manner as to affect the surface.

e. Surface use, except for purposes that permit the land or water area to remain predominantly in its natural condition.

f. Activities detrimental to drainage, flood control, water conservation, erosion control, soil conservation, or fish and wildlife habitat preservation.

g. Acts or uses detrimental to such retention of land or water areas.

h. Acts or uses detrimental to the preservation of the structural integrity or the physical appearance of sites or properties of historical, architectural, or cultural significance.

15. **Endangered Species Act**: The Section 7 Endangered Species Act effects determination for this project was based on the negative survey results for the Indiana bat and northern long-eared bat. If the project has not completed tree clearing by April 1, 2017, the Permittee is required to reinitiate consultation under Section 7 of the Endangered Species Act.

16. **Regulatory Agency Changes**: Should any other regulatory agency require changes to the work authorized or obligated by this permit, the Permittee is advised that a modification to this permit instrument is required prior to initiation of those changes. It is the Permittee's responsibility to request a modification of this permit from the Nashville District Regulatory Office.

17. **Compliance Certification:** Upon completion of the authorized work, the Permittee shall sign the enclosed "compliance certification" and return it to our office. If you fail to comply with any of the conditions, this authorization may be modified, suspended, or revoked pursuant to 33 CFR 325.7.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Tennessee Department of Transportation	File Number: 2013-00712	Date: 10-24-2014
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
x	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Joshua Frost United States Army Corps of Engineers Nashville District 3701 Bell Road Nashville, TN 37214 615-369-7512 Joshua.w.frost@usace.army.mil	Attn: Appeal Review Officer Great Lakes and Ohio River Division CELRD-PD-REG 550 Main Street, Room 10524 Cincinnati, OH 45202-3222 513-684-6212; FAX 513-684-2460

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

ATTENTION

YOU ARE REQUIRED TO SUBMIT THIS SIGNED CERTIFICATION REGARDING THE COMPLETED ACTIVITY AND ANY REQUIRED MITIGATION.

I hereby certify that the work authorized by **Permit No. 2013-00712** and any required mitigation was done in accordance with the Corps authorization, including any general or special conditions.

_____
Permittee Signature

Date_____

Submit this signed certification to the office checked below:

☒ U.S. Army Corps of Engineers
Regulatory Branch
3701 Bell Road
Nashville, TN 37214

☐ Eastern Regulatory Field Office
501 Adessa Blvd., Ste. 250
Lenoir City, TN 37771

☐ Western Regulatory Field Office
2042 Beltline Road, Southwest
Building C, Suite 415
Decatur, AL 35601

Joshua Frost
Project Manager

Tennessee Valley Authority
Section 26a Approval

Permit # 262590 **Reservoir** Lenoir City - Off **Category** 3

DOT Project # 65001-1256-14 - SR 29 - SR 328 - Whetstone Rd - Roane/Morgan Co

Name	Company	Address	Phone/Email
	TDOT	505 Deadrick Street, Suite 900 Nashville TN 37243	615-253-2466

Tract(s)

Subdivision/Lot(s)	Stream	Mile	Bank	Map Sheet(s)
Subdivision: N/A	Bitter Cr			130 Quad Sheet NW
	Forked Cr			123 Quad Sheet NE
	Muddy Br			

The facilities and/or activities listed below are APPROVED subject to the plans and general and special conditions attached.

1.	Fill - Causeway/Roadway	Volume (cu yd): 0.77
2.	Utilities - Underground - Water	
3.	Culvert - Roadway	Length (ft., in.): 27'; Width (ft., in.): 18"
4.	Riprap	Length (ft., in.): 671'
5.	Culvert - Roadway	Length (ft., in.): 146'; Width (ft., in.): 12'
6.	Culvert - Roadway	Length (ft., in.): 146'; Width (ft., in.): 12'
7.	Culvert - Roadway	Length (ft., in.): 146'; Width (ft., in.): 12'
8.	Culvert - Roadway	Length (ft., in.): 67'; Width (ft., in.): 12'
9.	Culvert - Roadway	Length (ft., in.): 67'; Width (ft., in.): 12'
10.	Culvert - Roadway	Length (ft., in.): 67'; Width (ft., in.): 12'
11.	Culvert - Roadway	Length (ft., in.): 54'; Width (ft., in.): 12'
12.	Culvert - Roadway	Length (ft., in.): 54'; Width (ft., in.): 12'
13.	Culvert - Roadway	Length (ft., in.): 54'; Width (ft., in.): 12'
14.	Culvert - Roadway	Length (ft., in.): 25'; Width (ft., in.): 12'
15.	Culvert - Roadway	Length (ft., in.): 25'; Width (ft., in.): 12'
16.	Culvert - Roadway	Length (ft., in.): 25'; Width (ft., in.): 12'

Tennessee Valley Authority
Section 26a Approval

The facilities and/or activities listed below are APPROVED subject to the plans and general and special conditions attached. (continued)

17. Bridge - Vehicular	Length (ft., in.): 236'; Width (ft., in.): 36'
18. Bridge - Vehicular	Length (ft., in.): 214'; Width (ft., in.): 36'
19. Bridge - Vehicular	Length (ft., in.): 214'; Width (ft., in.): 36'
20. Bridge - Vehicular	Length (ft., in.): 214'; Width (ft., in.): 36'
21. Bridge - Vehicular	Length (ft., in.): 214'; Width (ft., in.): 36'
22. Bridge - Vehicular	Length (ft., in.): 214'; Width (ft., in.): 36'
23. Bridge - Vehicular	Length (ft., in.): 42'; Width (ft., in.): 36'
24. Bridge - Vehicular	Length (ft., in.): 42'; Width (ft., in.): 36'
25. Bridge - Vehicular	Length (ft., in.): 42'; Width (ft., in.): 36'
26. Utilities - Aerial - Telephone	
27. Culvert - Roadway	Length (ft., in.): 240'; Width (ft., in.): 8'
28. Culvert - Roadway	Length (ft., in.): 240'; Width (ft., in.): 8'
29. Culvert - Roadway	Length (ft., in.): 126'; Width (ft., in.): 8'
30. Culvert - Roadway	Length (ft., in.): 17'; Width (ft., in.): 8'
31. Bridge - Vehicular	Length (ft., in.): 127'; Width (ft., in.): 15'
32. Bridge - Vehicular	Length (ft., in.): 127'; Width (ft., in.): 15'
33. Bridge - Vehicular	Length (ft., in.): 33'; Width (ft., in.): 10'
34. Utilities - Aerial - Electric	

This permit SUPERSEDES all previous TVA approvals at this location including permits approved under land record numbers:

TVA Representative: Anne W Patrick **Date:** 01/13/2015

May require review by U.S. Army Corps of Engineers (USACE). Plans have been forwarded to the USACE.
No construction shall commence until you have written approval or verification that no permit is required.

Applicant is also responsible for all local and state approvals that may be required relating to water quality.
No construction shall commence until you have written approval or verification that no permit is required.

GENERAL AND STANDARD CONDITIONS
Section 26a

General Conditions

1) You agree to make every reasonable effort to construct and operate the facility authorized herein in a manner so as to minimize any adverse impact on water quality, aquatic life, wildlife, vegetation, and natural environmental values.

2) This permit may be revoked by TVA by written notice if:

a) the structure is not completed in accordance with approved plans;

b) if in TVA's judgment the structure is not maintained in a good state of repair and in good, safe, and substantial condition;

c) the structure is abandoned;

d) the structure or work must be altered or removed to meet the requirements of future reservoir or land management operations of the United States or TVA;

e) TVA finds that the structure has an adverse effect upon navigation, flood control, or public lands or reservations;

f) all invoices related to this permit are not timely paid;

g) you no longer have sufficient property rights to maintain a structure at this location; or

h) a land use agreement (e.g., license, easement, lease) for use of TVA land at this location related to this permit expires, is terminated or cancelled, or otherwise ceases to be effective.

3) If this permit for this structure is revoked, you agree to remove the structure, at your expense, upon written notice from TVA. In the event you do not remove the structure within 30 days of written notice to do so, TVA shall have the right to remove or cause to have removed, the structure or any part thereof. You agree to reimburse TVA for all costs incurred in connection with removal.

4) In issuing this Approval of Plans, TVA makes no representations that the structures or work authorized or property used temporarily or permanently in connection therewith will not be subject to damage due to future operations undertaken by the United States and/or TVA for the conservation or improvement of navigation, for the control of floods, or for other purposes, or due to fluctuations in elevations of the water surface of the river or reservoir, and no claim or right to compensation shall accrue from any such damage. By the acceptance of this approval, applicant covenants and agrees to make no claim against TVA or the United States by reason of any such damage, and to indemnify and save harmless TVA and the United States from any and all claims by other persons arising out of any such damage.

5) In issuing this Approval of Plans, TVA assumes no liability and undertakes no obligation or duty (in tort, contract, strict liability or otherwise) to the applicant or to any third party for any damages to property (real or personal) or personal injuries (including death) arising out of or in any way connected with applicant's construction, operation, or maintenance of the facility which is the subject of this Approval of Plans.

6) This approval shall not be construed to be a substitute for the requirements of any federal, state, or local statute, regulation, ordinance, or code, including, but not limited to, applicable building codes, now in effect or hereafter enacted. State 401 water quality certification may apply.

7) The facility will not be altered, or modified, unless TVA's written approval has been obtained prior to commencing work.

8) You understand that covered second stories are prohibited by Section 1304.204 of the Section 26a Regulations.

9) You agree to notify TVA of any transfer of ownership of the approved structure to a third party. Third party is required to make application to TVA for permitting of the structure in their name (1304.10). Any permit which is not transferred within 60 days is subject to revocation.

10) You agree to stabilize all disturbed areas within 30 days of completion of the work authorized. All land-disturbing activities shall be conducted in accordance with Best Management Practices as defined by Section 208 of the Clean Water Act to control erosion and sedimentation to prevent adverse water quality and related aquatic impacts. Such practices shall be consistent with sound engineering and construction principles; applicable federal, state, and local statutes, regulations, or ordinances; and proven techniques for controlling erosion and sedimentation, including any required conditions under Section 6 of the Standard Conditions.

11) You agree not to use or permit the use of the premises, facilities, or structures for any purposes that will result in draining or dumping into the reservoir of any refuse, sewage, or other material in violation of applicable standards or requirements relating to pollution control of any kind now in effect or hereinafter established.

12) The Native American Graves Protection and Repatriation Act and the Archaeological Resources Protection Act apply to archaeological resources located on the premises of land connected to any application made unto TVA. If LESSEE {or licensee or grantee (for easement) or applicant (for 26a permit)} discovers human remains, funerary objects, sacred objects, objects of cultural patrimony, or any other archaeological resources on or under the premises, LESSEE {or licensee, grantee, or applicant} shall immediately stop activity in the area of the discovery, make a reasonable effort to protect the items, and notify TVA by telephone (865-228-1374). Work may not be resumed in the area of the discovery until approved by TVA.

13) You should contact your local government official(s) to ensure that this facility complies with all applicable local floodplain regulations.

14) You agree to abide by the conditions of the vegetation management plan. Unless otherwise stated on this permit, vegetation removal is prohibited on TVA land.

15) You agree to securely anchor all floating facilities to prevent them from floating free during major floods.

16) You are responsible for accurately locating your facility, and this authorization is valid and effective only if your facility is located as shown on your application or as otherwise approved by TVA in this permit. The facility must be located on land owned or leased by you, or on TVA land at a location approved by TVA.

17) You agree to allow TVA employees access to your water use facilities to ensure compliance with any TVA issued approvals.

18) It is understood that you own adequate property rights at this location. If at any time it is determined that you do not own sufficient property rights, or that you have only partial ownership rights in the land at this location, this permit may be revoked. TVA may require the applicant to provide appropriate verification of ownership.

19) In accordance with 18 CFR Part 1304.9, Approval for construction covered by this permit expires 18 months after the date of issuance unless construction has been initiated.

Standard Conditions (Only items that pertain to this request have been listed.)

2) Ownership Rights

b) You are advised that TVA retains the right to flood this area and that TVA will not be liable for damages resulting from flooding.

e) You recognize and understand that this authorization conveys no property rights, grants no exclusive license, and in no way restricts the general public's privilege of using shoreland owned by or subject to public access rights owned by TVA. It is also subject to any existing rights of third parties. Nothing contained in this approval shall be construed to detract or deviate from the rights of the United States and TVA held over this land under the Grant of Flowage Easement. This Approval of Plans does not give any property rights in real estate or material and does not authorize any injury to private property or invasion of private or public rights. It merely constitutes a finding that the facility, if constructed at the location specified in the plans submitted and in accordance with said plans, would not at this time constitute an obstruction unduly affecting navigation, flood control, or public lands or reservations.

3) Shoreline Modification and Stabilization

a) For purposes of shoreline bank stabilization, all portions will be constructed or placed, on average, no more than two feet from the existing shoreline at normal summer pool elevation.

c) Bank, shoreline, and floodplain stabilization will be permanently maintained in order to prevent erosion, protect water quality, and preserve aquatic habitat.

5) Bridges and Culverts

a) You agree to design/construct any instream piers in such a manner as to discourage river scouring or sediment deposition.

b) Applicant agrees to construct culvert in phases, employing adequate streambank protection measures, such that the diverted streamflow is handled without creating streambank or streambed erosion/sedimentation and without preventing fish passage.

c) Concrete box culverts and pipe culverts (and their extensions) must create/maintain velocities and flow patterns which offer refuge for fish and other aquatic life, and allow passage of indigenous fish species, under all flow conditions. Culvert floor slabs and pipe bottoms must be buried below streambed elevation, and filled with naturally occurring streambed materials. If geologic conditions do not allow burying the floor, it must be otherwise designed to allow passage of indigenous fish species under all flow conditions.

d) All natural stream values (including equivalent energy dissipation, elevations, and velocities; riparian vegetation; riffle/pool sequencing; habitat suitable for fish and other aquatic life) must be provided at all stream modification sites. This must be accomplished using a combination of rock and bioengineering, and is not accomplished using solid, homogeneous riprap from bank to bank.

e) You agree to remove demolition and construction by-products from the site for recycling if practicable, or proper disposal--outside of the 100-year floodplain. Appropriate BMPs will be used during the removal of any abandoned roadway or structures.

6) Best Management Practices

a) You agree that removal of vegetation will be minimized, particularly any woody vegetation providing shoreline/streambank stabilization.

b) You agree to installation of cofferdams and/or silt control structures between construction areas and surface waters prior to any soil-disturbing construction activity, and clarification of all water that accumulates behind these devices to meet state water quality criteria at the stream mile where activity occurs before it is returned to the unaffected portion of the stream. Cofferdams must be used wherever construction activity is at or below water elevation.

c) A floating silt screen extending from the surface to the bottom is to be in place during excavation or dredging to prevent sedimentation in surrounding areas. It is to be left in place until disturbed sediments are visibly settled.

d) You agree to keep equipment out of the reservoir or stream and off reservoir or stream banks, to the extent practicable (i.e., performing work "in the dry").

e) You agree to avoid contact of wet concrete with the stream or reservoir, and avoid disposing of concrete washings, or other substances or materials, in those waters.

f) You agree to use erosion control structures around any material stockpile areas.

g) You agree to apply clean/shaken riprap or shot rock (where needed at water/bank interface) over a water permeable/soil impermeable fabric or geotextile and in such a manner as to avoid stream sedimentation or disturbance, or that any rock used for cover and stabilization shall be large enough to prevent washout and provide good aquatic habitat.

h) You agree to remove, redistribute, and stabilize (with vegetation) all sediment which accumulates behind cofferdams or silt control structures.

i) You agree to use vegetation (versus riprap) wherever practicable and sustainable to stabilize streambanks, shorelines, and adjacent areas. These areas will be stabilized as soon as practicable, using either an appropriate seed mixture that includes an annual (quick cover) as well as one or two perennial legumes and one or two perennial grasses, or sod. In winter or summer, this will require initial planting of a quick cover annual only, to be followed by subsequent establishment of the perennials. Seed and soil will be protected as appropriate with erosion control netting and/or mulch and provided adequate moisture. Streambank and shoreline areas will also be permanently stabilized with native woody plants, to include trees wherever practicable and sustainable (this vegetative prescription may be altered if dictated by geologic conditions or landowner requirements). You also agree to install or perform additional erosion control structures/techniques deemed necessary by TVA.

Additional Conditions

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-3655

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

April 16, 2014

Mr. Jimmy Smith
Natural Resource Section
Tennessee Department of Environment and Conservation
11th Floor William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue
Nashville, Tennessee 37243

Subject: Project #65001-1256-14
PIN 101411.05
State Route 29 (US-27)
From South of Whetstone Road
To North of SR 328
Morgan County

Dear Mr. Smith:

In accordance with T.C.A. 69-3-108(b), this office is submitting form CN-1091; drawings; portions of the USGS quad map for Camp-Austin, TN (122-SE), Petros, TN (129-SW), Harriman, TN (123-NE), and Elverton, TN (130-NW) showing the location of all proposed stream and wetland impacts; and a half-size set of plans with a location map on the plans cover sheet; where we believe permits may be needed

Per the Army Corps of Engineers request, all impacts to Whetstone Road have been moved to Section 1 of the project (PIN 101411.04). This application adjusts the mitigation information.

SECTION 8.1, 10, and 11

Permits Required	**MOVED TO PROJECT 101411.04**
	Site Information
TDEC: ARAP #1	
Corps: Nationwide #14	**Feature Name:** *WTL-10, forested*
TVA: Section 26a	**Proposed Impact Type:** *Wetland Fill*

	Latitude 36.0002°, Longitude 84.5060°
Sta. 259+25 – 260+12, SR 29:	**Impact Description:** **Temporary Impact:** 0.00 ac **Permanent Impact:** 0.07 ac

Mitigation
Permanent Impact
~~We propose to mitigate the permanent wetland impact by debiting, at a 4:1 ratio, 0.28 acres from the Shady Valley Wetland Mitigation Bank.~~

Please see attached spreadsheet for mitigation.

Monitoring:
No monitoring is required for this impact.

Alternatives
Although the chosen alternative results in the complete loss of WTL-10, this alternative was selected because it causes the least overall impact to surrounding natural resources. WTL-10 is located in the area of the median and northbound lanes of the proposed SR-29 widening. Avoiding the impact to WTL-10 would require a dramatic shift of the roadway alignment to the south due to the proximity of Bitter Creek (STR-6) to the existing alignment just east of WTL-10. This shift would cause unsafe driving conditions based on the design speed of the proposed roadway facility. Shifting the proposed roadway alignment to the south in a more gradual manner would require over 1,000 feet of channel relocation of STR-6. Additionally, shifting the proposed widening to the south would result in a greater length of encapsulation of stream STR-15.

A non-degradation alternative was not feasible due to the need to widen the existing alignment in order to provide greater traffic capacity and safety for the travelling public.

Permits Required	**MOVED TO PROJECT 101411.04** **Site Information**
TDEC: ARAP #2 **Corps:** Nationwide #12 **TVA:** Section 26a	**Feature Name:** *WTL-10* **Proposed Impact Type:** *Utility Impact (Water)* Latitude 36.0002°, Longitude 84.5060°
Sta. 259+66±, SR 29:	**Impact Description:** Remove/retire water line

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
An existing 10-inch water main is currently located outside of and adjacent to the existing northbound travel lane of SR-29. Due to the proposed widening of SR-29, the existing line would be beneath the proposed median ditch and northbound lanes of the roadway. Therefore, this line will be removed or retired and replaced with a new 12-inch water main located within the fill slope of the proposed southbound lanes.

Due to the need to keep the line accessible for possible maintenance, maintain service to the surrounding area, and to widen the existing SR-29 roadway facility, no other alternative to these impacts is feasible.

Permits Required	**MOVED TO PROJECT 101411.04** **Site Information**
TDEC: ARAP #3 **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-15* **Proposed Impact Type:** *Encapsulation* Latitude 36.0002°, Longitude 84.5060°
Sta. 259+66±, SR 29:	**Impact Description:** Existing structure: 58 ft of 30 in RCP (to be removed) Proposed structure: • 27 ft of 18 in perforated pipe • 69 ft of 36 in RCP • 18 ft of Class B rip rap

Mitigation
No mitigation is required for this impact.

Monitoring:
No monitoring is required for this impact.

Alternatives
Shifting the proposed alignment to the south would be impractical because it would result in a greater encapsulation length of STR-15 and would require the relocation of Bitter Creek (STR-6). Due to the presence of a large cut section within an adjacent hill slope, shifting the proposed widening to the north would require greater acquisition of right-of-way and increased construction costs. Removal of the existing 30-inch RCP and construction of a bridge would provide unnecessary hydraulic capacity and include significantly higher construction costs.

Permits Required	**MOVED TO PROJECT 101411.04** **Site Information**
TDEC: ARAP #4 **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** STR-15, UT to Bitter Creek **Proposed Impact Type:** *Utility Impact (Water)* Latitude 36.0002°, Longitude 84.5060°

Sta. 259+66±, SR 29	**Impact Description:** Install 12 inch water line

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
An existing 10-inch water main is currently located outside of and adjacent to the existing northbound travel lane of SR-29. Due to the proposed widening of SR-29, the existing line would be beneath the proposed median ditch and northbound lanes of the roadway. Therefore, this line will be retired and replaced with a new 12-inch water main located within the fill slope of the proposed southbound lanes, which cross stream STR-15. Due to the need to keep the line accessible for possible maintenance, maintain service to the surrounding area, and to widen the existing SR-29 roadway facility, no other alternative to these impacts is feasible.

Permits Required	**MOVED TO PROJECT 101411.04** **Site Information**
TDEC: ARAP #5 **Corps:** Nationwide #14 **TVA:** Section 26a	**Feature Name:** *WTL-11, forested* **Proposed Impact Type:** *Wetland Impact* Latitude 36.0008°, Longitude 84.5070°
Sta. 262+11 – 266+57, SR 29	**Impact Description:** Temporary Impact: 0.00 ac Permanent Impact: 0.17 ac

Mitigation
Permanent Impact
~~We propose to mitigate the permanent wetland impact by debiting, at a 4:1 ratio, 0.68 acres from the Shady Valley Wetland Mitigation Bank.~~

Please see attached spreadsheet for mitigation.

Monitoring:
No monitoring is required for this impact.

Alternatives
The chosen alternative was based on surrounding environmental and physical constraints, and efforts were made in the design to cause the least amount of impact to natural resources possible. Although the proposed alignment will result in the total loss of WTL-11, shifting the proposed roadway alignment to the south is not feasible due to the proximity of Bitter Creek (STR-6) to the existing alignment just west and east of WTL-11.

STR-6 is parallel to and just outside of the present and proposed rights-of-way, and would require over 1,000 feet of channel relocation if impacted. Shifting the alignment to the north would require abandonment of the existing roadway facility, acquisition of greater amounts of right-of-way, and result in increased grading and paving activities, therefore resulting in significantly higher construction costs.

A non-degradation alternative was not feasible due to the need to widen the existing alignment in order to provide greater traffic capacity and safety for the travelling public.

Permits Required	**MOVED TO PROJECT 101411.04** **Site Information**
TDEC: ARAP #6 **Corps:** Nationwide #12 **TVA:** Section 26a	**Feature Name:** *WTL-11* **Proposed Impact Type:** *Wetland Impact / Water line* Latitude 36.0008°, Longitude 84.5070°
Sta. 262+11 – 266+57, SR 29	**Impact Description:** Remove/retire 10 inch water line

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
An existing 10-inch water main is currently located outside of and adjacent to the existing northbound travel lane of SR-29. Due to the proposed widening of SR-29, the existing line would be beneath the proposed median ditch of the roadway. Therefore, this line will be removed or retired and replaced with a new 12-inch water main located within the fill slope of the proposed southbound lanes.

Due to the need to keep the line accessible for possible maintenance, maintain service to the surrounding area, and to widen the existing SR-29 roadway facility, no other alternative to these impacts is feasible.

Permits Required	**MOVED TO PROJECT 101411.04** **Site Information**
TDEC: ARAP #7 **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-16, UT to Bitter Creek* **Proposed Impact Type:** *Stream Relocation* Latitude 36.0017°, Longitude 84.5092°
Sta. 269+60 – 271+42, SR 29	**Impact Description:** **Existing open/total stream length:** 118 ft **Proposed stream relocation:** 118 ft

Mitigation
Replacement in-kind: As part of on site in-kind replacement of 118 ft of stream, we propose to replace the stream in maintained lawn (as existing). The proposed stream channel has been designed to mimic existing channel characteristics (size, shape, etc.) as closely as possible. For more detail see the proposed roadway plans.

Monitoring:
A monitoring report will be sent at a later date.

Alternatives
Several alternatives were considered in this location. Shifting the proposed roadway widening to the south would result in far greater impacts to natural resources due to the presence of Bitter Creek (STR-6) just outside of and parallel to the present and proposed rights-of-way. A large gas line utility is also located south of the rights-of-way in this location. Shifting the alignment to the north would result in greater encapsulation of Forked Creek (STR-17) at approximately Station 280+50 and abandonment of existing roadway facility, therefore unnecessarily increasing impacts to natural resources and construction costs. Construction of a retaining wall would reduce the amount of slope length along the southbound portion of the proposed roadway. However, doing so would require installation of guardrail, therefore increasing the width of the roadway shoulder. This increase in shoulder width and the size of the work area (ground disturbance) needed to construct the wall would off-set any reduction in the final footprint of the roadway by construction of the wall.

A non-degradation alternative was not feasible due to the need to widen the existing alignment in order to provide greater traffic capacity and safety for the travelling public.

Permits Required	**MOVED TO PROJECT 101411.04** **Site Information**
TDEC: ARAP #8 **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-16A, UT to Bitter Creek.* **Proposed Impact Type:** *Encapsulation* Latitude 36.0015°, Longitude 84.5088°
Sta. 270+29 – 270+31 LT, SR 29	**Impact Description:** **Existing open/total stream length:** 36 ft **Proposed open/total stream length:** 0 ft

Mitigation
- 36 ft. (36 ft. x 1.0) of stream length losses, we propose a payment of $8,640.

Monitoring:
A monitoring report is not required.

Alternatives
Several alternatives were considered in this location. Shifting the proposed roadway widening to the south would result in far greater impacts to natural resources due to the presence of Bitter Creek (STR-6) just outside of and parallel to the present and proposed rights-of-way. A large gas line utility is also located south of the rights-of-way in this

location. Shifting the alignment to the north would result in greater encapsulation of Forked Creek (STR-17) at approximately Station 280+50 and abandonment of existing roadway facility, therefore unnecessarily increasing construction costs and impacts to natural resources. Construction of a retaining wall and a straight headwall would significantly reduce the amount of encapsulation of STR-16A along the southbound portion of the proposed roadway. However, doing so would require installation of guardrail, therefore increasing the width of the roadway shoulder. This increase in shoulder width and the size of the work area (ground disturbance) needed to construct the wall would off-set any reduction in the final footprint of the roadway by construction of the wall.

A non-degradation alternative was not feasible due to the need to widen the existing alignment in order to provide greater traffic capacity and safety for the travelling public.

Permits Required	**MOVED TO PROJECT 101411.04** **Site Information**
TDEC: ARAP #9 **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-17, Forked Creek* **Proposed Impact Type:** *Encapsulation* Latitude 36.0032°, Longitude 84.5121°
Sta. 280+51, SR 29 Sta. 280+50±, SR 29 Sta. 281+00±, SR 29	**Impact Description:** **Existing Structure:** Existing structures to remain shown in proposed **Proposed Structure**: • 146 ft of 3 @ 12 ft by 5 ft RCBC, including: – 67 ft of 3 @ 12 ft by 5 ft RCBC (to remain) – 54 ft of 3 @ 12 ft by 5 ft RCBB inlet extension, plus 8 ft of Class C rip rap **Excavated stream bed/cobble shall be placed on top of rip rap to fill voids** – 25 ft of 3 @ 12 ft by 5 ft RCBB outlet extension, plus 22 ft of Class C rip rap **Excavated stream bed/cobble shall be placed on top of rip rap to fill voids** **Proposed structures length:** 79 ft **Total structures length:** 146 ft **Associated Impacts** Outfall structure and Class A1 rip rap Outfall structure and Class B rip rap

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
Several alternatives were considered in this location and efforts were made in the design to result in the least amount of impact to natural resources possible. Shifting the proposed roadway alignment to the south or north would not result in any reduction in impacts to Forked Creek (STR-17). The existing multi-barrel RCBC is structurally sound and the non-degradation alternative of replacement of the existing structure with a bridge in order to restore an open channel is not practical due to the prohibitive cost of building a bridge. The cost of a bridge is $722,000, whereas the cost of extending the inlet and outlet of the RCBC is $416,000. The roadway facility has been narrowed and slopes steepened in this portion of the roadway in order to minimize the length of the culvert extensions to the extent that guardrail is required.

Permits Required	**MOVED TO PROJECT 101411.04** **Site Information**
TDEC: ARAP #10 **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-17, Forked Creek* **Proposed Impact Type:** *Utility Relocation (Water)* Latitude 36.0032°, Longitude 84.5121°
Sta. 280+51± LT, SR 29: Sta. 280+51± RT, SR 29:	**Impact Description:** Install 12 inch water line Remove/retire 10 inch water line

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
Due to the proposed widening of the SR-29 roadway and the necessary culvert extensions (inlet and outlet) at approximately Station 280+50, an existing 10-inch water main is to be retired from the location of where the culvert inlet will be extended. A new 12-inch water main will be installed over the outlet end of the existing culvert in order to maintain service in to the surrounding area.

Due to the need to keep the line accessible for possible maintenance, maintain service to the surrounding area, and to widen the existing SR-29 roadway facility, no other alternative to these impacts is feasible.

Permits Required	**Site Information**
TDEC: ARAP **Corps:** Nationwide #14 **TVA:** Section 26a	**Feature Name:** *STR-6, Bitter Creek* **Proposed Impact Type:** *Span Bridge / Encapsulation* Latitude 36.0156°, Longitude 84.5255° Sta. 299+98 – 342+85, SR 29

	Impact Description:
Sta. 342+85, SR 29:	**Existing open stream:** 99 ft **Existing structure:** • Existing structures to remain shown in proposed **Total existing structures length:** 176 ft **Total structures to be removed:** 0 ft **Total existing length:** 275 ft
Sta. 342+85, SR 29:	**Proposed open stream:** 19 ft (Class C rip rap at outlet) Proposed structure: • 256 ft of 3 @ 12 ft by 9 ft slab bridge, including: – 176 ft of 3 @ 12 ft by 9 ft slab bridge (to remain) – 38 ft of 3 @ 12 ft by 9 ft slab bridge inlet extension – 42 ft of 3 @ 12 ft by 9 ft slab bridge outlet extension, plus 19 ft of Class C rip rap. **Excavated stream bed/cobble shall be placed on top of rip rap to fill voids** **Proposed structures length:** 80 ft **Total structures length:** 256 ft **Total proposed length:** 275 ft
	Associated Impacts (Outfall Structures)
Sta. 297+50 – 298+50, LT:	100 ft of Class B rip rap
Sta. 299+98, LT, SR 29:	20 ft of Class C rip rap
Sta. 305+50, LT , SR 29:	19 ft of Class C rip rap
Sta. 309+95, LT SR 29:	23 ft of Class B rip rap
Sta. 314+00 LT, SR 29:	20 ft of Class C rip rap
Sta. 317+00 LT, SR 29:	18 ft of Class B rip rap
Sta. 319+32 LT, SR 29:	21 ft of Class B rip rap
Sta. 322+00 LT, SR 29:	18 ft of Class B rip rap
Sta. 335+76 LT, SR 29:	15 ft of Class C rip rap
	Associated Impacts (Highland Telephone)
Sta. 298+90±, SR 29:	Install pole #14
Sta. 301+80±, SR 29:	Install pole #13
Sta. 306+70±, SR 29:	Install pole #12
Sta. 317+90±, SR 29:	Install pole #8
Sta. 326+25±, SR 29:	Install pole #5
Sta. 344+00±, SR 29:	Install pole #99

Mitigation

~~For the above stream impacts, we propose the following mitigation:~~

- ~~256 ft. (256 ft. x 1.0) of stream encapsulation and length losses, we propose a payment of $61,440.~~

Please see spreadsheet for mitigation.

Monitoring:

No monitoring is required for this impact.

Alternatives

The preferred alternative of extending the existing 3 @ 12 ft by 9 ft RCBC at the inlet and outlet ends was chosen for the crossing of STR-6 at Station 342+85. However, adjacent roadway fill slopes were steepened as much as possible to minimize the length of the culvert extensions. By choosing this alternative, removal of 174 feet of existing structure will not be necessary and the least amount of disturbance to the channel of STR-6 will occur. Due to the presence of multiple barrels within the RCBC, stream flow will be adequately separated from construction during extension of the culvert. Impacts to the channel of STR-6 will be further minimized by harvesting existing channel substrate (cobbles and gravel) during excavation for placement of Class C riprap outlet protection. The natural substrate will be placed over the riprap once installed in order to maintain surface flow and natural habitat in this location.

Construction of a new culvert would not be practical because the existing structure is structurally sound and in alignment with the channel of STR-6. A minimal water impact of maintaining use of the existing RCBC in its current size is not possible due to the need to widen the roadway for greater traffic capacity and safety for the travelling public. A non-degradation alternative including the removal of the existing RCBC and replacement with a bridge is not practical due to the prohibitive cost of building a bridge. The cost of a bridge is $1,030,000, whereas the cost of extending the existing culvert is $600,000.

The various proposed outfall structures are placed as close to the toe of the proposed roadway fill slope as possible, preventing the placement of storm drain outlet protection within the flow path (normal base flow elevation) of STR-6. Therefore, no direct impacts to STR-6 are anticipated as a result of construction of the outfall structures.

Permits Required	**Site Information**
TDEC: ARAP **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-18* **Proposed Impact Type:** *Utility Relocation (Water)* Latitude 36.0120°, Longitude 84.5215°

	Impact Description:
Sta. 324+59±, SR 29:	Install 12 inch water line

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
Due to the proposed widening of the SR-29 roadway, an existing 10-inch water main is to be retired from the location of where the culvert inlet will be extended. A new 12-inch water main will be installed over the outlet end of the existing culvert in order to maintain service in to the surrounding area.

Due to the need to keep the line accessible for possible maintenance, maintain service to the surrounding area, and to widen the existing SR-29 roadway facility, no other alternative to these impacts is feasible.

Permits Required	Site Information
TDEC: ARAP **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-19, UT to Bitter Creek.* **Proposed Impact Type:** *Encapsulation / Stream Relocation* Latitude 36.0127°, Longitude 84.5225°

	Impact Description:
Sta. 328+39, SR 29: Sta. 328+79, SR 29:	**Existing open stream:** 161 ft Existing structures: • Existing structures to remain shown in proposed • 20 ft of 86 in CMP (to be removed) **Total existing structures length:** 117 ft **Existing structures to be removed:** 20 ft **Total existing length:** 278 ft
Sta. 328+43, SR 29:	**Proposed open stream:** 15 ft, including 15 ft of Class C rip rap Proposed Structures: • 240 ft of 8 ft by 6 ft RCBC, including: – 97 ft of 8 ft by 6 ft RCBC (to remain) – 126 ft of 8 ft by 6 ft RCBC inlet extension – 17 ft of 8 ft by 6 ft RCBC of outlet extension **Proposed structures length:** 143 ft **Total proposed structure:** 240 ft of 8 ft by 6 ft RCBC **Total proposed length:** 255 ft
	Associated Impacts (Roadway)
Sta. 58+83, Hanging Rock Rd: Sta. 60+08, Hanging Rock Rd:	Outfall Structure: 8 ft Class B rip rap Outfall Structure: 8 ft Class B rip rap
	Associated Impacts (Water Relocation)

Sta. 328+43± RT, SR 29: Sta. 328+43± LT, SR 29:	Remove/retire 10 inch water line Install 12 inch water line

Mitigation

~~For the above stream impacts, we propose the following mitigation:~~

- ~~29 ft. (29 ft. x 1.0) of stream length losses, we propose to use credit generated at the STR-22 site. (0 ft credit remaining)~~
- ~~234 ft. (263 – 29 ft) of stream encapsulation and length losses, we propose a payment of $56,160.~~

Please see spreadsheet for mitigation.

Monitoring:

No monitoring is required for this impact.

Alternatives

Several alternatives were considered in this location and efforts were made in the design to result in the least amount of impact to natural resources possible. Shifting the proposed roadway alignment to the south would require the relocation of over 1,000 feet of Bitter Creek (STR-6), which is immediately adjacent and parallel to the project right-of-way, and is therefore not practical. Shifting the alignment to the north would not result in any reduction in impacts to STR-19, and would require greater acquisition of right-of-way and grading costs associated with a cut section in a nearby hill slope, as well as costs associated with a major realignment of the intersection of Hanging Rock Road with SR-29. The existing single-barrel RCBC is structurally sound and replacement of the existing structure with a bridge in order to restore an open channel is not practical due to the prohibitive cost of building a bridge. Additionally, construction of a bridge would also require a major realignment of the intersection of Hanging Rock Road with SR-29. The proximity of Bitter Creek to the existing alignment would also require a substantial shift in the new alignment to the north in order to place fill material for the bridge approaches without requiring a relocation of the creek. This would require the abandonment and removal of the existing SR-29 roadway facility, significantly raising construction costs. The cost of a bridge is $712,000, whereas the cost of extending the inlet and outlet ends of the RCBC is $280,000, which is the preferred alternative.

Permits Required	**Site Information**
TDEC: ARAP **Corps:** Nationwide #14 **TVA:** Section 26a	**Feature Name:** *WTL-12* **Proposed Impact Type:** *Wetland Impact* Latitude 36.0125°, Longitude 84.5225°

	Impact Description:
Sta. 328+62 – 330+33, SR 29	**Temporary Impact:** 0.00 ac **Permanent Impact:** 0.18 ac
Sta. 328+62± – 330+33±, SR 29	**Associated Water Relocation** Remove/retire 10 inch water line

Mitigation
Permanent Impact
~~We propose to mitigate the permanent wetland impact by debiting, at a 4:1 ratio, 0.72 acres from the Shady Valley Wetland Mitigation Bank.~~

Please see attached spreadsheet for mitigation.

Monitoring:
No monitoring is required for this impact.

Alternatives
Several alternatives were considered in this location and efforts were made in the design to result in the least amount of impact to natural resources possible. Shifting the proposed roadway alignment to the south would require the relocation of over 1,000 feet of Bitter Creek (STR-6), which is immediately adjacent and parallel to the project right-of-way, and is therefore not practical. Shifting the alignment to the north would require greater acquisition of right-of-way and grading costs associated with a cut section in a nearby hill slope (just east of Hanging Rock Road). Additionally, this would require the abandonment of the existing roadway facility and construction of an entirely new widened roadway, significantly raising construction costs. Construction of a retaining wall was also considered. However, the retaining wall would be in the clear zone and require guardrail, therefore requiring wider shoulders and off-setting the majority of the reduced impact while substantially raising construction costs.

A non-degradation alternative was not feasible due to the need to widen the existing alignment in order to provide greater traffic capacity and safety for the travelling public.

Permits Required	**Site Information**
TDEC: ARAP **Corps:** Nationwide #14 **TVA:** Section 26a	**Feature Name:** *WTL-13* **Proposed Impact Type:** *Wetland Impact* Latitude 36.0135°, Longitude 84.5233°
Sta. 333+00 – 335+14, SR 29	**Impact Description:** **Temporary Impact:** 0.18 ac **Permanent Impact:** 0.02 ac

Mitigation
Permanent Impact
~~We propose to mitigate the permanent wetland impact by debiting, at a 4:1 ratio, 0.08 acres from the Shady Valley Wetland Mitigation Bank.~~

Please see attached spreadsheet for mitigation.

Temporary Wetland Impacts
- Topsoil is to be removed from all areas of temporary wetland impacts and stockpiled prior to construction. Upon completion of construction activities, temporary haul roads (if applicable) are to be removed. Excavated material from

the haul roads is to be disposed of as directed by the engineer. Upon completion of construction activities, all temporary wetland impact areas are to be restored to pre-construction contours and the stockpiled wetland topsoil spread to restore these areas to pre-construction elevation.

- The area of temporary wetland impact shall be restored to preconstruction elevation and reseeded as soon as possible following the completion of construction activities.
- No substitution for any of these species will be accepted without permission from TDOT Environmental Division. No clones or coltivars will be accepted. Any trees found to be incorrect species, improperly planted, or which do not survive at any time prior to termination of the contract shall be removed and replaced at the contractor's expense. Stakes and wires will be removed immediately prior to contract termination.

Alternatives

Several alternatives were considered in this location and efforts were made in the design to result in the least amount of impact to natural resources possible. Shifting the proposed roadway alignment to the south would require the relocation of several hundred feet of Bitter Creek (STR-6), which is in close proximity to the project right-of-way, and is therefore not practical. Shifting the alignment to the north would require the abandonment of the existing roadway facility and construction of an entirely new widened roadway, significantly raising construction costs. Construction of a retaining wall was also considered. However, the retaining wall would be in the clear zone and require guardrail, therefore requiring wider shoulders and off-setting the majority of the reduced impact while substantially raising construction costs.

A non-degradation alternative was not feasible due to the need to widen the existing alignment in order to provide greater traffic capacity and safety for the travelling public.

Permits Required	**Site Information**
TDEC: ARAP **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-6, Bitter Creek* **Proposed Impact Type:** *Utility Relocation (Water)* Latitude 36.0156°, Longitude 84.5255° Sta. 342+85 – 354+79, SR 29

	Impact Description:
Sta. 342+85± LT, SR 29: Sta. 343+50± RT, SR 29: Sta. 354+79± RT, SR 29:	Install 12 inch water line Remove 10 inch water line Install ¾" service line and water meter assembly

Mitigation

No mitigation required.

Monitoring:

No monitoring is required for this impact.

Alternatives

A 10-inch water main attached to the existing SR-29 bridge over Bitter Creek (STR-6) is

to be retired due to the proposed demolition and replacement of the bridge. A new 12-inch water main will be attached to the southbound lanes of the new bridge over the river.

Due to the proposed widening of the SR-29 roadway and the necessary culvert extensions (inlet and outlet) at approximately Station 343+00, an existing 10-inch water main is to be retired from the location of where the culvert inlet will be extended. A new 12-inch water main will be installed over the outlet end of the existing culvert in order to maintain service in to the surrounding area.

At approximately Station 354+50, an existing 10-inch water main will be retired and replaced with a new 12-inch water main. Near where the new main crosses the SR-29 alignment, a new ¾-inch service line and water meter assembly will be connected in order to provide service to an adjacent property.

Locating the new water mains and service line near the proposed roadway widening is necessary in order to keep the lines easily accessible in the event maintenance is required. Therefore, no other alternatives to these impacts are feasible.

Permits Required	**Site Information**
TDEC: ARAP **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-20, Muddy Branch.* **Proposed Impact Type:** *Encapsulation* Latitude 36.0171°, Longitude 84.5263°

	Impact Description:
Sta. 349+20, SR 29	**Existing Structure:** Existing structures to remain shown in proposed **Existing stream impact:**137 ft Proposed structure/work: • 127 ft of 2 @ 15 ft by 8 ft slab brdige, including: – 102 ft of 2 @ 15 ft by 8 ft slab bridge (to remain) – 20 ft of 2 @ 15 ft by 8 ft slab bridge of inlet extension – 5 ft of 2 @ 15 ft by 8 ft slab bridge outlet extension, plus 10 ft of Class B rip rap **Excavated stream bed/cobble shall be placed on top of rip rap to fill voids** **Proposed structures length:** 25 ft **Total structures length:** 127 ft **Proposed stream impact:** 137 ft
Sta. 348+03, SR 29	**Associated Impact:** 3 ft "T" ditch, lined with Class B rip rap on south side of inlet

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
The preferred design alternative in this location has been modified to result in the least amount of impact to natural resources possible. The roadway facility has been narrowed and the adjacent slopes have been steepened in order to minimize the amount that the existing multi-barrel box culvert is extended to the extent that guardrail is required. Impacts to the channel of STR-6 will be further minimized by harvesting existing channel substrate (cobbles and gravel) during excavation for placement of Class C riprap outlet protection. The natural substrate will be placed over the riprap once installed in order to maintain surface flow and natural habitat in this location.
The existing multi-barrel RCBC is structurally sound and the non-degradation alternative of replacing the existing structure with a bridge in order to restore an open channel is not practical due to the prohibitive cost of building a bridge. The cost of a bridge is $634,000, whereas the cost of extending the inlet and outlet of the RCBC is $150,000. Construction of a retaining wall was also considered. However, the retaining wall would be in the clear zone and require guardrail, therefore requiring wider shoulders and off-setting the majority of the reduced impact while substantially raising construction costs. Shifting the proposed roadway alignment to the north or south would not result in any reduction in impacts to Muddy Branch (STR-20), could result in additional impacts to Bitter Creek, and could result in significantly greater construction costs due to the abandonment of existing roadway facility.

Permits Required	**Site Information**
TDEC: ARAP **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-20, Muddy Branch* **Proposed Impact Type:** *Utility Relocation (Water)* Latitude 36.0171°, Longitude 84.5263°

	Impact Description:
Sta. 349+20± RT, SR 29: Sta. 349+20± LT, SR 29:	Remove/retire 10 inch water line Install 12 inch water line

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
Due to the proposed widening of the SR-29 roadway and the necessary culvert (inlet) extension at approximately Station 349+20, an existing 10-inch water main is to be retired from the outlet area of the culvert. A new 12-inch water main will be installed at the inlet end of the culvert extension in order to maintain service in to the surrounding area.
Due to the need to keep the line accessible for possible maintenance, maintain service to the surrounding area, and to widen the existing SR-29 roadway facility, no other alternative to these impacts is feasible.

Permits Required	**Site Information**
TDEC: ARAP **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-21, UT to Muddy Branch.* **Proposed Impact Type:** *Encapsulation / Stream Relocation* Latitude 36.0178°, Longitude 84.5268°

	Impact Description:
	Existing open stream: 275 ft
Sta. 350+55, SR 29:	**Existing structure:** 33 ft of 10 ft by 4 ft RCBC (to be removed)
Sta. 357+00, SR 29:	**Existing structure:** 20 ft of 30" CMP (to be removed)
	Total Existing Length: 328 ft
Sta. 349+25 – 352+00, SR 29:	**Proposed in kind replacement:** 275 ft
Sta. 350+53, SR 29:	**Proposed structure:** 33 ft of 10 ft by 4 ft RCBC
	Total Proposed Length: 308 ft

Mitigation

Replacement in-kind: As part of on site in-kind replacement of 275 ft of stream, we propose to follow the natural stream design that is included in the roadway plans. Plantings and structures, including Newberry riffles, boulder sills, and log drop structures. For more detail see the proposed roadway plans.

~~For the above stream impacts, we propose the following mitigation:~~

- ~~20 ft. (20 ft. x 1.0) of stream length losses, we propose to use credit generated at the STR-22 site. (29 ft credit remaining)~~

Please see spreadsheet for mitigation.

Monitoring:

A monitoring report will be sent at a later date.

Alternatives

The preferred alternative is to utilize and widen the roadway sub-grade of the existing roadway facility for the proposed roadway improvements. The facility has been narrowed and slopes steepened to minimize impacts to surrounding natural resources. However, impacts to STR-21 will result due to the slope ratio required for safely traversable slopes. Steepening the roadway slopes from 3:1 to 2:1 was considered. However, doing so would require installation of guardrail and widening the roadway shoulders, effectively off-setting the majority of the reduced impact. Additionally, construction of a retaining wall was considered. However, due to additional shoulder required for guardrail installation and the impact area required to construct the wall, as well as the significant increase in construction costs, this alternative is also not practicable. Shifting the alignment to the north is not feasible due to the extensive channel relocation that would be required due to the proximity of Bitter Creek (STR-6). Additionally, although dramatically shifting the alignment to the south would reduce impacts to STR-21, it would also require substantially more acquisition of right-of-way and grading costs due to the presence of an adjacent hill slope. The proposed channel relocation for STR-21 will be designed so that

the new channel mimics the characteristics of the existing channel and that tree and shrub plantings adjacent to the channel provide habitat and temperature control over time. The existing box culvert will be replace in the same dimensions in order to provide adequate drainage for STR-21 while not over-widening the flow path of the stream in proximity to the culvert.

Permits Required	**Site Information**
TDEC: ARAP #23 **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-22, UT to Muddy Branch.* **Proposed Impact Type:** *Stream Relocation / Encapsulation* Latitude 36.0188°, Longitude 84.5270°

	Impact Description:
Sta. 349+25 to 352+00, SR 29: Sta. 356+94 LT, SR 29:	**Existing open stream:** 571 ft **Existing structure:** 0 ft (none) **Proposed open stream:** 504 ft (in kind replacement) **Proposed structure:** 116 ft including, • 100 ft of 30 in RCP • 11 ft of U-shaped endwall at inlet and • 5 ft of U-shaped endwall at outlet **Total proposed length:** 620 ft

Mitigation

Replacement in-kind: As part of on site in-kind replacement of 504 ft of stream, we propose to follow the natural stream design that is included in the roadway plans. Plantings and structures, including Newberry riffles, log vane deflectors, boulder sills, and log drop structures. For more detail see the proposed roadway plans.

- ~~49 ft (620-571 ft) of stream credits has been generated by this impact.~~

Please see spreadsheet for mitigation.

Monitoring:

A monitoring report will be sent at a later date.

Alternatives

The preferred alternative is to utilize and widen the roadway sub-grade of the existing roadway facility for the proposed roadway improvements. The facility has been narrowed and slopes steepened to minimize impacts to surrounding natural resources. However, impacts to STR-22 will result due to the slope ratio required for safely traversable slopes. Steepening the roadway slopes from 3:1 to 2:1 was considered. However, doing so would require installation of guardrail and widening the roadway shoulders, effectively off-setting the majority of the reduced impact. Additionally, construction of a retaining wall was considered. However, due to additional shoulder required for guardrail installation and the impact area required to construct the wall, as well as the significant increase in construction costs, this alternative is also not practicable. Shifting the alignment to the north is not feasible due to the extensive channel relocation that would be required due to the proximity of Bitter Creek (STR-6). Additionally, although dramatically shifting the

alignment to the south would reduce impacts to STR-22, it would also require substantially more acquisition of right-of-way and grading costs due to the presence of an adjacent hill slope.

A non-degradation alternative was not feasible due to the need to widen the existing alignment in order to provide greater traffic capacity and safety for the travelling public. The proposed channel relocation for STR-22 will be designed so that the new channel mimics the characteristics of the existing channel and that tree and shrub plantings adjacent to the channel provide habitat and temperature control over time.

Permits Required	**Site Information**
TDEC: ARAP #24 **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-22, UT to Muddy Branch & WTL-14* **Proposed Impact Type:** *Utility Relocation (Power)* Latitude 36.0188°, Longitude 84.5270°
	Impact Description:
Sta. 354+50±, SR 29:	Install power pole

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
Due to the need to keep the line accessible for possible maintenance, maintain service to the surrounding area, and to widen the existing SR-29 roadway facility, no other alternative to these impacts is feasible.

Permits Required	**Site Information**
TDEC: ARAP #25 **Corps:** Non-notification **TVA:** Section 26a	**Feature Name:** *STR-22, UT to Muddy Branch.* **Proposed Impact Type:** *Utility Relocation (Water)* Latitude 36.0200°, Longitude 84.5263°
	Impact Description:
Sta. 354+50±, SR 29:	Install water line

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
At approximately Station 354+50, an existing 10-inch water main will be retired and

replaced with a new 12-inch water main. Near where the new main crosses the SR-29 alignment, the new main will be connected to an existing service to an adjacent property on the west side of the roadway. This connection crosses STR-22.

Due to the need to keep the line accessible for possible maintenance, maintain service to the surrounding area, and to widen the existing SR-29 roadway facility, no other alternative to these impacts is feasible.

Permits Required	**Site Information**
TDEC: ARAP #26 **Corps:** Nationwide #14 **TVA:** Section 26a	**Feature Name:** *WTL-14* **Proposed Impact Type:** *Wetland Fill / Excavation* Latitude 36.0183°, Longitude 84.5271°

	Impact Description:
Sta. 350+76 – 357+16, SR 29:	Temporary Impact: 0.00 ac Permanent Impact: 0.33 ac

Mitigation

Permanent Impact

~~We propose to mitigate the permanent wetland impact by debiting, at a 4:1 ratio, 1.32 acres from the Shady Valley Wetland Mitigation Bank.~~

Please see spreadsheet for mitigation.

Monitoring:

No monitoring is required for this impact.

Alternatives

The preferred alternative is to utilize and widen the roadway sub-grade of the existing roadway facility for the proposed roadway improvements. The facility has been narrowed and slopes steepened to minimize impacts to surrounding natural resources. However, impacts to WTL-14 will result due to the slope ratio required for safely traversable slopes. Steepening the roadway slopes from 3:1 to 2:1 was considered. However, doing so would require installation of guardrail and widening the roadway shoulders, effectively off-setting the majority of the reduced impact. Additionally, construction of a retaining wall was considered. However, due to additional shoulder required for guardrail installation and the impact area required to construct the wall, as well as the significant increase in construction costs, this alternative is also not practicable. Shifting the alignment to the north is not feasible due to the extensive channel relocation that would be required due to the proximity of Bitter Creek (STR-6). Additionally, although dramatically shifting the alignment to the south would reduce impacts to WTL-14, it would also require substantially more acquisition of right-of-way and grading costs due to the presence of an adjacent hill slope.

A non-degradation alternative was not feasible due to the need to widen the existing alignment in order to provide greater traffic capacity and safety for the travelling public.

Permits Required	**Site Information**
TDEC: ARAP #27 **Corps:** Nationwide #12 **TVA:** Section 26a	**Feature Name:** *WTL-14* **Proposed Impact Type:** *Utility Relocation (Water)* Latitude 36.0183°, Longitude 84.5271°

	Impact Description:
Sta. 354+25± LT, SR 29: Sta. 354+47± LT, SR 29:	Remove / retire water line Install water line

Mitigation
No mitigation required.

Monitoring:
No monitoring is required for this impact.

Alternatives
At approximately Station 354+50, an existing 10-inch water main will be retired and replaced with a new 12-inch water main. Near where the new main crosses the SR-29 alignment, the new main will be connected to an existing service to an adjacent property on the west side of the roadway. This connection crosses WTL-14.

Due to the need to keep the line accessible for possible maintenance, maintain service to the surrounding area, and to widen the existing SR-29 roadway facility, no other alternative to these impacts is feasible.

This project includes the permanent filling of ~~1.52~~ 0.53 acres of wetland, and the temporary filling of ~~0.10~~ 0.18 acre of wetland for construction/haul roads. We propose to mitigate the permanent wetland impacts by debiting, at a 2:1 ratio, ~~3.04~~ 1.06 acres from available wetland credits at the Walls Wetland Mitigation Site. Please refer to the following table, which provides additional clarification to the proposed mitigation:

As mitigation for ~~1,892 ft. (1,892 ft. x 1.0)~~ 470 ft. (470 ft. x 1.0) of stream encapsulation and length losses, we propose a payment of ~~$454,080~~ $112,800. A total payment of ~~$464,640~~ $112,800 is proposed to the In-Lieu Fee Stream Mitigation Program. **Please cite this payment to the TWRF in your permits.**

This project is currently scheduled for the June 18, 2014 turn-in. We would greatly appreciate your initial review and request for additional information needed, or issuance of the public notice, within 15 days of receipt of our application; and issuance of these permits as soon as possible.

Please see the complete application submitted on February 14, 2014, for supporting documentation.

If you have any questions or we can be of further assistance please contact me at (615) 253-2466 or DJ Wiseman at (615) 532-4554.

Sincerely,

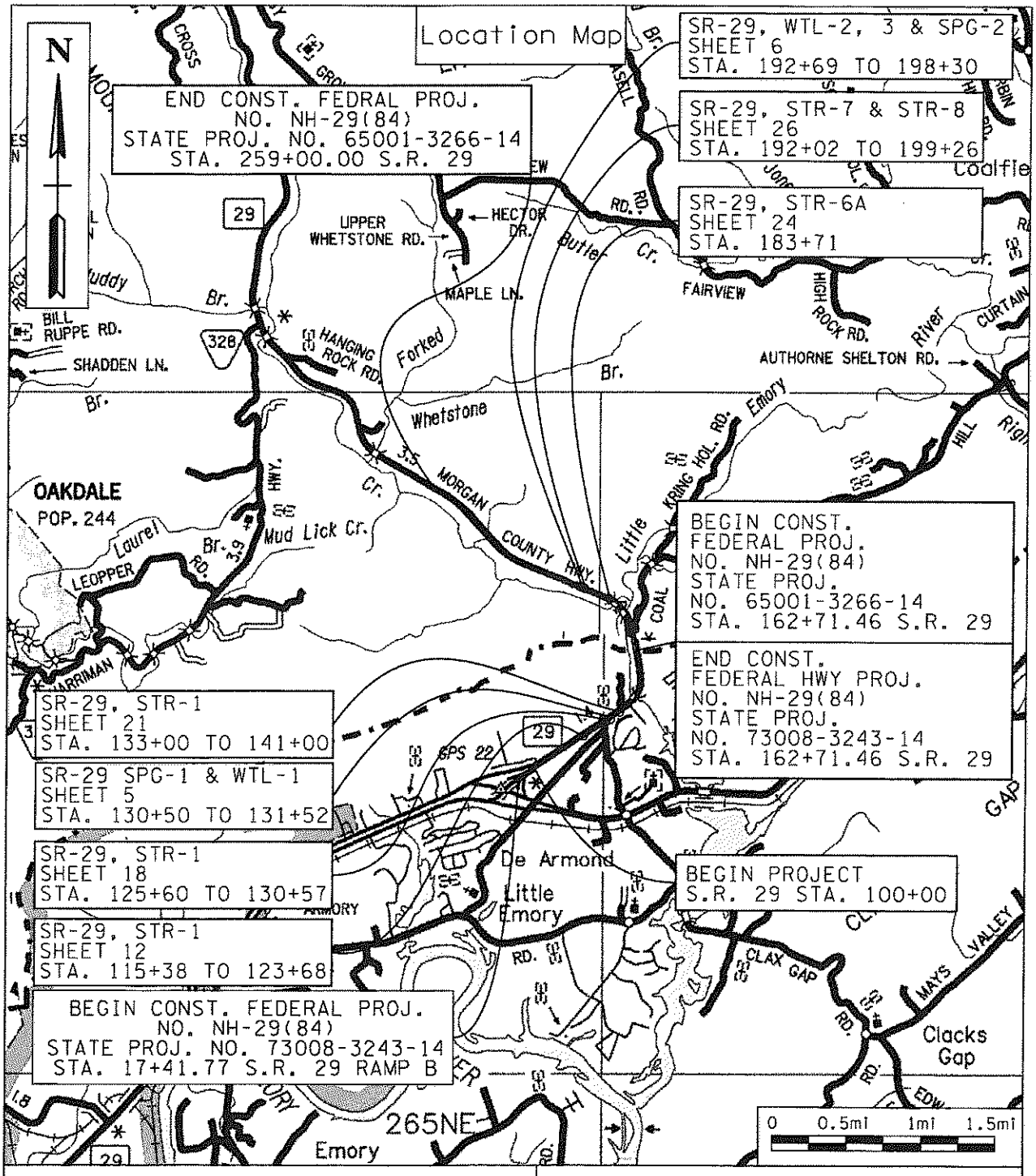
Melanie Bumpus

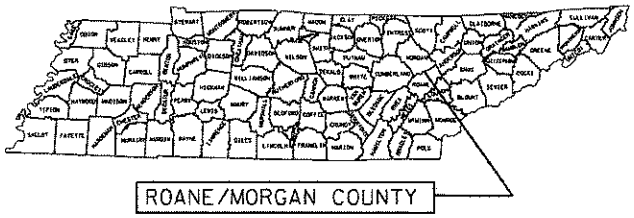
Melanie Bumpus, EI
Environmental Permits Section
Enclosures

JLH: MBB: DJW: pc

cc: *Via Hardcopy*
Ms. Tammy Turley, USACE
Ms. Kelly Baxter, TVA

Via Email
Ms. Jeanene Woodruff, TDEC
Ms. Kelly Baxter, TVA
Mr. Mike Russell, Project Management Office
Mr. Brandon Crowley, HQ (Region 1) Construction Office
Ms. Mary Howard, Region 1 Construction Office
Mr. Mark Doty, Region 1 Environmental Coordinator
Mr. Keven Brown, Region 1 Biologist
Mr. Matt Richards, HQ Ecology Section
Ms. R. Deedee Kathman, HQ Ecology Section
Mr. Baxter Wilson, TDOT Compliance
Mr. Hugh (Chip) Hannah, TDOT Compliance
Mr. John Hewitt, Natural Resources Office
Permit File



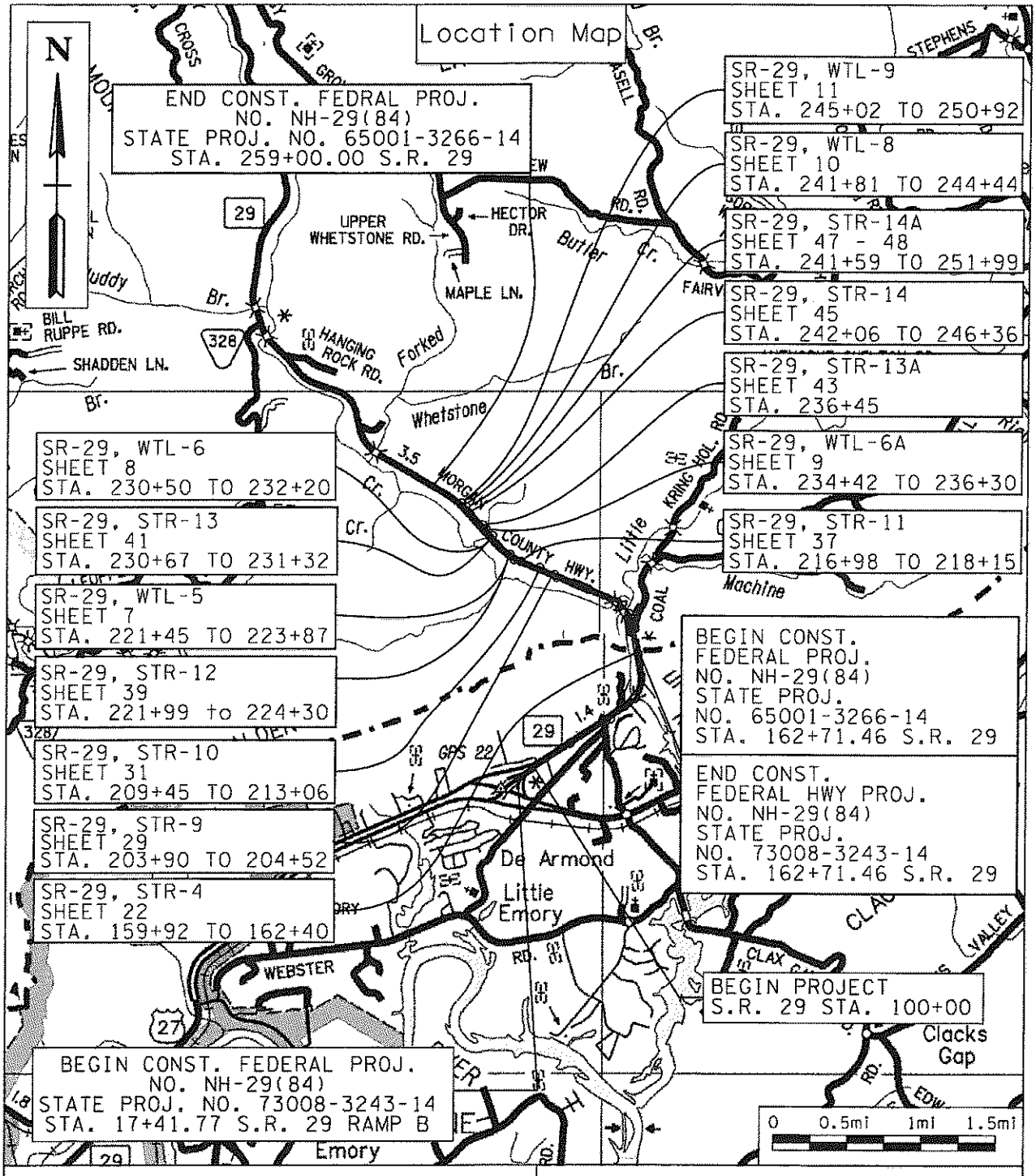


APPLICATION BY:

TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY FED. AID PROJ. NO. NH-29(84)
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE# 65001-1256-14, 73008-1237-14
PIN# 101411.04
S.R. 29 HARRIMAN/MORGAN COUNTY HWY
NEAR HARRIMAN, TENNESSEE

DATE: 03/04/2013 REVISED: / /

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
Sheet 1 of 79



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DATE: 03/04/2013 REVISED: / /

TDOT - SR-29, PIN 101411.04
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Morgan / Roane County, TN
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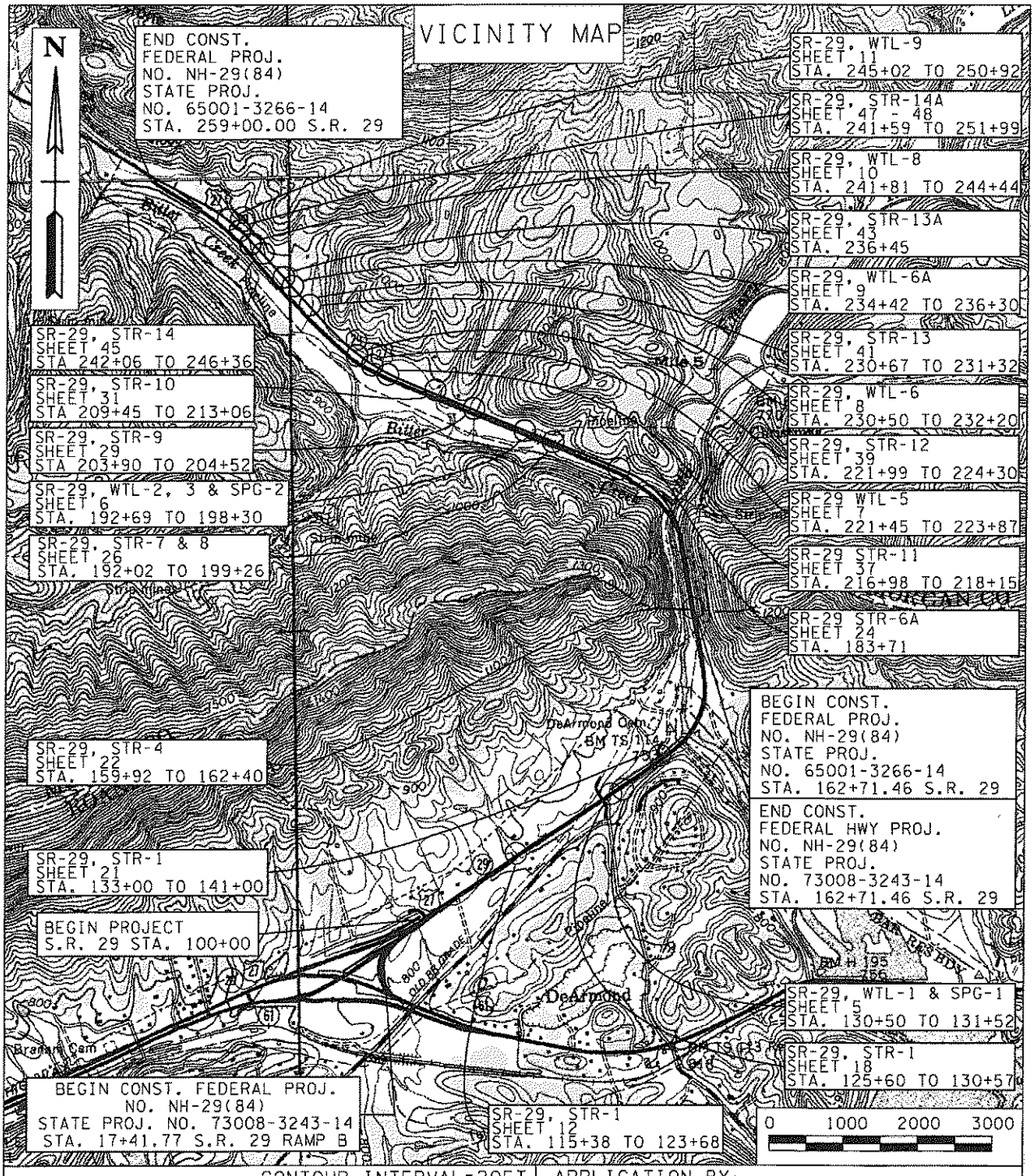
VICINITY MAP



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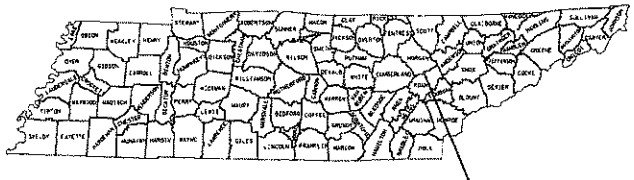

ROANE/MORGAN COUNTY

APPLICATION BY:

TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY FED. AID PROJ. NO. NH-29(84)
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE # 65001-1256-14, 73008-1237-14
PIN # 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUADS 123NE HARRIMAN, 130NW ELVERTON

DATE: 03/04/2013 REVISED: / /

TDOT - SR-29, PIN 101411.04
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Morgan / Roane County, TN
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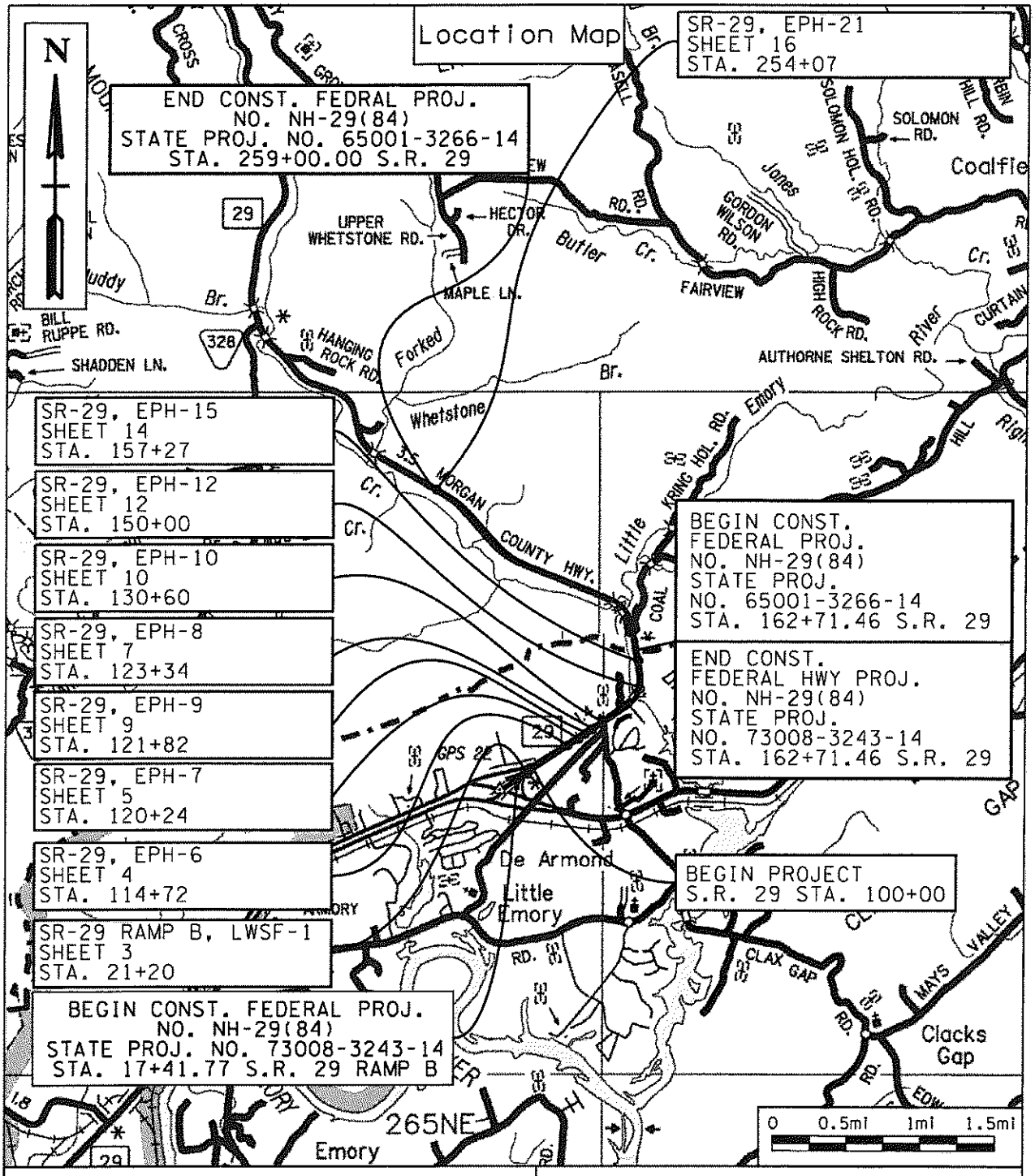

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MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE# 65001-1256-14, 73008-1237-14
PIN# 101411.04
S.R. 29 HARRIMAN/MORGAN COUNTY HWY
NEAR HARRIMAN, TENNESSEE

DATE: 06/02/2014 REVISED: / /

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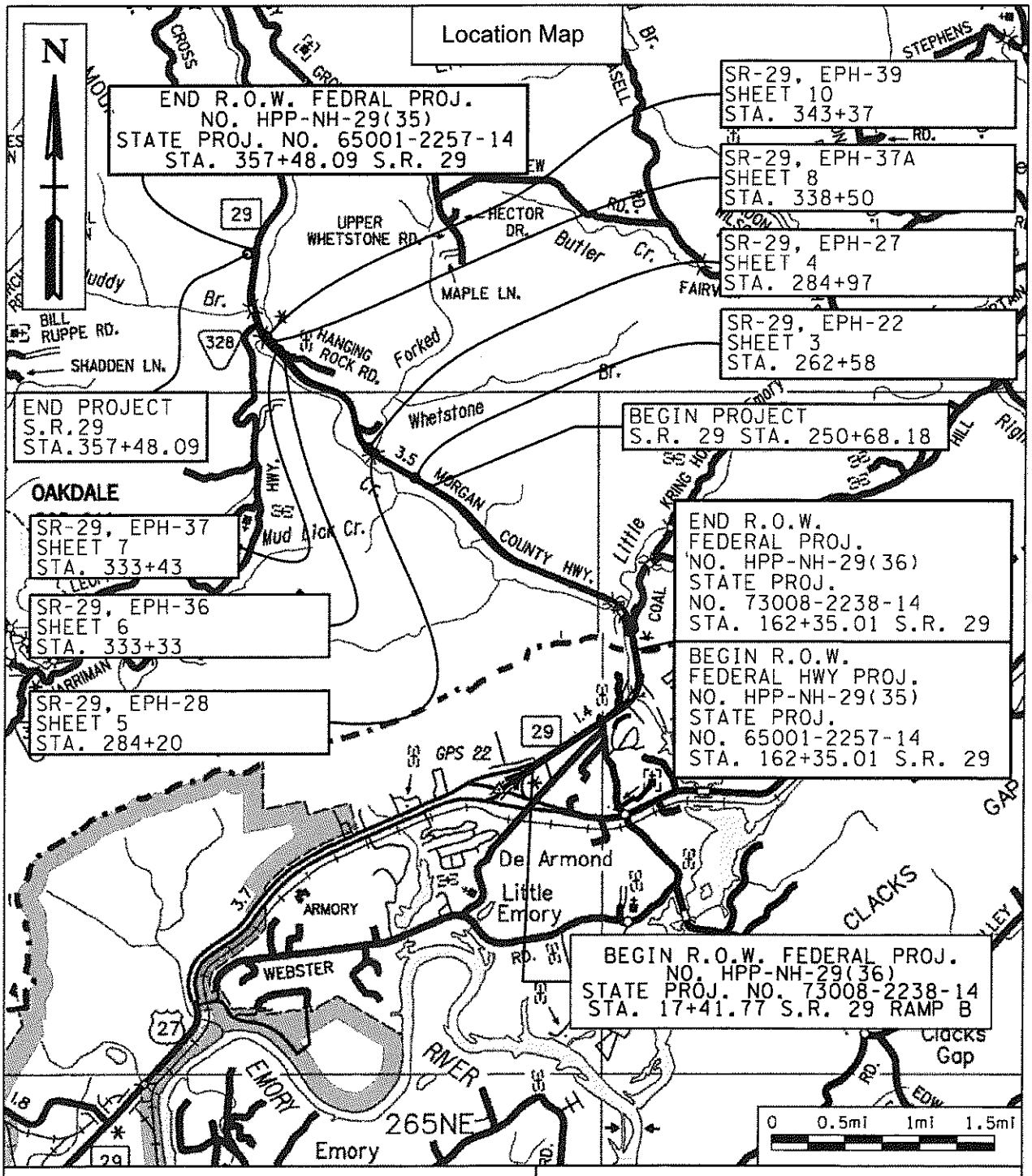

TDOT - SR-29, PIN 101411.04
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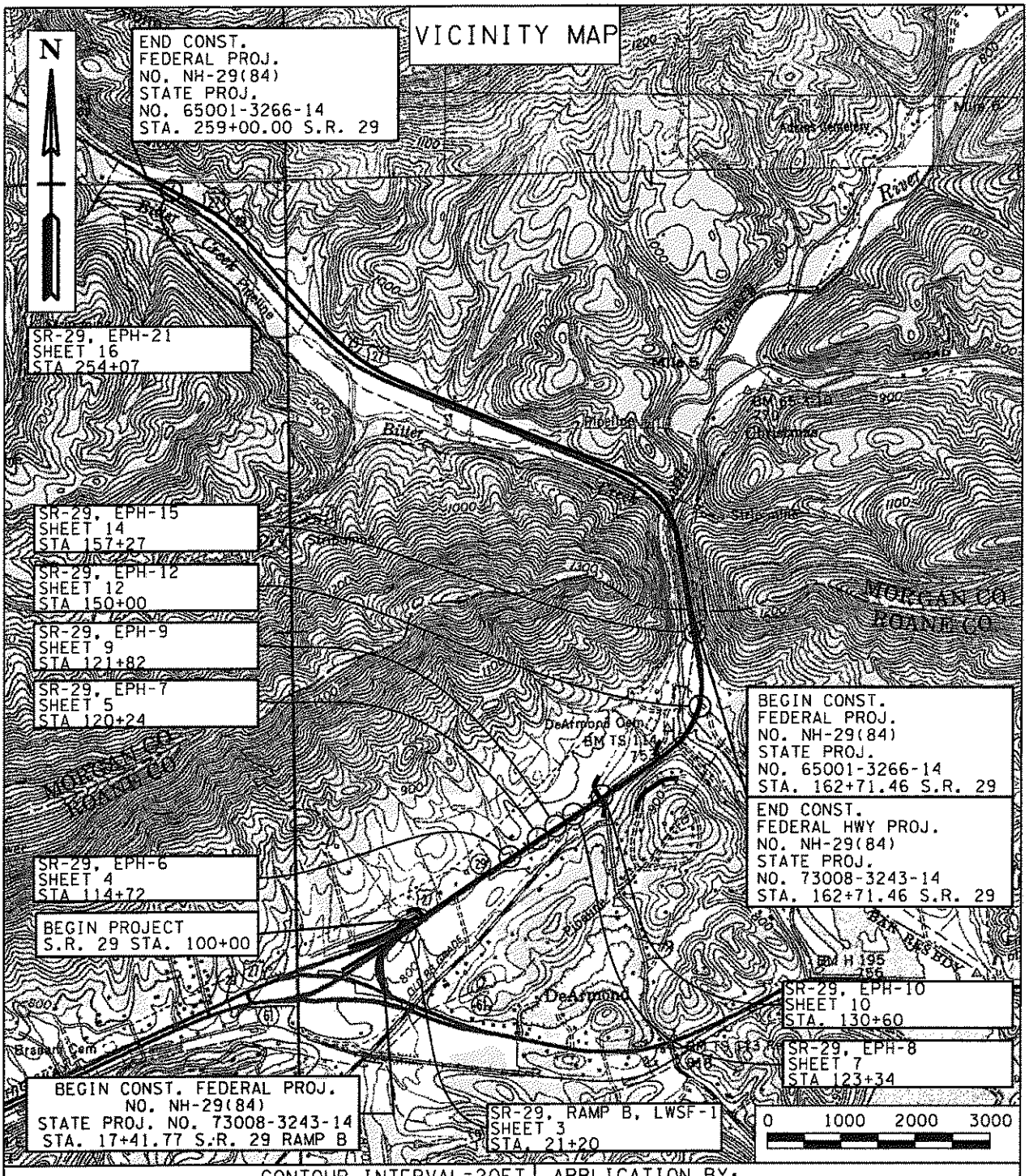
VICINITY MAP



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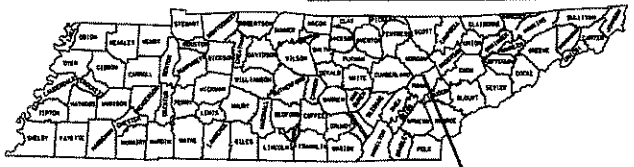

ROANE/MORGAN COUNTY

APPLICATION BY:

TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY FED. AID PROJ. NO. NH-29(84)
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE # 65001-1256-14, 73008-1237-14
PIN # 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUADS 123NE HARRIMAN, 130NW ELVERTON

DATE: 06/02/2014 REVISED: / /

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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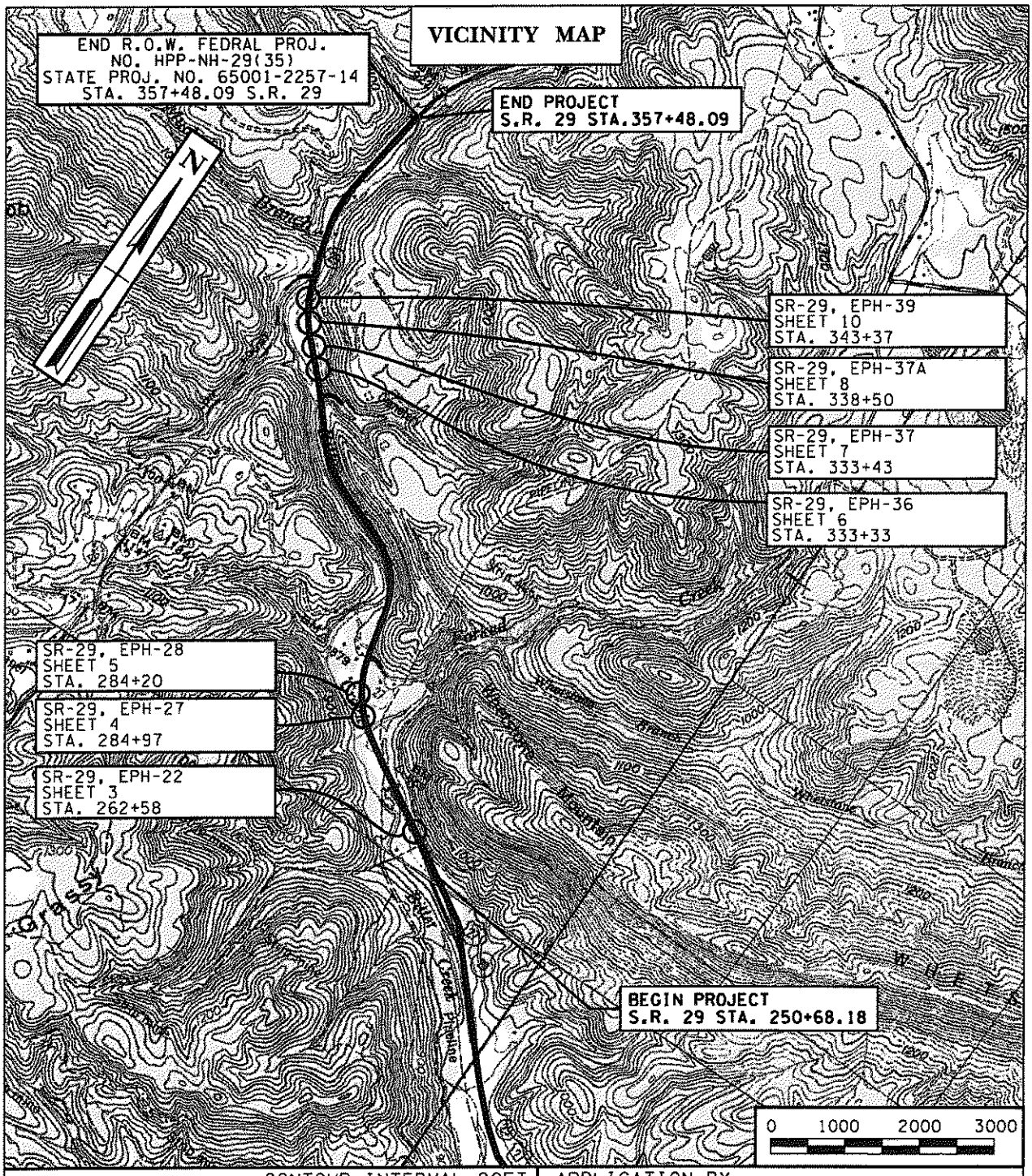

TDOT - SR-29, PIN 101411.04
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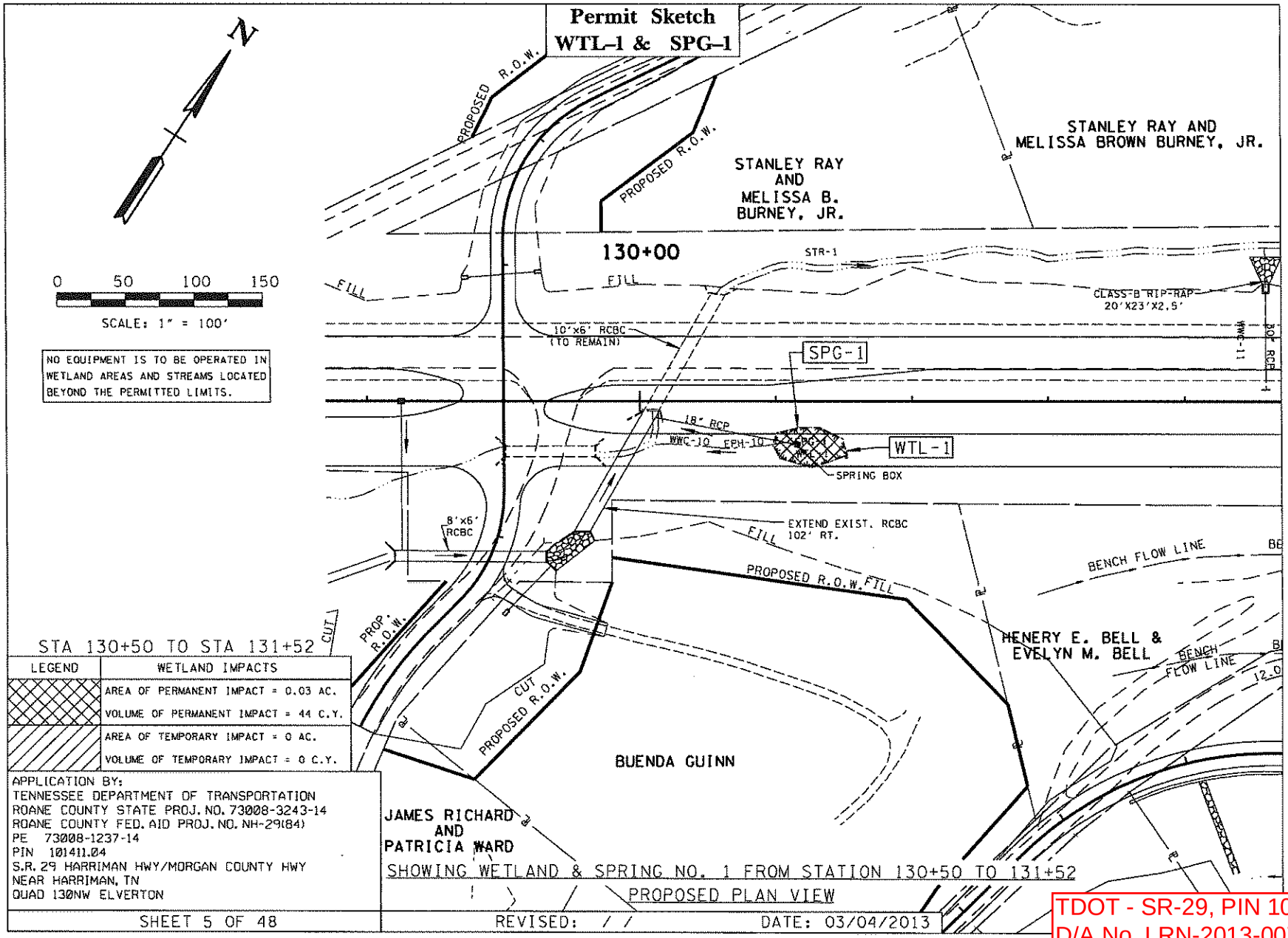

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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Permit Sketch
WTL–2, 3 & SPG–2

WTL-2 STA 192+69 TO STA 198+00	
LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.30 AC.
	VOLUME OF PERMANENT IMPACT = 484 C.Y.
	AREA OF TEMPORARY IMPACT = 0.00 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

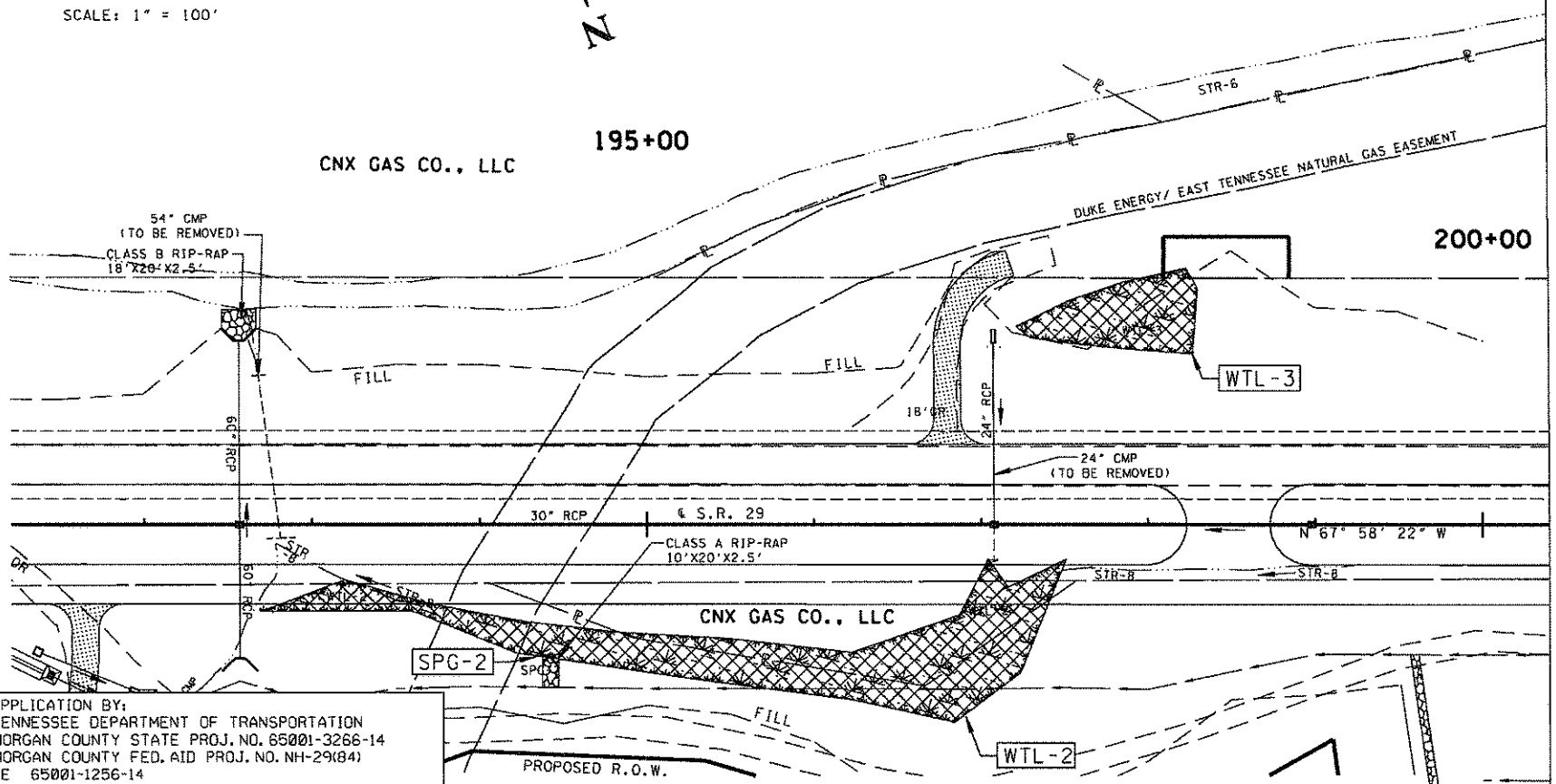
WTL-3 STA 197+90	
LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.07 AC.
	VOLUME OF PERMANENT IMPACT = 130 C.Y.
	AREA OF TEMPORARY IMPACT = 0.0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

0 50 100 150

SCALE: 1" = 100'

N



PROPOSED PLAN VIEW
SHOWING WETLAND NO. 2 & 3 FROM STATION 192+69 TO 198+30
SHOWING SPRING NO. 2 STATION 196+81

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 130NW ELVERTON

SHEET 6 OF 48 | REVISED: / / | DATE: 03/04/2013

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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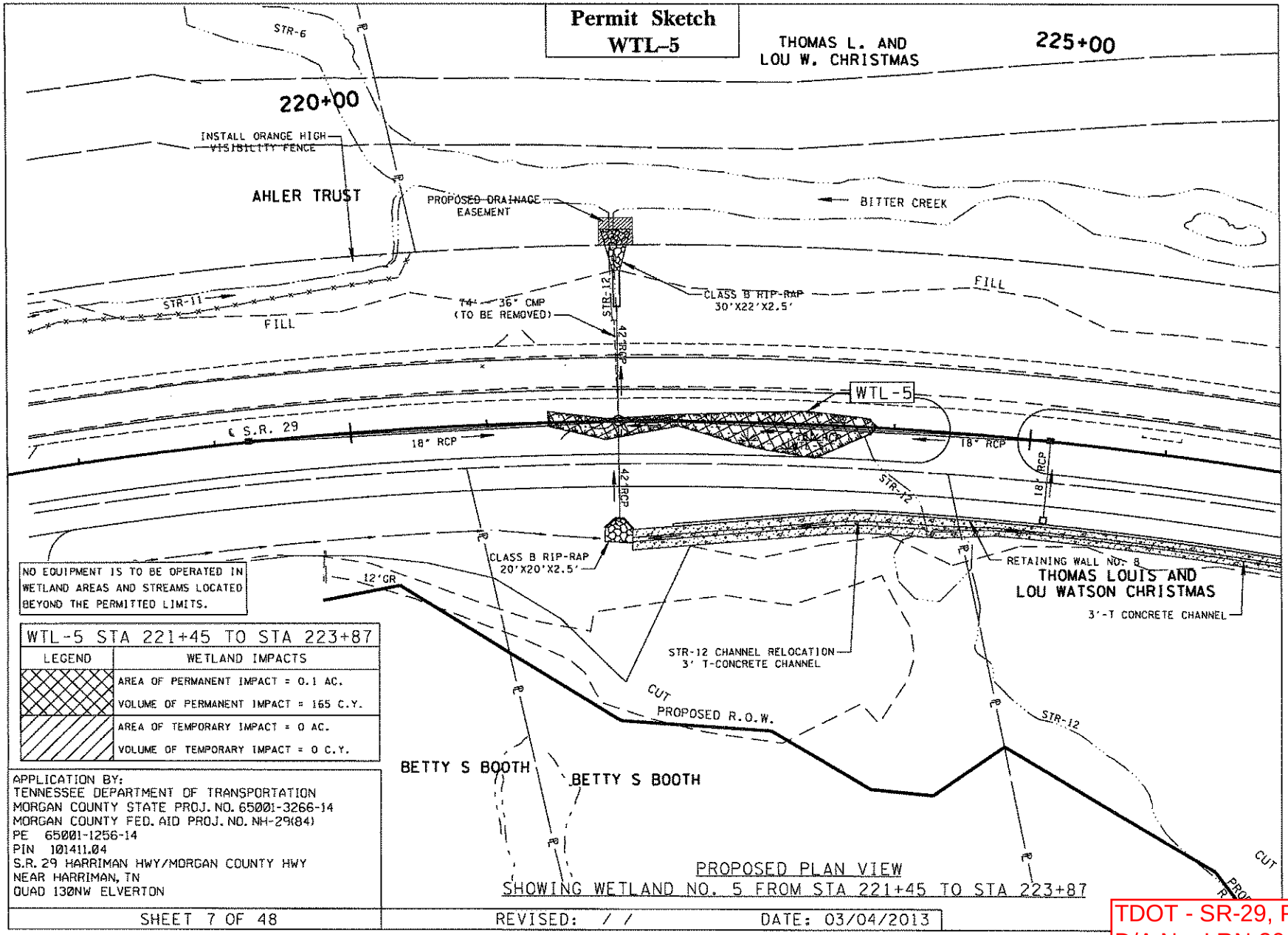


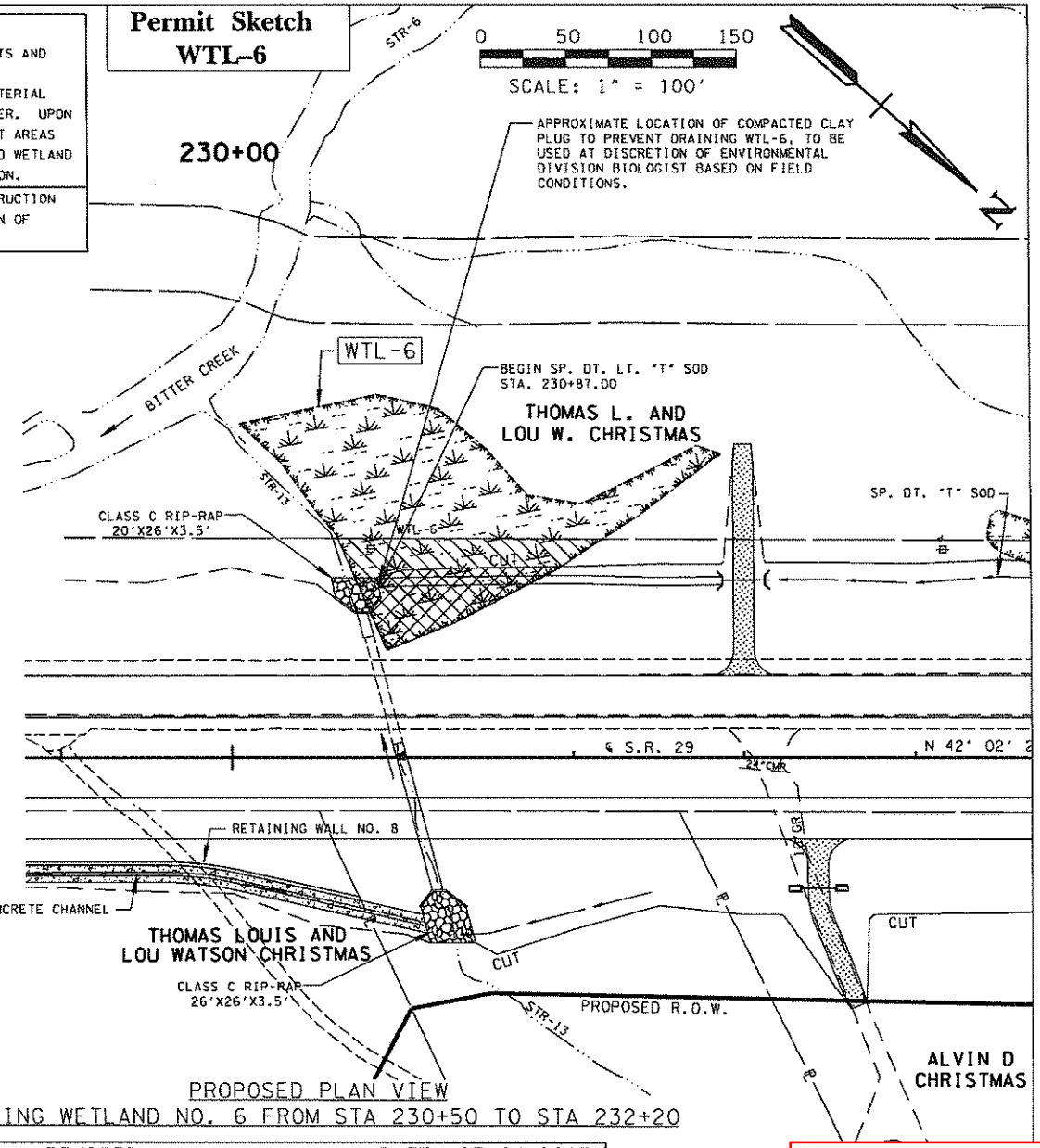
TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
Sheet 10 of 79

FOR WETLAND MITIGATION

TOPSOIL IS TO BE REMOVED FROM ALL AREAS OF TEMPORARY WETLAND IMPACTS AND STOCKPILED PRIOR TO CONSTRUCTION. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, TEMPORARY HAUL ROADS ARE TO BE REMOVED. EXCAVATED MATERIAL FROM THE HAUL ROADS IS TO BE DISPOSED OF AS DIRECTED BY THE ENGINEER. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, ALL TEMPORARY WETLAND IMPACT AREAS ARE TO BE RESTORED TO PRE-CONSTRUCTION CONTOURS AND THE STOCKPILED WETLAND TOPSOIL SPREAD TO RESTORE THESE AREAS TO PRE-CONSTRUCTION ELEVATION.

THE AREA OF TEMPORARY WETLAND IMPACT SHALL BE RESTORED TO PRECONSTRUCTION ELEVATION AND RESEEDED AS SOON AS POSSIBLE FOLLOWING THE COMPLETION OF CONSTRUCTION ACTIVITIES.

Permit Sketch
WTL-6



PROPOSED PLAN VIEW
SHOWING WETLAND NO. 6 FROM STA 230+50 TO STA 232+20

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

WTL-6 STA 230+50 TO STA 232+20

LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.068 AC.
	VOLUME OF PERMANENT IMPACT = 110 C.Y.
	AREA OF TEMPORARY IMPACT = 0.058 AC.
	VOLUME OF TEMPORARY IMPACT = 94 C.Y.

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 130NW ELVERTON

SHEET 8 OF 48 | REVISED: / / | DATE: 03/04/2013

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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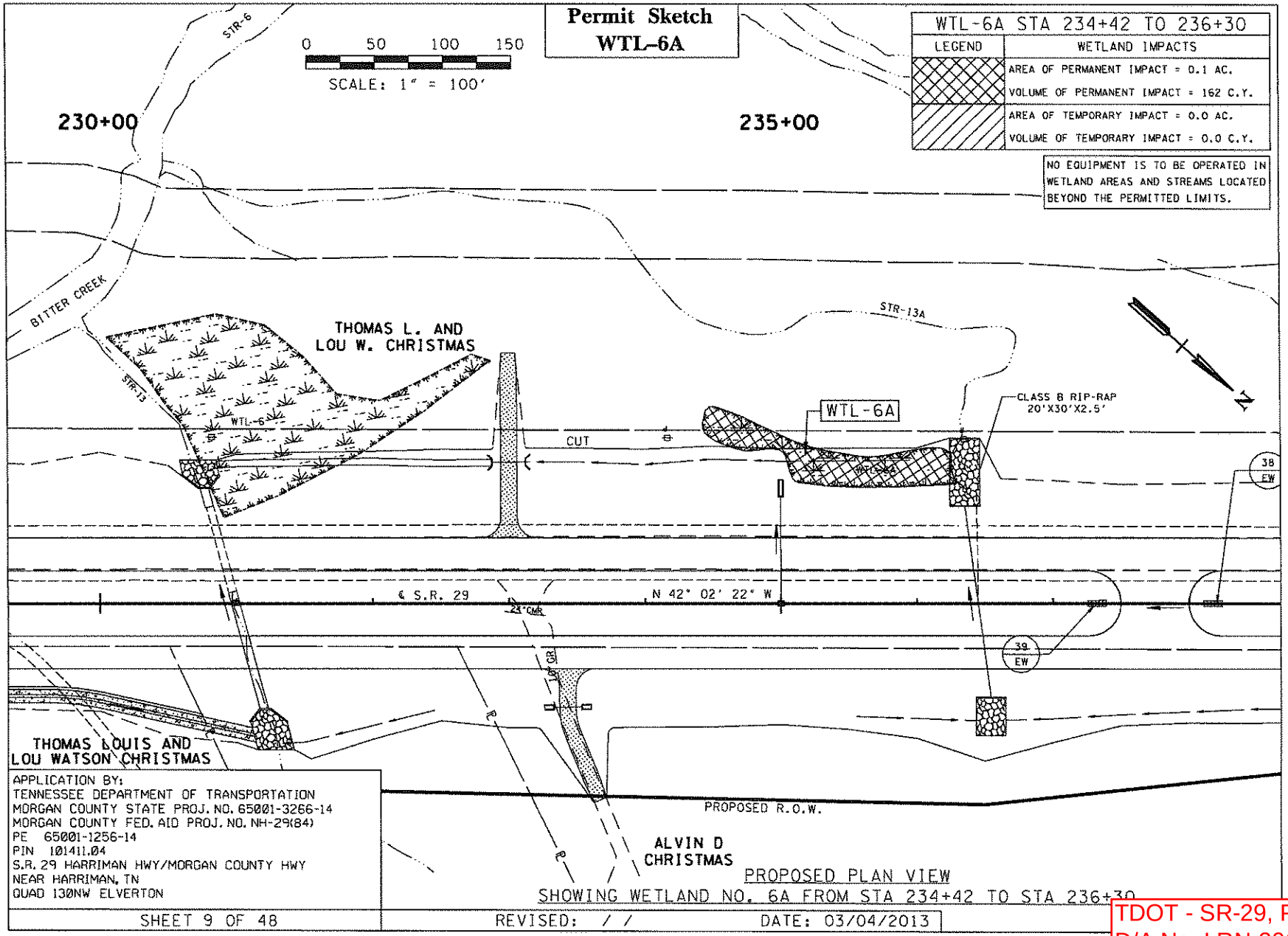


TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
Sheet 12 of 79

Permit Sketch
WTL–8

WTL-8 STA 241+81 TO 244+44	
LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.034 AC.
	VOLUME OF PERMANENT IMPACT = 55 C.Y.
	AREA OF TEMPORARY IMPACT = 0.041 AC.
	VOLUME OF TEMPORARY IMPACT = 66 C.Y.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT WTL-7 AND PORTIONS OF WTL-8 OUTSIDE THE FILL SLOPE WILL NOT BE DISTURBED AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS BEYOND THE PERMITTED LIMITS.

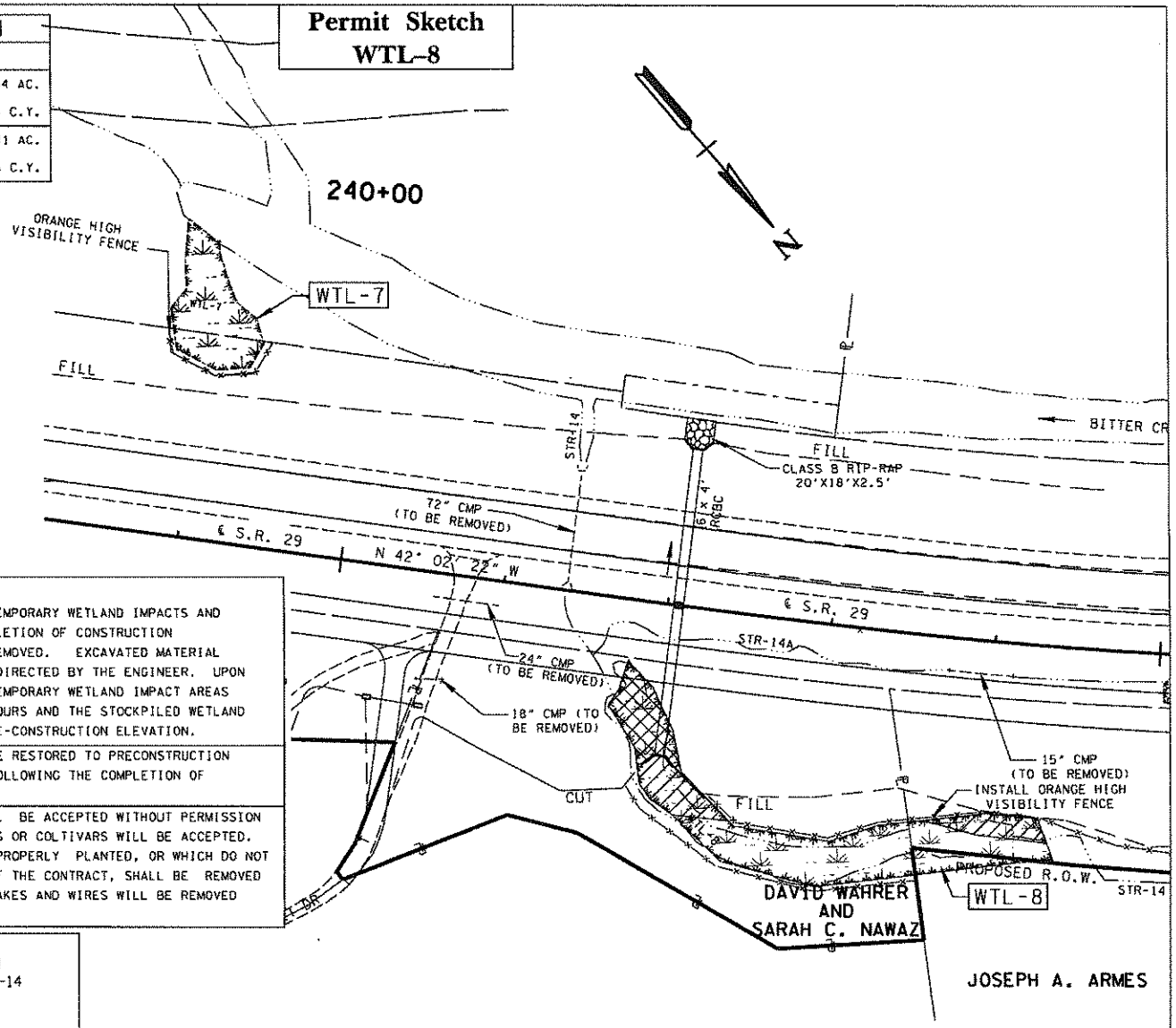
FOR WETLAND MITIGATION

TOPSOIL IS TO BE REMOVED FROM ALL AREAS OF TEMPORARY WETLAND IMPACTS AND STOCKPILED PRIOR TO CONSTRUCTION. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, TEMPORARY HAUL ROADS ARE TO BE REMOVED. EXCAVATED MATERIAL FROM THE HAUL ROADS IS TO BE DISPOSED OF AS DIRECTED BY THE ENGINEER. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, ALL TEMPORARY WETLAND IMPACT AREAS ARE TO BE RESTORED TO PRE-CONSTRUCTION CONTOURS AND THE STOCKPILED WETLAND TOPSOIL SPREAD TO RESTORE THESE AREAS TO PRE-CONSTRUCTION ELEVATION.

THE AREA OF TEMPORARY WETLAND IMPACT SHALL BE RESTORED TO PRECONSTRUCTION ELEVATION AND RESEEDED AS SOON AS POSSIBLE FOLLOWING THE COMPLETION OF CONSTRUCTION ACTIVITIES.

NO SUBSTITUTION FOR ANY OF THESE SPECIES WILL BE ACCEPTED WITHOUT PERMISSION FROM TDOT ENVIRONMENTAL DIVISION. NO CLONES OR COLTIVARS WILL BE ACCEPTED. ANY TREES FOUND TO BE INCORRECT SPECIES, IMPROPERLY PLANTED, OR WHICH DO NOT SURVIVE, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT, SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE. STAKES AND WIRES WILL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION.

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 123 NE HARRIMAN



PROPOSED PLAN VIEW
SHOWING WETLAND NO. 8 FROM STA 241+81 TO 244+44

0 50 100 150

SHEET 10 OF 48 | REVISED: / / | DATE: 03/04/2013

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
Sheet 13 of 79

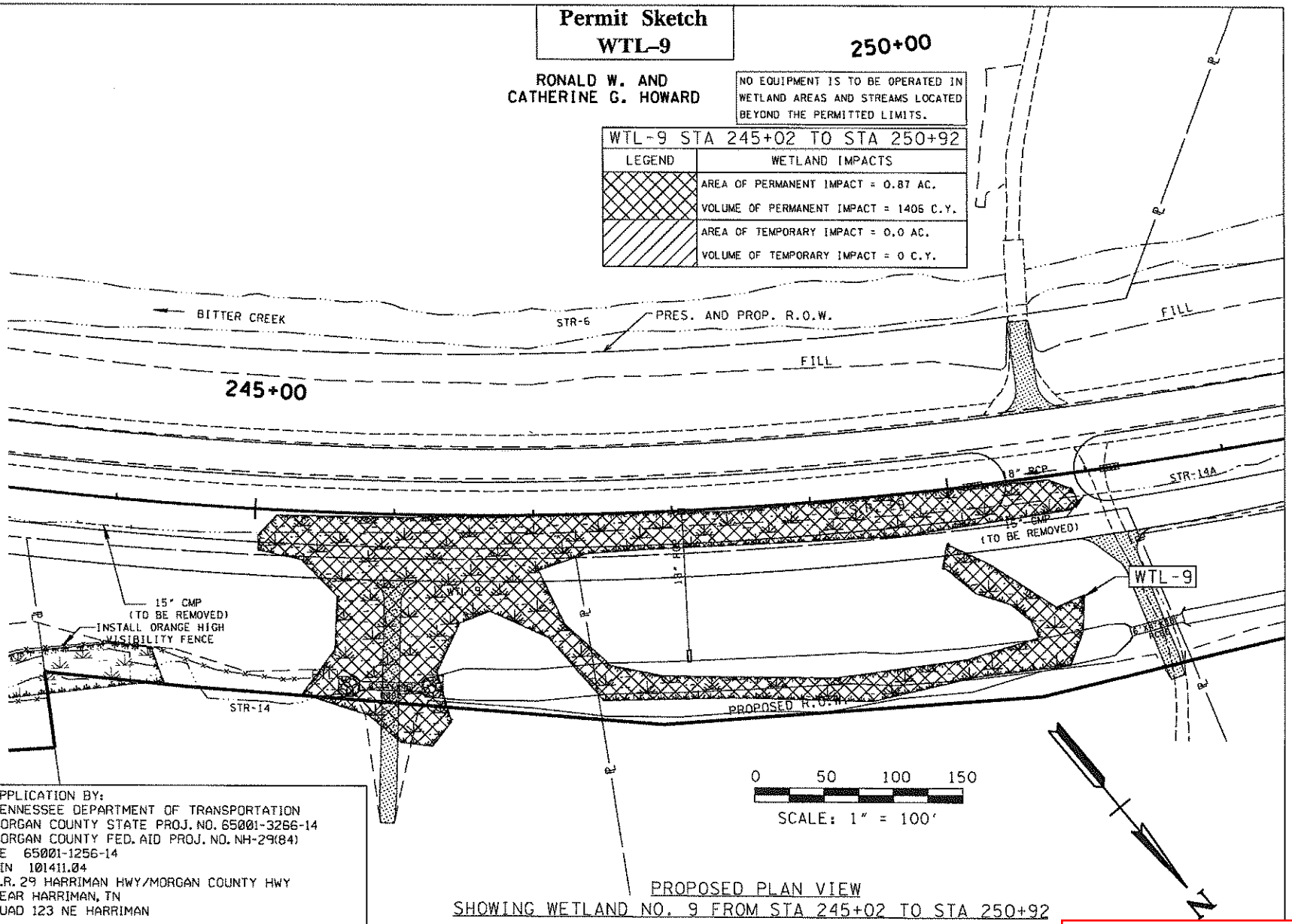
Permit Sketch
WTL–9

RONALD W. AND
CATHERINE G. HOWARD

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

WTL-9 STA 245+02 TO STA 250+92

LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.87 AC.
	VOLUME OF PERMANENT IMPACT = 1406 C.Y.
	AREA OF TEMPORARY IMPACT = 0.0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.



APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 123 NE HARRIMAN

PROPOSED PLAN VIEW
SHOWING WETLAND NO. 9 FROM STA 245+02 TO STA 250+92

SHEET 11 OF 48 | REVISED: / / | DATE: 03/04/2013

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Morgan / Roane County, TN
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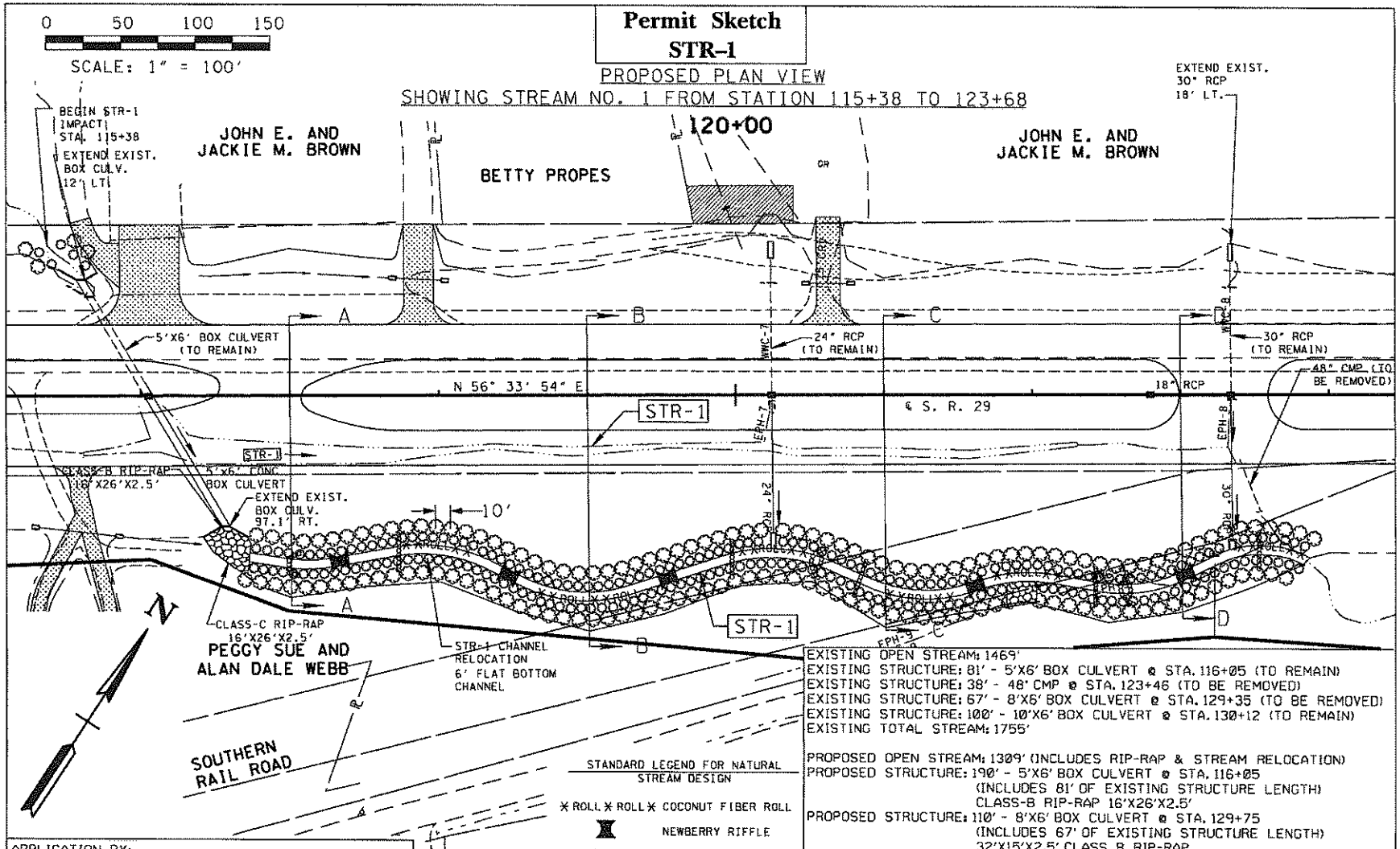
PROPOSED PLAN VIEW
SHOWING STREAM NO. 1 FROM STATION 115+38 TO 123+68



STANDARD LEGEND FOR NATURAL STREAM DESIGN

- ROLL ROLL COCONUT FIBER ROLL
- NEWBERRY RIFFLE
- LOG VANE DEFLECTOR
- CROSS VANE
- STEP POOL
- BOULDER SILL
- LOG DROP STRUCTURE

EXISTING OPEN STREAM: 1469'
EXISTING STRUCTURE: 81' - 5'X6' BOX CULVERT @ STA. 116+05 (TO REMAIN)
EXISTING STRUCTURE: 38' - 48' CMP @ STA. 123+46 (TO BE REMOVED)
EXISTING STRUCTURE: 67' - 8'X6' BOX CULVERT @ STA. 129+35 (TO BE REMOVED)
EXISTING STRUCTURE: 100' - 10'X6' BOX CULVERT @ STA. 130+12 (TO REMAIN)
EXISTING TOTAL STREAM: 1755'

PROPOSED OPEN STREAM: 1309' (INCLUDES RIP-RAP & STREAM RELOCATION)
PROPOSED STRUCTURE: 190' - 5'X6' BOX CULVERT @ STA. 116+05
(INCLUDES 81' OF EXISTING STRUCTURE LENGTH)
CLASS-B RIP-RAP 16'X26'X2.5'
PROPOSED STRUCTURE: 110' - 8'X6' BOX CULVERT @ STA. 129+75
(INCLUDES 67' OF EXISTING STRUCTURE LENGTH)
32'X15'X2.5' CLASS B RIP-RAP
PROPOSED STRUCTURE: 202' - 10'X6' BOX CULVERT @ STA. 130+12
(INCLUDES 100' OF EXISTING STRUCTURE LENGTH)
BANK STABILIZATION/OUTFALL STRUCTURES:
OUTFALL STRUCTURE: 11' - OUTLET ENDWALL @ STA. 120+25 RT
OUTFALL STRUCTURE: 7' - OUTLET ENDWALL @ STA. 123+34 RT
OUTFALL STRUCTURE: 7' - OUTLET ENDWALL @ STA. 134+60 LT
20'X23'X2.5' CLASS B RIP-RAP
OUTFALL STRUCTURE: 9.5' - OUTLET ENDWALL @ STA. 137+00 LT
11'X13'X2.5' CLASS B RIP-RAP
STREAM RELOCATION: 1065' (INCLUDES RIP-RAP)
PROPOSED TOTAL STREAM: 1811'

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
ROANE COUNTY FED. AID PROJ. NO. NH-29(84)
PE 73008-1237-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 130NW ELVERTON

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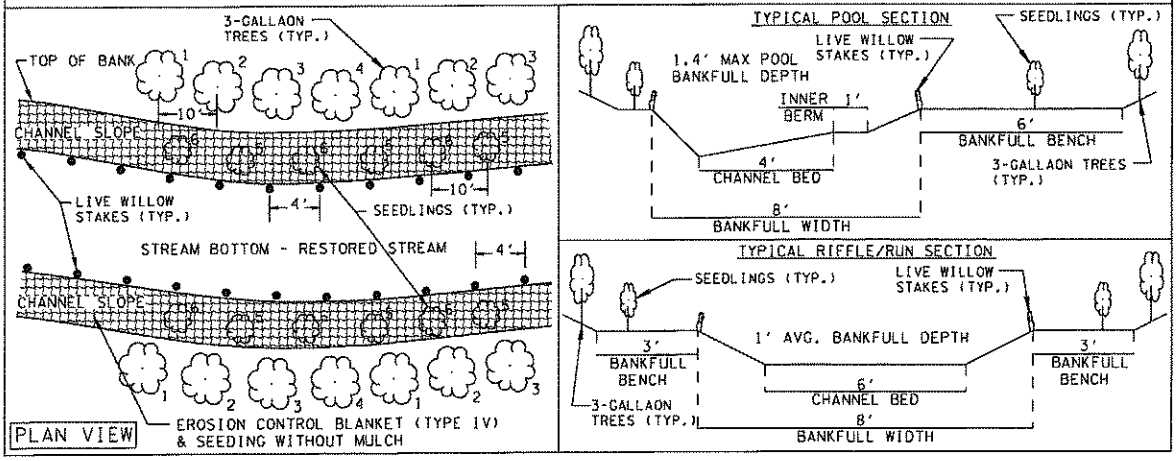
ESTIMATED STREAM QUANTITIES - STREAM-1			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
802-11.16	1 FRAXINUS PENNSYLVANICA (GREEN ASH) 3 GALLON CONTAINER-GROWN	EACH	53
802-11.19	2 LIRIODENDRON TULIPIFERA (TULIP POPLAR) 3-GALLON CONTAINER-GROWN	EACH	53
802-11.02	3 ACER RUBRUM (RED MAPLE) 3-GALLON CONTAINER-GROWN	EACH	53
802-11.26	4 PLATANUS OCCIDENTALIS (AMERICAN SYCAMORE) 3 GALLON CONTAINER-GROWN	EACH	53
802-02.01	5 ALNUS SERRULATA (HAZEL ALDER), 18-24 INCH BARE ROOT SEEDLINGS	EACH	108
802-02.02	6 ASIMINA TRILOBA (PAWPAW) 18-24 INCH BARE ROOT SEEDLINGS	EACH	108
201-01	CLEARING AND GRUBBING	LS	N/A
203-01.79	BACKFILL	CY	N/A
203-08	CHANNEL EXCAVATION (UNCLASSIFIED)	CY	N/A
209-03.35	STREAM MITIGATION - LOG DROP STRUCTURES	EACH	3
209-03.36	STREAM MITIGATION - STEP POOL	EACH	2
	STREAM MITIGATION - BOULDER SILL	EACH	4
	STREAM MITIGATION - SINGLE LOG VANE DEFLECTOR	EACH	0
	STREAM MITIGATION - NEWBERRY RIFFLE	EACH	5
209-03.37	STREAM MITIGATION - CROSS VANE STRUCTURE	EACH	1
	STREAM MITIGATION - COIR ROLLS	LF	650
209-03.44	STREAM MITIGATION - WILLOW POLES (WILLOW, ELDERBERRY, OR SILKY DOGWOOD	EACH	654
209-08.02	TEMPORARY SILT FENCE (WITH BACKING) FOR OLD CHANNEL	LF	650
209-65.01	TEMPORARY STREAM DIVERSION (PUMP AROUND)	LS	1
209-95.02	TEMPORARY STREAM DIVERSION (PIPE AROUND)	LS	1
209-65.14	TEMPORARY STREAM DIVERSION (IN CHANNEL)	LS	1
(1) 801-01.34	GRASS SEED MIX (RPNZN/FLPL)	UNIT	28.5
(1) 801-01.30	COVER CROP SEED MIX (RIPZN/FLPL) W/MULCH	UNIT	65.5
805-12.04	EROSION CONTROL BLANKET (TYPE IV)	SY	600
805-12.08	700 GRAM COIR FIBER EROSION CONTROL BLANKET	SY	600
709-05.83	CLASS A-1 RIP-RAP	TON	20

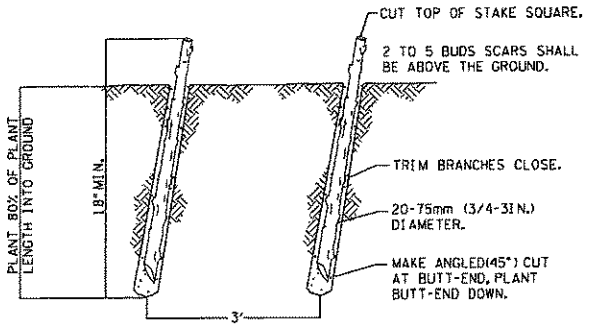
NOTES:
NO SUBSTITUTION FOR ANY OF THESE SPECIES WILL BE ACCECPTED WITHOUT PERMISSION FROM TDOT ENVIRONMENTAL PLANNING AND PERMITS DIVISION. NO CLONES OR COLTIVARS WILL BE ACCEPTED. ANY TREES FOUND TO BE INCORRECT SPECIES, IMPROPERLY PLANTED, OR WHICH DO NOT SURVIVE, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT, SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENCE. STAKES AND WIRES WILL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION.

FOOTNOTES:

1. PLANTING RATE FOR ITEM NO. 801-01.34 IS 40lbs/ac. PLANTING. RATE FOR ITEM NO. 801-01.30 IS 100lbs/ac.

TYPICAL CHANNEL RESTORATION & TREE PLANTING DETAIL FOR STREAM RELOCATIONS





DETAIL:
LIVE STOUT STAKES SHOULD BE LONG ENOUGH TO REACH BELOW THE GROUNDWATER TABLE. (GENERALLY, A LENGTH OF 2 TO 3 FEET) ADDITIONALLY, THE STAKES SHOULD HAVE A DIAMETER IN THE RANGE OF 0.75 TO 3.0 INCHES.

NOTES:
1. HARVEST AND PLANT STAKES DURING THE DORMANT SEASON.
2. USE HEALTHY, STRAIGHT AND LIVE WOOD AT LEAST 1 YEAR OLD.
3. MAKE CLEAN CUTS AND DO NOT DAMAGE STAKES OR SPLIT ENDS DURING INSTALLATION; USE AN IRON BAR AND PILOT HOLE IN FIRM SOILS.
4. SOAK CUTTINGS FOR AT LEAST 24 HOURS PRIOR TO INSTALLATION. SOAK FOR 5-7 DAYS FOR BEST RESULTS.
5. TAMP THE SOIL AROUND THE STAKE.

LIVE STAKES
N.T.S.

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PROPOSED MORPHOLOGY FOR STREAM 1 (STA. 125+60 – 128+10)

PARAMETER	STREAM 1	
	MIN	MAX
MEAN DEPTH @ BANKFULL (BKF)[1] (FT)	0.8	
WETTED POOL DEPTH @ BASEFLOW (FT)	4	5
MAX POOL DEPTH @ BKF (FT)	1.2	1.8
POOL WIDTH @ BKF (FT)	7	10
POOL LENGTH (FT)	3	10
SLOPE POOL (FT/FT)	0	
RUN LENGTH @ BKF (FT)	80	80
RUN WIDTH @ BKF (FT)	8	
RUN DEPTH @ BKF (FT)	1	
SLOPE RUN (FT/FT)	0.5%	
RIFFLE LENGTH @ BKF (FT)	N/A	
RIFFLE WIDTH @ BKF (FT)	N/A	
RIFFLE DEPTH @ BKF (FT)	N/A	
SLOPE RIFFLE (FT/FT)	N/A	
RIFFLE DMIN, D50[2], DMAX (IN)	N/A	
DROP FOR LOG DROP STRUCTURE (FT)	0.25	

[1] AVERAGE DEPTH ACROSS SECTION AT BANKFULL.
[2] D50 IS THE AVERAGE SUBSTRATE SIZE OBSERVED AT FEATURE (I.E., RIFFLE, RUN, POOL) IN EXISTING CHANNEL. PROPOSED CHANNEL FEATURES SHOULD BE CONSTRUCTED WITH SUBSTRATE FROM THE EXISTING CHANNEL. PROPOSED NEWBURY RIFFLES MAY BE ALSO CONSTRUCTED USING CLASS A1 RIPRAP; HOWEVER, CONTRACTOR SHOULD BE CAREFUL WHEN SELECTING APPROPRIATE SUBSTRATE DIAMETER SIZES.

PROPOSED MORPHOLOGY FOR STREAM 1 (STA. 116+73 – 123+85)

PARAMETER	STREAM 1	
	MIN	MAX
MEAN DEPTH @ BANKFULL (BKF)[1] (FT)	0.8	
WETTED POOL DEPTH @ BASEFLOW (FT)	4	5
MAX POOL DEPTH @ BKF (FT)	1.2	1.8
POOL WIDTH @ BKF (FT)	7	10
POOL LENGTH (FT)	3	10
SLOPE POOL (FT/FT)	0	
RUN LENGTH @ BKF (FT)	20	70
RUN WIDTH @ BKF (FT)	8	
RUN DEPTH @ BKF (FT)	1	
SLOPE RUN (FT/FT)	0.7%	2.29%
RIFFLE LENGTH @ BKF (FT)	5	15
RIFFLE WIDTH @ BKF (FT)	5	7
RIFFLE DEPTH @ BKF (FT)	0.9	1.0
SLOPE RIFFLE (FT/FT)	3%	6%
RIFFLE DMIN, D50[2], DMAX (IN)	1, 3, 5	
AVG. DROP FOR CROSS VANE, LOG DROPS, AND SINGLE LOG VANE (FT)	0.5	
AVG. DROP FOR BOULDER SILLS (FT)	0.3	
TOTAL DROP STEP POOLS (FT)	0.8	

[1] AVERAGE DEPTH ACROSS SECTION AT BANKFULL.
[2] D50 IS THE AVERAGE SUBSTRATE SIZE OBSERVED AT FEATURE (I.E., RIFFLE, RUN, POOL) IN EXISTING CHANNEL. PROPOSED CHANNEL FEATURES SHOULD BE CONSTRUCTED WITH SUBSTRATE FROM THE EXISTING CHANNEL. PROPOSED NEWBURY RIFFLES MAY BE ALSO CONSTRUCTED USING CLASS A1 RIPRAP; HOWEVER, CONTRACTOR SHOULD BE CAREFUL WHEN SELECTING APPROPRIATE SUBSTRATE DIAMETER SIZES.

ENVIRONMENTAL - ECOLOGY

1. THE NEW CHANNEL MUST BE CONSTRUCTED TO ALLOW NATIVE STONE (BOULDERS, COBBLES, ETC.) FROM THE EXISTING CHANNEL TO BE HARVESTED FOR PLACEMENT IN THE NEW CHANNEL.

2. THE FOLLOWING IS THE RECOMMENDED CONSTRUCTION SEQUENCE:

   A. FLAG EDGE OF THE NEW CHANNEL TOP BANK PRIOR TO CLEARING. DO NOT CLEAR LARGE TREES IN POSITION TO SHADE THE NEW CHANNEL. LEAVE AS MANY TREES AND SHRUBS AS POSSIBLE AS A STREAM BUFFER.
   B. EXCAVATE CHANNEL "IN THE DRY" LEAVING AREAS OF UNDISTURBED EARTH AT BOTH ENDS.
   C. INSTALL GRAVITY BYPASS PIPE FOR EXISTING STR-1.
   D. SHAPE CHANNEL TO SPECIFICATIONS SHOWN. REMOVE LOOSE SOILS AND DEBRIS.
   E. IF SUFFICIENT NATIVE STONE (AS APPROVED BY ENGINEER) IS NOT ENCOUNTERED WITHIN THE NEW CHANNEL EXCAVATION, THEN EXCAVATE NATIVE STONE FROM EXISTING STR-1.
   F. PLACE TOPSOIL, SEED & EROSION CONTROL BLANKET AS SPECIFIED.
   G. REMOVE DIVERSION BERMS, BEGINNING WITH THE MOST DOWNSTREAM BERM. BANKS AND BOTTOM ELEVATION OF THE OLD CHANNEL SHOULD TRANSITION SMOOTHLY INTO THE NEW CHANNEL. THE ELEVATIONS OF THE NEW CHANNEL BOTTOM AT EACH END OF THE RELOCATION SEQUENCE SHOULD MATCH THE ELEVATIONS OF THE EXISTING CHANNEL, AND A STEADY PERCENT SLOPE SHOULD BE MAINTAINED THROUGHOUT THE RELOCATED CHANNEL CENTERLINE OR AS SPECIFIED.
   H. INSTALL TREES ACCORDING TO DETAIL.

3. CONTRACTOR IS ENCOURAGED TO EXCAVATE THE MAIN PROFILE OF THE NEW CHANNEL FIRST, THEN, AS DROP STRUCTURES ARE CONSTRUCTED WITHIN THE NEW CHANNEL, POOLS CAN BE EXCAVATED ACCORDING TO THE TYPICAL PROFILE FOR THE GIVEN STR-1.

4. STABILIZE THE BANKS OF THE NEW CHANNEL WITH SEED AND COIR EROSION CONTROL BLANKET BEFORE ANTICIPATED RAINFALL.

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5. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. LIVE STAKES, BIOENGINEERING MEASURES, SEEDING, AND SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW-WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.

6. REQUESTS BY ANY AGENCY THAT WOULD REQUIRE THE MODIFICATION OF CHANNELS, DITCHES, ELEVATIONS, RIP-RAP OR ANY OTHER STREAM MITIGATION ITEMS ASSOCIATED WITH THE CHANNEL RELOCATIONS SHALL BE REFERRED TO THE PROJECT ENGINEER.

SPECIAL NOTES

1. THIS IS A STREAM RELOCATION PROJECT THAT IS TO BE DONE IN ACCORDANCE WITH 404/401 WATER QUALITY CERTIFICATION.

2. ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE WITH SEED/STRAW MULCH OR HYDROSEED UNLESS OTHERWISE NOTED IN THE PLANS OR BY THE ENGINEER.

TREES & SHRUBS:

NO SUBSTITUTIONS OF TREE SPECIES OR SIZES SHALL - BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER/LANDSCAPE ARCHITECT. CONCERNING STREAM MITIGATION, TREES SHALL BE OF THE VARIETY REQUESTED, BARE ROOT (ROOTS MUST BE KEPT MOIST AT ALL TIMES), AND FIRST QUALITY. ANY FOUND TO BE INCORRECT SPECIES, OR IMPROPERLY PLANTED, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. STAKES AND WIRES SHALL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER.

TREE SPECIES SHOULD BE 3-GALLON CONTAINER GROWN OR BALL AND BURLAP STOCK. TREES SHOULD BE PLACED ON 10-FOOT CENTERS. SHRUB SPECIES (ALDER AND PAW PAW) SHOULD BE 1-GALLON OR SEEDLINGS AND SHOULD BE PLACED ON 10-FT CENTERS. LIVE STAKE ELDERBERRY, SILKY DOGWOODS AND/OR BLACK WILLOWS WILL ALSO BE USED ALONG THE STREAMBANK. CONSTRUCTION SPECIFICATIONS FOR LIVE STAKES.

1. HARVESTING:

A. LIVE STAKES MAY CONSIST OF A COMBINATION OF SILKY DOGWOOD AND ELDERBERRY.

B. STAKES SHOULD BE HARVESTED AND PLANTED WHEN THE WILLOWS OR OTHER CHOSEN SPECIES ARE DORMANT. THIS PERIOD IS GENERALLY FROM LATE FALL TO EARLY SPRING, OR BEFORE THE BUDS START TO BREAK.

C. WHEN HARVESTING CUTTINGS, SELECT HEALTHY, LIVE WOOD THAT IS REASONABLY STRAIGHT.

D. USE LIVE WOOD AT LEAST 1 YEAR OLD OR OLDER. THE BEST WOOD IS 2 TO 5 YEARS OLD WITH SMOOTH BARK THAT IS NOT DEEPLY FURROWED.

E. MAKE CLEAN CUTS WITH UNSPLIT ENDS. TRIM BRANCHES FROM CUTTING AS CLOSE AS POSSIBLE. CUT THE BUTT END OF THE CUTTING AT AN ANGLE (~45 DEGREES) AND THE TOP END SQUARE.

F. THE TOP (SQUARE CUT END) SHOULD BE PAINTED AND SEALED BY DIPPING THE TOP 1-INCH TO 2-INCHES INTO A 50-50 MIX OF LIGHT COLORED LATEX PAINT AND WATER. THIS REDUCES THE POSSIBILITY OF DESICCATION AND DISEASE CAUSING MORTALITY AND MAKES THEM MORE VISIBLE FOR SUBSEQUENT PLANTING EVALUATIONS. ASSURE THE STAKES ARE PLANTED WITH THE TOP UP.

G. CUTTINGS SHOULD GENERALLY BE BETWEEN 0.5-INCHES TO 2-INCHES IN DIAMETER BUT CAN BE LARGER DEPENDING ON THE SPECIES. HIGHEST SURVIVAL RATES ARE OBTAINED FROM USING CUTTINGS 2-INCHES TO 3-INCHES IN DIAMETER. LARGER DIAMETER CUTTINGS ARE NEEDED FOR PLANTING INTO ROCK RIPRAP.

H. CUTTINGS OF SMALL DIAMETER (UP TO 1.5-INCHES) SHOULD BE 18 INCHES LONG MINIMUM. THICKER CUTTINGS SHOULD BE LONGER.

I. STAKES SHOULD BE CUT SO A TERMINAL BUD SCAR IS WITHIN 1-INCH TO 4-INCHES OF THE TOP. AT LEAST TWO BUDS AND/OR BUD SCARS SHOULD BE ABOVE THE GROUND AFTER PLANTING.

2. INSTALLATION:

A. STAKES MUST BE PLANTED WITH BUTT-ENDS INTO THE GROUND. LEAF BUD SCARS OR EMERGING BUDS SHOULD ALWAYS POINT UP.

B. STAKES MUST NOT BE ALLOWED TO DRY OUT. THE CUTTINGS NOT PLANTED THE DAY THEY ARE HARVESTED SHOULD BE SOAKED IN WATER FOR A MINIMUM OF 24 HOURS AS SOAKING SIGNIFICANTLY INCREASES THE SURVIVAL RATE OF THE CUTTINGS.

C. PLANT STAKES 4 FEET APART AND ALTERNATE SPECIES.

D. SET THE STAKE AS DEEP AS POSSIBLE INTO THE SOIL, PREFERABLY WITH 80 PERCENT OF ITS LENGTH BURIED BUT NO LESS THAN ONE-HALF OF THE TOTAL LENGTH BURIED.

E. TAMP THE SOIL AROUND THE CUTTING.

USE AN IRON STAKE OR BAR TO MAKE A PILOT HOLE IN FIRM SOIL OR BETWEEN RIPRAP. DRIVE LIVE STAKES INTO THE SOIL WITH A RUBBER MALLET OR DEAD-BLOW HAMMER.

MULCHING OF SEEDED AREAS

ALL SEEDED AREAS ARE TO BE COVERED BY STRAW MULCH. HYDROSEEDING IN WHICH SEED, TACKIFIER, AND MULCH IS IN THE MIX MAY BE USED IN LIEU OF STRAW MULCH.

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STANDARD STREAM MITIGATION

1. CHANNEL LENGTH PLACED IN SPRING-BOXES OR CULVERTS COUNTS AS PART OF THE NEW CHANNEL LENGTH (BUT MAY REQUIRE OFF-SITE COMPENSATORY MITIGATION THAT WOULD NOT BE REQUIRED FOR AN OPEN CHANNEL).
2. THE USE OF RIP-RAP SHOULD BE AVOIDED IF POSSIBLE. IF RIP-RAP IS REQUIRED, THE RIP-RAP SHOULD BE IMBEDDED INTO THE SOIL SO THE TOP OF THE RIP-RAP IS FLUSH WITH THE BOTTOM AND SIDES OF THE CHANNEL.
3. PLANT TWO ALTERNATING ROWS OF TREE OR SHRUB SPECIES ON BOTH SIDES OF THE NEW CHANNELS; THE FIRST ROW SHALL BE BARE ROOT SEEDLINGS THAT ARE PLANTED ON THE CHANNEL SLOPE, CENTERED ON THE MIDPOINT OF THE SLOPE. ALONG THE TOP OF BANK, 3-GALLON CONTAINER-GROWN TREES ARE TO BE PLANTED WITHIN ONE FOOT OF THE TOP OF BANK.
4. RIP-RAP, IF REQUIRED, SHOULD BE LIMITED TO ENDS OF CULVERTS.
5. ALL RELOCATED CHANNELS AND THEIR ACCOMPANYING MITIGATION FEATURES, INCLUDING TREES, ARE TO BE PLACED IN RIGHT-OF-WAY RATHER THAN EASEMENTS.

CHANNEL RELOCATION SEQUENCE AND IMPELEMENTATION NOTES FOR RELOCATED STREAM CHANNELS (IGNORE REFERENCES TO ITEMS NOT SPECIFIED)

1. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. RIP-RAP (ONLY AS SHOWN ON PLANS), SEEDING, AND SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW-WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.
2. CHANNEL RELOCATION SEQUENCE:
   A. FLAG EDGE OF THE NEW CHANNEL TOP BANK PRIOR TO CLEARING. DO NOT CLEAR LARGE TREES IN POSITION TO SHADE THE NEW CHANNEL. LEAVE AS MANY TREES AND SHRUBS AS POSSIBLE BETWEEN THE TOE OF THE NEW HIGHWAY SLOPE AND THE STREAM.
   B. EXCAVATE THE NEW CHANNEL "IN THE DRY" BY LEAVING AREAS OF UNDISTURBED EARTH (DIVERSION BERMS) IN PLACE AT BOTH ENDS.
   C. SHAPE CHANNEL TO SPECIFICATIONS SHOWN. REMOVE LOOSE SOILS AND DEBRIS.
   D. PLACE TOPSOIL, EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER, SEED AND SOD AS SPECIFIED
   E. REMOVE DIVERSION BERMS, BEGINNING WITH THE MOST DOWNSTREAM, BANKS AND BOTTOM ELEVATION OF THE OLD CHANNEL SHOULD TRANSITION SMOOTHLY INTO THE NEW CHANNEL. THE ELEVATIONS OF THE NEW CHANNEL BOTTOM AT EACH END OF THE RELOCATION SEQUENCE SHOULD MATCH THE ELEVATIONS OF THE EXISTING CHANNEL, AND A STEADY PERCENT SLOPE SHOULD BE MAINTAINED THROUGHOUT THE RELOCATED CHANNEL CENTERLINE OR AS SPECIFIED.
   F. INSTALL TREES ACCORDING TO STANDARD SPECIFICATIONS SECTION 802.
3. ONLY RIP-RAP SHOWN ON PLANS SHOULD BE USED IN THE RELOCATED CHANNEL REACH. ANY OTHER PROPOSED RIP-RAP SHOULD BE COORDINATED WITH THE ENVIRONMENTAL DIVISION THROUGH THE TDOT HEADQUARTERS CONSTRUCTION OFFICE.
4. REQUESTS BY ANY AGENCY THAT WOULD REQUIRE THE MODIFICATION OF CHANNELS, DITCHES, ELEVATIONS, RIP-RAP OR ANY OTHER STREAM MITIGATION ITEMS ASSOCIATED WITH THE CHANNEL RELOCATIONS SHALL BE REFERRED TO THE TDOT ENVIRONMENTAL DIVISION VIA THE HEADQUARTERS CONSTRUCTION OFFICE FOR COORDINATION WITH ALL INVOLVED AGENCIES AND TDOT DIVISIONS.

TREES

1. NO SUBSTITUTIONS OF TREE SPECIES OR SIZES SHALL BE ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE TDOT ENVIRONMENTAL DIVISION. CONCERNING STREAM MITIGATION, TREES SHALL BE OF THE VARIETY REQUESTED, AND FIRST QUALITY. CONCERNING TEMPORARY WETLAND MITIGATION, TREES SHALL BE OF THE VARIETY REQUESTED, WELL BRANCHED, BARE ROOT (ROOTS MUST BE KEPT MOIST AN ALL TIMES), AND FIRST QUALITY. NO CLONES OR CULTIVARS WILL BE ACCEPTED. ANY FOUND TO BE INCORRECT SPECIES, OR IMPROPERLY PLANTED, AT ANY TIME PRIOR TO TERMINATION OF THE CONTR ACT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. STAKES AND WIRES SHALL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION, UNLESS OTHER WISE DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHOULD ARRANGE SEVERAL MONTHS AHEAD OF TIME TO OBTAIN THE CORRECT TREE SPECIES, AS SOME MAY REQUIRE SOME TIME TO LOCATE.
3. ALL TREES PLANTED SHALL BE WRAPPED AS PER SECTION 802.07 OF TDOT STANDARD SPECIFICATIONS FOR THE ROAD AND BRIDGE CONSTRUCTION.
4. TREES SHALL BE WATERED AS REQUIRED THROUGH THE PERIOD OF ESTABLISHMENT TO ENSURE SURVIVAL.

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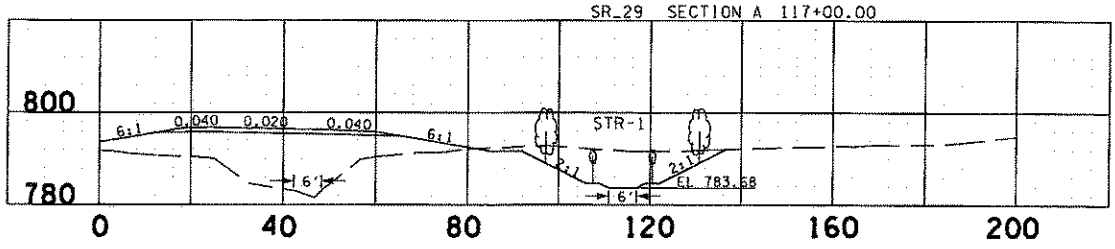
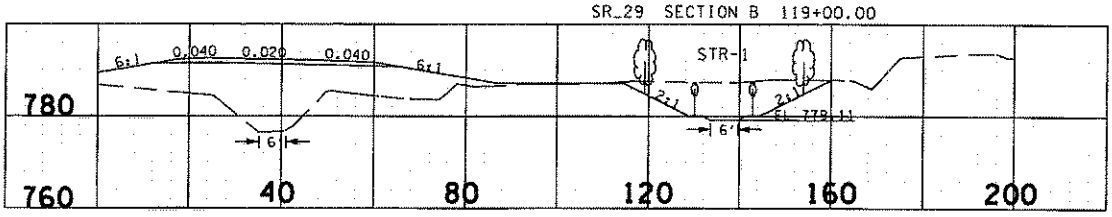
SR_29 SECTION A 117+00.00



1"=40' H
1"=40' V

SR_29 SECTION B 119+00.00



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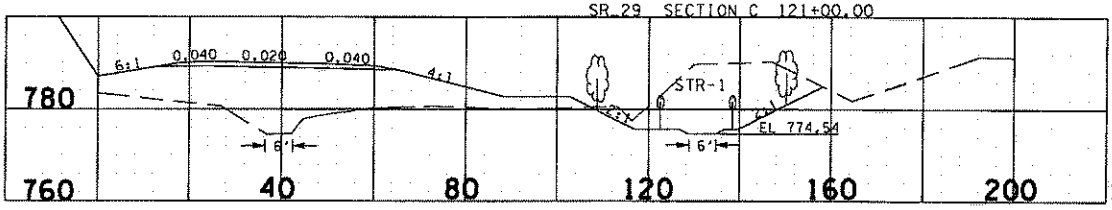

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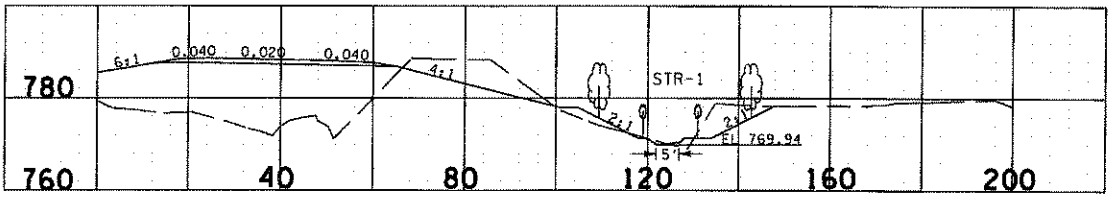

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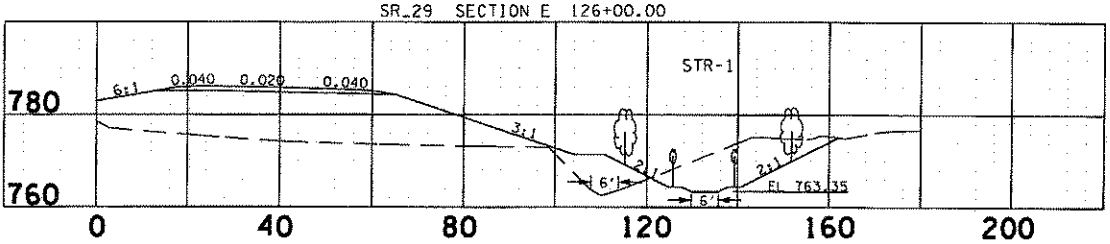

1"=40' H
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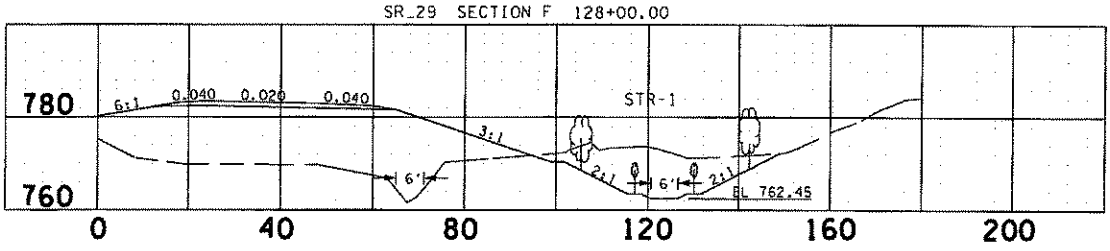
SR_29 SECTION F 128+00.00



1"=40' H
1"=40' V

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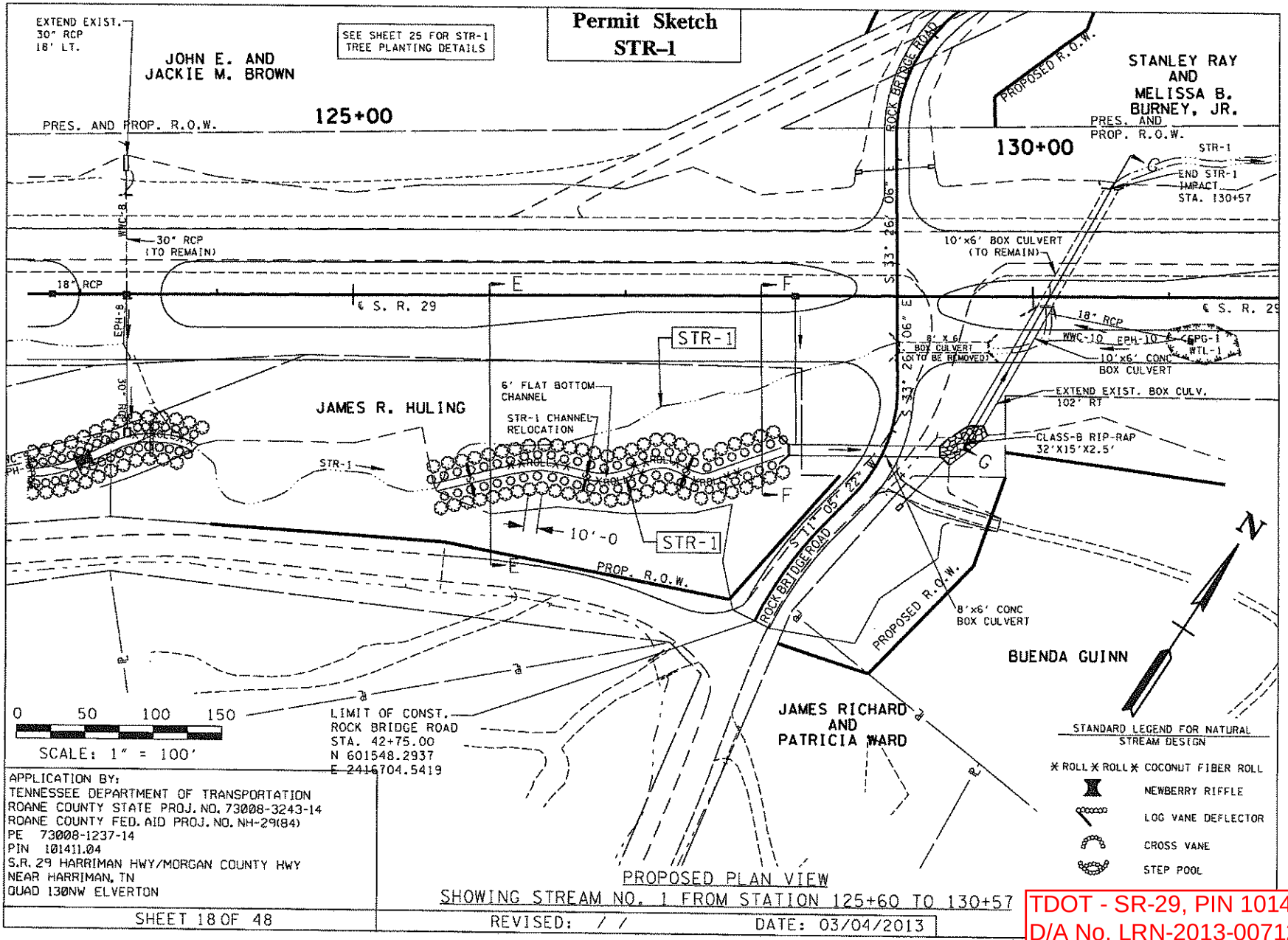

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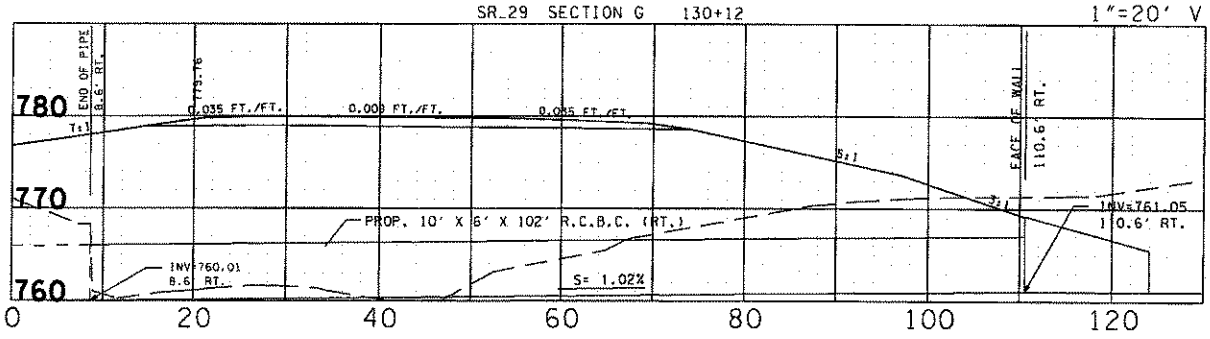
STR-1

SR_29 SECTION G 130+12

1"=20' H
1"=20' V



SR_29 SECTION G 130+12

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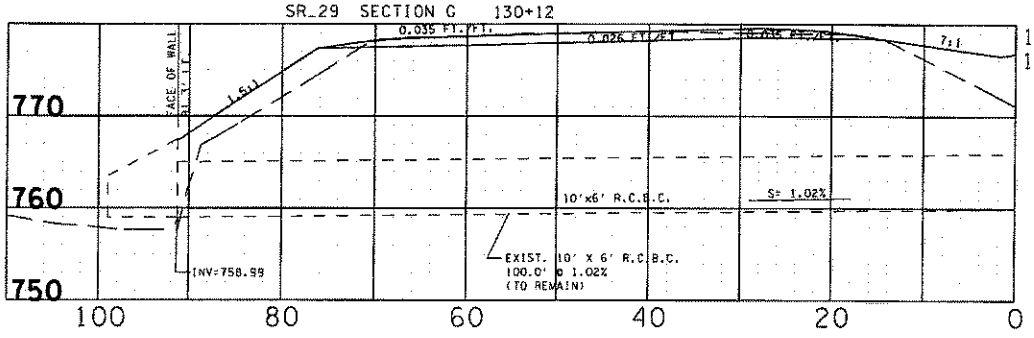
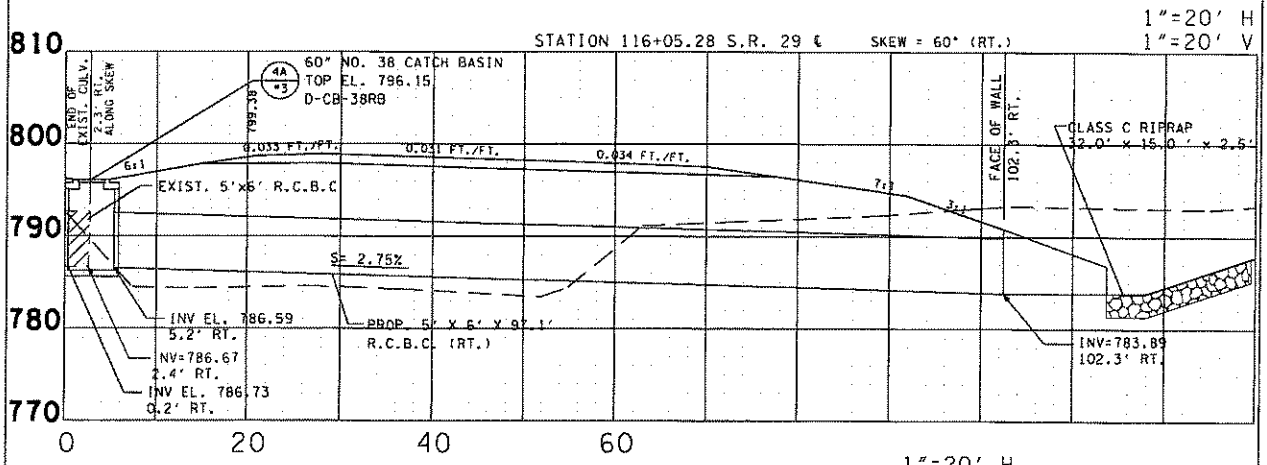
1"=20' V



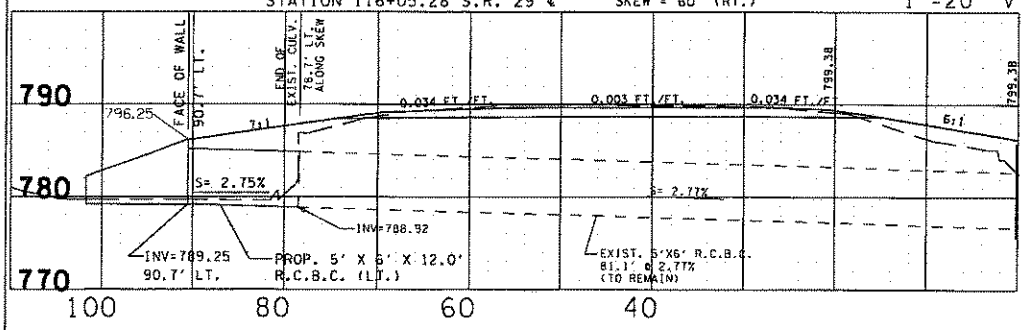
STATION 116+05.28 S.R. 29 ℄ SKEW = 60° (RT.)

1"=20' H
1"=20' V



STATION 116+05.28 S.R. 29 ℄ SKEW = 60° (RT.)

1"=20' H
1"=20' V



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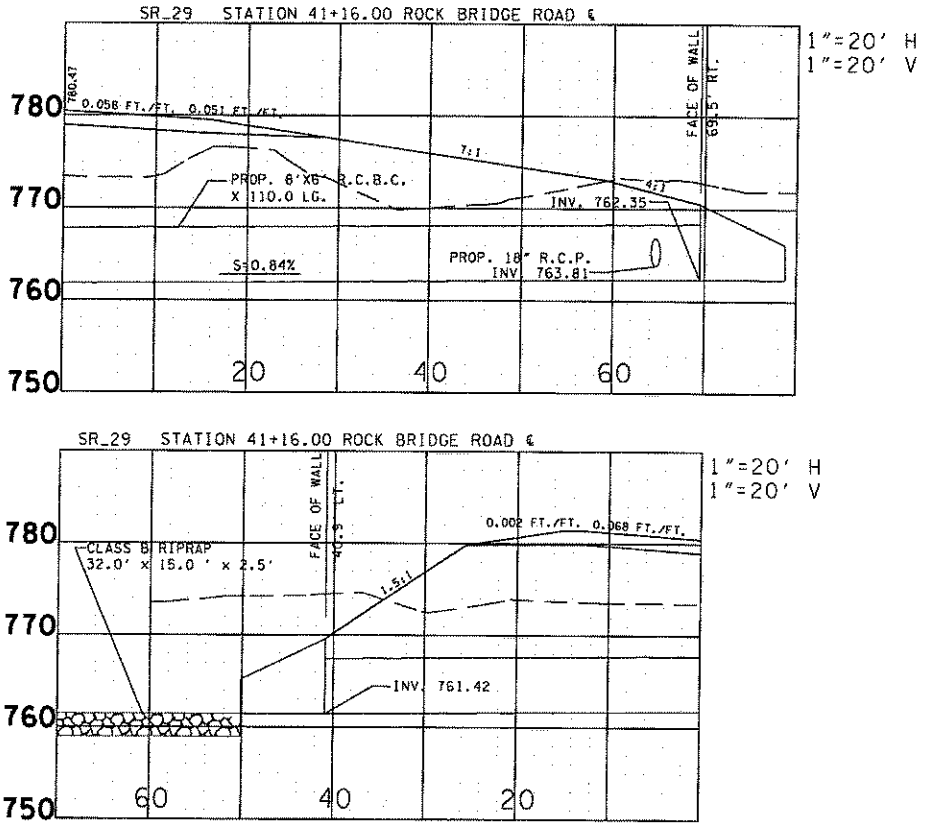
Permit Sketch
STR-1



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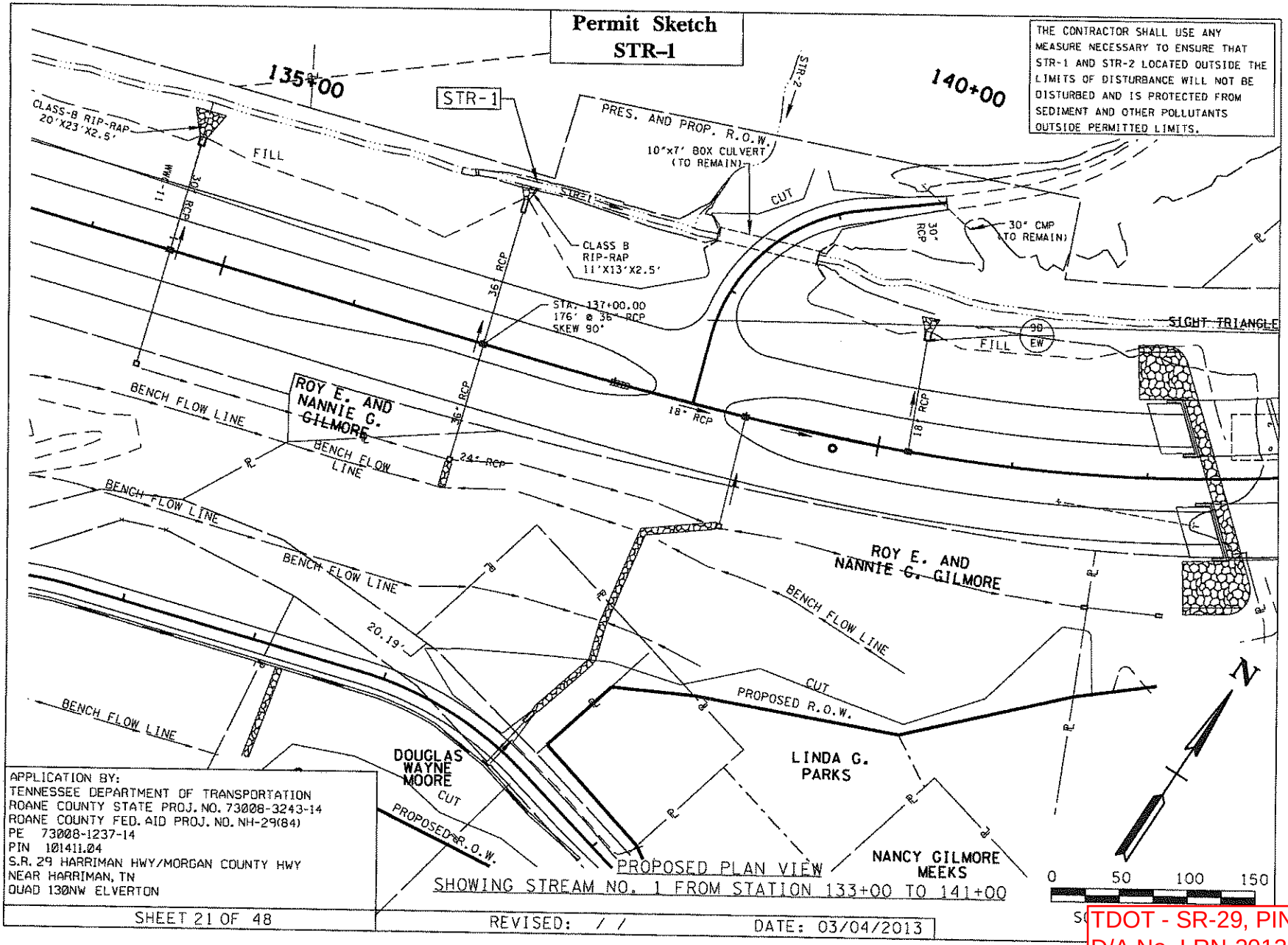

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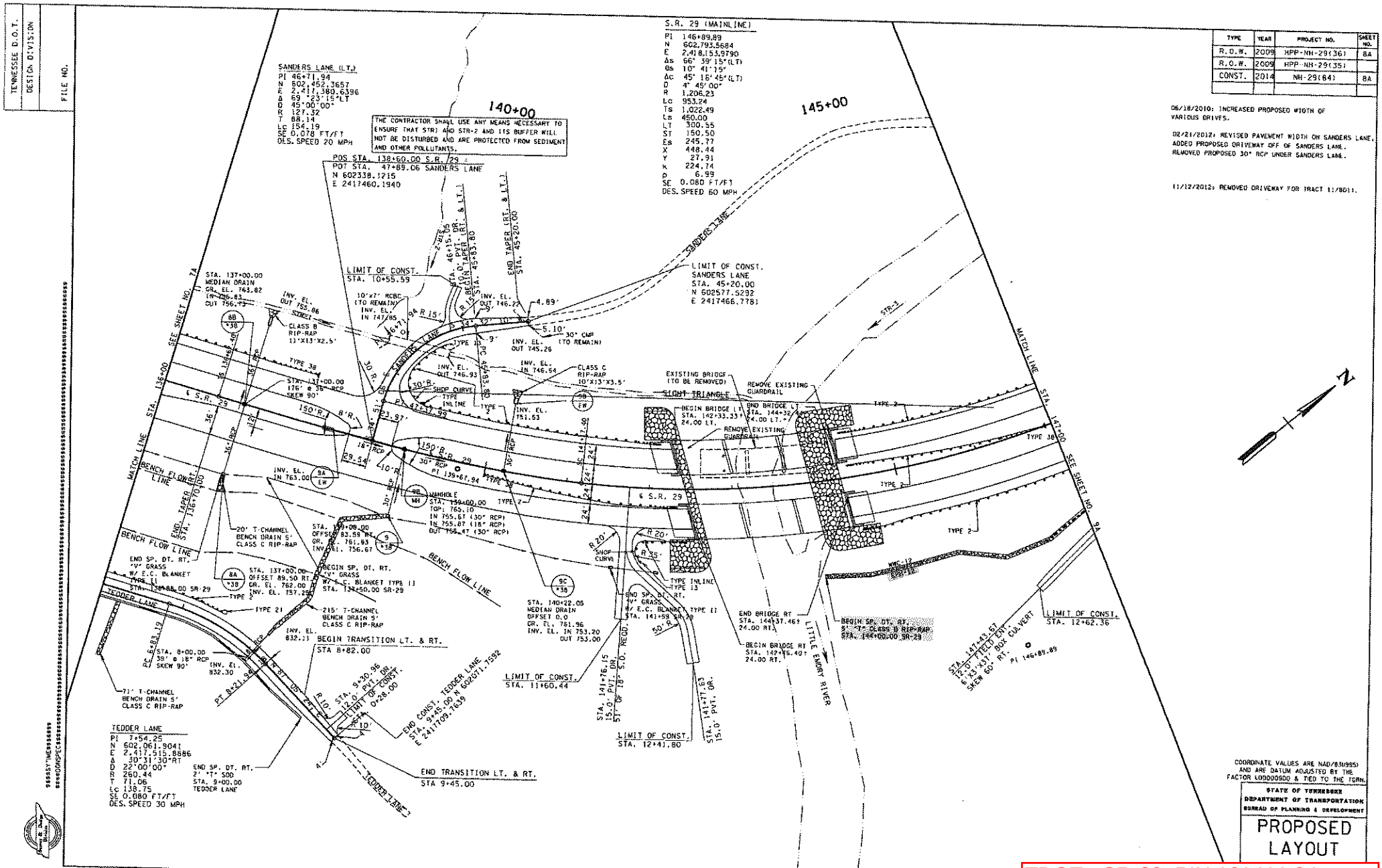

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EXISTING OPEN STREAM: 287'
EXISTING STRUCTURE: 72' - 24" RCP @ STA. 159+94 LT
EXISTING TOTAL STREAM: 359'

PROPOSED OPEN STREAM: 0'
PROPOSED STRUCTURE: 170' - 24" RCP @ STA. 159+94 LT
12' - U-SHAPED ENDWALL 10'X13'X2.5' CLASS B RIP-RAP
PROPOSED STRUCTURE: 145' - 18" RCP @ STA. 161+09

STREAM RELOCATION: 0'
PROPOSED TOTAL STREAM: 0' (TOTAL LOSS)

Permit Sketch
STR-4

THELMA LOUISE FORD COFER

165+00

CNX GAS CO., LLC

ROANE COUNTY / MORGAN COUNTY

TRATL

CLASS B RIP-RAP 10'X13'X2.5'

PRES. AND PROP. R.O.W.

160+00

STR-3

END STREAM 4 IMPACT STA. 159+94

FILL

STR-4

24" CMP (TO BE REMOVED)

30" CMP (TO BE REMOVED)

EPH-15 WWC-15

N 10° 05' 21" W

18" RCP

℄ S.R. 29

BEGIN STREAM 4 IMPACT STA. 162+33

V CONCRETE CHANNEL

3'-1' CONCRETE CHANNEL

RETAINING WALL NO. 4-1

RETAINING WALL NO. 4-2

T.O. DIRT DR

PROPOSED R.O.W.

JACKIE SUE MCCLEMORE

PROPOSED PLAN VIEW

SHOWING STREAM NO. 4 AT STATION 159+92 TO STATION 162+40

0 50 100 150

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

SHEET 22 OF 48

REVISED: / /

DATE: 03/04/2013

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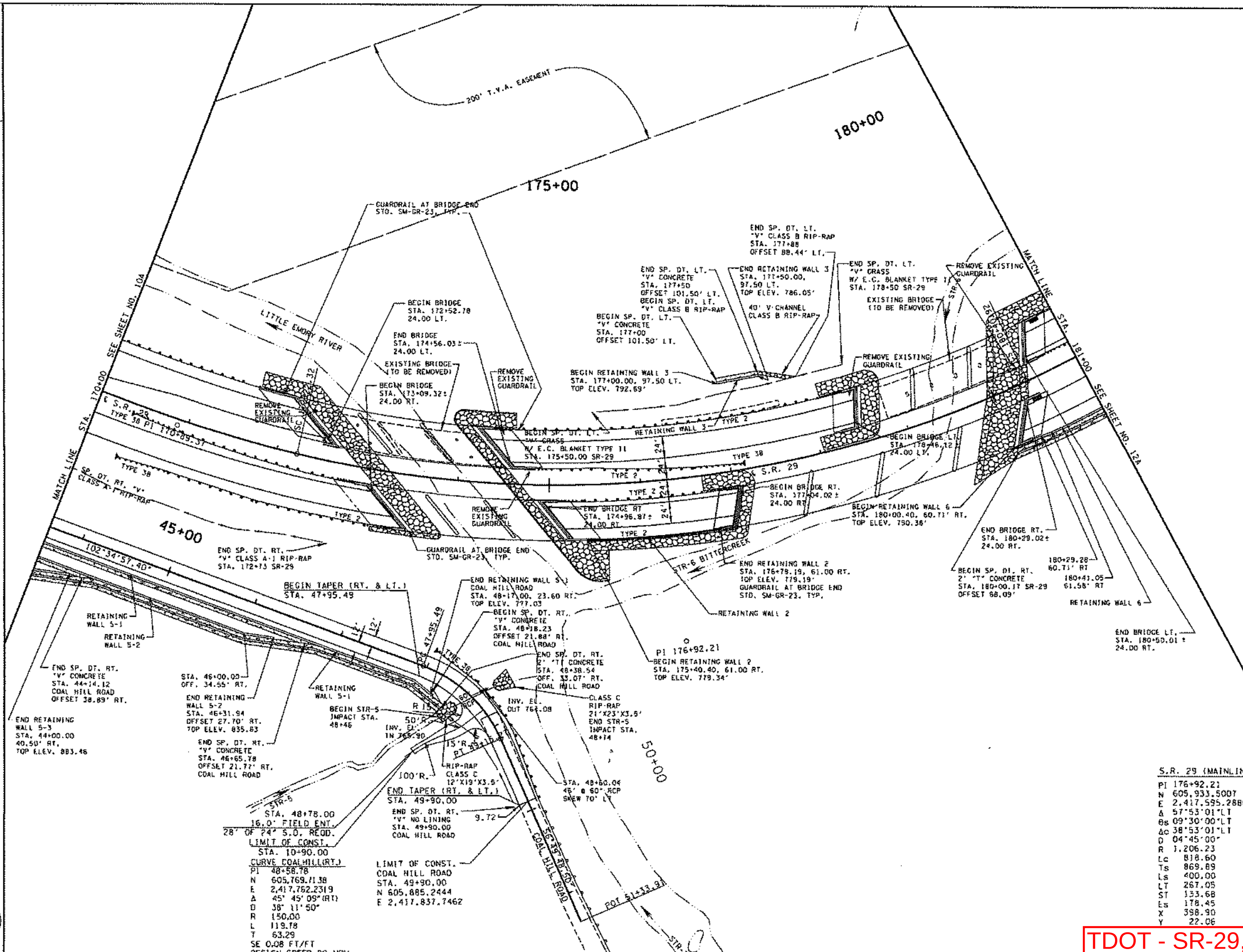
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	11A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(84)	11A

12/16/2011: RELOCATED COAL HILL ROAD ALIGNMENT AND ADDED PRIVATE DRIVE STA 48+78.

RIP-RAP SHALL BE PLACED AS TO MIMIC THE EXISTING CONTOURS OF THE STREAM CHANNEL. THE TOP OF THE PROPOSED RIP-RAP SHALL BE AT GRADE WITH THE BOTTOM OF THE EXISTING STREAM CHANNEL. VOIDS WITHIN THE RIP-RAP SHALL BE FILLED WITH CREEK GRAVEL TO PREVENT LOSS OF STREAM WITHIN RIP-RAP AREAS. CREEK GRAVEL CAN BE USED FROM CULVERT EXCAVATION AREA.



CURVE COALHILL(RT.)	
PI	48+58.78
N	605,769.1138
E	2,417,762.2319
Δ	45° 45' 09" (RT)
D	38° 11' 50"
R	150.00
L	119.78
T	63.29

SE 0.08 FT/FT
DESIGN SPEED 20 MPH

S.R. 29 (MAINLINE)	
PI	176+92.21
N	605,933.5007
E	2,417,595.2886
Δ	57°53'01"LT
θs	09°30'00"LT
Δc	38°53'01"LT
D	04°45'00"
R	1,206.23
Lc	818.60
Ts	869.89
Ls	400.00
LT	267.05
ST	133.68
Es	178.45
X	398.90
Y	22.06

COORDINATE VALUES ARE NAD/83(95) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TCRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

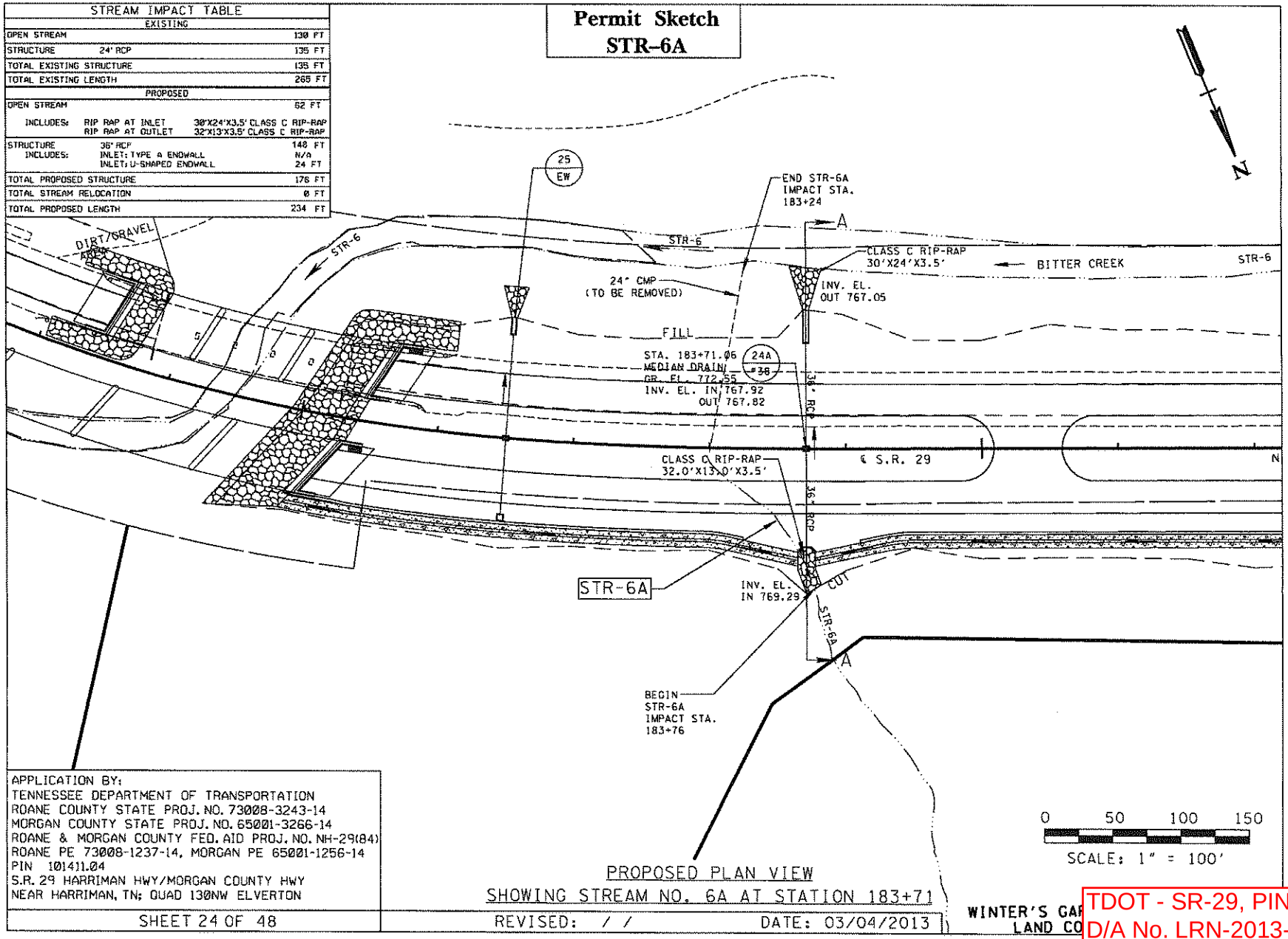
PROPOSED LAYOUT

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

$$$$SYTIME$$$$$$$$
$$$$DGNSPEC$$$$$$$$

Permit Sketch
STR-6A

STREAM IMPACT TABLE		
EXISTING		
OPEN STREAM		130 FT
STRUCTURE	24" RCP	135 FT
TOTAL EXISTING STRUCTURE		135 FT
TOTAL EXISTING LENGTH		265 FT
PROPOSED		
OPEN STREAM		52 FT
INCLUDES:	RIP RAP AT INLET: 30'X24'X3.5' CLASS C RIP-RAP RIP RAP AT OUTLET: 32'X13'X3.5' CLASS C RIP-RAP	
STRUCTURE	36" RCP	148 FT
INCLUDES:	INLET: TYPE A ENDWALL	N/A
	INLET: U-SHAPED ENDWALL	24 FT
TOTAL PROPOSED STRUCTURE		176 FT
TOTAL STREAM RELOCATION		0 FT
TOTAL PROPOSED LENGTH		234 FT



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ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING STREAM NO. 6A AT STATION 183+71

WINTER'S GAP
LAND CO

SHEET 24 OF 48 | REVISED: / / | DATE: 03/04/2013

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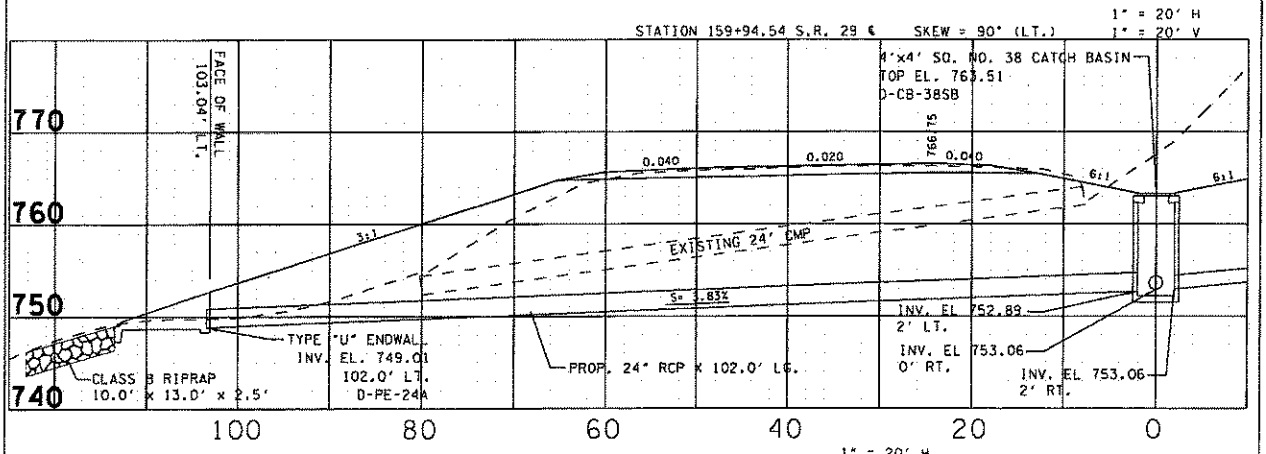
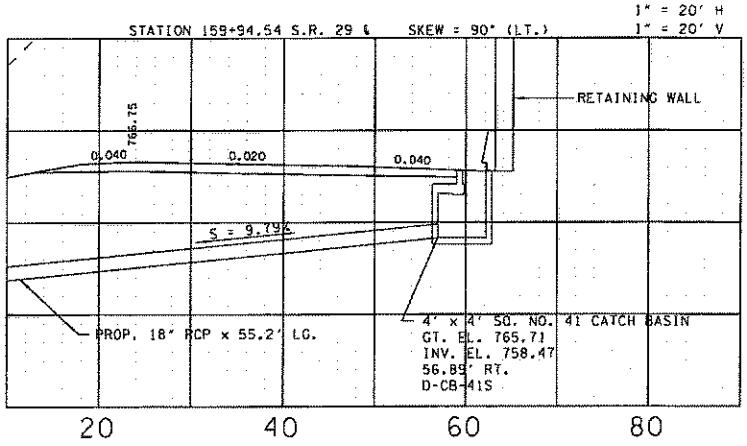
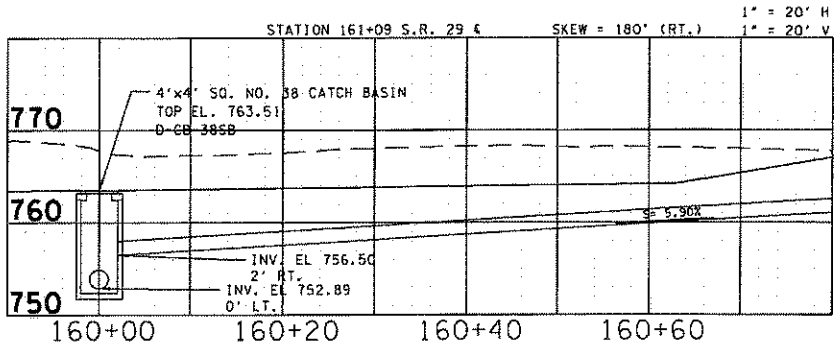
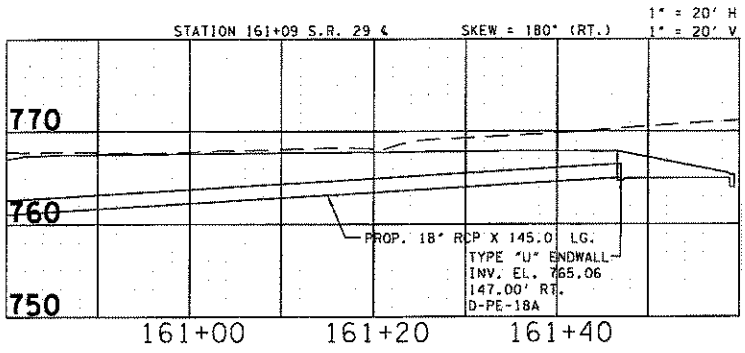
STR-4









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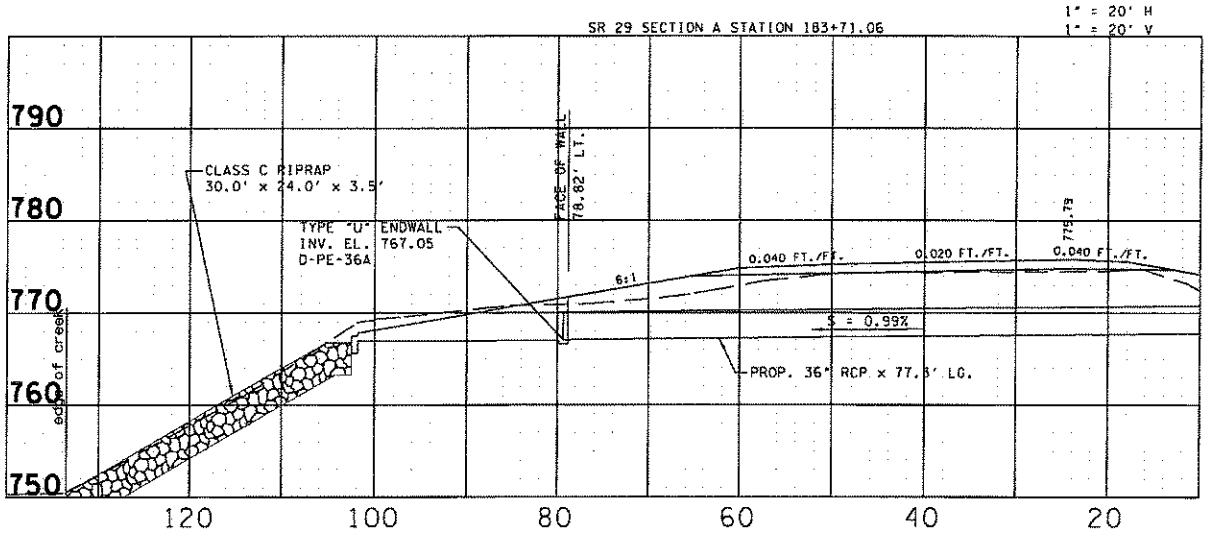

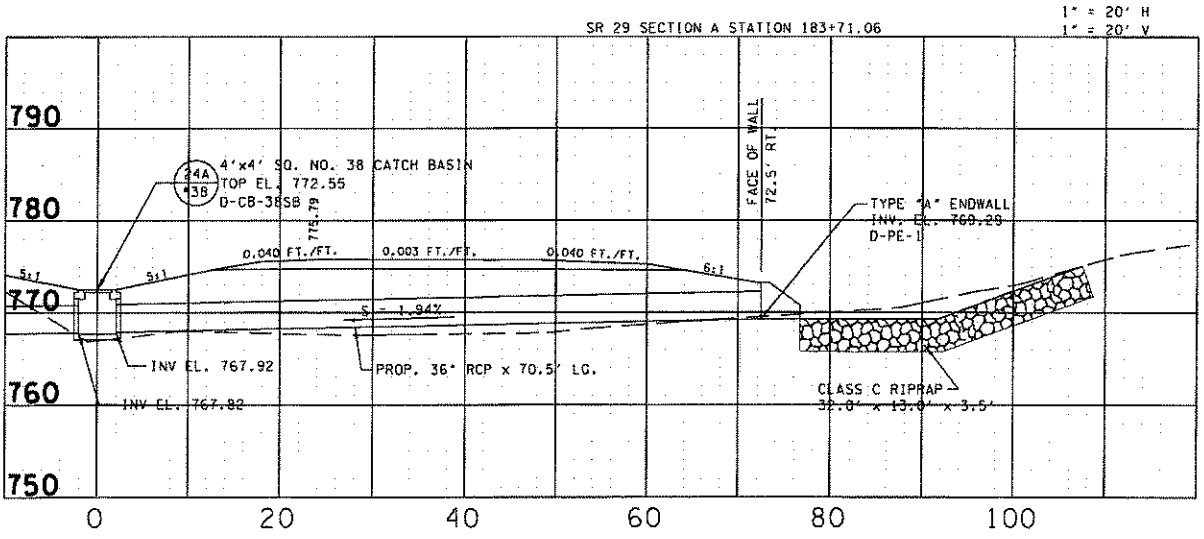

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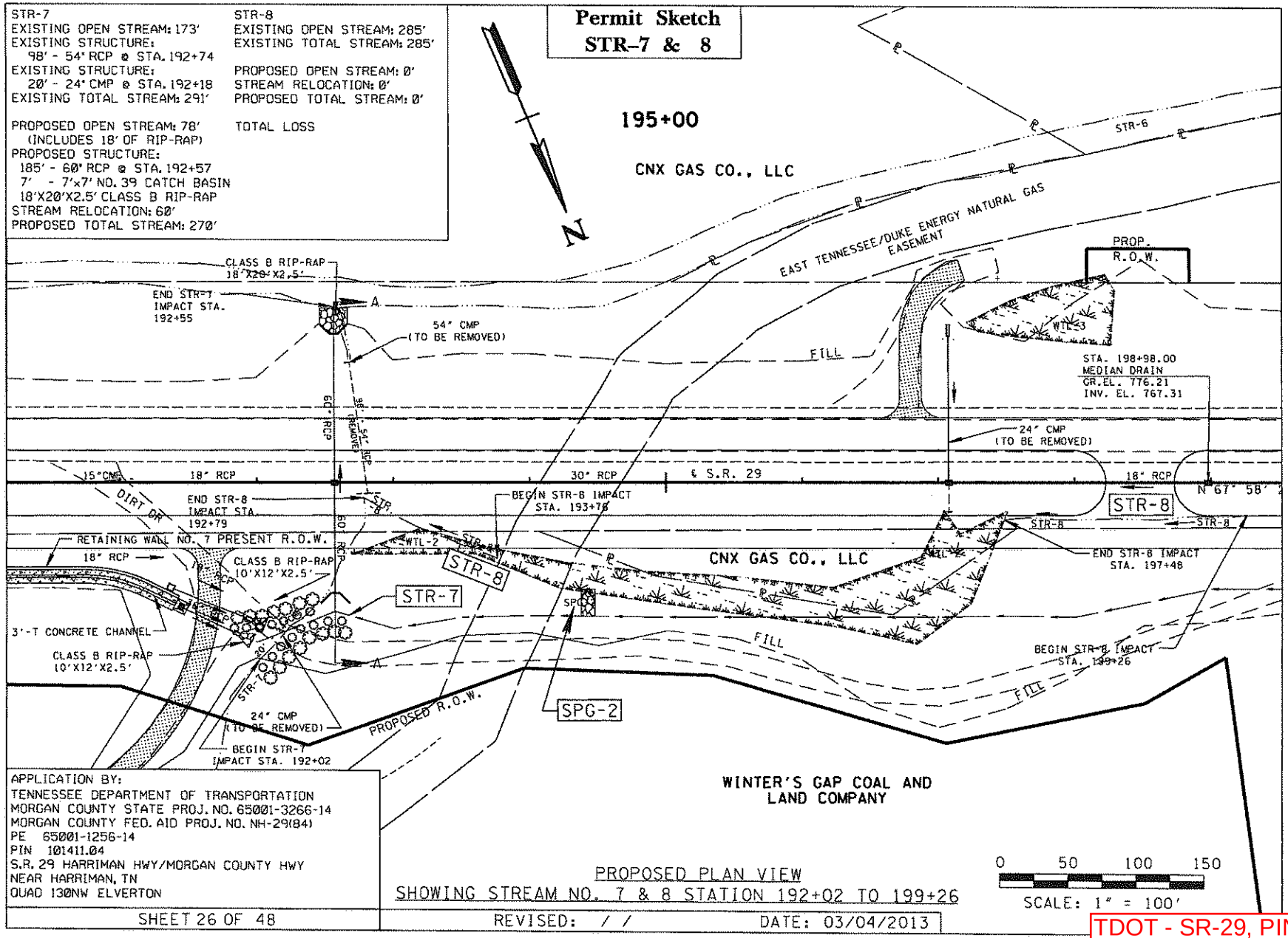

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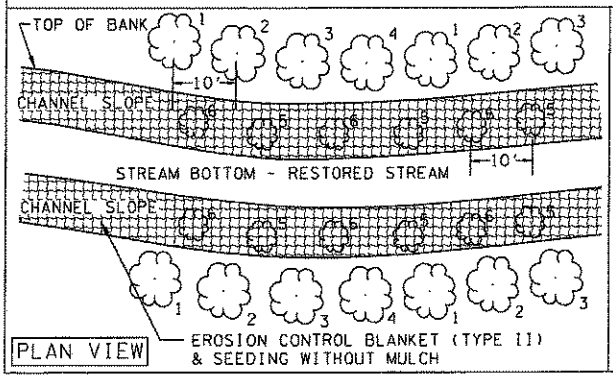
STR–7

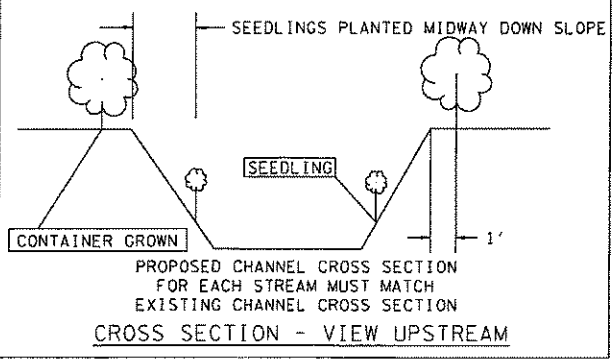
APPLY THESE MEASURES TO ALL APPLICABLE STREAMS LISTED IN FORM J. DUPLICATE THE LENGTH, BOTTOM CHANNEL WIDTH, ELEVATIONS, SIDE SLOPES, MEANDER WAVELENGTH, AND CURVATURE OF THE EXISTING CHANNELS TO THE EXTENT POSSIBLE. EACH CHANNEL SHOULD TRANSITION SMOOTHLY FROM ITS BEGINNING ELEVATION TO ITS TIE-IN ELEVATION IN THE RECEIVING STREAM, WITHOUT PROFILE DROPS OR JUMPS. LOCATE THE NEW CHANNELS IN AS FLAT AN AREA AS POSSIBLE TO AVOID UNUSUALLY HIGH SIDE SLOPES; THIS MAY REQUIRE SOME ADDITIONAL RIGHT-OF-WAY. CHANNEL LENGTH PLACED IN SPRING-BOXES OR CULVERTS COUNTS AS PART OF THE NEW CHANNEL LENGTH (BUT MAY REQUIRE OFF-SITE COMPENSATORY MITIGATION THAT WOULD NOT BE REQUIRED FOR AN OPEN CHANNEL). CHANNEL SIDE SLOPES SHOULD MIMIC EXISTING CHANNEL SIDE SLOPES, IF POSSIBLE, AND BE STABILIZED USING APPROPRIATE BMPS • THE USE OF RIP-RAP SHOULD BE AVOIDED IF POSSIBLE. IF RIP-RAP IS REQUIRED, THE RIP-RAP SHOULD BE IMBEDDED INTO THE SOIL SO THAT THE TOP OF THE RIP-RAP IS FLUSH WITH THE BOTTOM AND SIDES OF THE CHANNEL.

PLANT TWO ALTERNATING ROWS OF TREE OR SHRUB SPECIES ON BOTH SIDES OF THE NEW CHANNELS; THE FIRST ROW SHALL BE BARE ROOT SEEDLINGS THAT ARE PLANTED ON THE CHANNEL SLOPE, CENTERED ON THE MIDPOINT OF THE SLOPE. ALONG THE TOP OF BANK, 3-GALLON CONTAINER-GROWN TREES ARE TO BE PLANTED WITHIN ONE FOOT OF THE TOP OF BANK.

RIP-RAP, IF REQUIRED, SHOULD BE LIMITED TO ENDS OF CULVERTS. ALL RELOCATED CHANNELS AND THEIR ACCOMPANYING MITIGATION FEATURES, INCLUDING TREES, ARE TO BE PLACED IN RIGHT-OF-WAY RATHER THAN EASEMENTS; THIS MAY REQUIRE ACQUISITION OF ADDITIONAL RIGHT-OF-WAY.

TYPICAL CHANNEL RESTORATION & TREE PLANTING DETAIL FOR STREAM RELOCATIONS





STANDARD STREAM MITIGATION:

1) IF THE RELOCATED CHANNEL FLOWS INTO A PROPOSED CULVERT, THE NEW CHANNEL SHALL BE RELOCATED PRIOR TO INSTALLATION OF THE CULVERT TO ENSURE CORRECT ELEVATION LEVELS ARE SET FOR THE INLET. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. RIP-RAP (ONLY AS SHOWN ON PLANS), SEEDING OR SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.
2) CHANNEL RELOCATION SEQUENCE:
   A. FLAG THE EDGE OF THE NEW CHANNEL TOP OF BANK PRIOR TO CLEARING. DO NOT CLEAR LARGE TREES IN POSITION TO SHADE THE NEW CHANNEL. LEAVE AS MANY TREES AND SHRUBS AS POSSIBLE BETWEEN THETOE OF THE NEW HIGHWAY SLOPE AND THE STREAM.
   B. EXCAVATE THE NEW CHANNEL 'IN THE DRY' BY LEAVING AREAS OF UNDISTURBED EARTH (DIVERSION BERMS) IN PLACE AT BOTH ENDS.
   C. SHAPE CHANNEL TO SPECIFICATIONS SHOWN. REMOVE LOOSE SOILS AND DEBRIS.
   D. PLACE TOPSOIL, EROSION CONTROL BLANKET, SEED AND SOD AS SPECIFIED.
   E. REMOVE DIVERSION BERMS, BEGINNING WITH THE MOST DOWN STREAM. BANKS AND BOTTOM ELEVATION OF THE OLD CHANNEL SHOULD TRANSITION SMOOTHLY INTO THE NEW CHANNEL. THE ELEVATIONS OF THE NEW CHANNEL BOTTOM AT EACH END OF THE RELOCATION SEQUENCE SHOULD MATCH THE ELEVATIONS OF THE EXISTING CHANNEL, AND A STEADY PERCENT SLOPE SHOULD BE MAINTAINED THROUGHOUT THE RELOCATED CHANNEL CENTERLINE OR AS SPECIFIED.
   F. INSTALL TREES ACCORDING TO STANDARD SPECIFICATIONS SECTION 802.
3) ONLY RIP-RAP SHOWN ON PLANS SHOULD BE USED IN THE RELOCATED CHANNEL REACH. ANY OTHER PROPOSED RIP-RAP SHOULD BE COORDINATED WITH THE ENVIRONMENTAL DIVISION.
4) REQUESTS BY ANY AGENCY THAT WOULD REQUIRE THE MODIFICATION OF CHANNELS, DITCHES, ELEVATIONS, RIP-RAP OR ANY OTHER STREAM MITIGATION ITEMS ASSOCIATED WITH THE CHANNEL RELOCATIONS SHALL BE REFERRED TO THE TDOT ENVIRONMENTAL DIVISION VIA THE HEADQUARTERS CONSTRUCTION OFFICE FOR THE COORDINATION WITH ALL AGENCIES AND TDOT DIVISIONS. THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION MAY MAKE RECOMMENDATIONS CONCERNING EROSION CONTROL VIA THE ENGINEER WITHOUT SUCH REFERRAL.

TREES:

1. NO SUBSTITIONS OF TREE SPECIES OR SIZES SHALL BE ALLOWED WITHOUT THE WRITTEN APPROVAL OF TDOT ENVIRONMENTAL DIVISION. TREES SHALL BE THE VARIETY REQUESTED AND FIRST QUALITY. NO CLONES OR CULTIVARS WILL BE ACCEPTED. ANY FOUND TO BE INCORRECT SPECIES, OR IMPROPERLY PLANTED, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE. STAKES AND WIRES SHALL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHOULD ARRANGE SEVERAL MONTHS AHEAD OF TIME TO OBTAIN THE CORRECT TREE SPECIES, AS SOME MAY REQUIRE SOME TIME TO LOCATE.
3. TREES SHALL BE WATERED AS REQUIRED THROUGH THE PERIOD OF ESTABLISHMENT TO ENSURE SURVIVAL.

ESTIMATED TREE QUANTITIES - STR-7

ITEM NO.		DESCRIPTION	UNIT	QUANTITY
802-11.19	1	LIRIODENDRON TULIPIFERA (TULIP POPLAR) 3-GALLON CONTAINER-GROWN	EACH	4
802-11.18	2	LIQUIDAMBAR STYRACIFLUA (SWEETGUM) 3-GALLON CONTAINER-GROWN	EACH	4
802-11.02	3	ACER RUBRUM (RED MAPLE) 3-GALLON CONTAINER-GROWN	EACH	4
802-11.26	4	PLATANUS OCCIDENTALIS (AMERICAN SYCAMORE) 3 GALLON CONTAINER-GROWN	EACH	4
802-02.01	5	CORNUS AMMOMUM (SILKY DOGWOOD), 18-24INCH BARE ROOT SEEDLINGS	EACH	6
802-02.02	6	ASIMINA TRILOBA (PAWPAW) 18-24INCH BARE ROOT SEEDLINGS	EACH	6

NOTES:

NO SUBSTITUTION FOR ANY OF THESE SPECIES WILL BE ACCECPTED WITHOUT PERMISSION FROM TDOT ENVIRONMENTAL PLANNING AND PERMITS DIVISION. NO CLONES OR COLTIVARS WILL BE ACCEPTED. ANY TREES FOUND TO BE INCORRECT SPECIES, IMPROPERLY PLANTED, OR WHICH DO NOT SURVIVE, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT, SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENCE. STAKES AND WIRES WILL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION.

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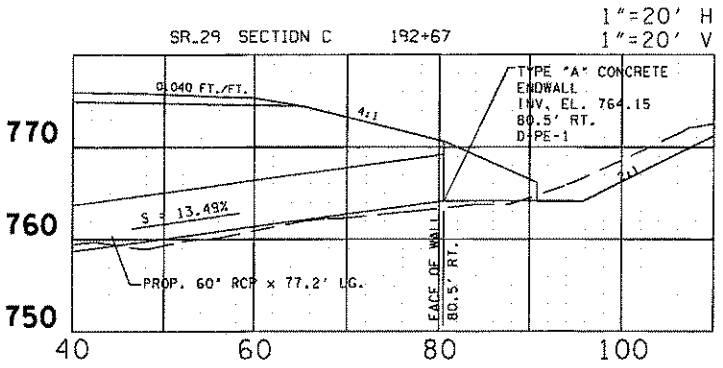

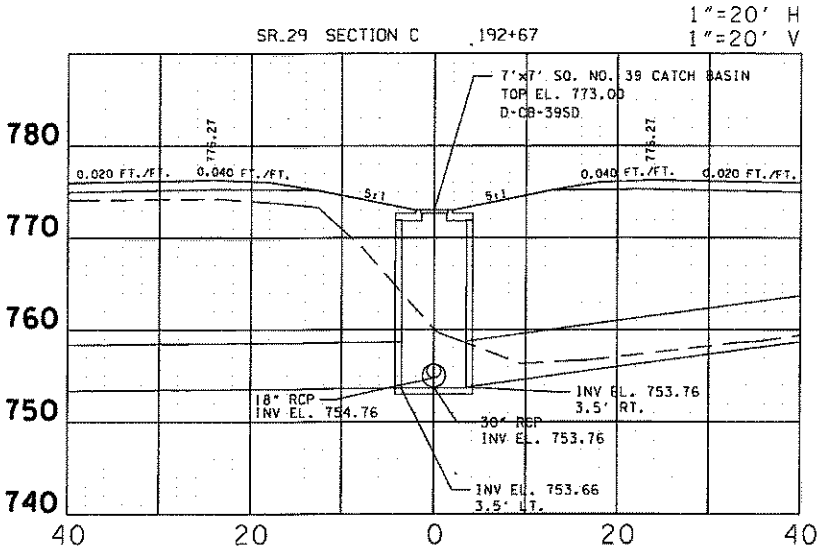

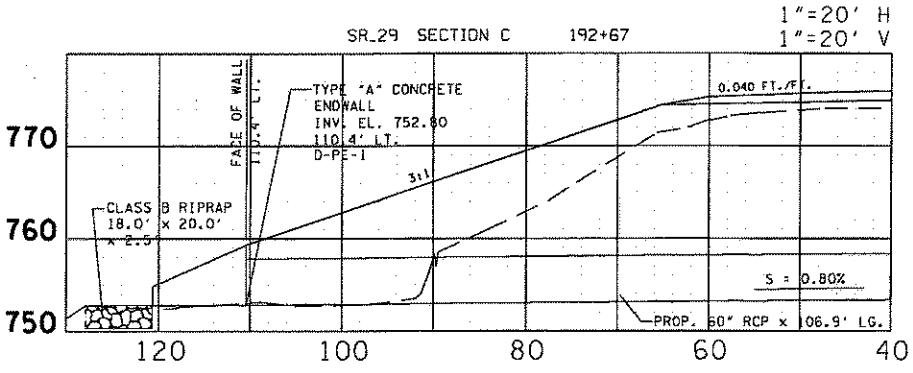

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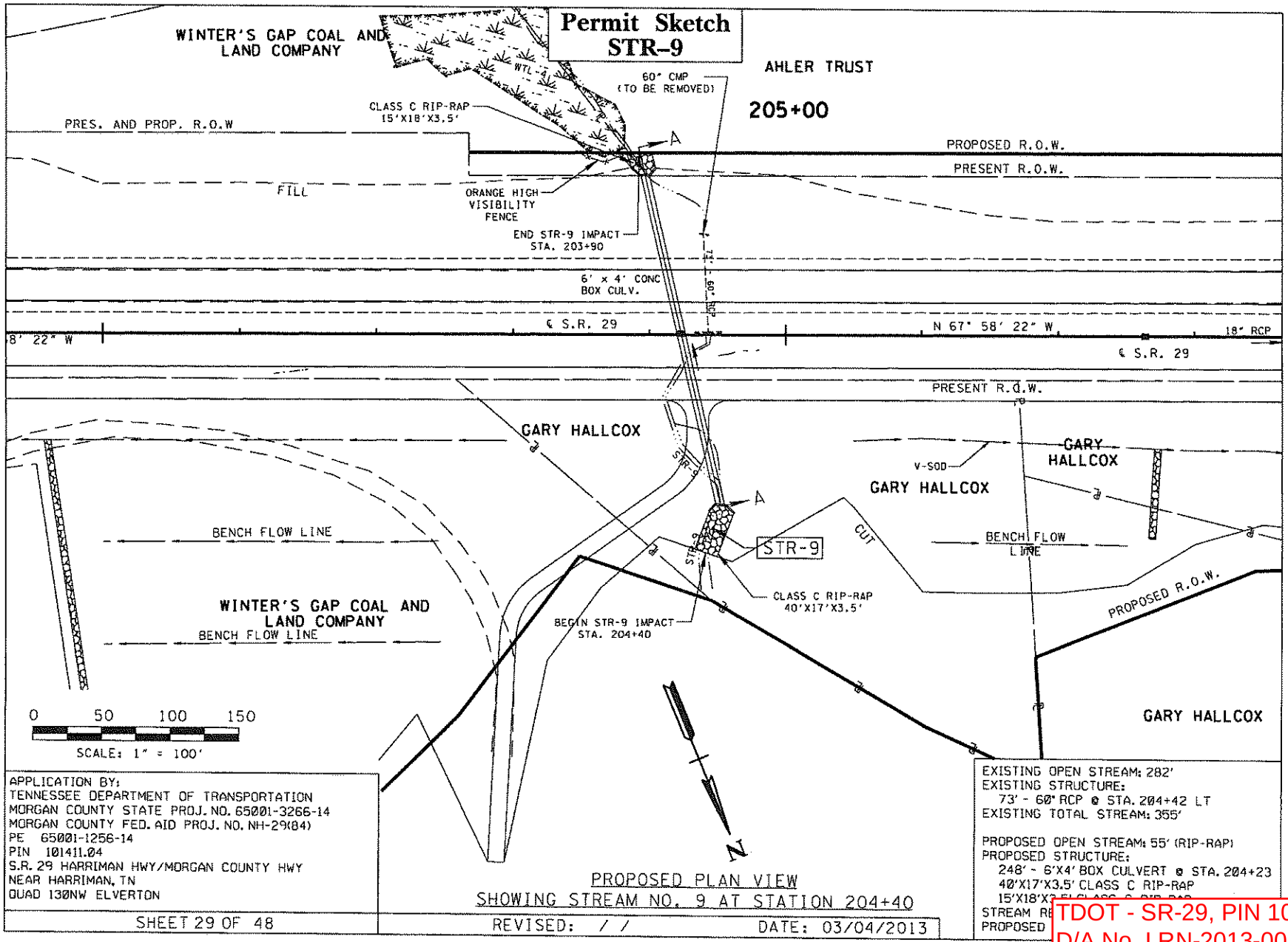

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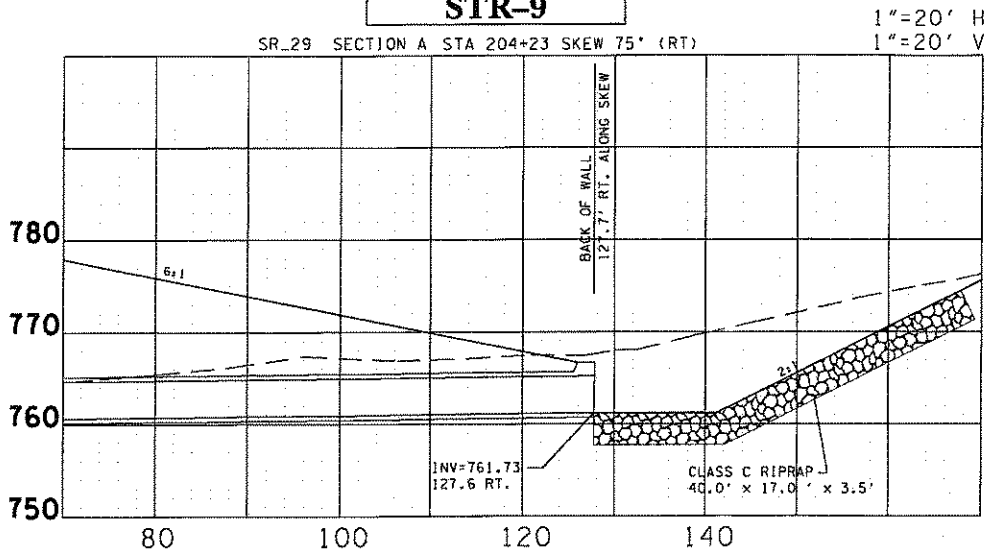

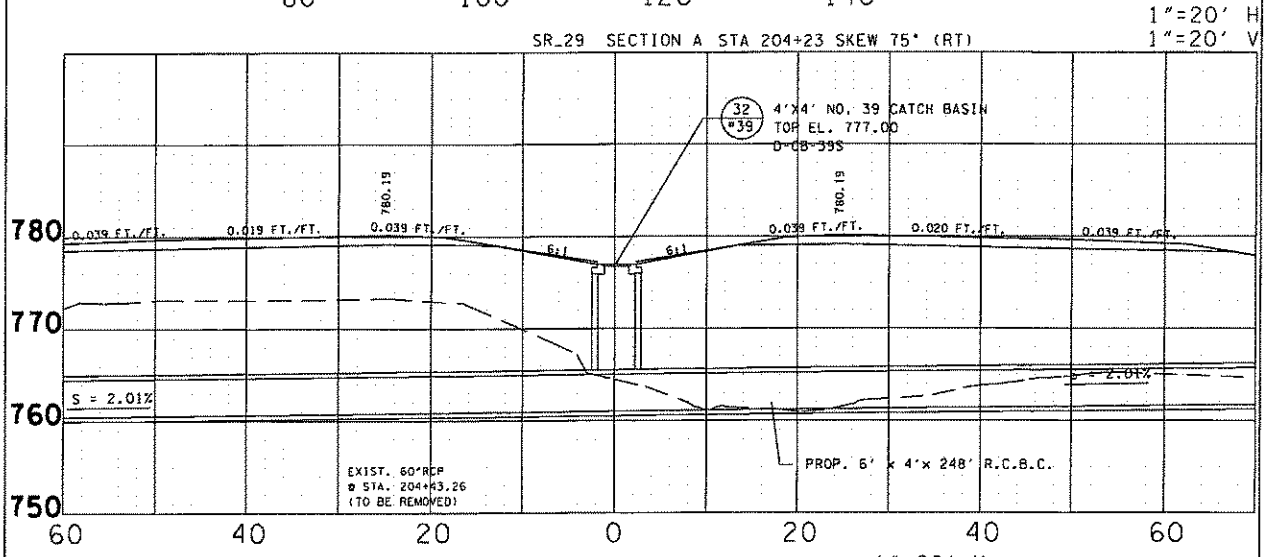

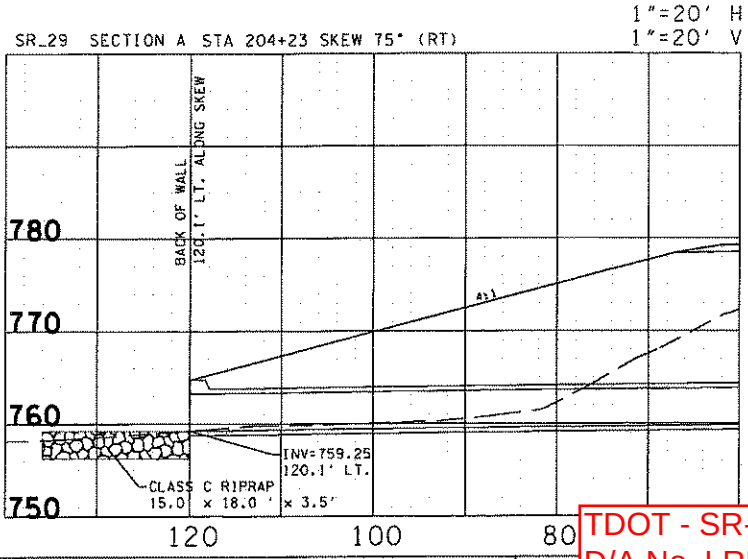

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EXISTING OPEN STREAM: 581'
EXISTING STRUCTURE:
63' - 6'X5' BOX CULVERT @ STA. 213+06 (TO REMAIN)
EXISTING STRUCTURE:
31' - 30" CMP @ STA. 210+03 (TO BE REMOVED)
EXISTING TOTAL STREAM: 675'

PROPOSED OPEN STREAM: 390'
(INCLUDES 311' OF STREAM RELOCATION)
PROPOSED STRUCTURE:
199' - 6'X5' BOX CULVERT @ STA. 213+06 RT
(INCLUDES 63' EXISTING STRUCTURE LENGTH)
PROPOSED STRUCTURE:
43' - 30" RCP @ STA. 209+78 RT
(2) 10' - U-SHAPED ENDWALLS
24'X27'X2.5' CLASS B RIP-RAP CHANNEL
35'X5'X2.5' CLASS B RIP-RAP CHANNEL
20'X18'X3.5' CLASS C RIP-RAP OUTLET PROTECTION
PROPOSED TOTAL STREAM: 652'

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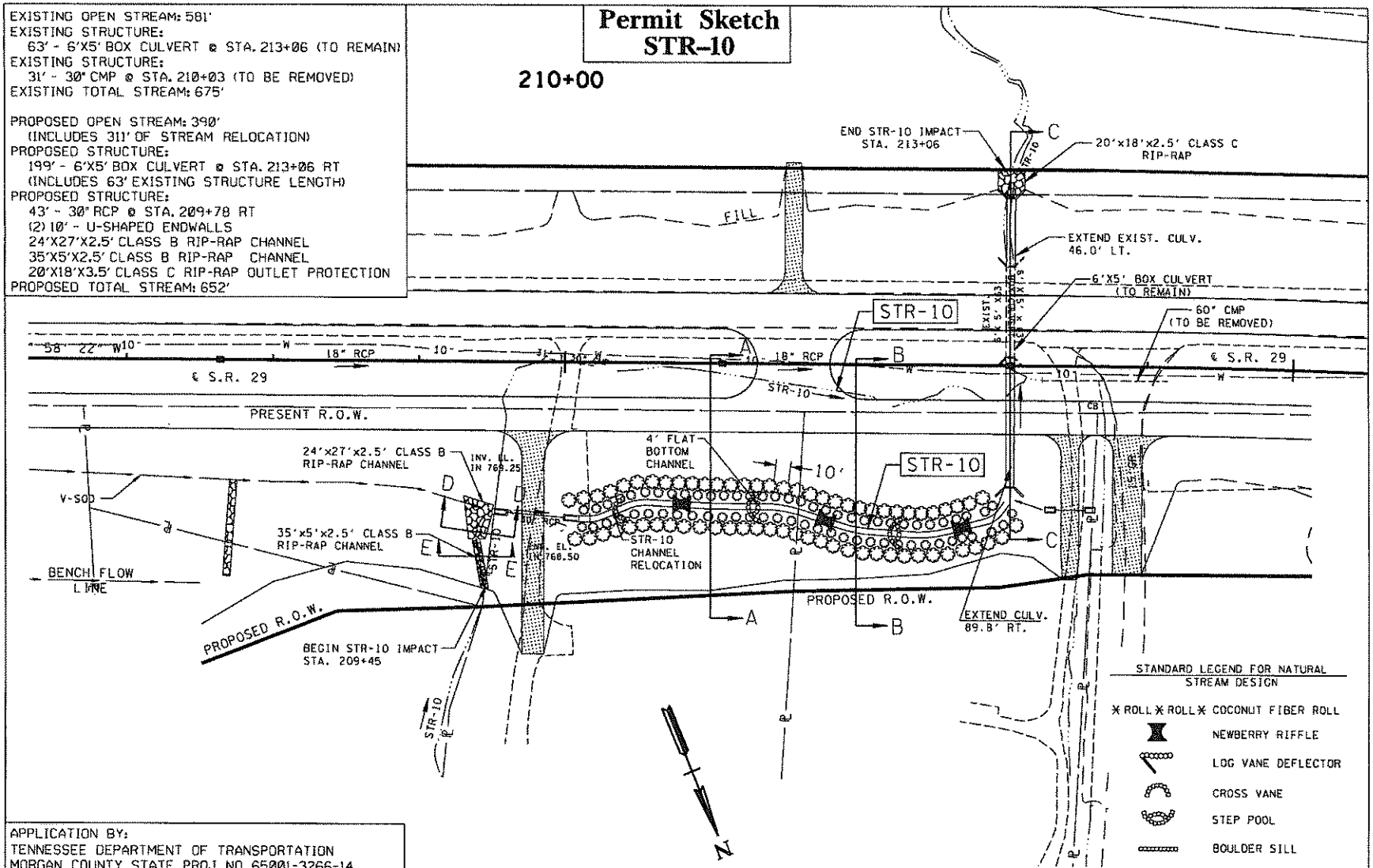
210+00



STANDARD LEGEND FOR NATURAL STREAM DESIGN

- ROLL ROLL COCONUT FIBER ROLL
- NEWBERRY RIFFLE
- LOG VANE DEFLECTOR
- CROSS VANE
- STEP POOL
- BOULDER SILL
- LOG DROP STRUCTURE

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING STREAM NO. 10 FROM STATION 209+50 TO 213+06

0 50 100 150
SCALE

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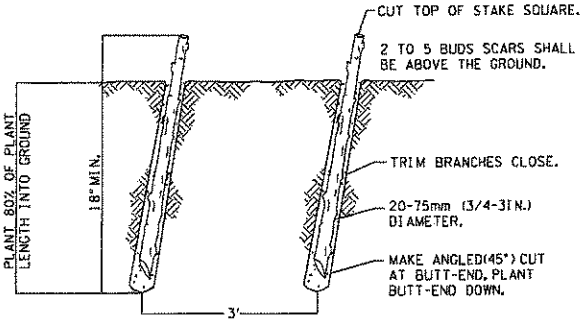
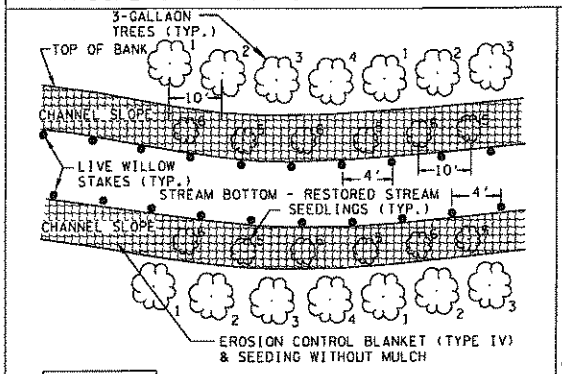


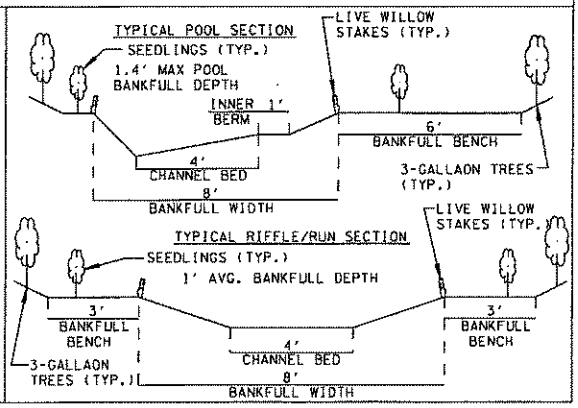
DETAIL:
LIVE STOUT STAKES SHOULD BE LONG ENOUGH TO REACH BELOW THE GROUNDWATER TABLE. (GENERALLY, A LENGTH OF 2 TO 3 FEET) ADDITIONALLY, THE STAKES SHOULD HAVE A DIAMETER IN THE RANGE OF 0.75 TO 3.0 INCHES.

NOTES:
1. HARVEST AND PLANT STAKES DURING THE DORMANT SEASON.
2. USE HEALTHY, STRAIGHT AND LIVE WOOD AT LEAST 1 YEAR OLD.
3. MAKE CLEAN CUTS AND DO NOT DAMAGE STAKES OR SPLIT ENDS DURING INSTALLATION; USE AN IRON BAR AND PILOT HOLE IN FIRM SOILS.
4. SOAK CUTTINGS FOR AT LEAST 24 HOURS PRIOR TO INSTALLATION. SOAK FOR 5-7 DAYS FOR BEST RESULTS.
5. TAMP THE SOIL AROUND THE STAKE.

LIVE STAKES
N.T.S.

TYPICAL CHANNEL RESTORATION & TREE PLANTING DETAIL FOR STREAM RELOCATIONS





ESTIMATED QUANTITIES - STR-10

	ITEM NO.		DESCRIPTION	UNIT	QUANTITY
	802-11.19	1	LIRIODENDRON TULIPIFERA (TULIP POPLAR), 3-GALLON CONTAINER GROWN	EACH	16
	802-11.18	2	LIQUIDAMBAR STYRACIFLUA (SWEETGUM), 3-GALLON CONTAINER-GROWN	EACH	16
	802-11.02	3	ACER RUBRUM (RED MAPLE) 3-GALLON CONTAINER-GROWN	EACH	16
	802-11.26	4	PLATANUS OCCIDENTALIS (AMERICAN SYCAMORE) 3 GALLON CONTAINER-GROWN	EACH	16
	802-02.01	5	ALNUS SERRULATA (HAZEL ALDER), 18-24 INCH BARE ROOT SEEDLINGS	EACH	32
	802-02.02	6	ASIMINA TRILOBA (PAWPAW) 18-24 INCH BARE ROOT SEEDLINGS	EACH	32
	201-01		CLEARING AND GRUBBING	LS	N/A
	203-01.79		BACKFILL	CY	N/A
	203-08		CHANNEL EXCAVATION (UNCLASSIFIED)	CY	N/A
	209-03.35		STREAM MITIGATION - LOG DROP STRUCTURES	EACH	0
	209-03.36		STREAM MITIGATION - STEP POOL	EACH	2
			STREAM MITIGATION - BOULDER SILL	EACH	0
			STREAM MITIGATION - SINGLE LOG VANE DEFLECTOR	EACH	0
			STREAM MITIGATION - NEWBERRY RIFFLE	EACH	3
	209-03.37		STREAM MITIGATION - CROSS VANE STRUCTURE	EACH	1
			STREAM MITIGATION - COIR ROLLS	LF	650
	209-03.44		STREAM MITIGATION - WILLOW POLES (WILLOW, ELDERBERRY, OR SILKY DOGWOOD	EACH	194
	209-08.02		TEMPORARY SILT FENCE (WITH BACKING) FOR OLD CHANNEL	LF	650
	209-65.01		TEMPORARY STREAM DIVERSION (PUMP AROUND)	LS	1
	209-95.02		TEMPORARY STREAM DIVERSION (PIPE AROUND)	LS	1
	209-65.14		TEMPORARY STREAM DIVERSION (IN CHANNEL)	LS	1
(1)	801-01.34		GRASS SEED MIX (RPNZN/FLPL)	UNIT	28.5
(1)	801-01.30		COVER CROP SEED MIX (RIPZN/FLPL) W/MULCH	UNIT	65.5
	805-12.04		EROSION CONTROL BLANKET (TYPE IV)	SY	200
	805-12.08		700 GRAM COIR FIBER EROSION CONTROL BLANKET	SY	200
	709-05.83		CLASS A-1 RIP-RAP	TON	12.5

FOOTNOTES:

1. PLANTING RATE FOR ITEM NO. 801-01.34 IS 40lbs/ac. PLANTING. RATE FOR ITEM NO. 801-01.30 IS 100lbs/ac.

NOTES:

NO SUBSTITUTION FOR ANY OF THESE SPECIES WILL BE ACCECPTED WITHOUT PERMISSION FROM TDOT ENVIRONMENTAL PLANNING AND PERMITS DIVISION. NO CLONES OR COLTIVARS WILL BE ACCEPTED. ANY TREES FOUND TO BE INCORRECT SPECIES, IMPROPERLY PLANTED, OR WHICH DO NOT SURVIVE, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT, SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENCE. STAKES AND WIRES WILL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION.

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STRUCTURE BY STATION - STR-10		
STATION	STRUCTURE	DESCRIPTION
110+32	1	CROSS VANE
110+68	5	NEWBERRY RIFFLE
111+25	4	STEP POOLS
111+68	5	NEWBERRY RIFFLE
112+21	4	STEP POOLS
112+58	5	NEWBERRY RIFFLE

PROPOSED MORPHOLOGY FOR STREAM 10

PARAMETER	STREAM 1	
	MIN	MAX
MEAN DEPTH @ BANKFULL (BKF)[1] (FT)	0.8	
WETTED POOL DEPTH @ BASEFLOW (FT)	4	5
MAX POOL DEPTH @ BKF (FT)	1.2	1.6
POOL WIDTH @ BKF (FT)	7	10
POOL LENGTH (FT)	3	10
SLOPE POOL (FT/FT)	0	
RUN LENGTH @ BKF (FT)	20	70
RUN WIDTH @ BKF (FT)	8	
RUN DEPTH @ BKF (FT)	1	
SLOPE RUN (FT/FT)	0.5%	2.61%
RIFFLE LENGTH @ BKF (FT)	5	15
RIFFLE WIDTH @ BKF (FT)	5	7
RIFFLE DEPTH @ BKF (FT)	0.9	1.0
SLOPE RIFFLE (FT/FT)	4%	7%
RIFFLE DMIN, D50[2], DMAX (IN)	1, 3, 5	
TOTAL DROP STEP POOLS (FT)	0.8	

[1] AVERAGE DEPTH ACROSS SECTION AT BANKFULL.
[2] D50 IS THE AVERAGE SUBSTRATE SIZE OBSERVED AT FEATURE (I.E., RIFFLE, RUN, POOL) IN EXISTING CHANNEL. PROPOSED CHANNEL FEATURES SHOULD BE CONSTRUCTED WITH SUBSTRATE FROM THE EXISTING CHANNEL. PROPOSED NEWBURY RIFFLES MAY BE ALSO CONSTRUCTED USING CLASS A1 RIPRAP; HOWEVER, CONTRACTOR SHOULD BE CAREFUL WHEN SELECTING APPROPRIATE SUBSTRATE DIAMETER SIZES.

ENVIRONMENTAL - ECOLOGY

1. THE NEW CHANNEL MUST BE CONSTRUCTED TO ALLOW NATIVE STONE (BOULDERS, COBBLES, ETC.) FROM THE EXISTING CHANNEL TO BE HARVESTED FOR PLACEMENT IN THE NEW CHANNEL.

2. THE FOLLOWING IS THE RECOMMENDED CONSTRUCTION SEQUENCE:

   A. FLAG EDGE OF THE NEW CHANNEL TOP BANK PRIOR TO CLEARING. DO NOT CLEAR LARGE TREES IN POSITION TO SHADE THE NEW CHANNEL. LEAVE AS MANY TREES AND SHRUBS AS POSSIBLE AS A STREAM BUFFER.
   B. EXCAVATE CHANNEL "IN THE DRY" LEAVING AREAS OF UNDISTURBED EARTH AT BOTH ENDS.
   C. INSTALL GRAVITY BYPASS PIPE FOR EXISTING STR-1D.
   D. SHAPE CHANNEL TO SPECIFICATIONS SHOWN. REMOVE LOOSE SOILS AND DEBRIS.
   E. IF SUFFICIENT NATIVE STONE (AS APPROVED BY ENGINEER) IS NOT ENCOUNTERED WITHIN THE NEW CHANNEL EXCAVATION, THEN EXCAVATE NATIVE STONE FROM EXISTING STR-1.
   F. PLACE TOPSOIL, SEED & EROSION CONTROL BLANKET AS SPECIFIED.
   G. REMOVE DIVERSION BERMS, BEGINNING WITH THE MOST DOWNSTREAM BERM. BANKS AND BOTTOM ELEVATION OF THE OLD CHANNEL SHOULD TRANSITION SMOOTHLY INTO THE NEW CHANNEL. THE ELEVATIONS OF THE NEW CHANNEL BOTTOM AT EACH END OF THE RELOCATION SEQUENCE SHOULD MATCH THE ELEVATIONS OF THE EXISTING CHANNEL, AND A STEADY PERCENT SLOPE SHOULD BE MAINTAINED THROUGHOUT THE RELOCATED CHANNEL CENTERLINE OR AS SPECIFIED.
   H. INSTALL TREES ACCORDING TO DETAIL.

3. CONTRACTOR IS ENCOURAGED TO EXCAVATE THE MAIN PROFILE OF THE NEW CHANNEL FIRST, THEN, AS DROP STRUCTURES ARE CONSTRUCTED WITHIN THE NEW CHANNEL, POOLS CAN BE EXCAVATED ACCORDING TO THE TYPICAL PROFILE FOR THE GIVEN REACH (UPPER, MIDDLE, OR LOWER).

4. STABILIZE THE BANKS OF THE NEW CHANNEL WITH SEED AND COIR EROSION CONTROL BLANKET BEFORE ANTICIPATED RAINFALL.

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5. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. LIVE STAKES, BIOENGINEERING MEASURES, SEEDING, AND SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW-WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.

6. REQUESTS BY ANY AGENCY THAT WOULD REQUIRE THE MODIFICATION OF CHANNELS, DITCHES, ELEVATIONS, RIP-RAP OR ANY OTHER STREAM MITIGATION ITEMS ASSOCIATED WITH THE CHANNEL RELOCATIONS SHALL BE REFERRED TO THE PROJECT ENGINEER.

SPECIAL NOTES

1. THIS IS A STREAM RELOCATION PROJECT THAT IS TO BE DONE IN ACCORDANCE WITH 404/401 WATER QUALITY CERTIFICATION.

2. ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE WITH SEED/STRAW MULCH OR HYDROSEED UNLESS OTHERWISE NOTED IN THE PLANS OR BY THE ENGINEER.

TREES & SHRUBS:

NO SUBSTITUTIONS OF TREE SPECIES OR SIZES SHALL - BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER/LANDSCAPE ARCHITECT. CONCERNING STREAM MITIGATION, TREES SHALL BE OF THE VARIETY REQUESTED, BARE ROOT (ROOTS MUST BE KEPT MOIST AT ALL TIMES), AND FIRST QUALITY. ANY FOUND TO BE INCORRECT SPECIES, OR IMPROPERLY PLANTED, AT ANY TIME PRIOR TO TERMINATION OF THE CONTRACT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. STAKES AND WIRES SHALL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER.

SHRUB SPECIES (ALDER & PAW PAW) SHOULD BE 1-GALLON CONTAINER GROWN OR SEEDLINGS. SHRUBS SHOULD BE PLACED ON 10-FOOT CENTERS. TREE SPECIES SHOULD BE 3-GALLON CONTAINER GROWN OR BALL AND BURLAP STOCK. TREES SHOULD BE PLACED ON 10-FOOT CENTERS. LIVE STAKE ELDERBERRY, SILKY DOGWOODS AND/OR BLACK WILLOWS WILL ALSO BE USED ALONG THE STREAMBANK. CONSTRUCTION SPECIFICATIONS FOR LIVE STAKES.

1. HARVESTING:

A. LIVE STAKES MAY CONSIST OF A COMBINATION OF SILKY DOGWOOD AND ELDERBERRY.

B. STAKES SHOULD BE HARVESTED AND, PLANTED WHEN THE WILLOWS OR OTHER CHOSEN SPECIES ARE DORMANT. THIS PERIOD IS GENERALLY FROM LATE FALL TO EARLY SPRING, OR BEFORE THE BUDS START TO BREAK.

C. WHEN HARVESTING CUTTINGS, SELECT HEALTHY, LIVE WOOD THAT IS REASONABLY STRAIGHT.

D. USE LIVE WOOD AT LEAST 1 YEAR OLD OR OLDER. THE BEST WOOD IS 2 TO 5 YEARS OLD WITH SMOOTH BARK THAT IS NOT DEEPLY FURROWED.

E. MAKE CLEAN CUTS WITH UNSPLIT ENDS. TRIM BRANCHES FROM CUTTING AS CLOSE AS POSSIBLE. CUT THE BUTT END OF THE CUTTING AT AN ANGLE (r-45 DEGREES) AND THE TOP END SQUARE.

F. THE TOP. (SQUARE CUT END) SHOULD BE PAINTED AND SEALED BY DIPPING THE TOP 1-INCH TO 2-INCHES INTO A 50-50 MIX OF LIGHT COLORED LATEX PAINT AND WATER. THIS REDUCES THE POSSIBILITY OF DESICCATION AND DISEASE CAUSING MORTALITY AND MAKES THEM MORE VISIBLE FOR SUBSEQUENT PLANTING EVALUATIONS. ASSURE THE STAKES ARE PLANTED WITH THE TOP UP.

G. CUTTINGS SHOULD GENERALLY BE BETWEEN 0.5-INCHES TO 2-INCHES IN DIAMETER BUT CAN BE LARGER DEPENDING ON THE SPECIES. HIGHEST SURVIVAL RATES ARE OBTAINED FROM USING CUTTINGS 2-INCHES TO 3-INCHES IN DIAMETER. LARGER DIAMETER CUTTINGS ARE NEEDED FOR PLANTING INTO ROCK RIPRAP.

H. CUTTINGS, OF SMALL DIAMETER (UP TO 1.5-INCHES) SHOULD BE 18 INCHES LONG MINIMUM. THICKER CUTTINGS SHOULD BE LONGER.

I. STAKES SHOULD BE CUT SO A TERMINAL BUD SCAR IS WITHIN 1-INCH TO 4-INCHES OF THE TOP. AT LEAST TWO BUDS AND/OR BUD SCARS SHOULD BE ABOVE THE GROUND AFTER PLANTING.

2. INSTALLATION:

A. STAKES MUST BE PLANTED WITH BUTT-ENDS INTO THE GROUND. LEAF BUD SCARS OR EMERGING BUDS SHOULD ALWAYS POINT UP.

B. STAKES MUST NOT BE ALLOWED TO DRY OUT. THE CUTTINGS NOT PLANTED THE DAY THEY ARE HARVESTED SHOULD BE SOAKED IN WATER FOR A MINIMUM OF 24 HOURS AS SOAKING SIGNIFICANTLY INCREASES THE SURVIVAL RATE OF THE CUTTINGS.

C. PLANT STAKES 4 FEET APART AND ALTERNATE SPECIES.

D. SET THE STAKE AS DEEP AS POSSIBLE INTO THE SOIL, PREFERABLY WITH '80 PERCENT OF ITS LENGTH BURIED BUT NO LESS THAN ONE-HALF OF THE TOTAL LENGTH BURIED.

E. TAMP THE SOIL AROUND THE CUTTING.

USE AN IRON STAKE OR BAR TO MAKE A PILOT HOLE IN FIRM SOIL OR BETWEEN RIPRAP. DRIVE LIVE STAKES INTO THE SOIL WITH A RUBBER MALLET OR DEAD-BLOW HAMMER.

MULCHING OF SEEDED AREAS

ALL SEEDED AREAS ARE TO BE COVERED BY STRAW MULCH. HYDROSEEDING IN WHICH SEED, TACKIFIER, AND MULCH.

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STANDARD STREAM MITIGATION

1. CHANNEL LENGTH PLACED IN SPRING-BOXES OR CULVERTS COUNTS AS PART OF THE NEW CHANNEL LENGTH (BUT MAY REQUIRE OFF-SITE COMPENSATORY MITIGATION THAT WOULD NOT BE REQUIRED FOR AN OPEN CHANNEL).
2. THE USE OF RIP-RAP SHOULD BE AVOIDED IF POSSIBLE. IF RIP-RAP IS REQUIRED, THE RIP-RAP SHOULD BE IMBEDDED INTO THE SOIL SO THE TOP OF THE RIP-RAP IS FLUSH WITH THE BOTTOM AND SIDES OF THE CHANNEL.
3. PLANT TWO ALTERNATING ROWS OF TREE OR SHRUB SPECIES ON BOTH SIDES OF THE NEW CHANNELS; THE FIRST ROW SHALL BE BARE ROOT SEEDLINGS THAT ARE PLANTED ON THE CHANNEL SLOPE, CENTERED ON THE MIDPOINT OF THE SLOPE, ALONG THE TOP OF BANK, 3-GALLON CONTAINER-GROWN TREES ARE TO BE PLANTED WITHIN ONE FOOT OF THE TOP OF BANK.
4. RIP-RAP, IF REQUIRED, SHOULD BE LIMITED TO ENDS OF CULVERTS.
5. ALL RELOCATED CHANNELS AND THEIR ACCOMPANYING MITIGATION FEATURES, INCLUDING TREES, ARE TO BE PLACED IN RIGHT-OF-WAY RATHER THAN EASEMENTS.

CHANNEL RELOCATION SEQUENCE AND IMPELEMENTATION NOTES FOR RELOCATED STREAM CHANNELS (IGNORE REFERENCES TO ITEMS NOT SPECIFIED)

1. THE NEW CHANNEL SHALL BE EXCAVATED AND STABILIZED DURING A LOW-WATER PERIOD. RIP-RAP (ONLY AS SHOWN ON PLANS), SEEDING, AND SOD SHALL BE INSTALLED IMMEDIATELY FOLLOWING CHANNEL COMPLETION. TREES SHALL BE INSTALLED IN THE FIRST PLANTING SEASON FOLLOWING CHANNEL EXCAVATION. WATER SHALL BE DIVERTED INTO THE NEW CHANNEL ONLY AFTER IT IS COMPLETELY STABILIZED, AND ONLY DURING A LOW-WATER PERIOD. STABILIZED MEANS THAT ALL SPECIFIED ROCK AND EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER IS IN PLACE, AND SEEDING AND SOD ARE IN PLACE AND ESTABLISHED.
2. CHANNEL RELOCATION SEQUENCE:
   A. FLAG EDGE OF THE NEW CHANNEL TOP BANK PRIOR TO CLEARING. DO NOT CLEAR LARGE TREES IN POSITION TO SHADE THE NEW CHANNEL. LEAVE AS MANY TREES AND SHRUBS AS POSSIBLE BETWEEN THE TOE OF THE NEW HIGHWAY SLOPE AND THE STREAM.
   B. EXCAVATE THE NEW CHANNEL "IN THE DRY" BY LEAVING AREAS OF UNDISTURBED EARTH (DIVERSION BERMS) IN PLACE AT BOTH ENDS.
   C. SHAPE CHANNEL TO SPECIFICATIONS SHOWN. REMOVE LOOSE SOILS AND DEBRIS.
   D. PLACE TOPSOIL, EROSION CONTROL BLANKET OR FLEXIBLE CHANNEL LINER, SEED AND SOD AS SPECIFIED
   E. REMOVE DIVERSION BERMS, BEGINNING WITH THE MOST DOWNSTREAM, BANKS AND BOTTOM ELEVATION OF THE OLD CHANNEL SHOULD TRANSITION SMOOTHLY INTO THE NEW CHANNEL. THE ELEVATIONS OF THE NEW CHANNEL BOTTOM AT EACH END OF THE RELOCATION SEQUENCE SHOULD MATCH THE ELEVATIONS OF THE EXISTING CHANNEL, AND A STEADY PERCENT SLOPE SHOULD BE MAINTAINED THROUGHOUT THE RELOCATED CHANNEL CENTERLINE OR AS SPECIFIED.
   F. INSTALL TREES ACCORDING TO STANDARD SPECIFICATIONS SECTION 802.
3. ONLY RIP-RAP SHOWN ON PLANS SHOULD BE USED IN THE RELOCATED CHANNEL REACH. ANY OTHER PROPOSED RIP-RAP SHOULD BE COORDINATED WITH THE ENVIRONMENTAL DIVISION THROUGH THE TDOT HEADQUARTERS CONSTRUCTION OFFICE.
4. REQUESTS BY ANY AGENCY THAT WOULD REQUIRE THE MODIFICATION OF CHANNELS, DITCHES, ELEVATIONS, RIP-RAP OR ANY OTHER STREAM MITIGATION ITEMS ASSOCIATED WITH THE CHANNEL RELOCATIONS SHALL BE REFERRED TO THE TDOT ENVIRONMENTAL DIVISION VIA THE HEADQUARTERS CONSTRUCTION OFFICE FOR COORDINATION WITH ALL INVOLVED AGENCIES AND TDOT DIVISIONS.

TREES

1. NO SUBSTITUTIONS OF TREE SPECIES OR SIZES SHALL BE ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE TDOT ENVIRONMENTAL DIVISION, CONCERNING STREAM MITIGATION. TREES SHALL BE OF THE VARIETY REQUESTED, AND FIRST QUALITY. CONCERNING TEMPORARY WETLAND MITIGATION. TREES SHALL BE OF THE VARIETY REQUESTED, WELL BRANCHED, BARE ROOT (ROOTS MUST BE KEPT MOIST AT ALL TIMES), AND FIRST QUALITY. NO CLONES OR CULTIVARS WILL BE ACCEPTED. ANY FOUND TO BE INCORRECT SPECIES, OR IMPROPERLY PLANTED, AT ANY TIME PRIOR TO TERMINATION OF THE CONTR ACT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. STAKES AND WIRES SHALL BE REMOVED IMMEDIATELY PRIOR TO CONTRACT TERMINATION, UNLESS OTHER WISE DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHOULD ARRANGE SEVERAL MONTHS AHEAD OF TIME TO OBTAIN THE CORRECT TREE SPECIES, AS SOME MAY REQUIRE SOME TIME TO LOCATE.
3. ALL TREES PLANTED SHALL BE WRAPPED AS PER SECTION 802.07 OF TDOT STANDARD SPECIFICATIONS FOR THE ROAD AND BRIDGE CONSTRUCTION.
4. TREES SHALL BE WATERED AS REQUIRED THROUGH THE PERIOD OF ESTABLISHMENT TO ENSURE SURVIVAL.

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Morgan / Roane County, TN
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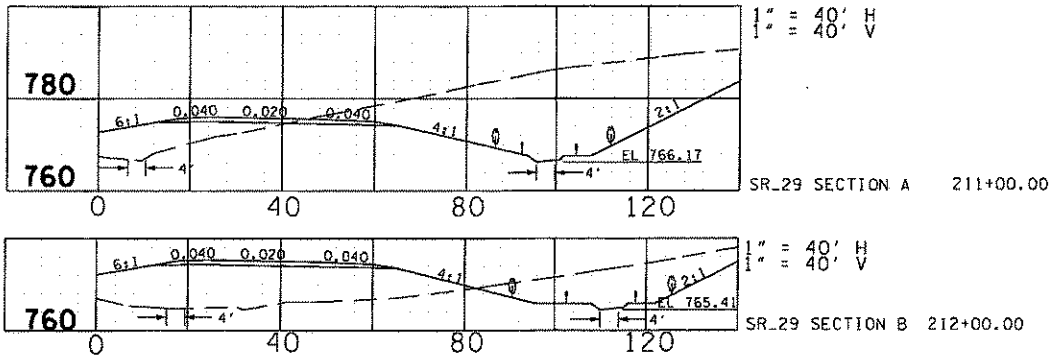
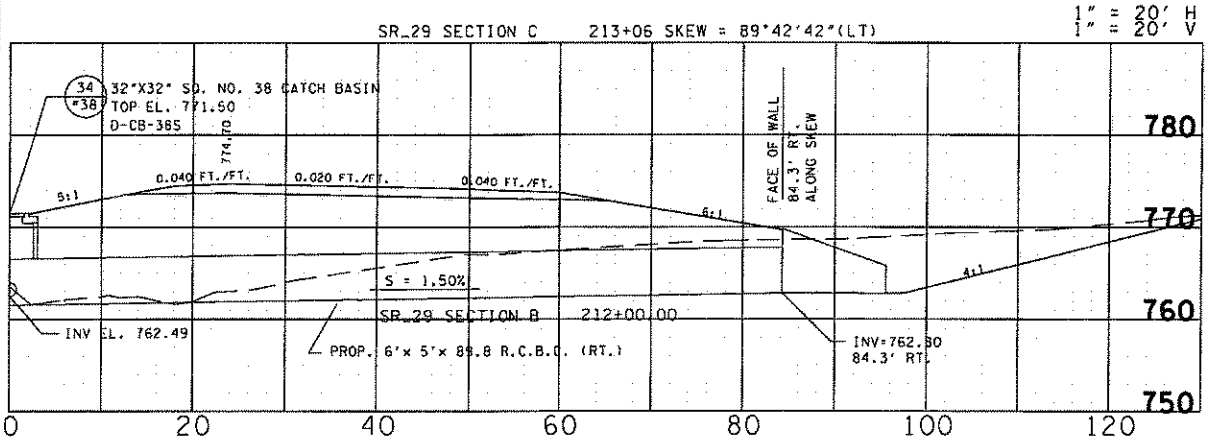
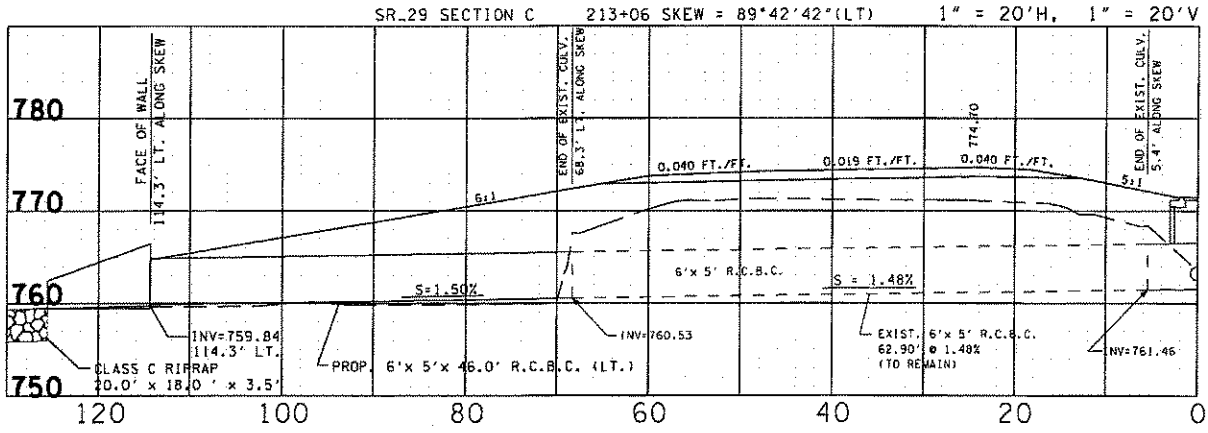
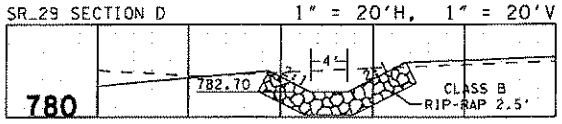
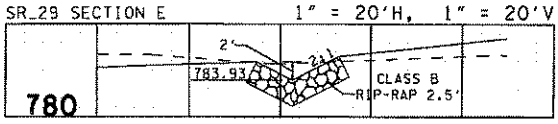
Permit Sketch
STR-10











DATE: 03/04/2013 REVISED: / /

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Morgan / Roane County, TN
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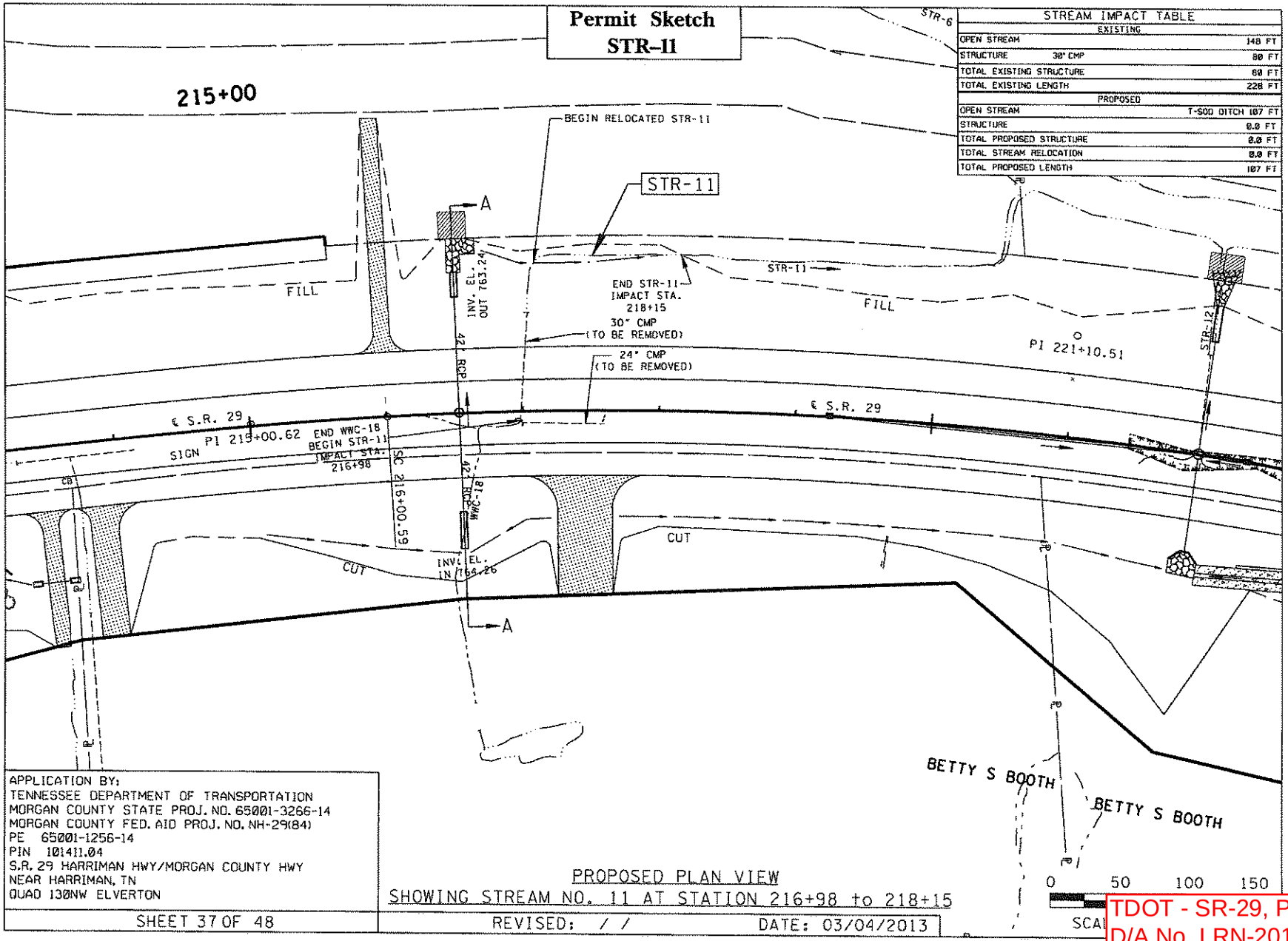
Permit Sketch
STR-11



STREAM IMPACT TABLE	
EXISTING	
OPEN STREAM	148 FT
STRUCTURE 30" CMP	80 FT
TOTAL EXISTING STRUCTURE	80 FT
TOTAL EXISTING LENGTH	228 FT
PROPOSED	
OPEN STREAM	T-SOD DITCH 107 FT
STRUCTURE	0.0 FT
TOTAL PROPOSED STRUCTURE	0.0 FT
TOTAL STREAM RELOCATION	0.0 FT
TOTAL PROPOSED LENGTH	107 FT

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING STREAM NO. 11 AT STATION 216+98 to 218+15

SHEET 37 OF 48 | REVISED: / / | DATE: 03/04/2013 | SCA

TDOT - SR-29, PIN 101411.04
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Morgan / Roane County, TN
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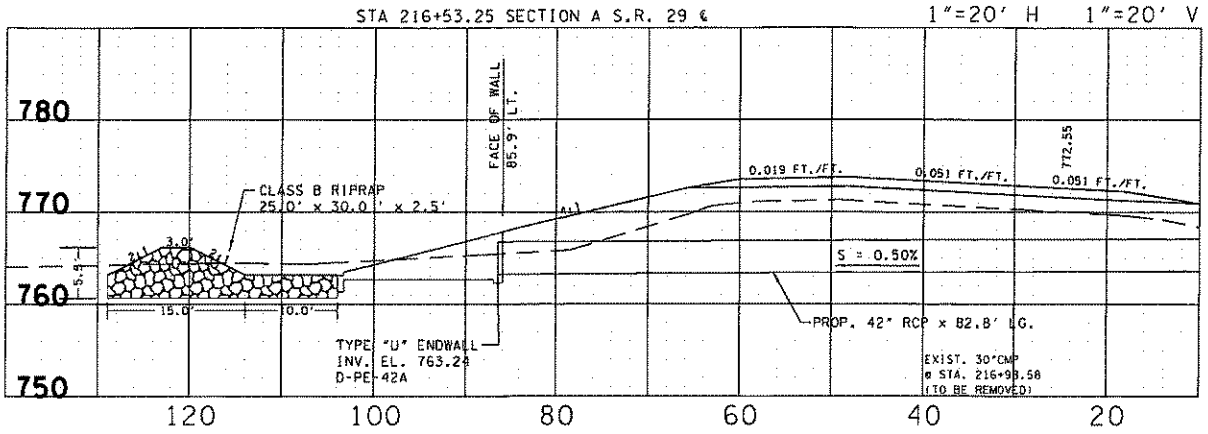
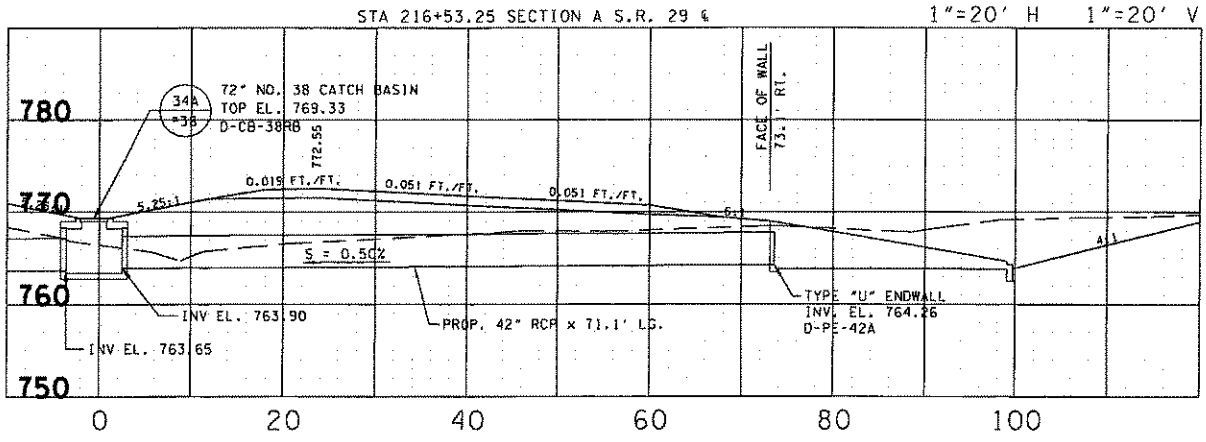
Permit Sketch
STR–11





DATE: 03/04/2013 REVISED: / /

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Morgan / Roane County, TN
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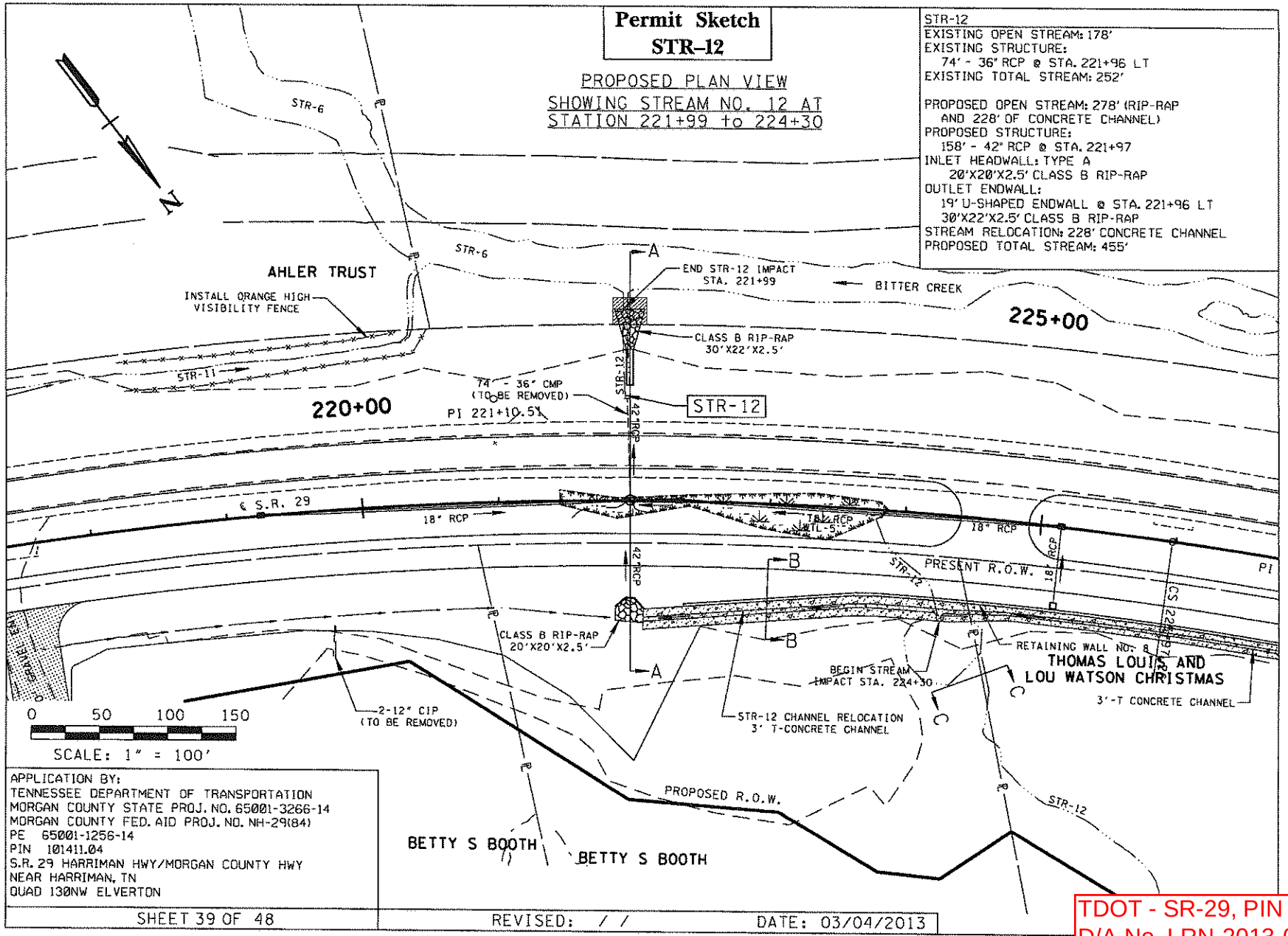
Permit Sketch
STR–12

PROPOSED PLAN VIEW
SHOWING STREAM NO. 12 AT
STATION 221+99 to 224+30



STR-12
EXISTING OPEN STREAM: 178'
EXISTING STRUCTURE:
74' - 36" RCP @ STA. 221+96 LT
EXISTING TOTAL STREAM: 252'

PROPOSED OPEN STREAM: 278' (RIP-RAP AND 228' OF CONCRETE CHANNEL)
PROPOSED STRUCTURE:
158' - 42" RCP @ STA. 221+97
INLET HEADWALL: TYPE A
20'X20'X2.5' CLASS B RIP-RAP
OUTLET ENDWALL:
19' U-SHAPED ENDWALL @ STA. 221+96 LT
30'X22'X2.5' CLASS B RIP-RAP
STREAM RELOCATION: 228' CONCRETE CHANNEL
PROPOSED TOTAL STREAM: 455'

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 130NW ELVERTON

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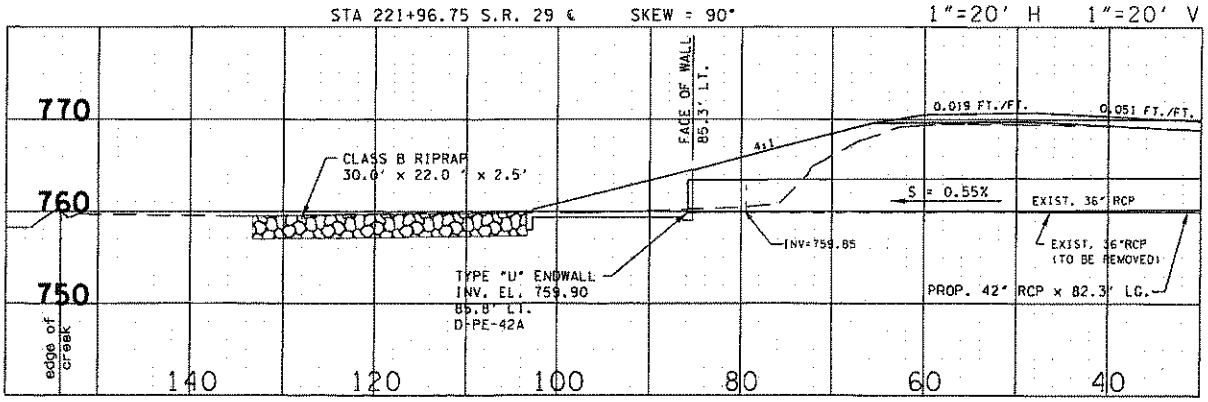
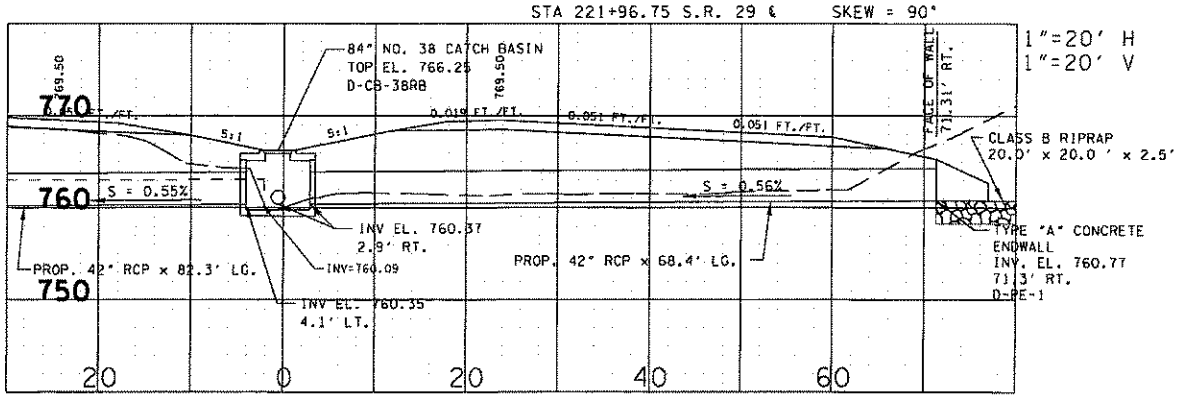
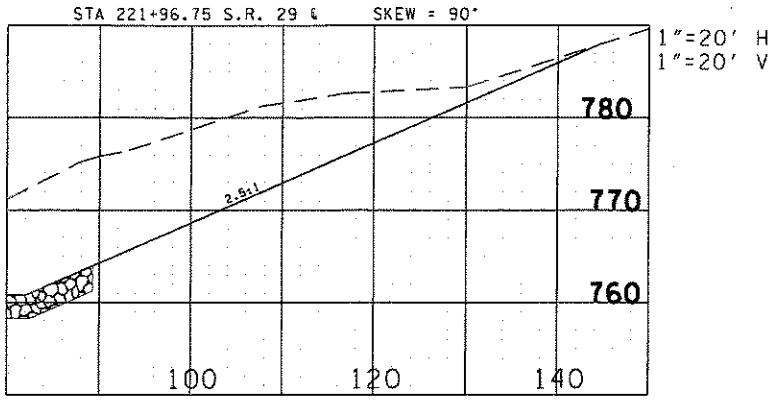
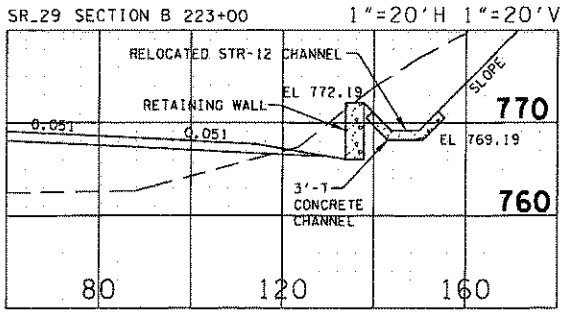
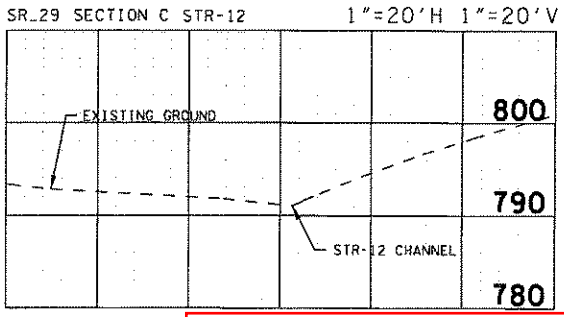
Permit Sketch
STR-12











DATE: 03/04/2013 REVISED: / /

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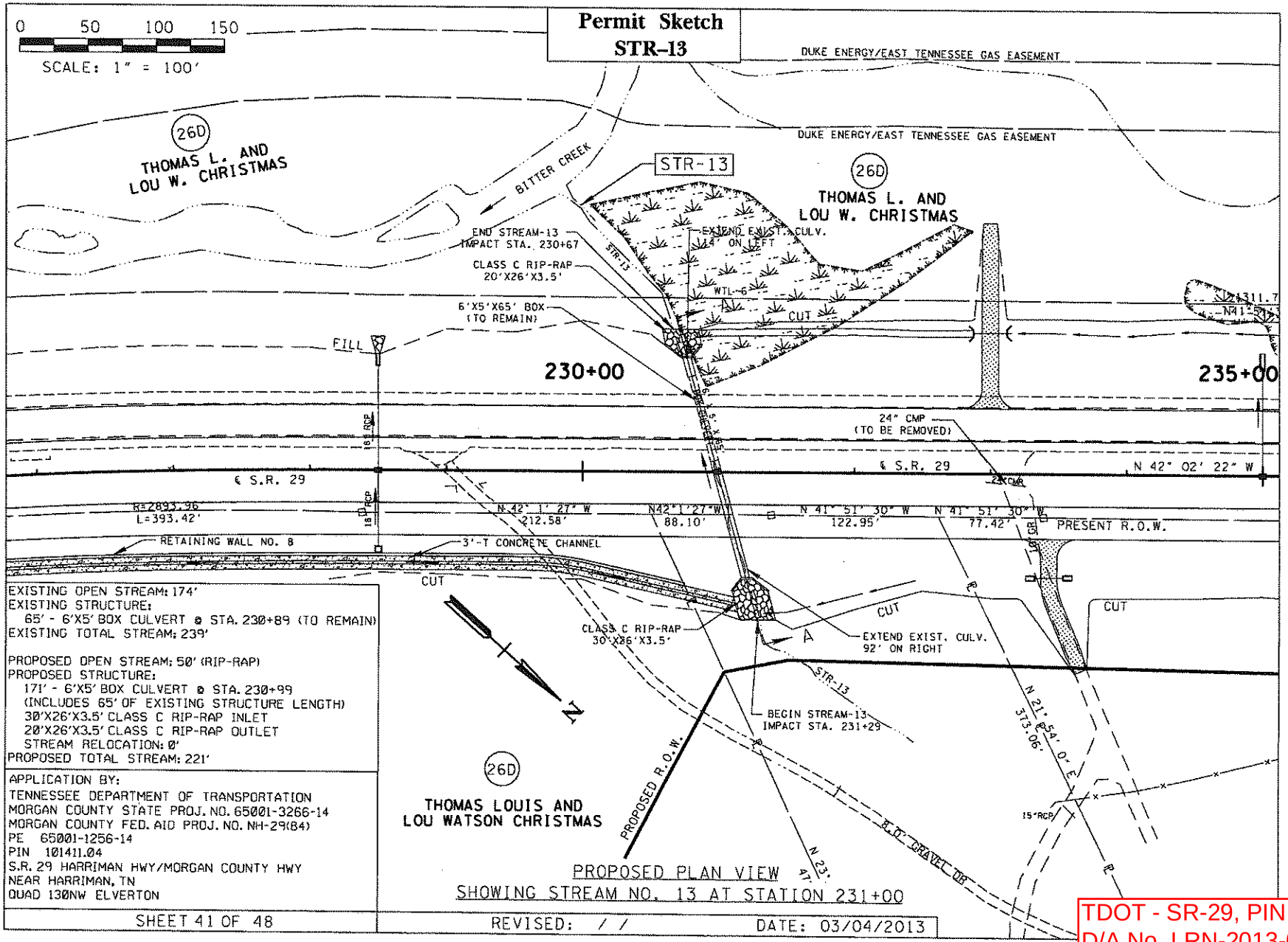

PROPOSED PLAN VIEW
SHOWING STREAM NO. 13 AT STATION 231+00

TDOT - SR-29, PIN 101411.04
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Morgan / Roane County, TN
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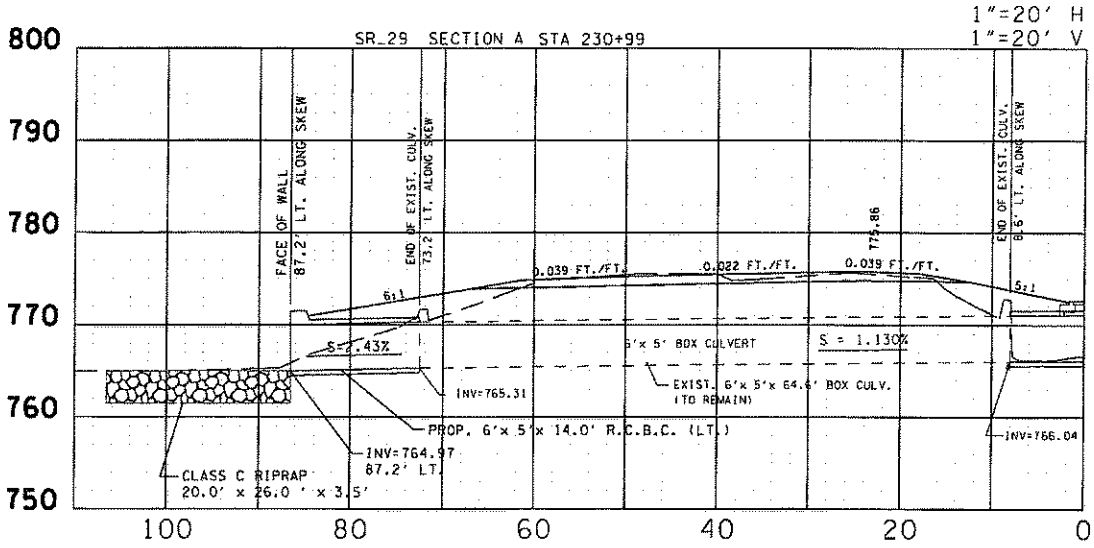
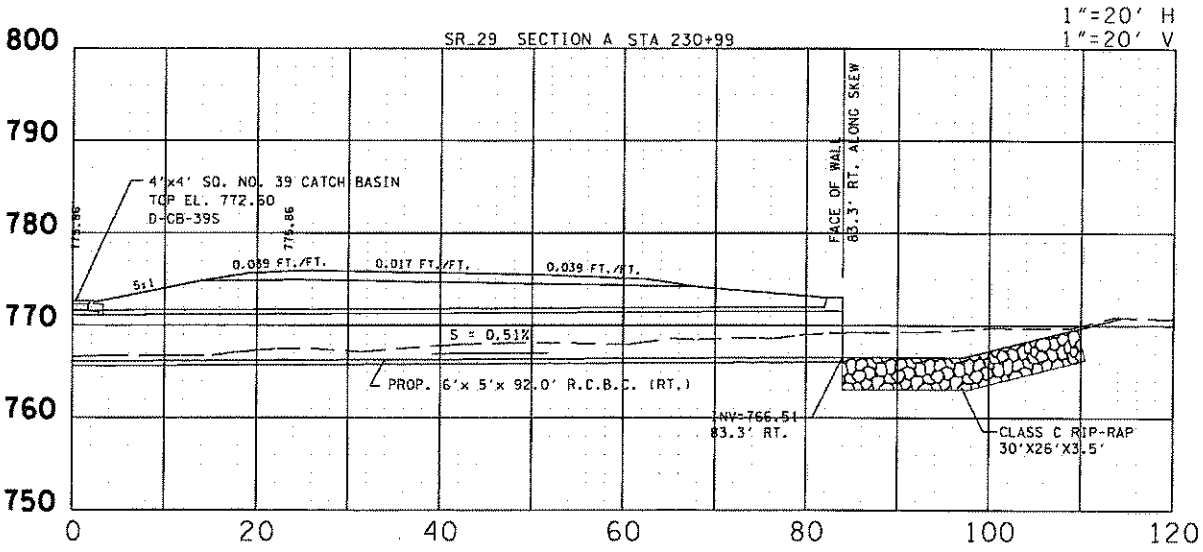
Permit Sketch
STR-13





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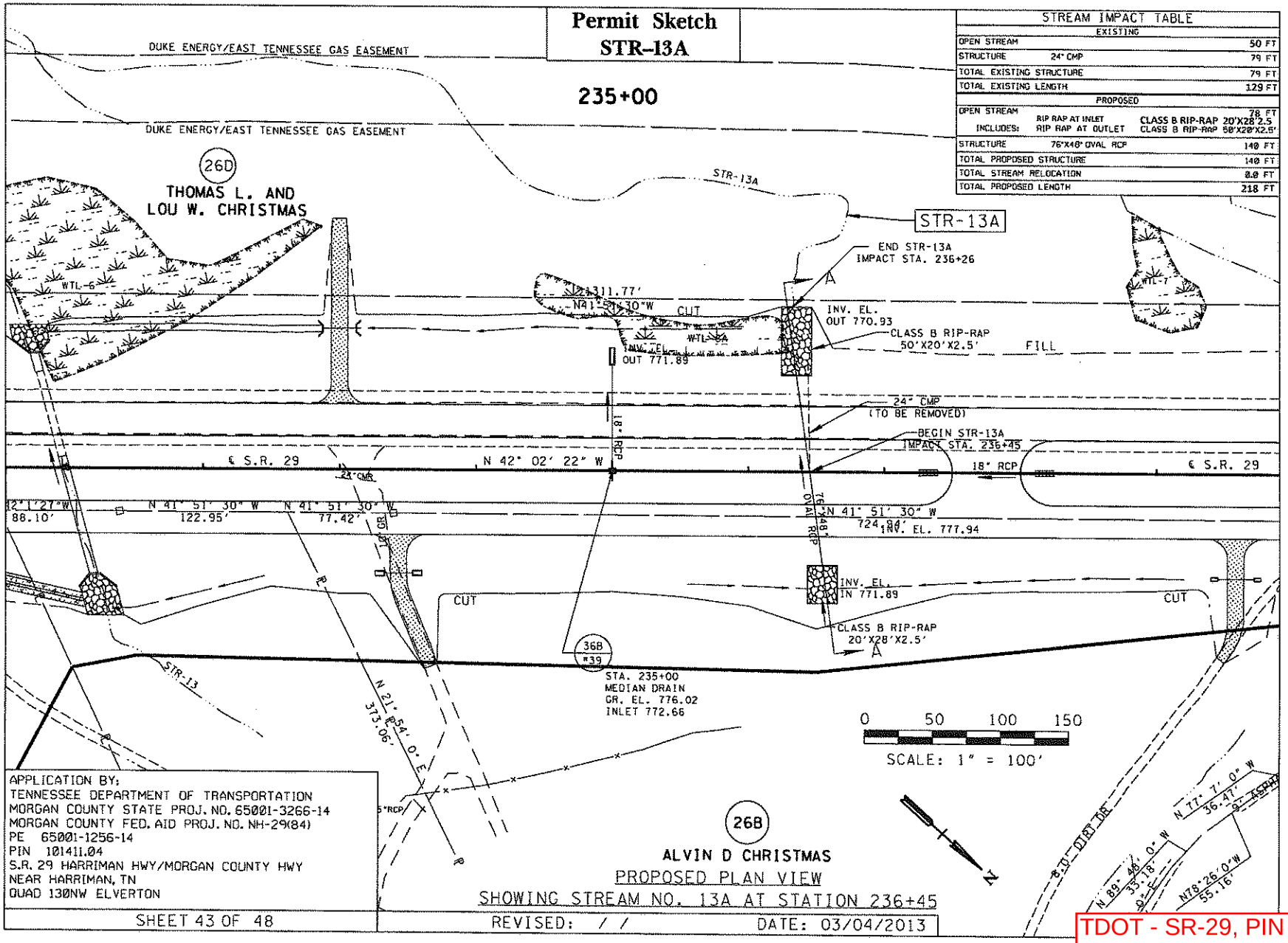
Permit Sketch
STR-13A

235+00



STREAM IMPACT TABLE

EXISTING		
OPEN STREAM		50 FT
STRUCTURE	24" CMP	79 FT
TOTAL EXISTING STRUCTURE		79 FT
TOTAL EXISTING LENGTH		129 FT
PROPOSED		
OPEN STREAM		78 FT
INCLUDES:	RIP RAP AT INLET — CLASS B RIP-RAP 20'X28'2.5	
	RIP RAP AT OUTLET — CLASS B RIP-RAP 50'X20'X2.5'	
STRUCTURE	76"X48" OVAL RCP	140 FT
TOTAL PROPOSED STRUCTURE		140 FT
TOTAL STREAM RELOCATION		8.0 FT
TOTAL PROPOSED LENGTH		218 FT

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING STREAM NO. 13A AT STATION 236+45

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Morgan / Roane County, TN
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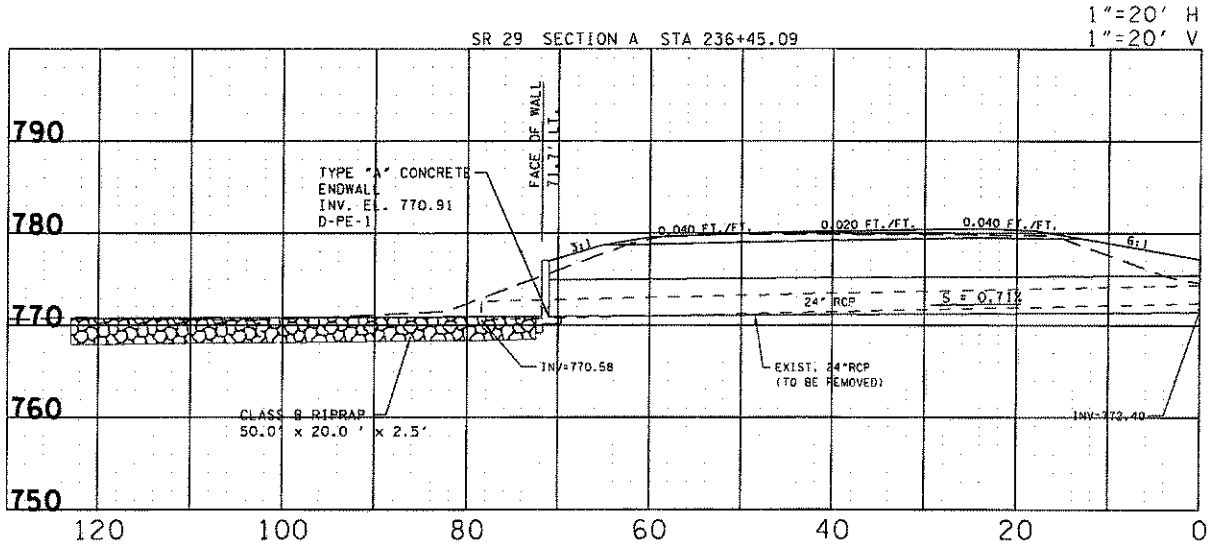
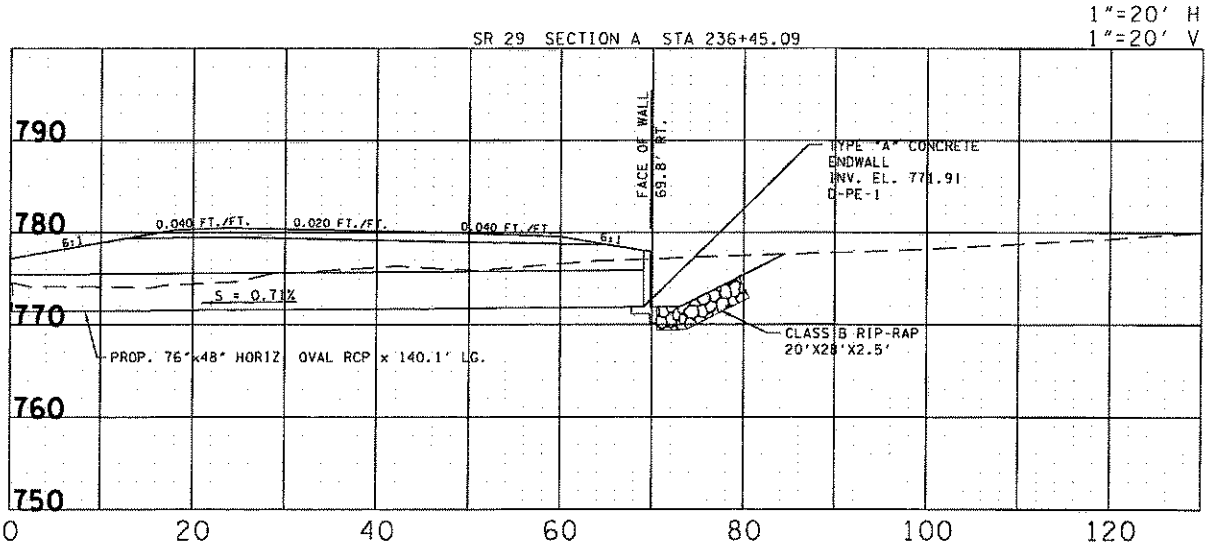
Permit Sketch
STR-13A





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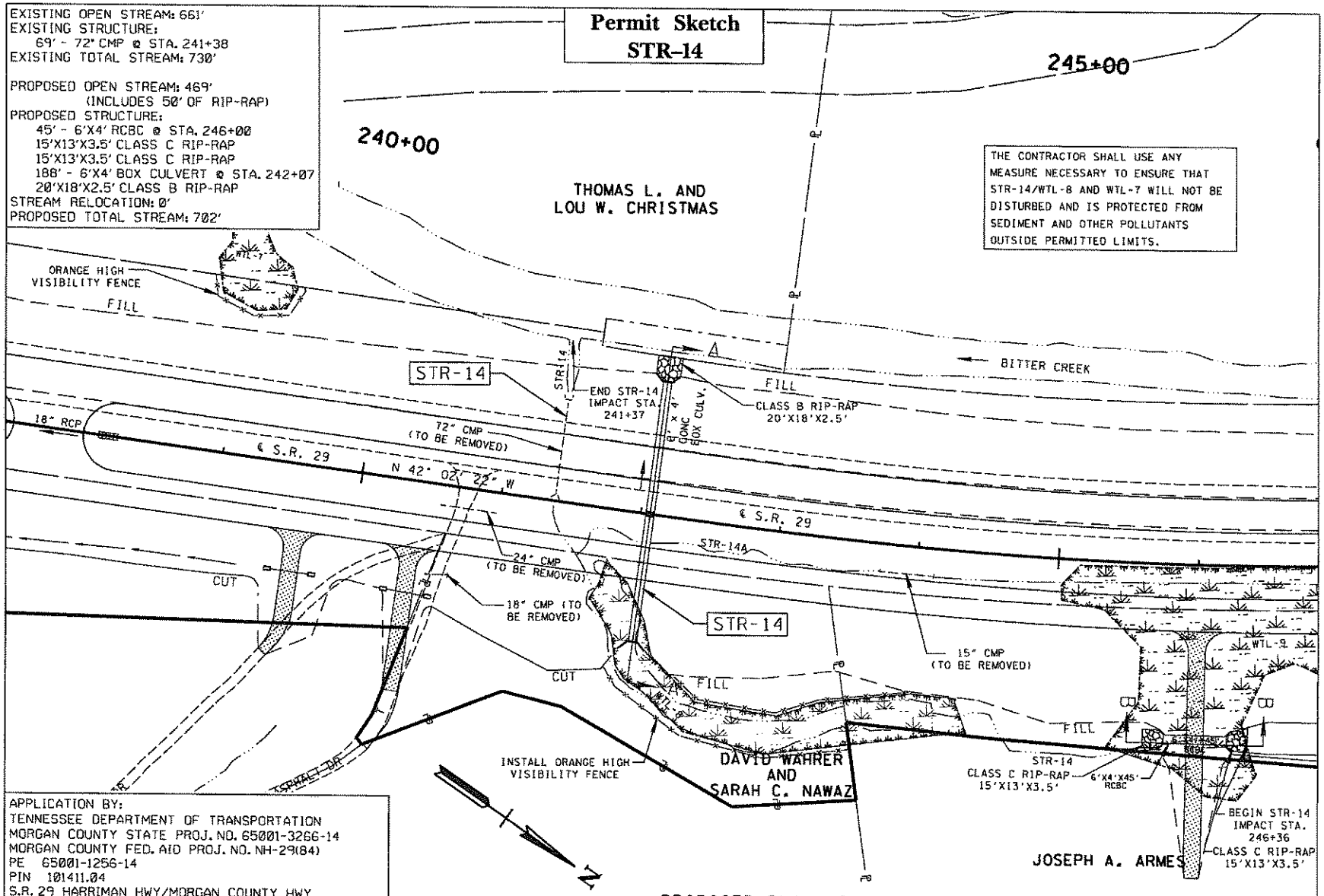
EXISTING OPEN STREAM: 661'
EXISTING STRUCTURE:
69' - 72" CMP @ STA. 241+38
EXISTING TOTAL STREAM: 730'

PROPOSED OPEN STREAM: 469'
(INCLUDES 50' OF RIP-RAP)
PROPOSED STRUCTURE:
45' - 6'X4' RCBC @ STA. 246+00
15'X13'X3.5' CLASS C RIP-RAP
15'X13'X3.5' CLASS C RIP-RAP
188' - 6'X4' BOX CULVERT @ STA. 242+07
20'X18'X2.5' CLASS B RIP-RAP
STREAM RELOCATION: 0'
PROPOSED TOTAL STREAM: 702'

Permit Sketch
STR-14



PROPOSED PLAN VIEW
SHOWING STREAM NO. 14 STATION 242+00

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 123 NE HARRIMAN

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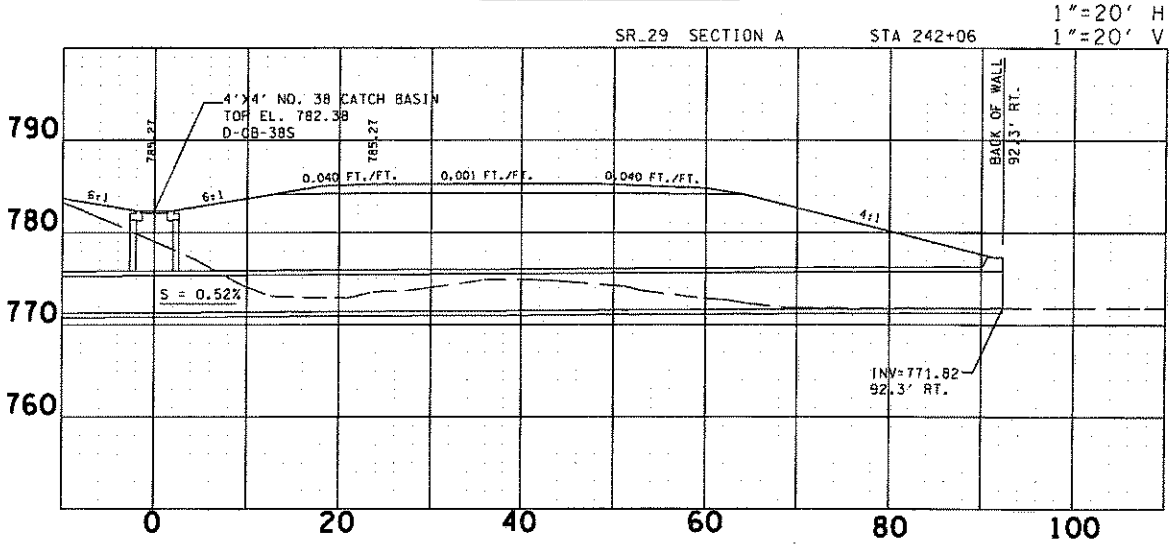
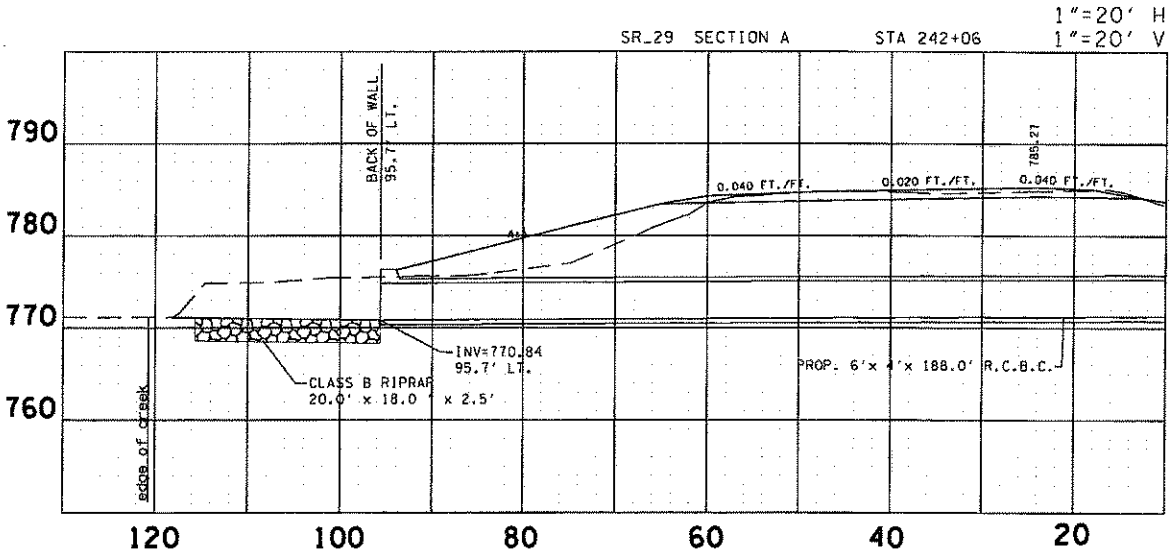
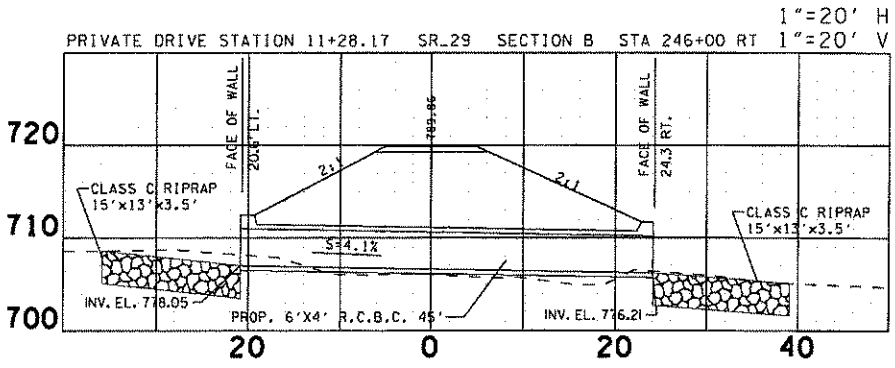
Permit Sketch
STR-14







DATE: 03/04/2013 REVISED: / /

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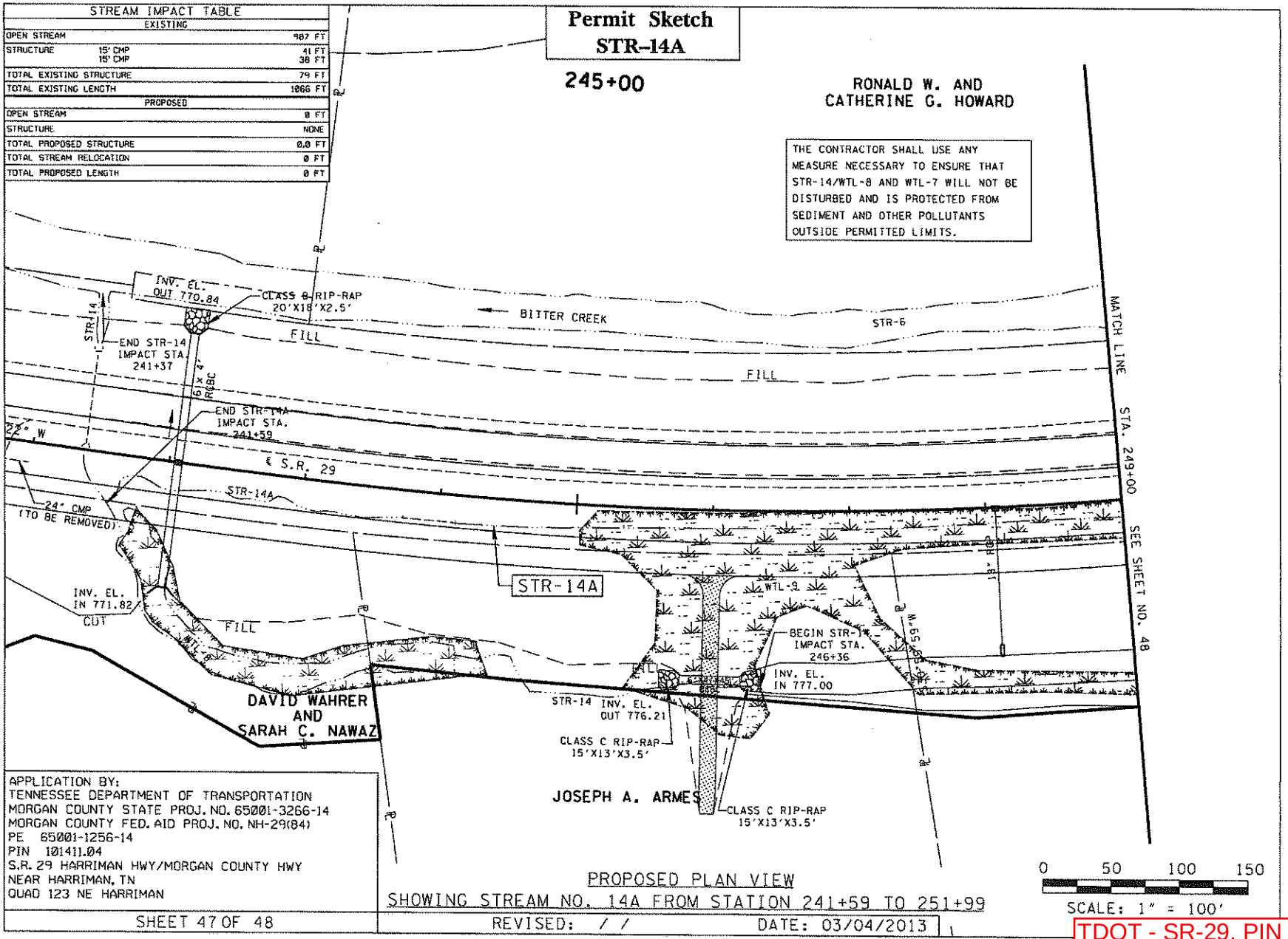

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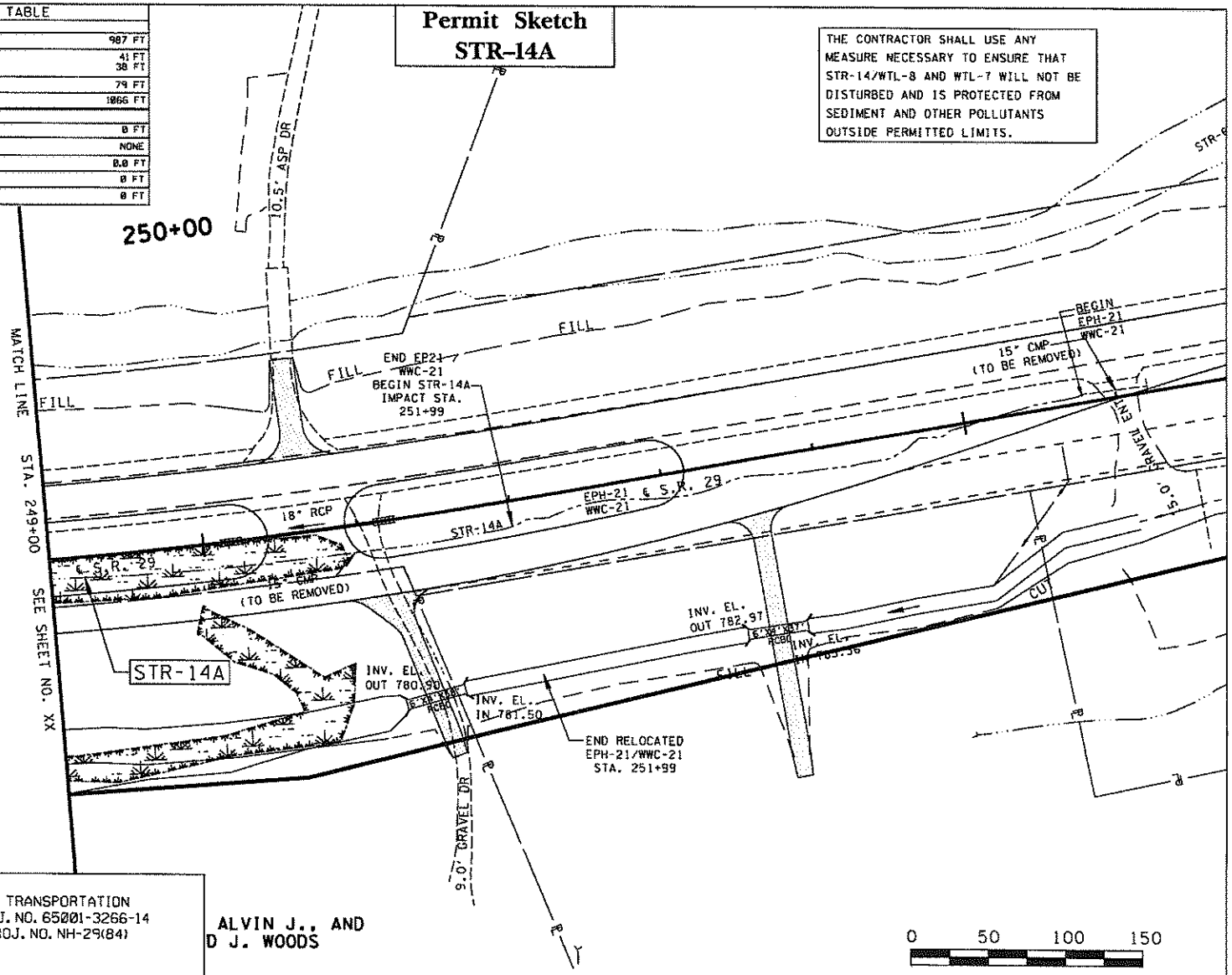
STREAM IMPACT TABLE		
EXISTING		
OPEN STREAM		987 FT
STRUCTURE	15" CMP 15" CMP	41 FT 38 FT
TOTAL EXISTING STRUCTURE		79 FT
TOTAL EXISTING LENGTH		1066 FT
PROPOSED		
OPEN STREAM		0 FT
STRUCTURE		NONE
TOTAL PROPOSED STRUCTURE		0.0 FT
TOTAL STREAM RELOCATION		0 FT
TOTAL PROPOSED LENGTH		0 FT

Permit Sketch
STR-14A

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-14/WTL-8 AND WTL-7 WILL NOT BE DISTURBED AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS OUTSIDE PERMITTED LIMITS.



0 50 100 150

SCALE: 1" = 100'

PROPOSED PLAN VIEW

SHOWING STREAM NO. 14A FROM STATION 241+59 TO 251+99

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN
QUAD 123 NE HARRIMAN

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D/A No. LRN-2013-00712
Morgan / Roane County, TN
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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	18A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	5A

06/18/2010: INCREASED PROPOSED WIDTH OF VARIOUS DRIVES.

12/16/2011: REMOVED DRIVEWAYS AT STA 256+05.92 AND STA 256+94.04.

RIP-RAP SHALL BE PLACED AS TO MIMIC THE EXISTING CONTOURS OF THE STREAM CHANNEL. THE TOP OF THE PROPOSED RIP-RAP SHALL BE AT GRADE WITH THE BOTTOM OF THE EXISTING STREAM CHANNEL. VOIDS WITHIN THE RIP-RAP SHALL BE FILLED WITH CREEK GRAVEL TO PREVENT LOSS OF STREAM WITHIN RIP-RAP AREAS. CREEK GravEL CAN BE REMOVE FROM CULVERT EXCAVATION AREA.

255+00

260+00

END CONSTRUCTION FEDERAL PROJECT
NO. NH-29(84)
STATE PROJECT NO. 65001-3266-14
STA. 259+00.00 S.R. 29
N 610184.6893
E 2410595.3063

BITTER CREEK

STR-6

TOP OF BANK

SEE SHEET NO. 4A

STA. 252+00

MATCH LINE

SEE SHEET NO. 6A

STA. 264+00

MATCH LINE

LST 253+18.72

OBLITERATE, TOPSOIL AND SOD

℄ S.R. 29

N 60° 03′ 31″ W

24′

STA. 254+07.17
MEDIAN DRAIN
GR. EL. 793.00
INV. EL. 788.75
44 / #38

18″ RCP

R 15′

INV. EL.
OUT 782.46

WWC-21

15′X4′X37′
RCBC

INV. EL.
IN 783.08

LIMIT OF CONST.
STA. 11+95.00

INV.EL.
OUT 784.12
45 / EW

STA. 253+58.00
12.0′ FIELD ENT.
6′X4′X37′ R.C.B.C.

BEGIN SP. DT. RT.
3′ "T" CLASS C RIP-RAP
STA. 258+80 SR-29

END SP. DT. RT.
3′ "T" CLASS C RIP-RAP
BEGIN SP. DT. RT.
CONCRETE
STA. 259+00 SR-29

RELOCATED WWC-21, SEE PROJ. NO.
65001-3266-14 CONST. PLANS FOR
MORE DETAILS.

END STR-15 IMPACT
STA. 259+74

CLASS B RIP-RAP
18′X12′X2.5′

STR-15

INV. EL.
OUT 795.30

GRADED SOLID ROCK
300′X100′X2.5′

27′ OF 18″ PERFORATED
PIPE INV. EL. IN 797.15
BEGIN STR-15 IMPACT
STA. 259+77

BEGIN RETAINING WALL 1
STA. 259+39.15, 63.61 RT.
TOP ELEV. 804.60′

STA. 259+50

36″ RCP

STA. 260+38.16
12.0′ FIELD ENT.
26′ OF 18″ S.D. REQD.

LIMIT OF CONST.
STA. 11+29.10

R 15′

STA. 260+00.00
DITCH DRAIN
OFFSET 70.25 RT.
GR. EL. 813.22
INV. EL. OUT 796.50
46 / #39

STA. 260+00.00
OFFSET 60.0′ RT.
GR. EL. 802.32
INV. EL. IN 796.46
OUT 795.93
47 / #41

44A / #38
STA. 260+00.00
MEDIAN DRAIN
OFFSET 0.0′
GR. EL. 800.49
INV. EL. IN 795.67 36″ RCP
OUT 795.64 36″ RCP
IN 797.15 18″ RCP
IN 797.15 18″ PERFORATED PIPE

STA. 262+00
MEDIAN DRAIN
OFFSET 0.0′
GR. EL. 802.91
INV. EL. IN 798.26
OUT 798.06
49 / #38

STA. 262+00
OFFSET 60.0′ RT.
GR. EL. 804.85
INV. EL. IN 799.63
OUT 799.43
48 / #41

INV. EL.
OUT 804.13
50 / EW

LIMIT OF CONST.
STA. 11+27.22

STA. 263+50.00
15.0′ PVT. DR.
26′ OF 18″ S.D. REQD.

R 25′

R 20′

24′R.

STA. 263+25.00

STA. 263+75.00

INV. EL.
IN 804.72
51 / EW

STA. 264+00
OFFSET 60.0′ RT.
GR. EL. 807.27
INV. EL. OUT 802.05
52 / #41

N

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

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Morgan / Roane County, TN
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 252+00 TO STA. 264+00

SCALE: 1″= 50′

Survey & Design Division

11/20/2013 2:58:44 PM
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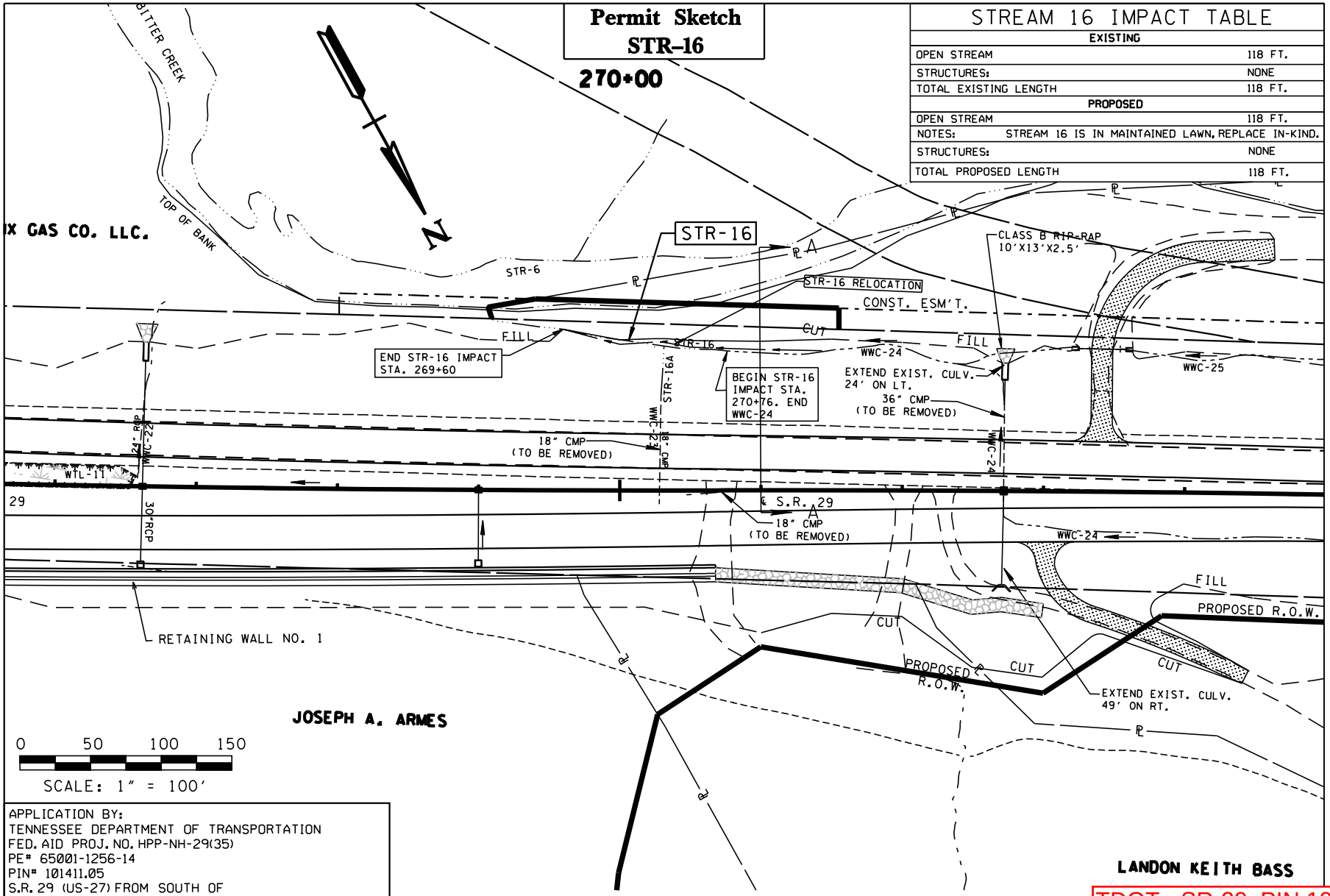

STREAM 16 IMPACT TABLE	
EXISTING	
OPEN STREAM	118 FT.
STRUCTURES:	NONE
TOTAL EXISTING LENGTH	118 FT.
PROPOSED	
OPEN STREAM	118 FT.
NOTES: STREAM 16 IS IN MAINTAINED LAWN, REPLACE IN-KIND.	
STRUCTURES:	NONE
TOTAL PROPOSED LENGTH	118 FT.

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

PROPOSED PLAN VIEW
SHOWING STREAM NO. 16 FROM STATION 269+60 TO 271+42

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TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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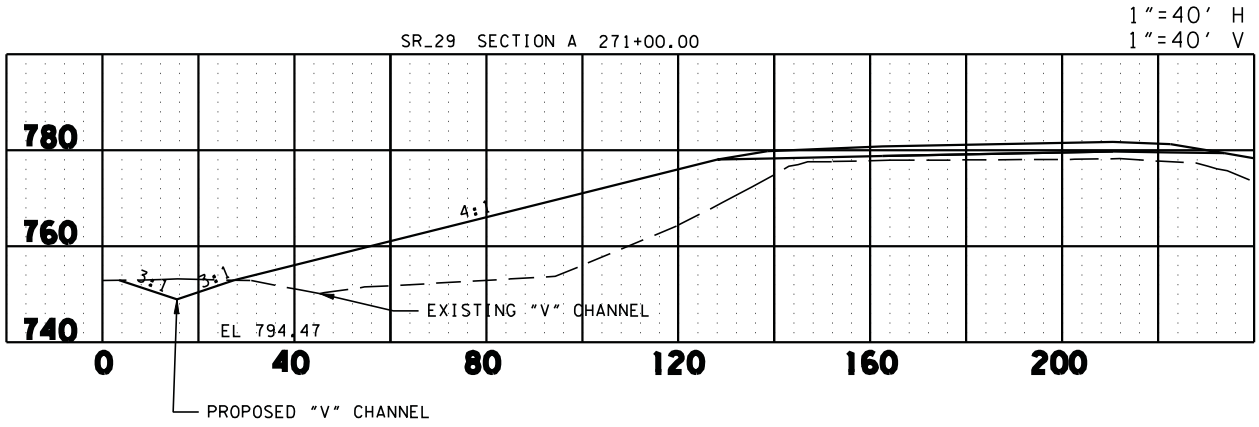
STREAM 16 IS IN MAINTAINED LAWN,
REPLACE IN-KIND.

Permit Sketch
STR-16



APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
N
C

DATE: 11/20/2013 REVISED: / /

TDOT - SR-29, PIN 101411.04
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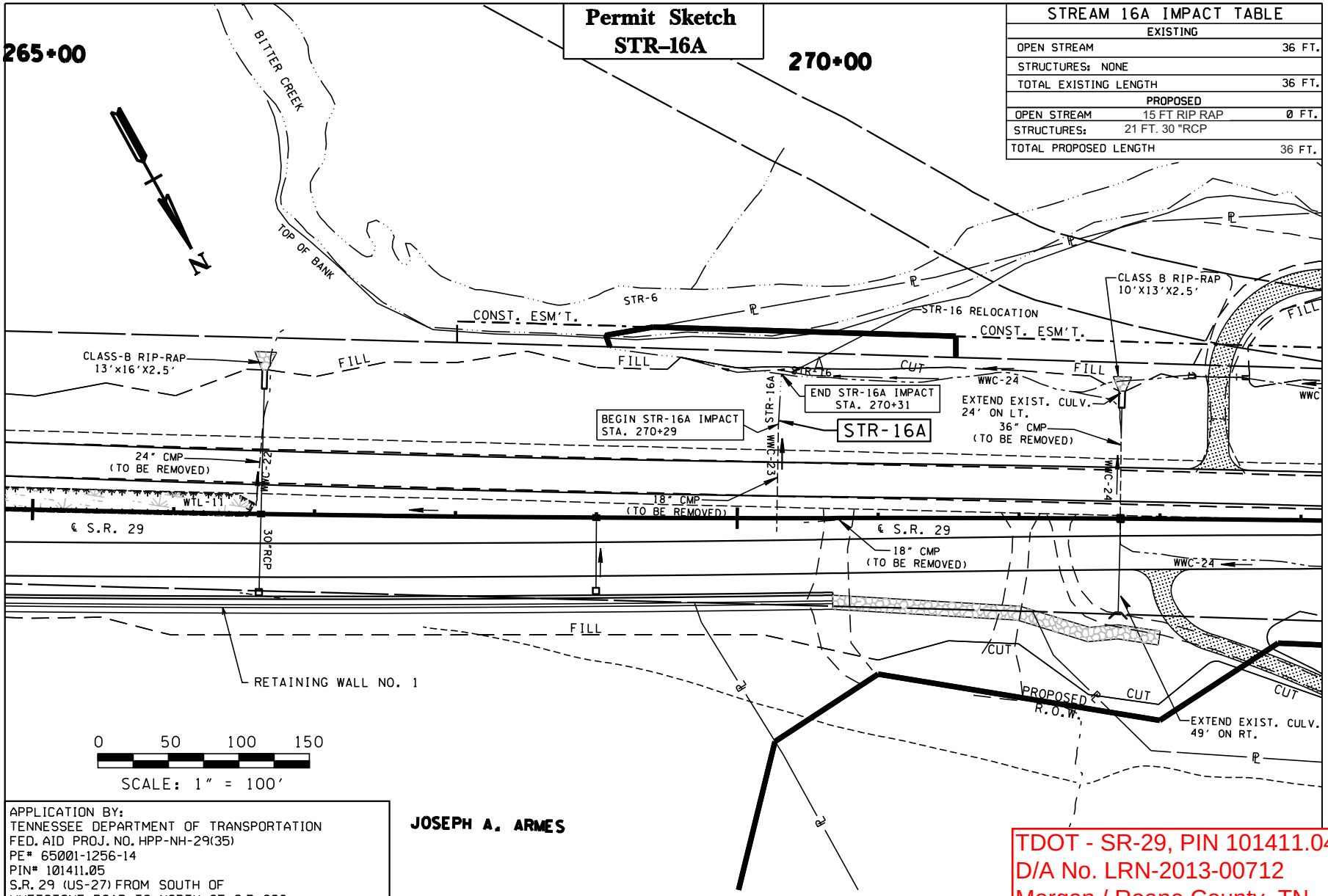

STREAM 16A IMPACT TABLE		
EXISTING		
OPEN STREAM		36 FT.
STRUCTURES: NONE		
TOTAL EXISTING LENGTH		36 FT.
PROPOSED		
OPEN STREAM	15 FT RIP RAP	0 FT.
STRUCTURES:	21 FT. 30 "RCP	
TOTAL PROPOSED LENGTH		36 FT.

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

JOSEPH A. ARMES

PROPOSED PLAN VIEW
SHOWING STREAM NO. 16A AT STATION 270+29 TO 270+31

SHEET 22 OF 30 | REVISED: / / | DATE: 11/20/2013

TDOT - SR-29, PIN 101411.04
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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	20A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	7A

06/18/2010: INCREASED PROPOSED WIDTH OF VARIOUS DRIVES.

RIP-RAP SHALL BE PLACED AS TO MIMIC THE EXISTING CONTOURS OF THE STREAM CHANNEL. THE TOP OF THE PROPOSED RIP-RAP SHALL BE AT GRADE WITH THE BOTTOM OF THE EXISTING STREAM CHANNEL. VOIDS WITHIN THE RIP-RAP SHALL BE FILLED WITH CREEK GRAVEL TO PREVENT LOSS OF STREAM WITHIN RIP-RAP AREAS. CREEK GRAVEL CAN BE REMOVE FROM CULVERT EXCAVATION AREA.

TDOT STANDARD DRAWING STD-15-16A, LOW FLOW CHANNEL CONSTRUCTION DETAILS FOR CULVERT INLET AND OUTLET, SHALL BE APPLICABLE TO THE CONSTRUCTION OF THE BOX CULVERT ON STR-17.

280+00

285+00

BITTER CREEK

TOP OF BANK

STA. 279+88.86
12.0' PVT. DR.

LIMIT OF CONST.
STA. 1+83.56

STR-6

STR-17

TYPE 13

INV. EL.
OUT 804.32

22'X55'X3.5' CLASS C RIP RAP. EXCAVATED STREAM BED/COBBLE SHALL BE PLACED ON TOP OF RIP-RAP TO FILL VOIDS.

EXTEND EXIST. RCBC.
25' ON LEFT

STR-6/BITTER CREEK

TOP OF BANK

PI 285+45.98

WWC-29

INV=804.86

TYPE INLINE

TYPE 2

TYPE 38

CLASS-B RIP-RAP
19'X22'X2.5'
14' U-ENDWALL

INV. EL.
OUT 801.04

END STR-17
IMPACT
STA. 280+28

R 15'

3@67'x12'x5'
RCBC
(TO REMAIN)

END SP. DT. RT.
5' "T" RIP RAP CLASS B
STA. 281+36.00 SR-29

30'

PI 279+95.48

MATCH LINE
STA. 276+00

N 60° 03' 24" W

30'

℄ S.R. 29

TYPE INLINE

INV=806.26

TYPE 38

INV. EL.
IN 807.08

SC 281+42.54

R 15'

TYPE 2

TYPE 38

TYPE INLINE

TYPE 13

END SP. DT. RT.
5' "T" GRASS
W/ E.C. BLANKET TYPE II
STA. 283+50.00 SR-29

STA. 281+53.14
12.0' PVT. DR.
25' OF 36" S.D. REQD.

BEGIN SP. DT. RT.
5' "T" GRASS
W/ E.C. BLANKET TYPE II
STA. 281+72.00 SR-29

R 15'

R 15'

℄ S.R. 29

STA. 287+00

SEE SHEET NO. 8A

TYPE 2

TYPE 38

R 15'

TYPE 13

BEGIN SP. DT. RT.
5' "T" RIP RAP CLASS A1
STA. 280+00.00 SR-29

140' OF
30" RCP

WWC-24

WWC-28

WWC-27

INV. EL.
IN 804.27

END TAPER (RT. & LT.)
STA. 277+20.53

END SP. DT. RT.
5' "T" RIP RAP CLASS A1
STA. 280+40.00 SR-29

LIMIT OF CONST.
STA. 1+32.85

BEGIN SP. DT. RT.
5' "T" RIP RAP CLASS B
STA. 281+00.00 SR-29

22'X55'X3.5' CLASS C RIP RAP. EXCAVATED STREAM BED/COBBLE SHALL BE PLACED ON TOP OF RIP-RAP TO FILL VOIDS.

EXTEND EXIST. RCBC.
54' ON RIGHT

BEGIN STR-17
IMPACT
STA. 280+71

STA. 279+76.38
12.0' PVT. DR.

LIMIT OF CONST.
STA. 11+70.00

STR-17 FORKED CREEK

TOP OF BANK

LIMIT OF CONST.
STA. 1+52.00

STA. 286+09.25
12.0' FIELD ENT.
38' OF 36" S.D. REQD.

SEE SHEET NO. 6A

MATCH LINE
STA. 287+00

S.R. 29 (MAINLINE)

PI 285+49.98
N 611,491.6546
E 2,408,290.1643
Δs 46° 46' 48" (RT)
θs 8° 00' 00"
Δc 30° 46' 48" (RT)
D 4° 00' 00"
R 1,432.39
Lc 769.50
Ts 821.44
Ls 400.00
LT 266.94
ST 133.58
Es 133.32
X 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH

N

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

TDOT - SR-29, PIN 101411.04
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Morgan / Roane County, TN
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 276+00 TO STA. 287+00

SCALE: 1"= 50'

Survey & Design Division

11/20/2013 2:59:49 PM
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EPHEMERAL STREAM IMPACT TABLE	
EXISTING	
OPEN STREAM	409 FT
STRUCTURE	237 FT
TOTAL EXISTING STRUCTURE	0 FT
TOTAL EXISTING LENGTH	646 FT
PROPOSED	
OPEN STREAM INCLUDES: RIP-RAP AT OUTLET 16'X20'X3.5' CLASS C RIP-RAP	293 FT
STRUCTURE 60" RCP INCLUDES: OUTLET: TYPE A ENDWALL N/A	116 FT
TOTAL PROPOSED STRUCTURE	116 FT
TOTAL STREAM RELOCATION	0 FT
TOTAL PROPOSED LENGTH	646 FT

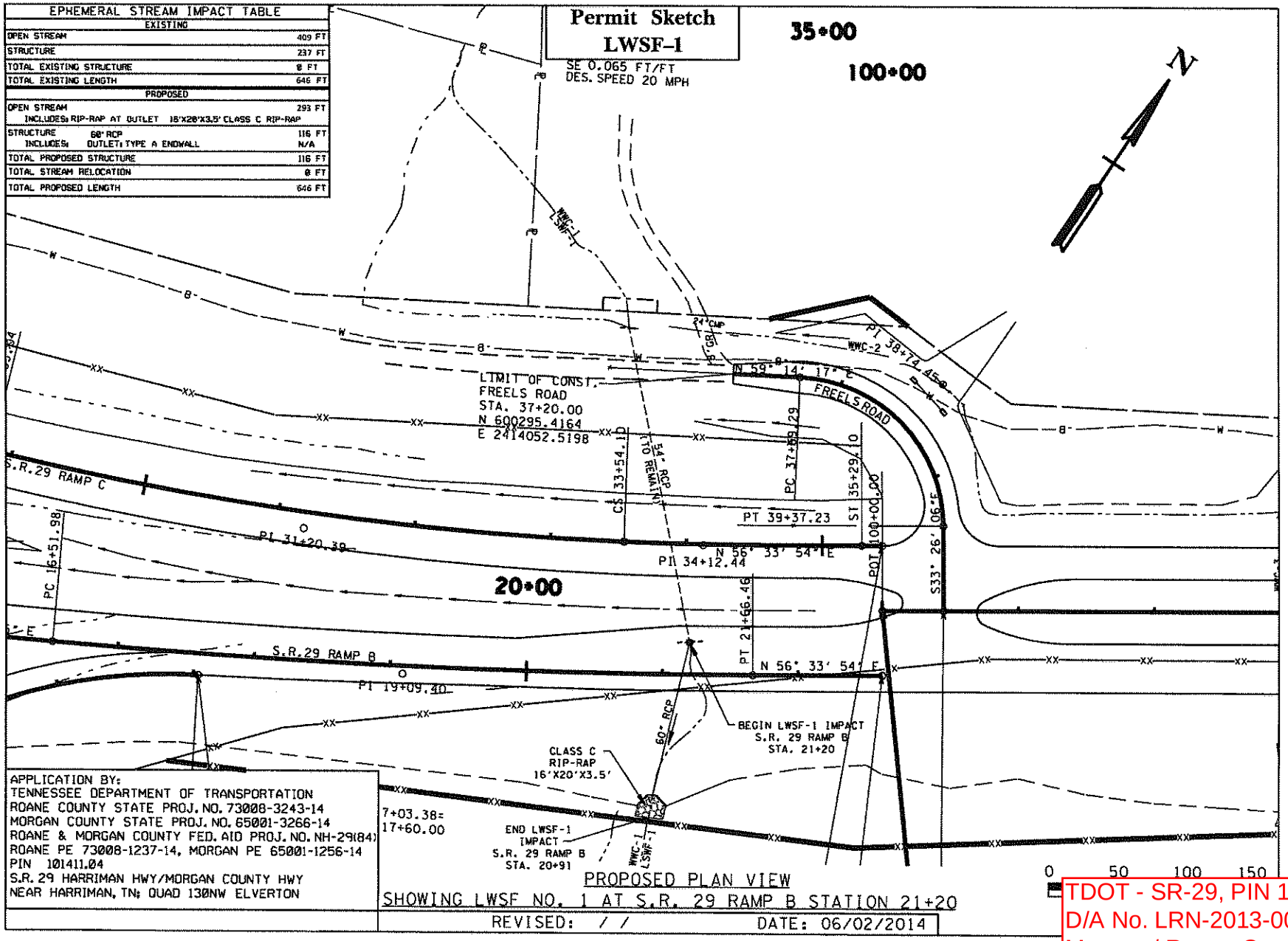
Permit Sketch
LWSF-1

SE 0.065 FT/FT
DES. SPEED 20 MPH

35+00

100+00

20+00



PROPOSED PLAN VIEW
SHOWING LWSF NO. 1 AT S.R. 29 RAMP B STATION 21+20

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

REVISED: / /

DATE: 06/02/2014

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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EPHEMERAL STREAM IMPACT TABLE		
EXISTING		
OPEN STREAM		131 FT
STRUCTURE	36" CMP	54 FT
TOTAL EXISTING STRUCTURE		54 FT
TOTAL EXISTING LENGTH		185 FT
PROPOSED		
OPEN STREAM		123 FT
STRUCTURE	24" RCP	52 FT
INCLUDES:	INLET: U-SHAPED ENDWALL	5 FT
	OUTLET: U-SHAPED ENDWALL	5 FT
TOTAL PROPOSED STRUCTURE		62 FT
TOTAL STREAM RELOCATION		0 FT
TOTAL PROPOSED LENGTH		185 FT

Permit Sketch
EPH-6

115+00

JOHN E. AND
JACKIE M. BROWN

N

10.0' BR

WWC-5

BEGIN EPH-6
IMPACT STA.
114+33

S.R. 29

℄ S.R. 29

END EPH-6
IMPACT STA.
116+09

N 56° 33' 54" E

WWC-6
EPH-5

54' OF
30" CMP

STR-1

BEGIN RELOCATED
EPH-6 STA.115+26

END RELOCATED
EPH-6 STA.116+41

52' OF
24" RCP

JOSHUA AND STEPHANIE BROWN

PEGGY SUE AND
ALAN DALE WEBB

SOUTHERN
RAIL ROAD

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN: QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 6 AT STATION 114+72

REVISED: / / DATE: 06/02/2014

0

SCA

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Morgan / Roane County, TN
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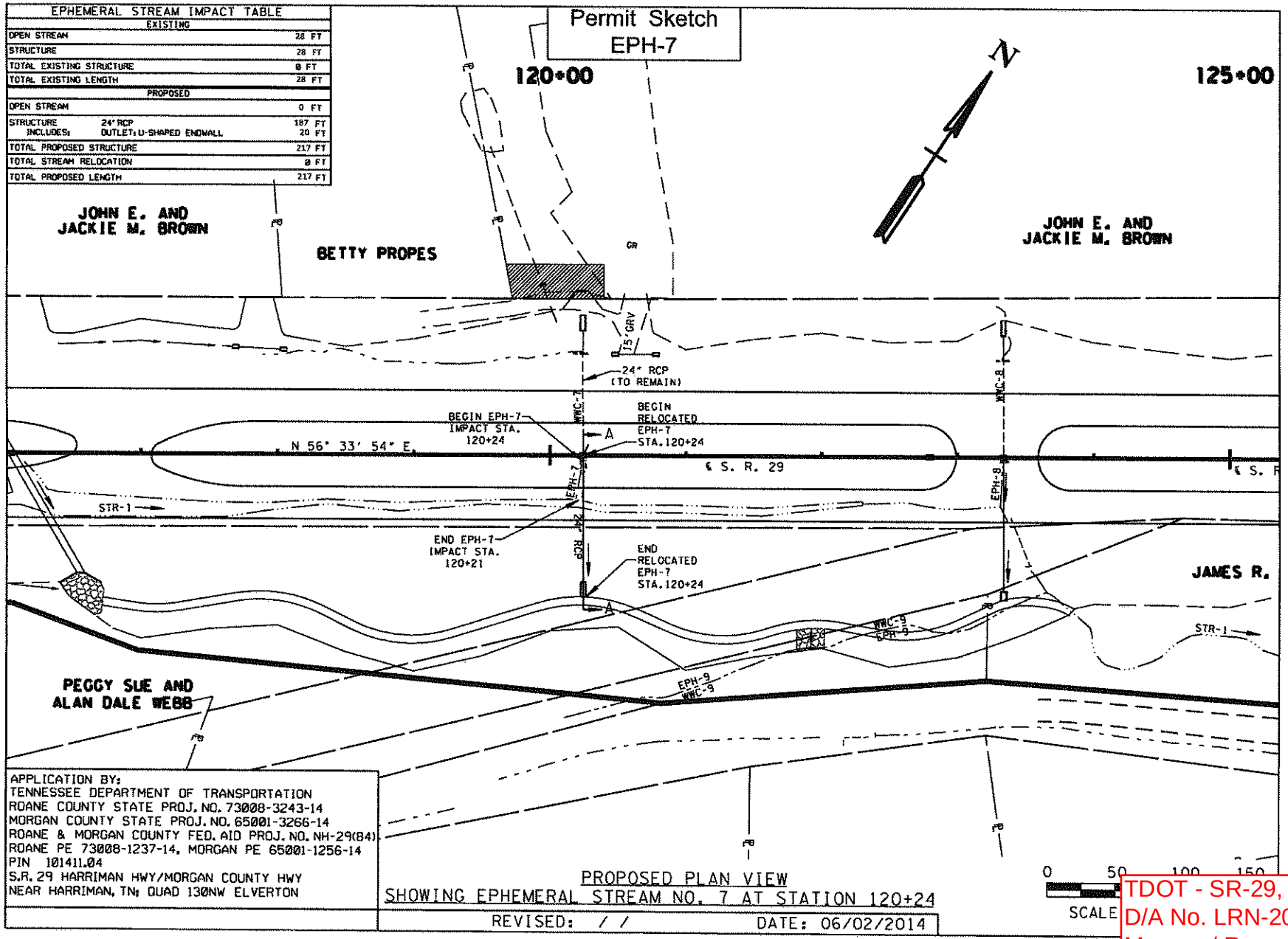

EPHEMERAL STREAM IMPACT TABLE		
EXISTING		
OPEN STREAM		28 FT
STRUCTURE		28 FT
TOTAL EXISTING STRUCTURE		0 FT
TOTAL EXISTING LENGTH		28 FT
PROPOSED		
OPEN STREAM		0 FT
STRUCTURE INCLUDES:	24" RCP OUTLET; U-SHAPED ENDWALL	197 FT 20 FT
TOTAL PROPOSED STRUCTURE		217 FT
TOTAL STREAM RELOCATION		0 FT
TOTAL PROPOSED LENGTH		217 FT

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 7 AT STATION 120+24

REVISED: / / DATE: 06/02/2014

TDOT - SR-29, PIN 101411.04
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Morgan / Roane County, TN
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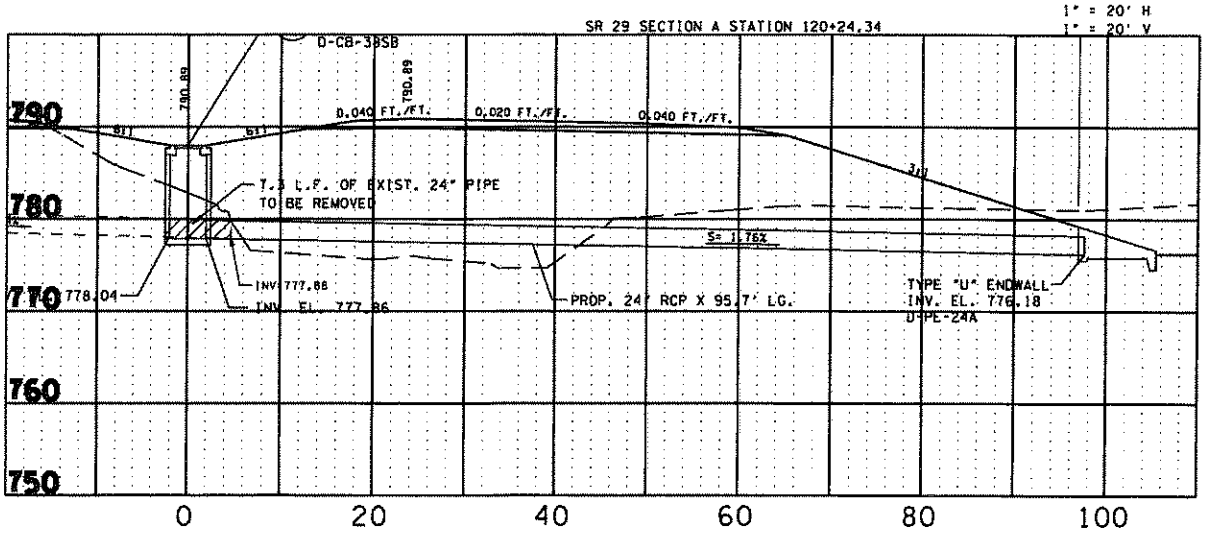
Permit Sketch
EPH-7



DATE: 06/02/2014 REVISED: / /

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Morgan / Roane County, TN
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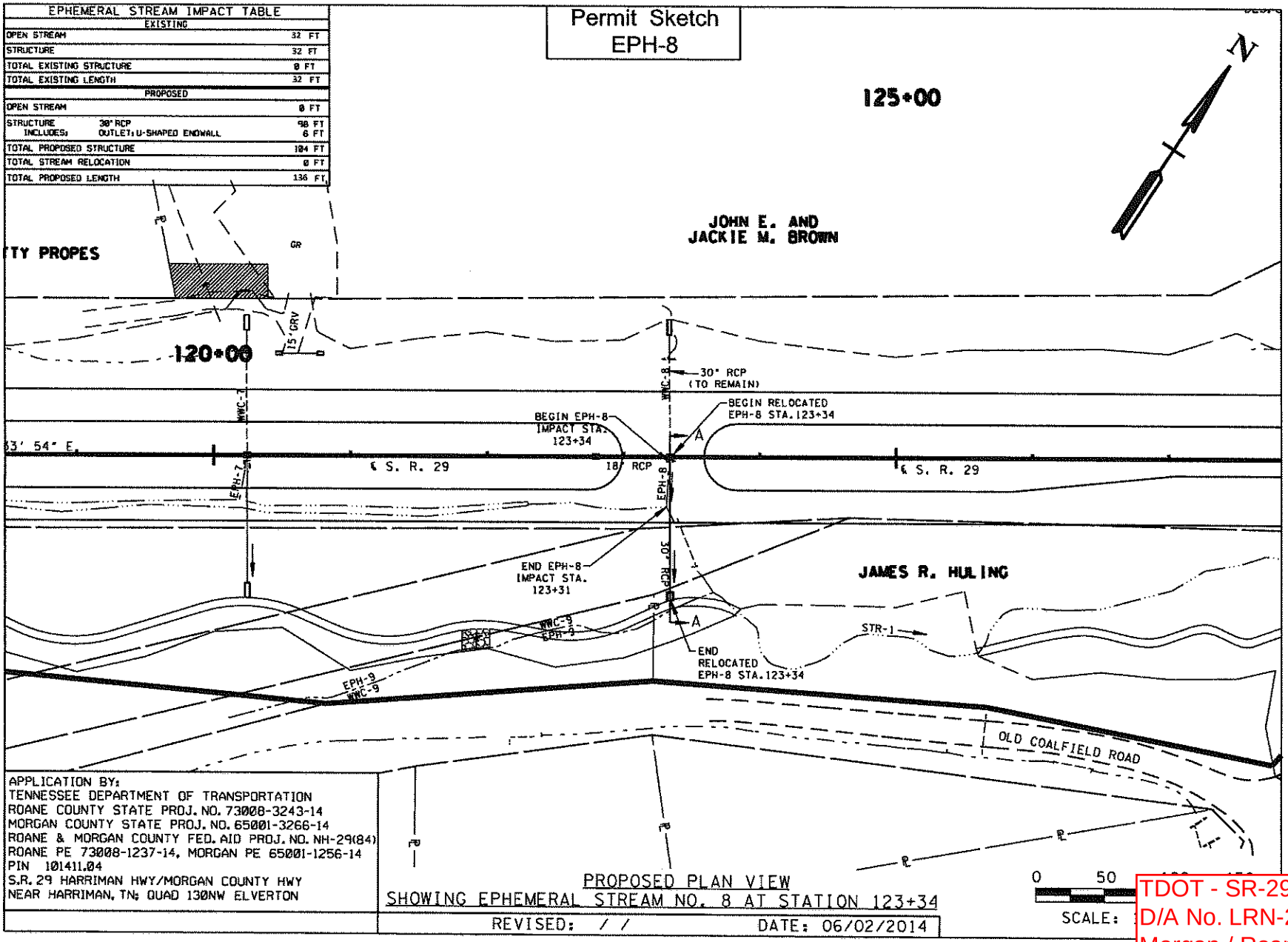
EPHEMERAL STREAM IMPACT TABLE		
EXISTING		
OPEN STREAM		32 FT
STRUCTURE		32 FT
TOTAL EXISTING STRUCTURE		0 FT
TOTAL EXISTING LENGTH		32 FT
PROPOSED		
OPEN STREAM		0 FT
STRUCTURE INCLUDES:	30" RCP OUTLET; U-SHAPED ENDWALL	98 FT 6 FT
TOTAL PROPOSED STRUCTURE		104 FT
TOTAL STREAM RELOCATION		0 FT
TOTAL PROPOSED LENGTH		136 FT

Permit Sketch
EPH-8



APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 8 AT STATION 123+34

REVISED: / /

DATE: 06/02/2014

SCALE:

TDOT - SR-29, PIN 101411.04
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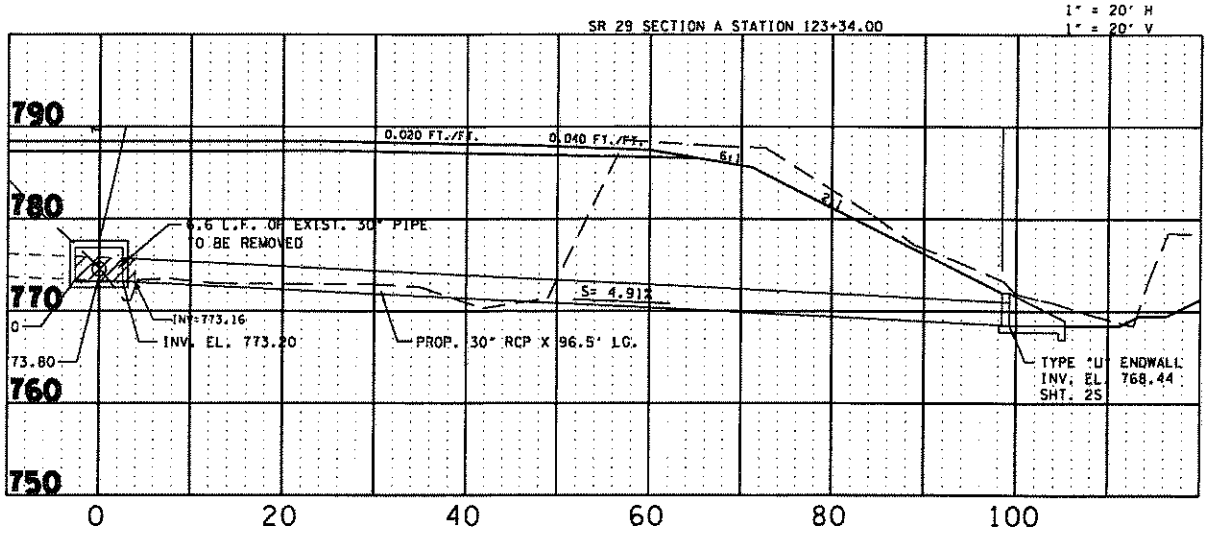
Morgan / Roane County, TN
Sheet 63 of 79

Permit Sketch
EPH-8



DATE: 06/02/2014 REVISED: / /

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Morgan / Roane County, TN
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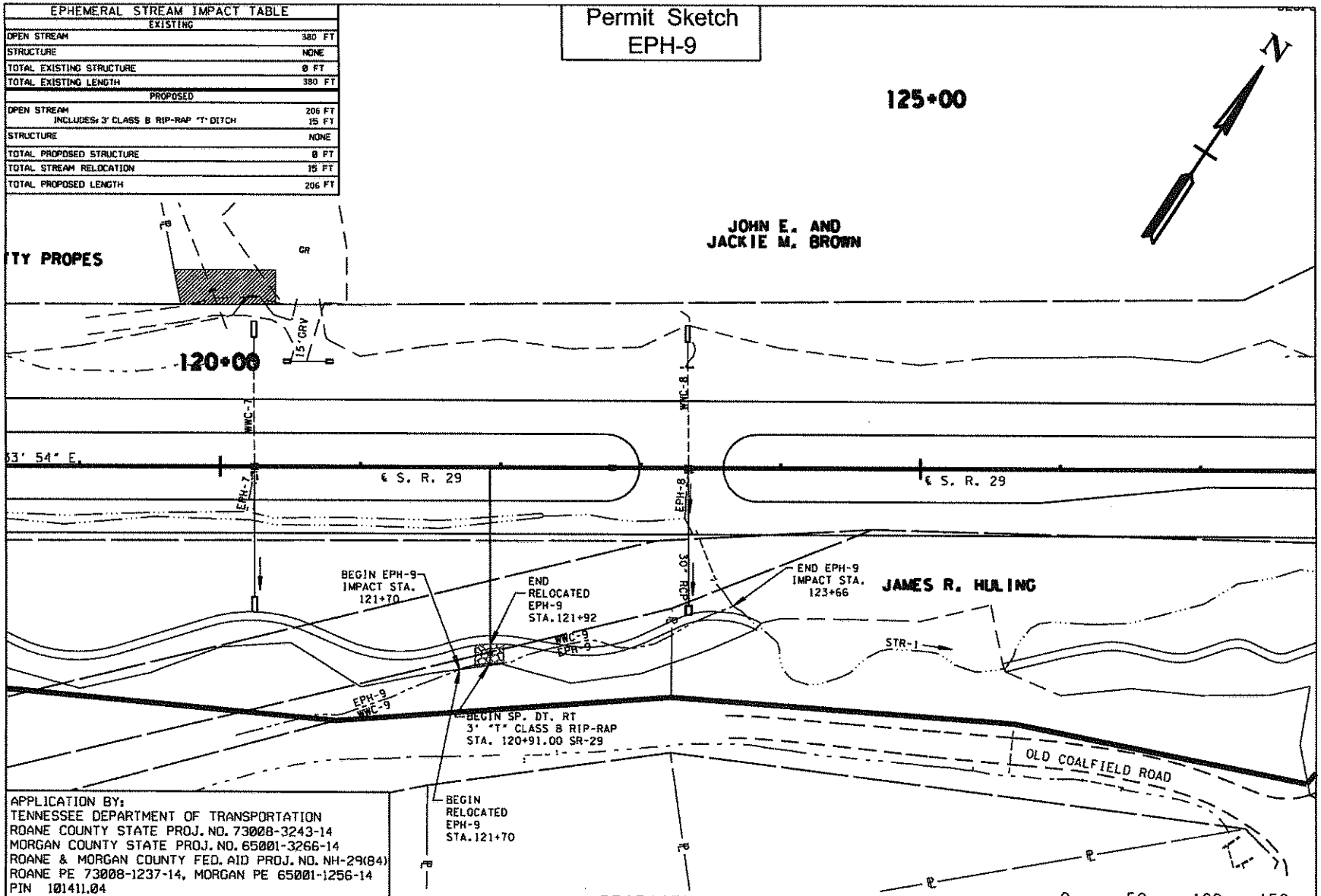
EPHEMERAL STREAM IMPACT TABLE	
EXISTING	
OPEN STREAM	380 FT
STRUCTURE	NONE
TOTAL EXISTING STRUCTURE	0 FT
TOTAL EXISTING LENGTH	380 FT
PROPOSED	
OPEN STREAM	206 FT
INCLUDES: 3' CLASS B RIP-RAP "T" DITCH	15 FT
STRUCTURE	NONE
TOTAL PROPOSED STRUCTURE	0 FT
TOTAL STREAM RELOCATION	15 FT
TOTAL PROPOSED LENGTH	206 FT

Permit Sketch
EPH-9



APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 9 AT STATION 121+82

REVISED: / / DATE: 06/02/2014

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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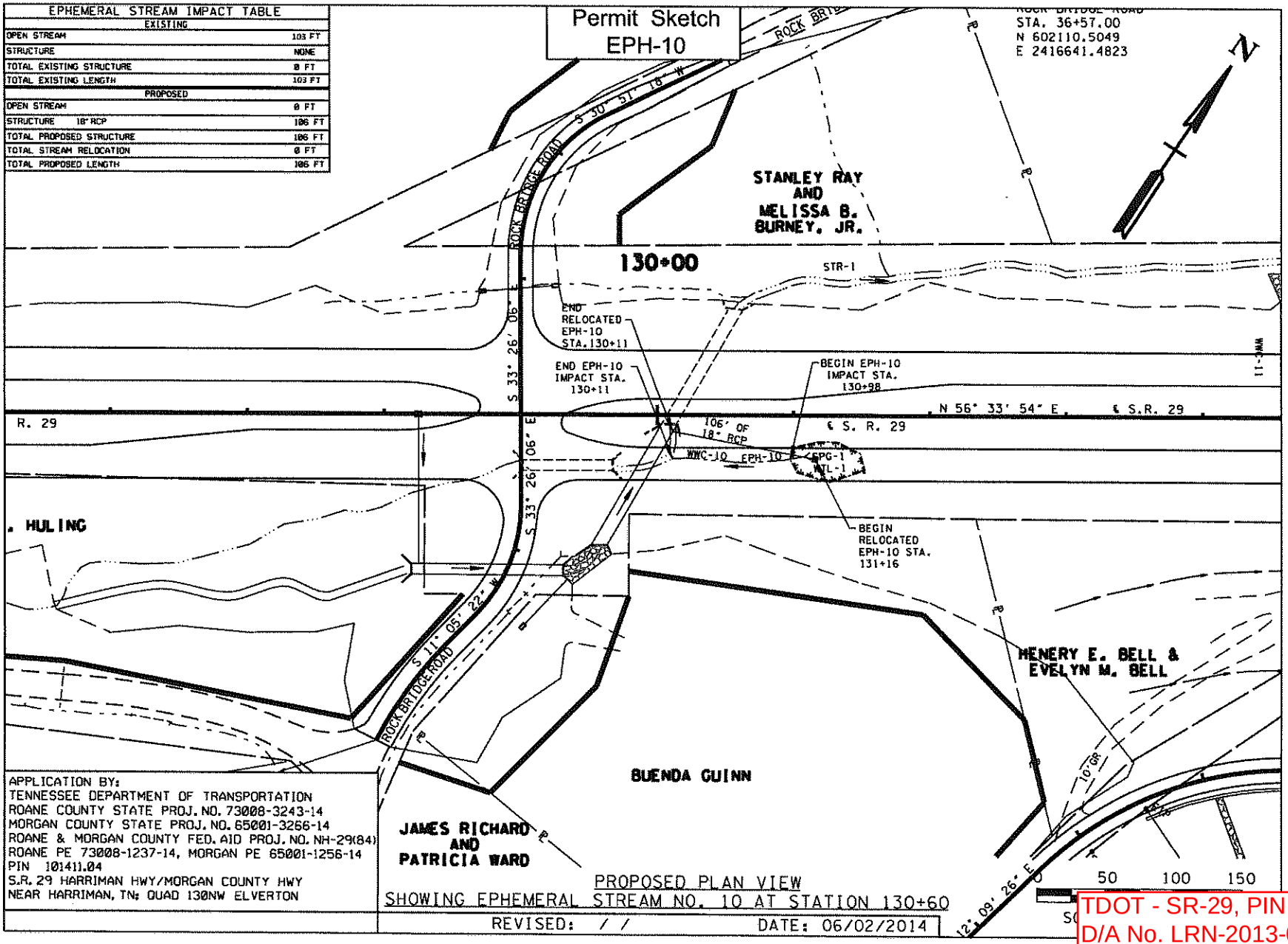
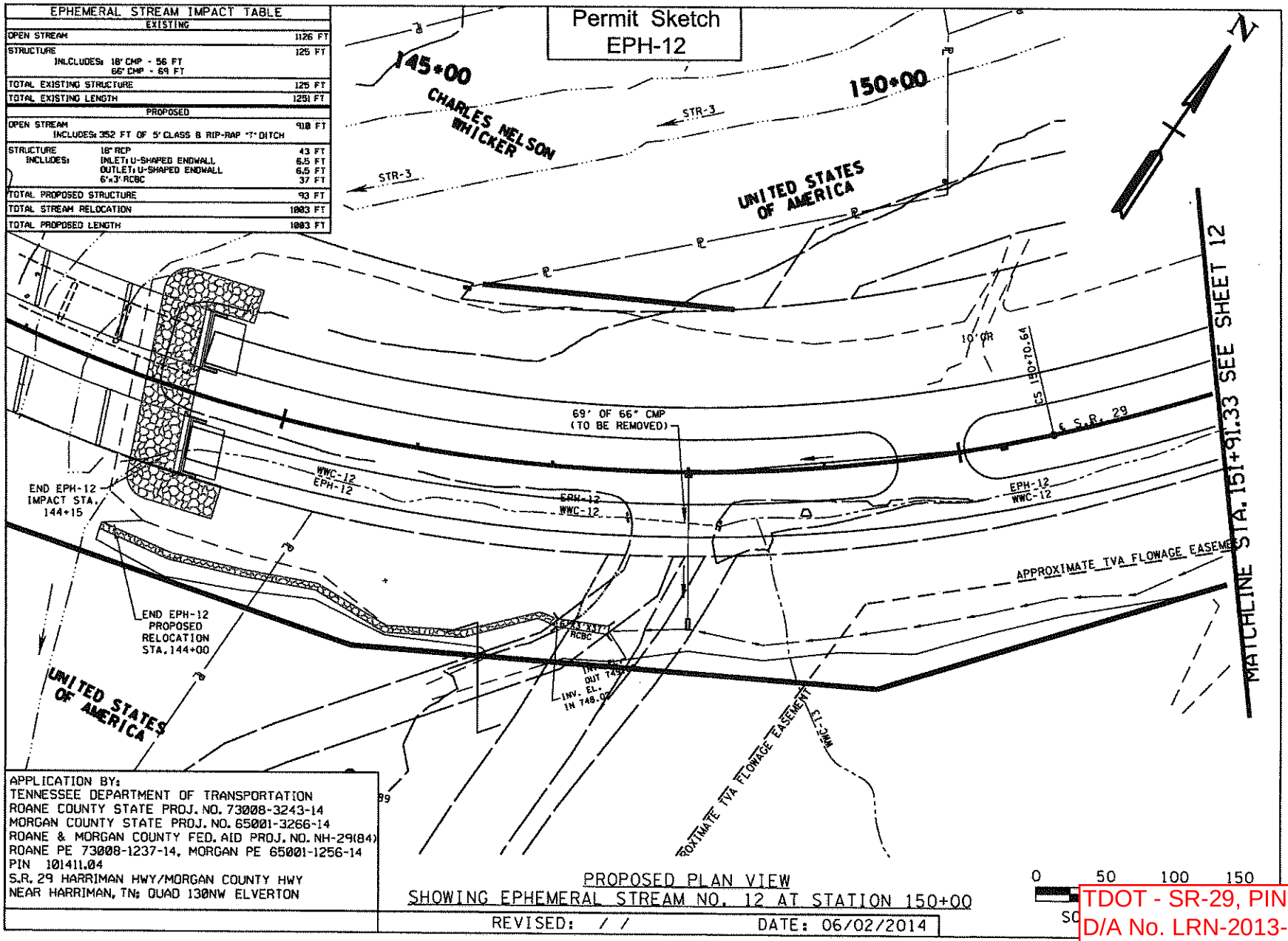


TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
Sheet 66 of 79



TDOT - SR-29, PIN 101411.04
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Morgan / Roane County, TN
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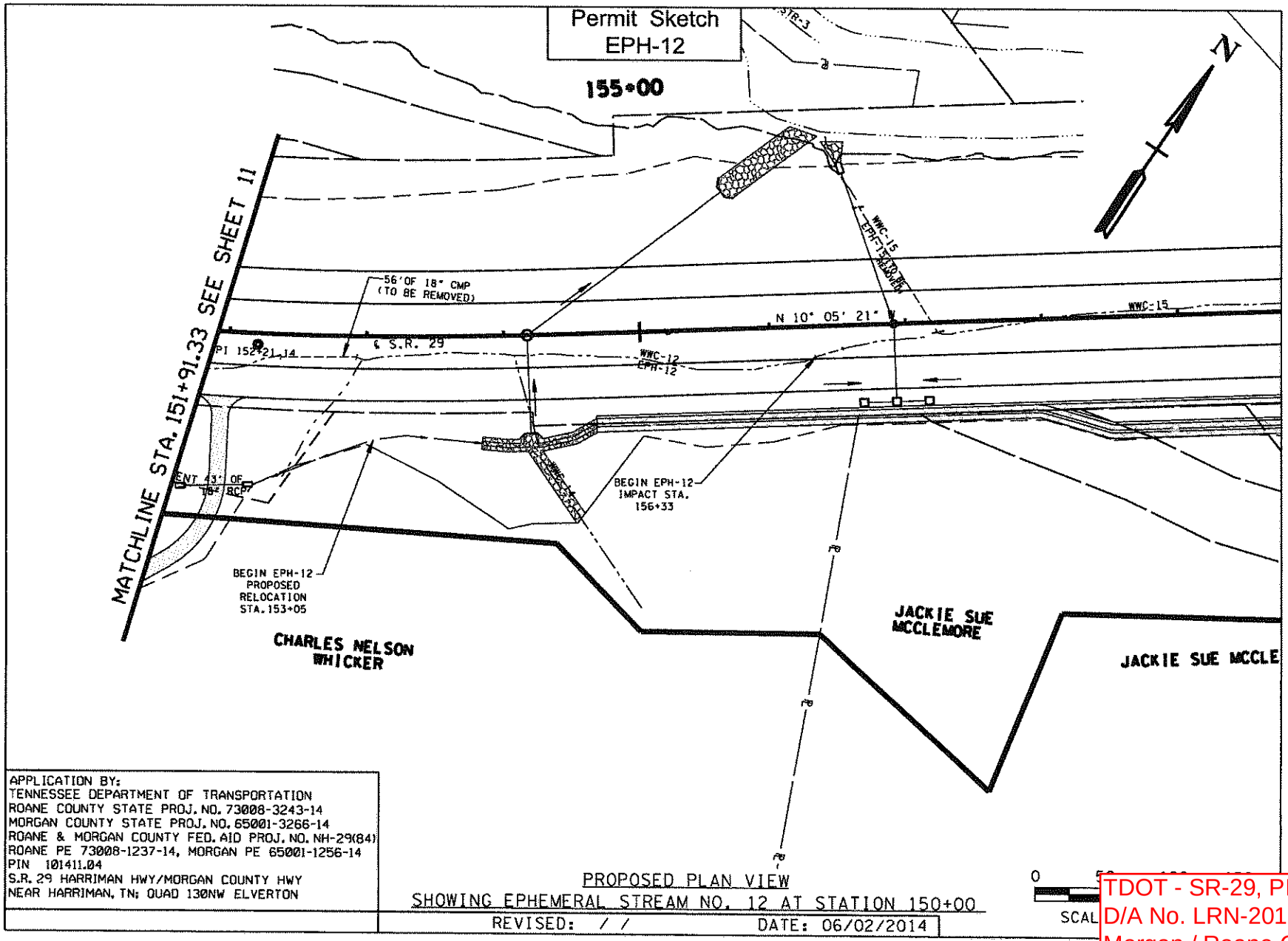

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 12 AT STATION 150+00

REVISED: / / DATE: 06/02/2014

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D/A No. LRN-2013-00712
Morgan / Roane County, TN
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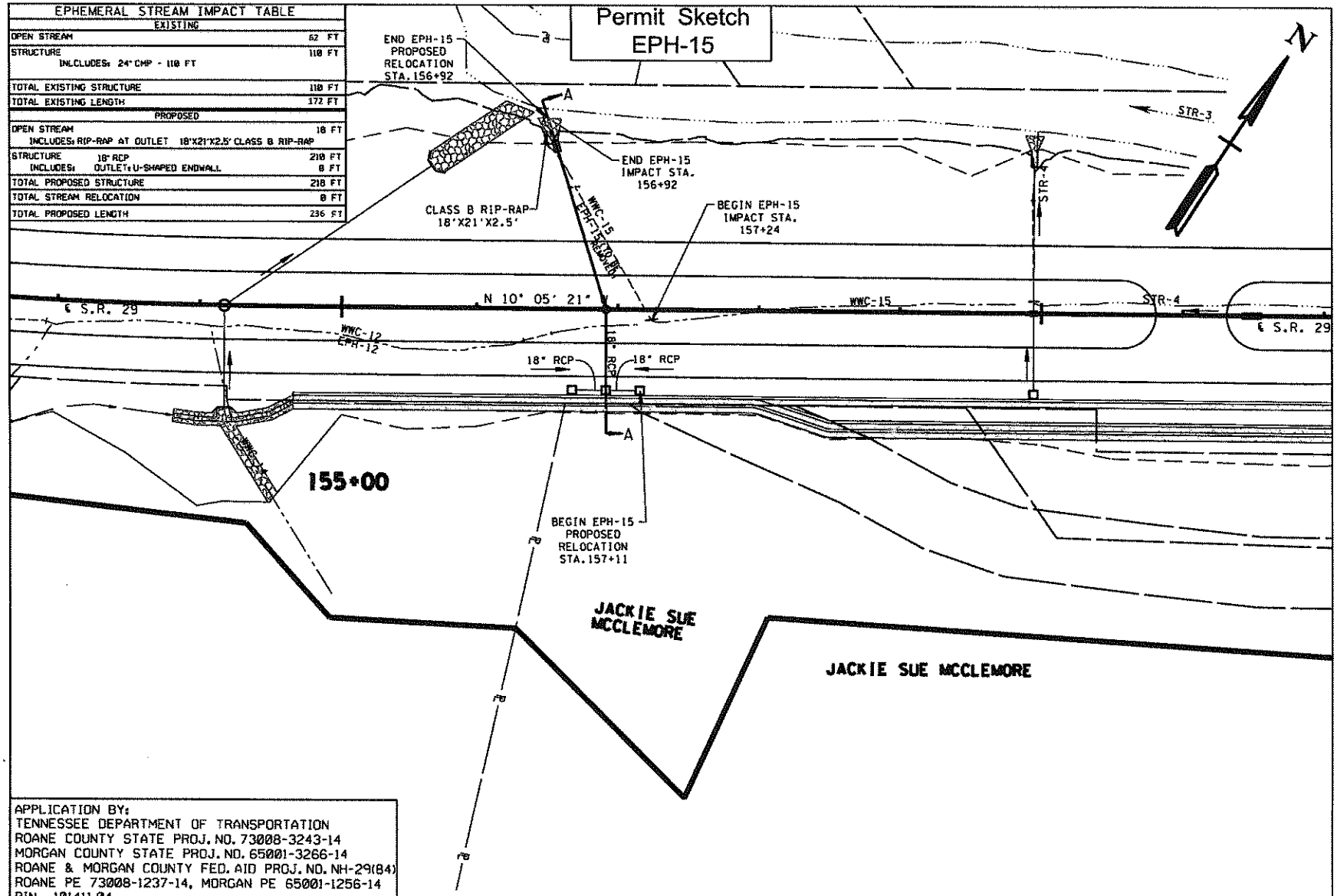
Permit Sketch
EPH-15

EPHEMERAL STREAM IMPACT TABLE	
EXISTING	
OPEN STREAM	62 FT
STRUCTURE INCLUDES: 24" CMP - 110 FT	110 FT
TOTAL EXISTING STRUCTURE	110 FT
TOTAL EXISTING LENGTH	172 FT
PROPOSED	
OPEN STREAM INCLUDES: RIP-RAP AT OUTLET 18'X21'X2.5' CLASS B RIP-RAP	18 FT
STRUCTURE 18" RCP INCLUDES: OUTLET: U-SHAPED ENDWALL	210 FT 8 FT
TOTAL PROPOSED STRUCTURE	218 FT
TOTAL STREAM RELOCATION	0 FT
TOTAL PROPOSED LENGTH	236 FT



APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

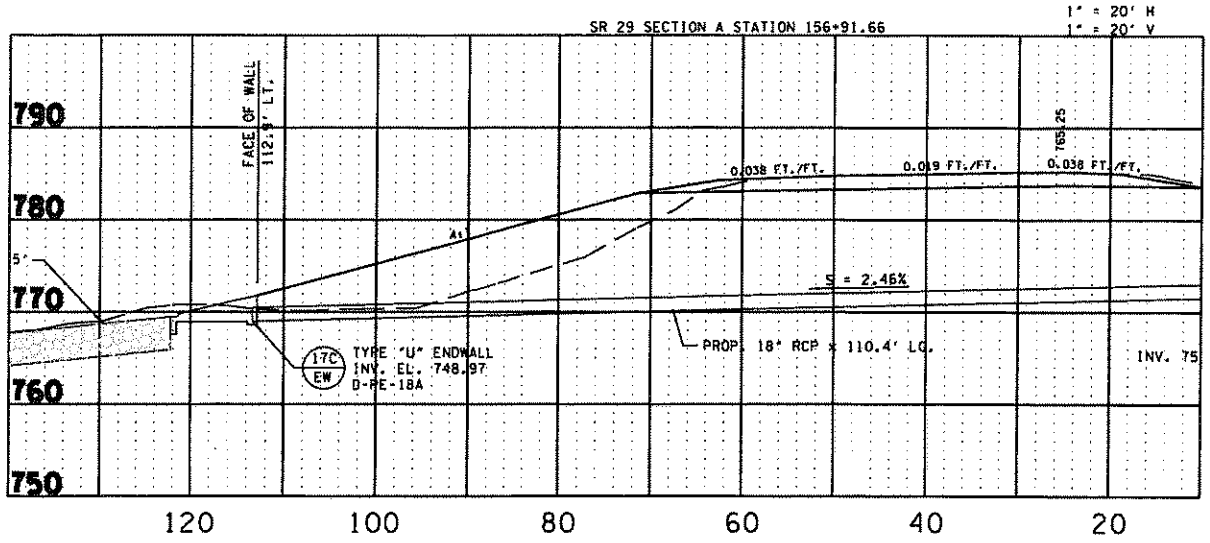
PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 15 AT STATION 157+27

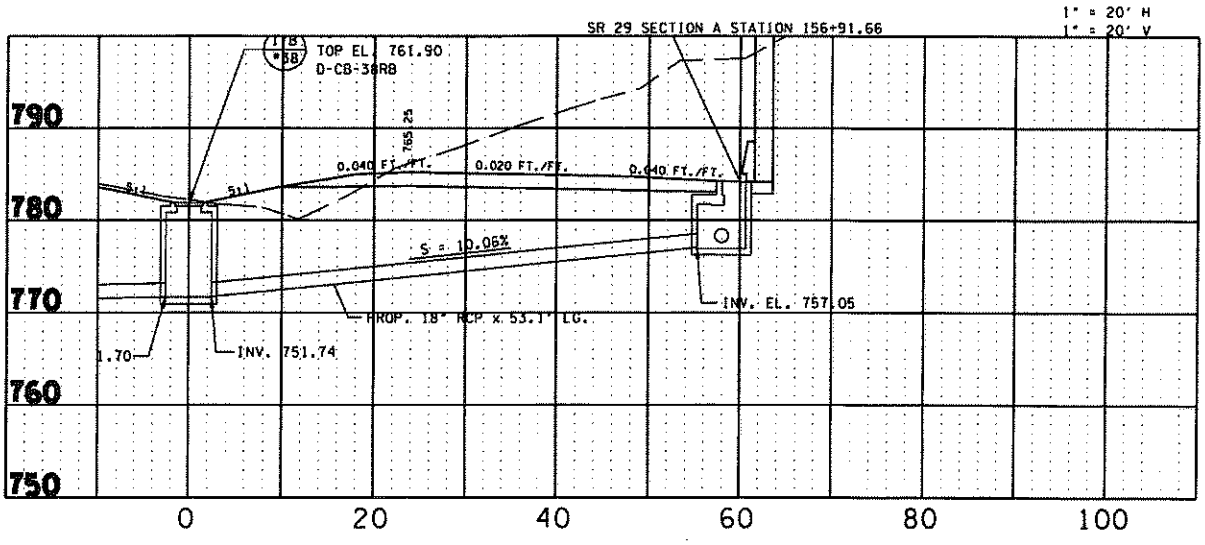
REVISED: / / DATE: 06/02/2014

0 50 100 150
SCALE

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
Sheet 69 of 79

Permit Sketch
EPH-15





DATE: 06/02/2014 REVISED: / /

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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EPHEMERAL STREAM IMPACT TABLE		
EXISTING		
OPEN STREAM		386 FT
STRUCTURE		0 FT
TOTAL EXISTING STRUCTURE		0 FT
TOTAL EXISTING LENGTH		386 FT
PROPOSED		
OPEN STREAM		906 FT
INCLUDES:	228 FT OF 10' "T" CLASS C RIP RAP DITCH	
STRUCTURE		
INCLUDES:	6' x 4' RCBC	37 FT
	6' x 4' RCBC	38 FT
TOTAL PROPOSED STRUCTURE		75 FT
TOTAL STREAM RELOCATION		906 FT
TOTAL PROPOSED LENGTH		981 FT

Permit Sketch
EPH-21

250+00

RONALD W. AND CATHERINE C. HOWARD

N

BITTER CREEK

STR-6

SC 244+17.75

CS 250+18.72

END EPH-21 IMPACT
STA. 252+00

PI 251+18.74

MATCHLINE STA. 253+00 SEE SHEET 16

WTL-9

PI 247+22.18

C.S.R. 29

STR-14A

EPH-21
WWC-21

STR-14

6' X 4' RCBC

23' "T" GRASS DITCH

10' "T" GRASS DITCH WITH E.C. BLANKET TYPE II

6' X 4' X 38' RCBC

END EPH-21
PROPOSED
RELOCATION
STA. 246+36

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
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MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

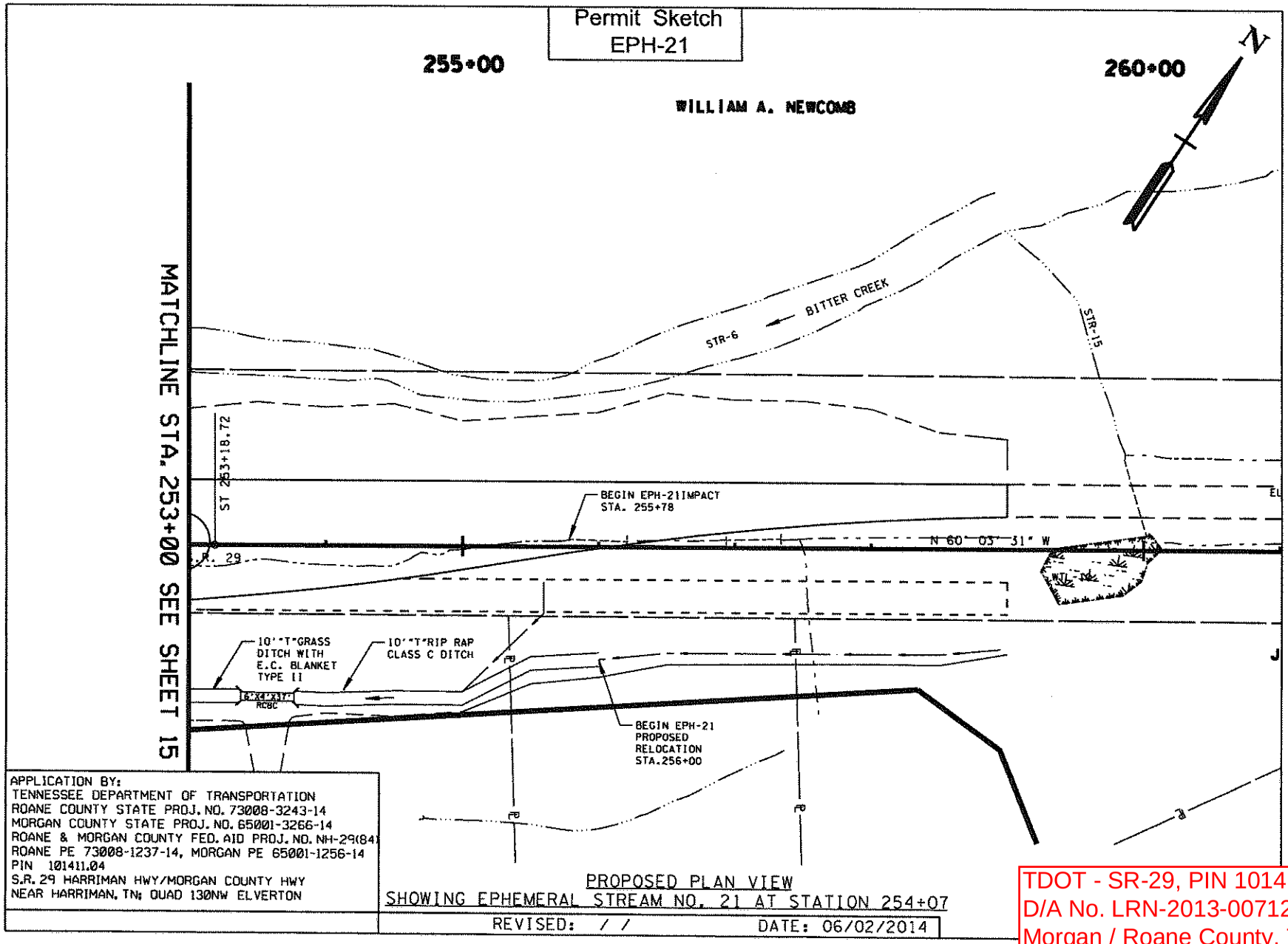
PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 21 AT STATION 254+07

0 50 100 150

SCA

REVISED: / / DATE: 06/02/2014

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
Sheet 71 of 79



APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
ROANE COUNTY STATE PROJ. NO. 73008-3243-14
MORGAN COUNTY STATE PROJ. NO. 65001-3266-14
ROANE & MORGAN COUNTY FED. AID PROJ. NO. NH-29(84)
ROANE PE 73008-1237-14, MORGAN PE 65001-1256-14
PIN 101411.04
S.R. 29 HARRIMAN HWY/MORGAN COUNTY HWY
NEAR HARRIMAN, TN; QUAD 130NW ELVERTON

PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 21 AT STATION 254+07

REVISED: / / DATE: 06/02/2014

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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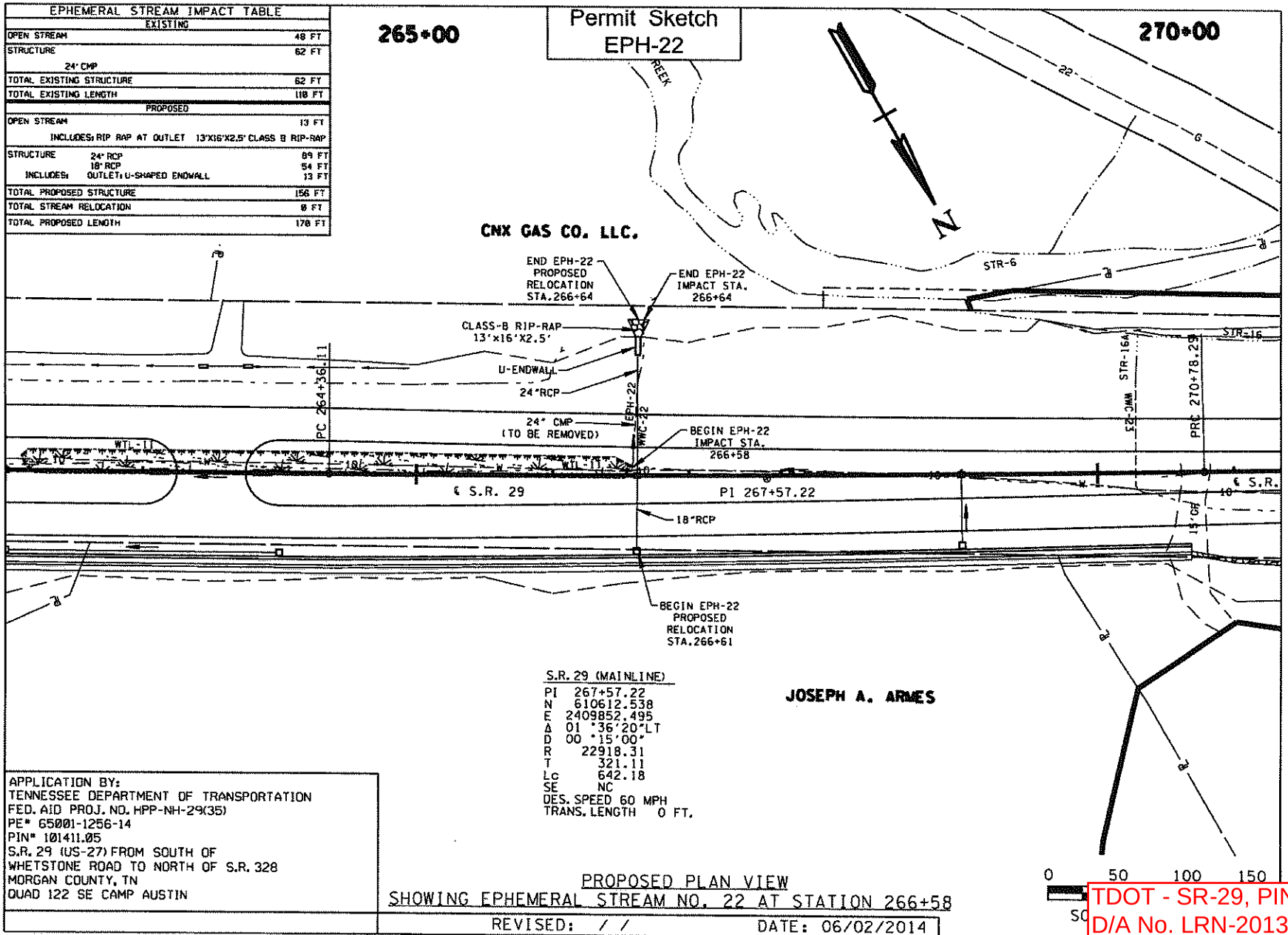
EPHEMERAL STREAM IMPACT TABLE	
EXISTING	
OPEN STREAM	48 FT
STRUCTURE	62 FT
24" CMP	
TOTAL EXISTING STRUCTURE	62 FT
TOTAL EXISTING LENGTH	110 FT
PROPOSED	
OPEN STREAM	13 FT
INCLUDES: RIP RAP AT OUTLET 13'X16'X2.5' CLASS B RIP-RAP	
STRUCTURE 24" RCP	89 FT
18" RCP	54 FT
INCLUDES: OUTLET: U-SHAPED ENDWALL	13 FT
TOTAL PROPOSED STRUCTURE	156 FT
TOTAL STREAM RELOCATION	8 FT
TOTAL PROPOSED LENGTH	170 FT

Permit Sketch
EPH-22



S.R. 29 (MAINLINE)

PI	267+57.22
N	610612.538
E	2409852.495
Δ	01 °36'20"LT
D	00 °15'00"
R	22918.31
T	321.11
Lc	642.18
SE	NC
DES. SPEED	60 MPH
TRANS. LENGTH	0 FT.

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 22 AT STATION 266+58

REVISED: / / DATE: 06/02/2014

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
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EPHEMERAL STREAM IMPACT TABLE		
EXISTING		
OPEN STREAM		375 FT
STRUCTURE		NONE
TOTAL EXISTING STRUCTURE		0 FT
TOTAL EXISTING LENGTH		375 FT
PROPOSED		
OPEN STREAM		
INCLUDES: 44' OF 5' "T" CLASS B RIP-RAP DITCH 388' OF 5' "T" GRASS W/ E.C. BLANKET TYPE II		352 FT
STRUCTURE	36" RCP	25 FT
INCLUDES:	INLET: TYPE A ENDWALL	N/A
	OUTLET: TYPE A ENDWALL	N/A
TOTAL PROPOSED STRUCTURE		25 FT
TOTAL STREAM RELOCATION		377 FT
TOTAL PROPOSED LENGTH		377 FT

Permit Sketch
EPH-27

285+00

WILLIAM TURNER
(IMPAIRED ACCESS)

CNX GAS CO., LLC

STR-6/BITTER CREEK

R=1397.06'
L=553.97'

PI 285+45.98

N

END EPH-27
IMPACT
STA. 281+19

PI 279+95.48

S.R. 29

5' "T" CLASS-B
RIP-RAP

EPH-27
WWC-27

25' OF 36" RCP

END EPH-27
PROPOSED
RELOCATION
STA. 280+94

5' "T" GRASS
W/ E.C. BLANKET
TYPE II

WWC-28

RAYMOND W. AND
ANNIE T. CURTIS

STR-17/FORKED CREEK

BEGIN EPH-27
PROPOSED
RELOCATION
STA. 284+97

BEGIN EPH-27
IMPACT
STA. 285+03

MICHAEL YEARY

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 27 AT STATION 284+97

REVISED: / /

DATE: 06/02/2014

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Morgan / Roane County, TN
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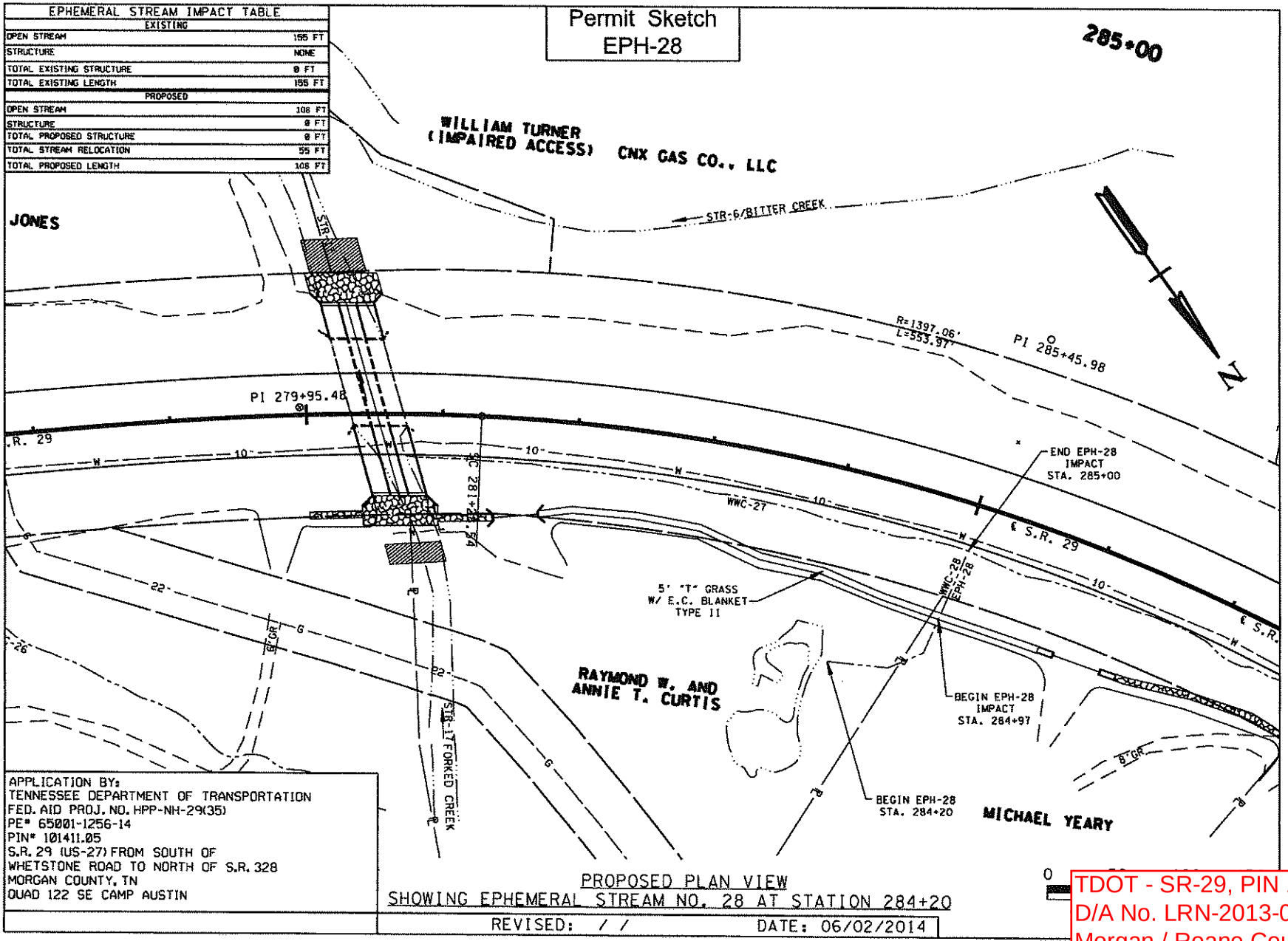

EPHEMERAL STREAM IMPACT TABLE	
EXISTING	
OPEN STREAM	155 FT
STRUCTURE	NONE
TOTAL EXISTING STRUCTURE	0 FT
TOTAL EXISTING LENGTH	155 FT
PROPOSED	
OPEN STREAM	108 FT
STRUCTURE	0 FT
TOTAL PROPOSED STRUCTURE	0 FT
TOTAL STREAM RELOCATION	55 FT
TOTAL PROPOSED LENGTH	108 FT

APPLICATION BY:
TENNESSEE DEPARTMENT OF TRANSPORTATION
FED. AID PROJ. NO. HPP-NH-29(35)
PE# 65001-1256-14
PIN# 101411.05
S.R. 29 (US-27) FROM SOUTH OF
WHETSTONE ROAD TO NORTH OF S.R. 328
MORGAN COUNTY, TN
QUAD 122 SE CAMP AUSTIN

PROPOSED PLAN VIEW
SHOWING EPHEMERAL STREAM NO. 28 AT STATION 284+20

REVISED: / / DATE: 06/02/2014

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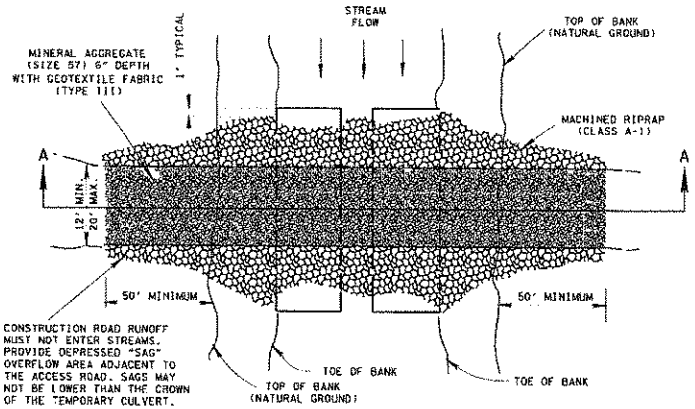
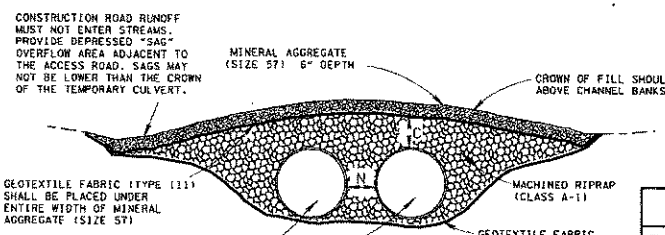
TEMPORARY CULVERT CROSSING



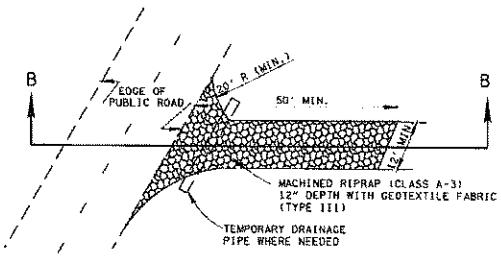
PLAN VIEW OF TEMPORARY CULVERT CROSSING



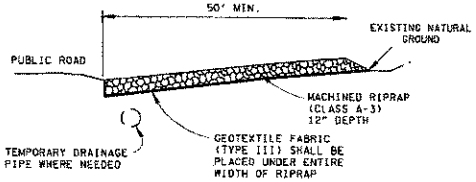
SECTION A-A

C = ½ DIAMETER OF PIPE OR 18" WHICHEVER IS GREATER
N = ½ DIAMETER OF PIPE OR 12" WHICHEVER IS GREATER

TEMPORARY CONSTRUCTION EXIT



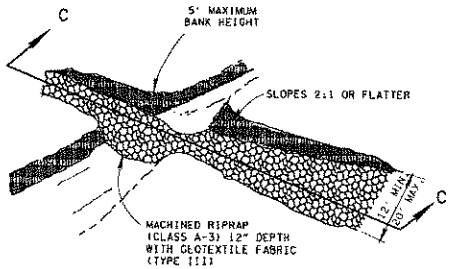
PLAN VIEW OF TEMPORARY CONSTRUCTION ROAD



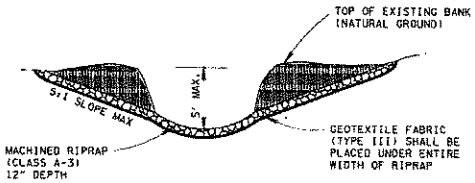
SECTION B-B

TEMPORARY CONSTRUCTION FORD

(NOT TO BE PLACED IN STREAMS)



PLAN VIEW OF TEMPORARY CONSTRUCTION FORD



SECTION C-C

- REV. 12-18-95: CHANGED DRAWING NO. FROM ESC-STR-25 TO EC-STR-26.

  REV. 5-27-01: CHANGED ITEM NO. 303-15.01 TO 303-10.01. CHANGED DESCRIPTIONS IN ITEM NOS. 621-03.02 TO 621-03.10, AND 709-05.05 TO 709-05.07.
- REV. 12-18-02: CHANGED GENERAL NOTE (B).
- REV. 1-22-03: CORRECTED GENERAL NOTE (C).
- REV. 7-29-03: ADDED GEOTEXTILE FABRIC TO TEMPORARY CULVERT CROSSING AND TEMPORARY CONSTRUCTION ROAD ENTRANCE DETAILS. CHANGED MINERAL AGGREGATE TO CLASS A-3 RIPRAP IN TEMPORARY CONSTRUCTION ROAD ENTRANCE DETAIL. CHANGED GENERAL NOTES (B) AND (F).
- REV. 4-15-06: REFORMATTED SHEET, REVISED NOTES, MISC. EDITS TO DRAWING.
- REV. 4-1-08: REVISED VARIOUS GENERAL NOTES, MISC. EDITS TO DRAWING, AND REMOVED CLASS A-2 RIPRAP.

GENERAL NOTES

(A) TEMPORARY CULVERT CROSSINGS SHALL CONSIST OF ONE OR MORE TEMPORARY DRAINAGE PIPES INSTALLED ACROSS A FLOWING WATER COURSE FOR USE BY CONSTRUCTION EQUIPMENT. THE TEMPORARY DRAINAGE PIPES WILL VARY IN SIZE FROM EIGHTEEN TO SEVENTY-TWO INCHES IN DIAMETER.

(B) MINIMIZE CLEARING OF VEGETATION FROM STREAM BANKS WHEN USING TEMPORARY CULVERT CROSSINGS.

(C) TEMPORARY CULVERT CROSSINGS SHALL BE SEPARATED FROM FLOWING WATER DURING THEIR CONSTRUCTION AND REMOVAL.

(D) PROVISION SHOULD BE MADE TO PREVENT CONSTRUCTION ROAD RUNOFF FROM ENTERING THE STREAM.

(E) TEMPORARY CULVERT CROSSINGS SHOULD BE REMOVED, INCLUDING THE AGGREGATE AND GEOTEXTILE, AS SOON AS POSSIBLE AFTER THE CROSSING IS NO LONGER REQUIRED. ANY EXPOSED AREAS SHOULD BE IMMEDIATELY STABILIZED.

(F) FOR SITES WHICH DRAIN TO HIGH-QUALITY OR SEDIMENT-IMPAIRED STREAMS, A 9-INCH LAYER OF MACHINED RIPRAP (CLASS A-3) SHALL BE SUBSTITUTED FOR THE MINERAL AGGREGATE (SIZE 57) USED TO TOP-DRESS A TEMPORARY CULVERT CROSSING.

(G) ALL TEMPORARY CULVERT CROSSINGS AND TEMPORARY CONSTRUCTION FORDS SHALL BE PLACED PERPENDICULAR TO THE STREAM WHERE POSSIBLE. CROSSINGS MAY DEVIATE AS MUCH AS 15 DEGREES FROM PERPENDICULAR, IF NECESSARY.

(H) TEMPORARY CONSTRUCTION EXITS SHALL BE BUILT TO REDUCE SEDIMENT LEAVING THE CONSTRUCTION SITE VIA CONSTRUCTION VEHICLES AND TO REDUCE SEDIMENT TRACKING ON TO PUBLIC ROADS AND OTHER PAVED AREAS.

(I) ADDITIONAL STONE MAY BE REQUIRED TO TOP-DRESS THE STONE PAD IF IT BECOMES CLOGGED WITH SEDIMENT TO ENSURE THE TEMPORARY CONSTRUCTION EXIT REMAINS EFFECTIVE.

(J) ON SITES WHERE THE GRADE TOWARD THE PUBLIC ROAD IS GREATER THAN 2% A MOUNTABLE BERM AT LEAST 6 INCHES HIGH WITH 3:1 SIDE SLOPES SHOULD BE PROVIDED AT THE END OF THE PAD TO PREVENT RUNOFF FROM LEAVING THE SITE.

(K) TEMPORARY CONSTRUCTION EXITS SHOULD BE REMOVED WHEN NO LONGER REQUIRED. ANY EXPOSED AREAS SHOULD BE IMMEDIATELY STABILIZED.

(L) TEMPORARY CONSTRUCTION FORDS ARE EFFECTIVE FOR INFREQUENT CROSSINGS OF DITCHES OR SWALES. THEY SHALL NOT BE USED IN STREAMS OR OTHER NATURAL WATER RESOURCES.

(M) TEMPORARY CONSTRUCTION FORDS SHOULD BE CONSTRUCTED TO MINIMIZE THE BLOCKAGE OF FLOW AND TO ALLOW FREE FLOW OVER THE FORD. THE MAXIMUM AMOUNT OF BLOCKAGE ALLOWED IS THE LESSER OF TWELVE INCHES OR ONE-HALF THE HEIGHT OF THE EXISTING BANKS.

(N) A MOUNTABLE BERM AT LEAST 6 INCHES HIGH WITH 3:1 SIDE SLOPES SHOULD BE PROVIDED ON EITHER SIDE OF THE CHANNEL TO PREVENT RUNOFF FROM ENTERING THE CHANNEL.

(O) TEMPORARY CONSTRUCTION FORDS SHOULD BE REMOVED WHEN NO LONGER REQUIRED. THE CHANNEL BANKS SHOULD BE RESTORED TO THEIR ORIGINAL DIMENSIONS. ANY EXPOSED AREAS SHOULD BE IMMEDIATELY STABILIZED.

(P) ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.

(Q) TEMPORARY CULVERT CROSSINGS, TEMPORARY CONSTRUCTION EXITS, AND TEMPORARY CONSTRUCTION FORDS SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS:

203-01	ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED) PER CUBIC YARD
303-10.01	MINERAL AGGREGATE (SIZE 57) PER TON
621-03.02 THRU 621-03.11	_ _" TEMPORARY DRAINAGE PIPE PER LINEAR FOOT
709-05.05	MACHINED RIPRAP (CLASS A-3) PER TON
709-05.06	MACHINED RIPRAP (CLASS A-1) PER TON
740-10.03	GEOTEXTILE (TYPE III) (EROSION CONTROL) PER SQUARE YARD

PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY CULVERT CROSSINGS, TEMPORARY CONSTRUCTION EXITS, AND TEMPORARY CONSTRUCTION FORDS.

EROSION CONTROL PLAN LEGEND:

TCC — TEMPORARY CULVERT CROSSING (DESCRIBE NUMBER AND SIZE OF PIPES)

TCE — TEMPORARY CONSTRUCTION EXIT

TCF — TEMPORARY CONSTRUCTION FORD

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TEMPORARY CULVERT CROSSING,

TDOT - SR-29, PIN 101411.04
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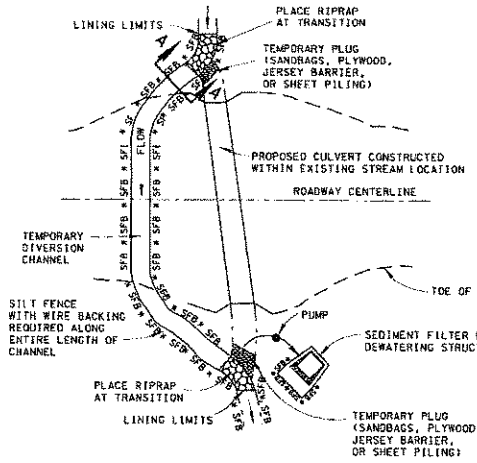
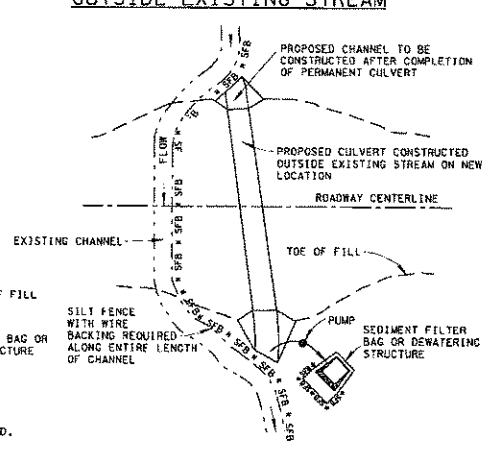
CULVERT CONSTRUCTED WITHIN EXISTING STREAM

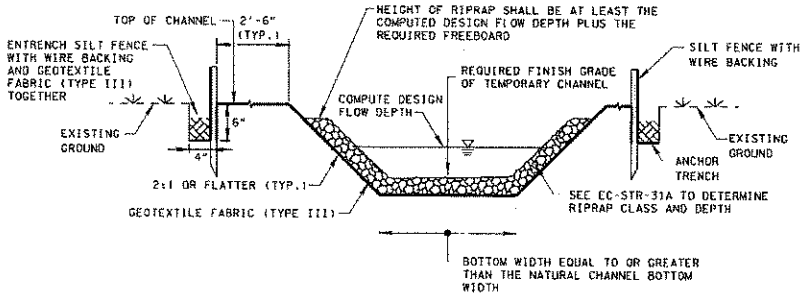


PLAN VIEW

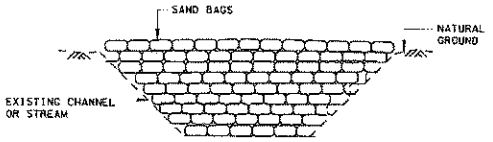
CULVERT CONSTRUCTED OUTSIDE EXISTING STREAM



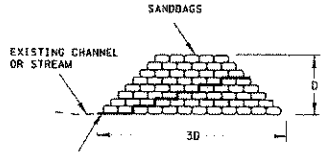
PLAN VIEW



SECTION A-A



ELEVATION VIEW



CROSS SECTION VIEW

PLUG DETAIL

EROSION CONTROL PLAN LEGEND: TEMPORARY DIVERSION CHANNEL (DESCRIBE - SIZE AND TYPE OF LINING)

TEMPORARY DIVERSION CHANNELS GENERAL NOTES

(A) DIVERSION CHANNELS SHALL BE USED TO DIVERT NORMAL STREAM FLOW FROM AN ERODIBLE AREA IN ORDER TO PREVENT POLLUTION OF THE STREAM DUE TO EROSION.

(B) EXAMPLE SHOWN IS FOR NEW CULVERT CONSTRUCTION. OTHER PROJECTS WOULD BE CONSTRUCTED IN A SIMILAR MANNER.

(C) TEMPORARY DIVERSION CHANNELS SHALL BE DESIGNED USING A 2-YEAR, 24-HOUR STORM FREQUENCY FLOW RATE. STANDARD DRAWING EC-STR-31A, MAY BE USED AS A GUIDELINE FOR DETERMINING THE CHANNEL SIZE. FOR ANY SITE WHERE Q_{50} EXCEEDS 500 CFS, THE DESIGN OF THIS MEASURE SHOULD BE COMPLETED BY THE HYDRAULICS SECTION OF THE STRUCTURES DIVISION. AT SITES WHICH INVOLVE HIGH-QUALITY OR SEDIMENT-IMPAIRED STREAMS, THE STABILITY OF THE RIPRAP CHANNEL LINING SHOULD BE DESIGNED FOR THE 5-YEAR, 24-HOUR PEAK FLOW.

(D) ALL TEMPORARY DIVERSION CHANNELS SHALL HAVE A TRAPEZOIDAL SHAPE AND THE BOTTOM WIDTH SHALL BE EQUAL TO OR GREATER THAN THE NATURAL CHANNEL BOTTOM WIDTH.

(E) TO DETERMINE RIPRAP CLASS AND DEPTH USE STANDARD DRAWING EC-STR-31A.

(F) ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.

(G) GEOTEXTILE (TYPE III) (EROSION CONTROL) SHALL BE USED EITHER WITH OR WITHOUT RIPRAP, AS RECOMMENDED IN NOTE B6 ON STANDARD DRAWING EC-STR-31A.

(H) GEOTEXTILE FABRIC (TYPE III) SHALL BE USED ALONE ONLY IN CHANNELS WITH INTERMITTENT FLOW. USE A RIPRAP LINED CHANNEL OR CULVERT WHERE THE STREAM FLOWS YEAR-ROUND.

(I) WHERE EXCAVATION FOR A DIVERSION CHANNEL EXPOSES BEDROCK, GEOTEXTILE FABRIC AND RIPRAP SHALL BE REQUIRED ONLY ON THE SIDES OF THE CHANNEL.

(J) RIPRAP TRANSITIONS AT THE ENTRANCE AND EXIT OF THE DIVERSION CHANNEL SHALL BE DESIGNED IN ACCORDANCE WITH APPROVED TDOT METHODS.

(K) DURING CONSTRUCTION OF THE DIVERSION CHANNEL, DAMAGE TO THE EXISTING STREAM AND DAMAGE TO THE CANOPY SHALL BE MINIMIZED. ALL EXISTING VEGETATION OUTSIDE THE CUT AND FILL LINES BUT INSIDE THE RIGHT-OF-WAY SHALL NOT BE DISTURBED UNLESS IT INTERFERES WITH SAFETY STANDARDS.

(L) THE PROJECT SHALL BE PLANNED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE DIVERSION WILL BE REQUIRED.

(M) DIVERSION CHANNEL CONSTRUCTION SHALL BE COMPLETED IN THE DRY BEFORE DIVERTING WATER FROM THE EXISTING CHANNEL. WHERE THIS IS NOT FEASIBLE, TEMPORARY FLOW DIVERSION STRUCTURES CAN BE USED UNTIL WORK IS COMPLETE. THESE STRUCTURES CAN BE ANY NON-ERODIBLE MATERIAL.

(N) CONSTRUCTION SHALL PROCEED AS FOLLOWS:

1. CONSTRUCT A MEANDERING TEMPORARY CHANNEL ADJACENT TO THE PROPOSED PROJECT. ISOLATE THE TEMPORARY CHANNEL FROM THE EXISTING CHANNEL WITH TEMPORARY PLUGS. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 209 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. THE DIVERSION CHANNEL SHALL BE STABILIZED AND INSPECTED BY THE PROJECT ENGINEER BEFORE FLOW IS DIVERTED. DIVERT FLOW BY MOVING THE TEMPORARY PLUGS FROM THE TEMPORARY CHANNEL TO THE EXISTING CHANNEL. A COFFER DAM MAY BE USED UPSTREAM TO PREVENT STREAM FLOW DURING THIS OPERATION.
3. CONSTRUCT THE PROJECT IN THE EXISTING STREAM AND PLACE PERMANENT EROSION CONTROL ON THE EXISTING STREAM BANKS.
4. WHERE A TEMPORARY PLUG IS REQUIRED AT THE DOWNSTREAM END OF THE DIVERSION, IT SHOULD BE REMOVED FIRST. THEN REMOVE THE UPPER PLUG IN ORDER TO RELEASE FLOW INTO THE RECONSTRUCTED CHANNEL.
5. REMOVE LINING MATERIALS FROM THE DIVERSION CHANNEL, RESTORE THE AREA TO GRADE, AND STABILIZE EXPOSED SOILS.

(O) ALTERNATIVE DIVERSION METHOD MAY INCLUDE PARALLEL JERSEY BARRIERS LINED WITH POLYETHYLENE SHEETING (6 MIL MINIMUM).

(P) DIVERSION CHANNEL SHALL BE INSPECTED WEEKLY OR AFTER EVERY RAIN EVENT. ANY NEEDED REPAIRS SHALL BE DONE IMMEDIATELY.

(Q) FOR INSTALLATION DETAILS AND ITEM NUMBERS FOR DEWATERING STRUCTURES (EC-STR-1), SEDIMENT FILTER BAGS (EC-STR-2), AND SILT FENCE WITH WIRE BACKING (EC-STR-3C) SEE THEIR RESPECTIVE STANDARD DRAWINGS.

(R) TEMPORARY DIVERSION CHANNELS SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS:

209-65.03	TEMPORARY DIVERSION CHANNEL PER LINEAR FOOT.
709-05.06	MACHINED RIPRAP (CLASS A-1) PER TON
740-10.03	GEOTEXTILE (TYPE III) (EROSION CONTROL) PER SQUARE YARD

DEWATERING STRUCTURES, SEDIMENT FILTER BAGS, AND SILT FENCE WITH WIRE BACKING SHALL BE PAID FOR ACCORDING TO THEIR RESPECTIVE STANDARD DRAWINGS.

TEMPORARY PLUGS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEM NUMBERS.

PAYMENT SHALL INCLUDE ALL MATERIALS (EXCAVATION, GEOTEXTILE FABRIC, RIPRAP, ETC.) AND LABOR NECESSARY FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY DIVERSION CHANNELS.

REV. 12-18-95: CHANGED DRAWING NO. FROM ESC-STR-31 TO EC-STR-31.

☐ REV. 5-27-01: CHANGED ITEM NO. 740-03.01 TO 740-10.03. CHANGED REFERENCE OF TEMPORARY EROSION CONTROL PIPE TO TEMPORARY PIPE.

☐ REV. 12-18-02: CHANGED ALL SILT FENCE IN DETAILS TO ENHANCED SILT FENCE. CHANGED GENERAL NOTE (E).

☐ REV. 4-15-06: MODIFIED ALL GENERAL NOTES. REMOVED "TEMPORARY CULVERT USED DURING CONSTRUCTION". REMOVED TABLE FOR "PIPE DIA. FOR STREAM CROSSINGS OR TEMP. DIVERSION CHANNELS (INCHES)" REMOVED DETAIL FOR "TEMP. DIVERSION CHANNEL W/GEOTEXTILE FABRIC LINING."REFORMATTED SHEET, REVISED NOTES, MISC. EDITS TO DRAWING.

☐ REV. 4-1-08: REVISED GENERAL NOTES. ADDED NOTE R, AND MISC. EDITS TO DRAWING.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TEMPORARY

TDOT - SR-29, PIN 101411.04
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☐ REV. 4-15-06: REFORMATTED SHEET, REVISED NOTES, MISC. EDITS TO DRAWING.

☐ REV. 4-1-08: DRAWING EDITS UPDATE TABLE AND REVISIONS TO GENERAL NOTES.

"K" VALUES FOR TEMPORARY DIVERSION CHANNEL DEPTH HYDROLOGIC AREA 1

DRAINAGE AREA (ACRES)	FLOW RATE (cfs)	INCREASING CHANNEL SLOPE → 0.5%	1.0%	1.5%	2.0%	2.5%	3.0%
SEE NOTE BELOW	4.0	56.6	40.0	32.7	28.3	25.3	23.1
	10.0	141.4	100.0	81.6	70.7	63.2	57.7
	25.0	353.6	250.0	204.1	176.8	158.1	144.3
128.0	35.3	499.2	353.0	288.2	249.6	223.3	203.8
150.0	39.8	562.9	398.0	325.0	281.4	251.7	229.8
200.0	49.4	658.6	494.0	403.3	349.3	312.4	285.2
250.0	58.5	826.9	584.7	477.4	413.4	369.8	337.6
300.0	67.2	950.4	672.0	548.7	476.2	425.0	388.0
400.0	83.5	1180.9	835.0	681.8	590.4	528.1	482.1
500.0	98.8	1397.2	988.0	806.7	698.6	624.9	570.4
600.0	113.3	1602.8	1133.3	925.4	801.4	716.8	654.3
700.0	127.3	1800.9	1273.4	1039.7	900.4	805.4	735.2
800.0	140.8	1991.2	1408.0	1149.6	995.6	890.5	812.9
900.0	153.9	2176.5	1539.0	1256.6	1088.2	973.3	888.5
1000.0	166.7	2357.5	1667.0	1361.1	1178.7	1054.3	962.4
1100.0	179.1	2532.9	1791.0	1462.3	1266.4	1132.7	1034.0
1200.0	191.3	2705.4	1913.0	1562.0	1352.7	1209.9	1104.5
1300.0	203.2	2873.7	2032.0	1659.1	1436.8	1285.1	1173.2

THE DESIGN FLOW RATE MAY BE DETERMINED FROM THIS TABLE FOR DRAINAGE AREAS > OR = 128 ACRES. FOR SMALLER DRAINAGE AREAS, USE TR-55 TO DETERMINE THE DESIGN FLOW RATE. ONCE THE DESIGN FLOW RATE HAS BEEN DETERMINED, USE THIS TABLE TO FIND THE REQUIRED "K" VALUE.

"K" VALUES FOR TEMPORARY DIVERSION CHANNEL DEPTH HYDROLOGIC AREA 2

DRAINAGE AREA (ACRES)	FLOW RATE (cfs)	INCREASING CHANNEL SLOPE → 0.5%	1.0%	1.5%	2.0%	2.5%	3.0%
	6.0	84.9	60.0	49.0	42.4	37.9	34.6
	15.0	212.1	150.0	122.5	106.1	94.9	86.6
SEE NOTE BELOW	30.0	424.3	300.0	244.9	212.1	189.7	173.2
	50.0	707.1	500.0	408.2	353.6	316.2	288.7
	70.0	989.9	700.0	571.5	495.0	442.7	404.1
	90.0	1272.8	900.0	734.8	636.4	569.2	519.6
	100.0	1414.2	1000.0	816.5	707.1	632.5	577.4
300.0	117.6	1663.1	1176.0	960.2	831.6	743.8	679.0
400.0	145.0	2050.6	1450.0	1183.9	1025.3	917.1	837.2
500.0	170.5	2411.2	1705.0	1392.1	1205.6	1078.3	984.4
600.0	194.6	2752.1	1946.0	1588.9	1376.0	1230.8	1123.5
700.0	217.7	3078.7	2177.0	1777.5	1539.4	1376.9	1256.9
800.0	239.9	3392.7	2399.0	1958.8	1696.3	1517.3	1385.1
900.0	261.4	3696.8	2614.0	2134.3	1848.4	1653.2	1509.2
1000.0	282.2	3990.9	2822.0	2304.2	1995.5	1784.8	1629.3
1100.0	302.4	4276.6	3024.0	2469.1	2138.3	1912.5	1745.9
1200.0	322.2	4556.6	3222.0	2630.8	2278.3	2037.8	1860.2
1300.0	341.5	4829.5	3415.0	2788.3	2414.8	2159.8	1971.7

THE DESIGN FLOW RATE MAY BE DETERMINED FROM THIS TABLE FOR DRAINAGE AREAS > OR = 300 ACRES. FOR SMALLER DRAINAGE AREAS, USE TR-55 TO DETERMINE THE DESIGN FLOW RATE. ONCE THE DESIGN FLOW RATE HAS BEEN DETERMINED, USE THIS TABLE TO FIND THE REQUIRED "K" VALUE.

"K" VALUES FOR TEMPORARY DIVERSION CHANNEL DEPTH HYDROLOGIC AREA 3

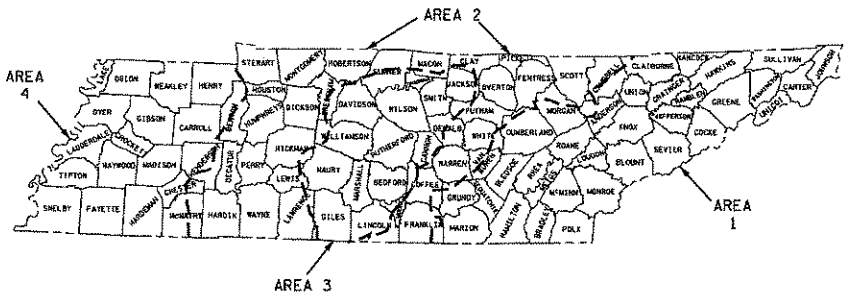
DRAINAGE AREA (ACRES)	FLOW RATE (cfs)	INCREASING CHANNEL SLOPE → 0.5%	1.0%	1.5%	2.0%	2.5%	3.0%
SEE NOTE BELOW	10.0	141.4	100.0	81.6	70.7	63.2	57.7
	25.0	353.6	250.0	204.1	176.8	158.1	144.3
	50.0	707.1	500.0	408.2	353.6	316.2	288.7
109.0	69.3	980.0	693.0	565.8	490.0	438.3	400.1
150.0	89.1	1260.1	891.0	727.5	630.0	563.5	514.4
200.0	111.8	1581.1	1118.0	912.8	790.5	707.1	645.5
250.0	133.4	1886.6	1334.0	1089.2	943.3	843.7	770.2
300.0	154.0	2177.9	1540.0	1257.4	1088.9	974.0	889.1
400.0	193.2	2732.3	1932.0	1577.5	1366.1	1221.9	1115.4
500.0	230.4	3258.3	2304.0	1881.2	1629.2	1457.2	1330.2
600.0	266.1	3763.2	2661.0	2172.7	1881.6	1683.0	1536.3
760.0	300.5	4249.7	3005.0	2453.6	2124.9	1900.5	1734.9
800.0	333.9	4722.1	3339.0	2726.3	2361.0	2111.8	1927.8
900.0	366.4	5181.7	3664.0	2991.5	2590.8	2317.3	2115.4
1000.0	398.2	5631.4	3982.0	3251.3	2815.7	2518.4	2299.0
1100.0	429.3	6071.2	4293.0	3505.2	3035.6	2715.1	2478.6
1200.0	459.8	6502.6	4598.0	3754.3	3251.3	2908.0	2654.7
1300.0	489.8	6926.8	4898.0	3999.2	3463.4	3097.8	2827.9

THE DESIGN FLOW RATE MAY BE DETERMINED FROM THIS TABLE FOR DRAINAGE AREAS > OR = 109 ACRES. FOR SMALLER DRAINAGE AREAS, USE TR-55 TO DETERMINE THE DESIGN FLOW RATE. ONCE THE DESIGN FLOW RATE HAS BEEN DETERMINED, USE THIS TABLE TO FIND THE REQUIRED "K" VALUE.

"K" VALUES FOR TEMPORARY DIVERSION CHANNEL DEPTH HYDROLOGIC AREA 4

DRAINAGE AREA (ACRES)	FLOW RATE (cfs)	INCREASING CHANNEL SLOPE → 0.5%	1.0%	1.5%	2.0%	2.5%	3.0%
	15.0	212.1	150.0	122.5	106.1	94.9	86.6
	30.0	424.3	299.8	244.8	212.0	189.6	173.1
	60.0	848.1	599.7	489.6	424.0	379.3	346.2
SEE NOTE BELOW	100.0	1414.2	1000.0	816.5	707.1	632.5	577.4
	150.0	2121.3	1500.0	1224.7	1060.7	948.7	866.0
	200.0	2828.4	2000.0	1633.0	1414.2	1264.9	1154.7
	250.0	3535.5	2500.0	2041.2	1767.8	1581.1	1443.4
	300.0	4242.6	3000.0	2449.5	2121.3	1897.4	1732.1
	350.0	4949.7	3500.0	2857.7	2474.9	2213.6	2020.7
486.0	377.1	5333.0	3771.0	3079.0	2666.5	2385.0	2177.2
600.0	421.4	5959.5	4214.0	3440.7	2979.7	2665.2	2433.0
700.0	457.1	6464.4	4571.0	3732.2	3232.2	2891.0	2639.1
800.0	490.4	6935.3	4904.0	4004.1	3467.7	3101.6	2831.3
900.0	521.6	7379.4	5218.0	4260.5	3689.7	3300.2	3012.6
1000.0	551.6	7800.8	5516.0	4503.8	3900.4	3488.6	3184.7
1100.0	580.0	8202.4	5800.0	4735.7	4101.2	3668.2	3348.6
1200.0	607.2	8587.1	6072.0	4957.8	4293.6	3840.3	3505.7
1300.0	633.4	8957.6	6334.0	5171.7	4478.8	4006.0	3656.9

THE DESIGN FLOW RATE MAY BE DETERMINED FROM THIS TABLE FOR DRAINAGE AREAS > OR = 486 ACRES. FOR SMALLER DRAINAGE AREAS, USE TR-55 TO DETERMINE THE DESIGN FLOW RATE. ONCE THE DESIGN FLOW RATE HAS BEEN DETERMINED, USE THIS TABLE TO FIND THE REQUIRED "K" VALUE.



SOURCE: "FLOOD FREQUENCY PREDICTION METHODS FOR UNREGULATED STREAMS OF TENNESSEE" WATER RESOURCES INVESTIGATIONS REPORT 03-4176. USGS 2000.

DIVERSION CHANNEL DEPTH TABLES GENERAL NOTES

(A1) THE TABLES ON THIS DRAWING MAY BE USED TO DESIGN TEMPORARY DIVERSION CHANNELS AS SHOWN ON STANDARD DRAWING EC-STR-31.

(A2) THE "K" VALUES PROVIDED IN THE TABLES REPRESENT "CONVEYANCE" WHICH MEASURES THE CAPACITY OF A CHANNEL TO PASS THE FLOW OF WATER. CONVEYANCE IS A TERM IN MANNING'S EQUATION AND IS CONSIDERED TO BE DIMENSIONLESS.

(A3) FOR EACH COMBINATION OF FLOW RATE AND CHANNEL SLOPE IN THE TABLES, THE CORRESPONDING "K" VALUE IS THE CONVEYANCE REQUIRED TO PASS THAT FLOW.

(A4) WHERE APPLICABLE, THE FLOW RATES SHOWN IN THE TABLES ARE BASED ON THE 2-YEAR EVENT AND ARE DETERMINED FROM THE USGS REGRESSION EQUATIONS FOR RURAL AREAS (2000 EDITION). THE REMAINING FLOW RATES ARE PROVIDED AS A REFERENCE FOR FINDING THE REQUIRED CONVEYANCE.

(A5) AS DESCRIBED IN THE PROCEDURE BELOW, THESE TABLES MAY BE USED TO DETERMINE THE 2-YEAR FLOW DEPTH IN A DIVERSION CHANNEL FOR THE FLOW RATES SHOWN. THE FLOW DEPTHS DETERMINED BY THIS PROCEDURE ACCOUNT FOR DIFFERENCES IN HYDRAULIC ROUGHNESS DUE TO THE DIFFERENT CLASSES OF RIPRAP REQUIRED. THE PROCEDURE IS A SIMPLE ALTERNATIVE TO ITERATIVE ANALYSIS USING THE MANNING EQUATION.

(A6) ALL TEMPORARY DIVERSION CHANNELS SHALL HAVE A TRAPEZOIDAL SHAPE AND THE BOTTOM WIDTH SHALL BE EQUAL TO OR GREATER THAN THE NATURAL CHANNEL BOTTOM WIDTH.

PROCEDURE FOR TEMPORARY DIVERSION CHANNEL DESIGN

(B1) USING THE FIGURE PROVIDED ON THIS DRAWING DETERMINE THE HYDROLOGIC AREA IN WHICH THE PROJECT SITE IS LOCATED.

(B2) INTERPOLATE THE REQUIRED "K" VALUE USING THE APPROPRIATE "K" VALUE TABLE, BASED ON THE DESIGN FLOW RATE AND AVERAGE STREAM SLOPE AT THE SITE. WHERE A PROJECT FALLS ON THE BOUNDARY BETWEEN TWO HYDROLOGIC AREAS, USE THE GREATER "K" VALUE. BASED ON THIS "K" VALUE, INTERPOLATE "A" AND "B" VALUES FROM THE TABLE "PARAMETERS FOR DEPTH OF FLOW EQUATION".

(B3) DETERMINE THE BOTTOM WIDTH OF THE EXISTING NATURAL CHANNEL. USE THIS AS THE BOTTOM WIDTH IN THE DEPTH OF FLOW EQUATION PRESENTED ON THIS DRAWING IN ORDER TO COMPUTE THE 2-YEAR FLOW DEPTH IN DIVERSION CHANNEL.

(B4) THE HEIGHT OF THE RIPRAP IN THE CHANNEL WILL BE EQUAL TO THE 2-YEAR FLOW DEPTH PLUS THE REQUIRED FREEBOARD. THE REQUIRED FREEBOARD WILL EITHER BE EQUAL TO THE FLOW DEPTH OR ONE FOOT, WHICHEVER IS LESS. THE TOP OF THE CHANNEL MUST BE EQUAL TO OR GREATER THAN THE HEIGHT OF THE RIPRAP. SEE THE FIGURE PROVIDED ON STANDARD DRAWING EC-STR-31.

(B5) COMPUTE FLOW AREA AS (DEPTH X BOTTOM WIDTH) + (Z X DEPTH^2), WHERE Z IS Z:1 FOR THE SIDE SLOPE.

(B6) COMPUTE VELOCITY AS (FLOW RATE / FLOW AREA). USE COMPUTED VELOCITY TO SELECT RIPRAP CLASS BASED ON APPROVED TDOT METHODS. IF THE COMPUTED VELOCITY IS LESS THAN 2.5 FEET PER SECOND, RIPRAP WILL NOT BE REQUIRED.

PARAMETERS FOR DEPTH OF FLOW EQUATION

K VALUE	A	B
20	-0.213	0.856
30	-0.238	0.998
60	-0.291	1.311
100	-0.323	1.545
175	-0.350	1.846
275	-0.373	2.064
350	-0.378	2.183
400	-0.384	2.260
500	-0.380	2.356
650	-0.401	2.535
750	-0.464	2.796
850	-0.494	2.944
1000	-0.540	3.162
2000	-0.812	4.406
3000	-1.000	5.321
4000	-1.100	5.960
5000	-1.176	6.567
6000	-1.241	7.072
7000	-1.300	7.515
8000	-1.323	7.895

DEPTH OF FLOW EQUATION

FLOW DEPTH = A X *ln* (BOTTOM WIDTH) + B

ln IS THE NATURAL LOG FUNCTION OF THE BOTTOM WIDTH OF THE CHANNEL.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

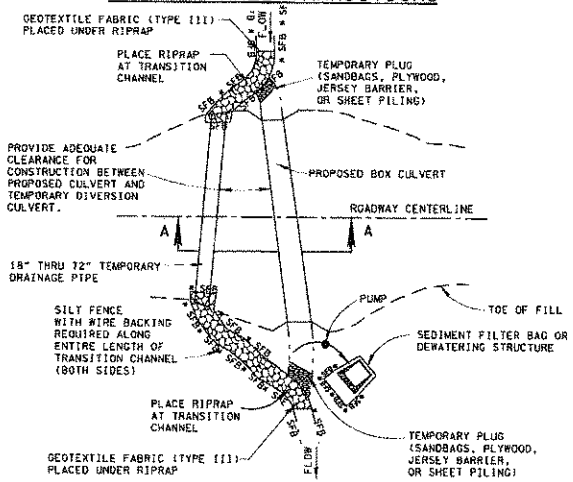
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TEMPORARY DIVERSION CHANNEL DESIGN

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
Sheet 78 of 79

- REV. 4-15-06: REFORMATTED SHEET, REVISED NOTES, MISC. EDITS TO DRAWING.
- REV. 4-1-08: REVISED GENERAL NOTES, ADDED NOTE N, MISC. EDITS TO DRAWING, AND CHANGED STANDARD SYMBOL.

TEMPORARY DIVERSION CULVERT WITH CHANNEL TRANSITIONS



PLAN VIEW

TEMPORARY DIVERSION CULVERT SELECTION

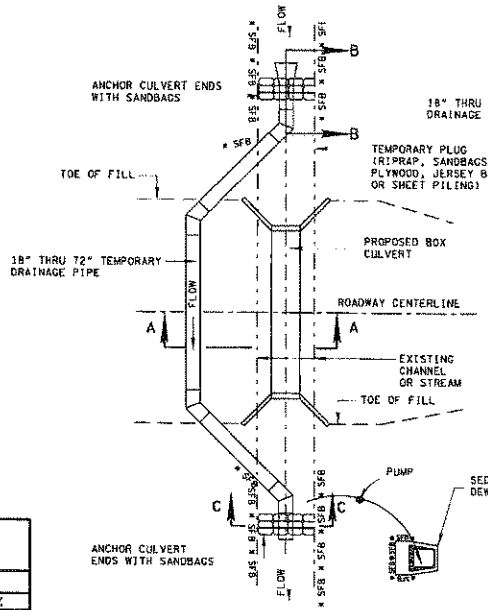
FLOW CAPACITY IN CFS OF A GIVEN PIPE AT A GIVEN CHANNEL SLOPE

PIPE DIAMETER (INCHES)	AVERAGE CHANNEL SLOPE					
	0.5%	1%	1.5%	2.0%	2.5%	3.0%
18	8.5	9.1	9.8	10.4	11.0	11.3
24	17.4	18.8	20.0	21.4	21.5	21.7
30	30.1	32.3	33.9	34.1	33.5	33.0
36	46.8	50.4	49.5	47.8	46.6	45.8
42	67.1	69.0	65.5	62.8	61.0	59.6
48	92.6	88.1	76.8	78.6	75.8	73.7
54	127.2	107.0	91.9	94.9	91.1	88.1
60	146.5	121.1	118.4	111.1	106.1	101.9
72	194.9	142.2	153.6	141.3	133.3	127.9
RIPRAP	B	B	B	B	B/C	B/C

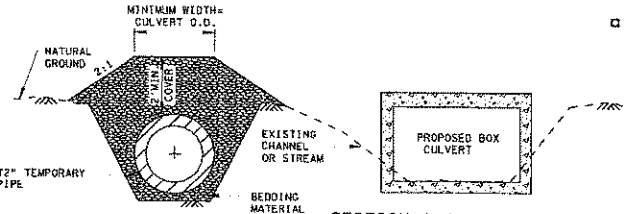
NOTES: FLOW RATES BASED ON 2.5-FOOT INCREASE IN WATER SURFACE ELEVATION ABOVE NORMAL LEVEL FOR THE 2-YEAR, 24 HOUR STORM EVENT

ASSUMES CORRUGATED PIPE (n = 0.024)

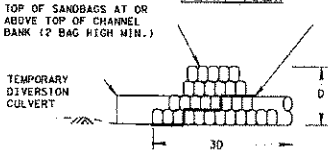
TEMPORARY DIVERSION CULVERT WITH ELBOWS



PLAN VIEW



SECTION A-A



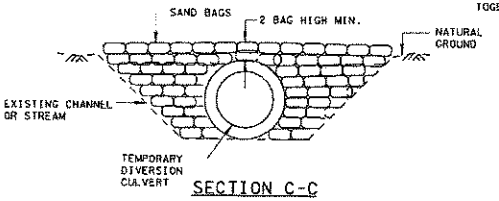
SECTION B-B

EXAMPLE:

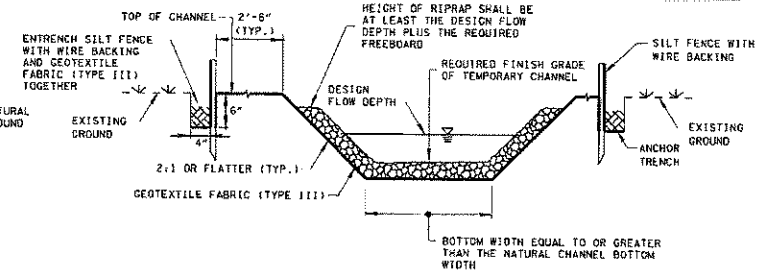
Q2 = 87.6 CFS
CHANNEL SLOPE 1%

SELECT EITHER:

SINGLE 48-INCH PIPE OR TWIN 36-INCH PIPES



SECTION C-C



TRANSITION CHANNEL CROSS-SECTION

TEMPORARY DIVERSION CULVERTS GENERAL NOTES

(A) TEMPORARY DIVERSION CULVERTS ARE GENERALLY CONSTRUCTED UNDER AN EXISTING ROADWAY, WHERE IT IS NECESSARY TO MAINTAIN TRAFFIC, TO CONVEY STREAM FLOW AROUND IN-STREAM CONSTRUCTION. THIS ALLOWS IN-STREAM WORK TO BE COMPLETED IN THE DRY, SEPARATED FROM FLOWING WATER.

(B) EXAMPLE SHOWN IS FOR CULVERT REPLACEMENT OR NEW CONSTRUCTION. OTHER PROJECTS WOULD BE CONSTRUCTED IN A SIMILAR MANNER.

(C) TEMPORARY DIVERSION CULVERTS SHALL BE DESIGNED USING A 2-YEAR FREQUENCY STORM FLOW RATE. AT SITES WHICH INVOLVE HIGH-QUALITY OR SEDIMENT-IMPAIRED STREAM, THE PIPE SHALL BE ADEQUATE TO CONVEY THE 5-YEAR, PEAK FLOW. THE TABLE "TEMPORARY DIVERSION CULVERT SELECTION" MAY BE USED AS A GUIDELINE FOR DETERMINING THE PIPE SIZE. FOR ANY SITE WHERE Q25 EXCEEDS 500 CFS, THE DESIGN OF THIS MEASURE SHOULD BE COMPLETED BY THE HYDRAULICS SECTION OF THE STRUCTURES DIVISION.

(D) THE DESIGNER SHALL PROVIDE CULVERT SECTIONS FOR TEMPORARY CULVERT CROSSINGS. MINIMUM COVER FOR CONSTRUCTION LOADS IS 2 FEET.

(E) THE RIPRAP TRANSITION AT THE INLET AND THE DIVERSION CULVERT SHALL BE DESIGNED IN ACCORDANCE WITH APPROVED TDOT METHODS.

(F) WHERE EXCAVATION FOR A DIVERSION TRANSITION EXPOSES BEDROCK, GEOTEXTILE FABRIC AND RIPRAP SHALL BE USED ONLY ON THE SIDES OF THE CHANNEL.

(G) IN ORDER TO PROVIDE THE BEST POSSIBLE SEAL, THE POLYETHYLENE SHEETING USED IN AN UPSTREAM PIPE ANCHOR SHOULD BE FITTED AROUND THE PIPE. SANDBAGS ON THE DOWNSTREAM SIDE OF THE SHEETING SHOULD BE PLACED FIRST, AND THE SHEETING PLACED ON THESE BAGS. THE REMAINING SANDBAGS WOULD THEN BE PLACED ON THE SHEETING. WHERE MULTIPLE SHEETS ARE USED, THEY SHOULD OVERLAP A MINIMUM OF 18 INCHES.

(H) DURING CONSTRUCTION OF THE TEMPORARY DIVERSION CULVERT, DAMAGE TO THE EXISTING STREAM AND CANOPY SHALL BE MINIMIZED. ALL EXISTING VEGETATION OUTSIDE THE CUT AND FILL LINES BUT INSIDE THE RIGHT-OF-WAY SHALL NOT BE DISTURBED UNLESS IT INTERFERES WITH SAFETY STANDARDS. THE TEMPORARY CULVERT SHOULD BE LOCATED SO AS TO MINIMIZE THE LENGTH OF ANY TRANSITIONS REQUIRED.

(I) DIVERSION CULVERT CONSTRUCTION SHALL BE COMPLETED IN THE DRY BEFORE DIVERTING WATER FROM THE EXISTING CHANNEL. WHERE THIS IS NOT FEASIBLE, TEMPORARY FLOW DIVERSION STRUCTURES CAN BE USED UNTIL WORK IS COMPLETE. THESE STRUCTURES CAN BE ANY NON-ERODIBLE MATERIAL.

(J) CONSTRUCTION SHALL PROCEED AS FOLLOWS:

1. CONSTRUCT THE TEMPORARY CULVERT ADJACENT TO THE PROPOSED PROJECT. ISOLATE THE TEMPORARY CHANNEL FROM THE EXISTING CHANNEL WITH TEMPORARY PLUGS.
2. DIVERT FLOW BY MOVING THE TEMPORARY PLUGS FROM THE TEMPORARY CHANNEL TO THE EXISTING CHANNEL. A COFFER DAM MAY BE USED UPSTREAM TO PREVENT STREAM FLOW DURING THIS OPERATION.
3. CONSTRUCT THE PROJECT IN THE EXISTING STREAM AND PLACE PERMANENT EROSION CONTROL ON THE EXISTING STREAM BANKS.
4. WHERE A TEMPORARY PLUG IS REQUIRED AT THE DOWNSTREAM END OF THE DIVERSION, IT SHOULD BE REMOVED FIRST. THEN REMOVE THE UPPER PLUG IN ORDER TO RELEASE FLOW INTO THE RECONSTRUCTED CHANNEL.
5. REMOVE LINING MATERIALS FROM THE DIVERSION TRANSITIONS. RESTORE THE AREA TO GRADE AND STABILIZE EXPOSED SOILS.

(K) DIVERSION CULVERT, SANDBAG ANCHORS AND TRANSITIONS SHALL BE INSPECTED WEEKLY OR AFTER EVERY RAIN EVENT. ANY NEEDED REPAIRS SHALL BE DONE IMMEDIATELY.

(L) ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.

(M) FOR INSTALLATION DETAILS AND ITEM NUMBERS FOR DEWATERING STRUCTURES (EC-STR-1), SEDIMENT FILTER BAGS (EC-STR-2), AND SILT FENCE WITH WIRE BACKING (EC-STR-3C), SEE THEIR RESPECTIVE STANDARD DRAWINGS.

(N) TEMPORARY DIVERSION CULVERTS SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS:

203-01	ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED) PER CUBIC YARD
209-09.01	SAND BAGS PER BAG
209-20.03	POLYETHYLENE SHEETING (6 MIL. MINIMUM) PER SQUARE YARD
621-03.02 THRU 621-03.11	__ "TEMPORARY DRAINAGE PIPE PER LINEAR FOOT.
709-05.05	MACHINED RIP-RAP (CLASS A-1) PER TON
709-05.08	MACHINED RIP-RAP (CLASS B) PER TON
709-05.09	MACHINED RIP-RAP (CLASS C) PER TON
740-10.03	GEOTEXTILE (TYPE III) (EROSION CONTROL) PER SQUARE YARD.

DEWATERING STRUCTURES, SEDIMENT FILTER BAGS, AND SILT FENCE WITH WIRE BACKING SHALL BE PAID FOR ACCORDING TO THEIR RESPECTIVE STANDARD DRAWINGS.

TEMPORARY PLUGS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEM NUMBERS.

PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY DIVERSION CULVERTS.

EROSION CONTROL PLAN LEGEND: TEMPORARY DIVERSION CULVERT (DESCRIBE NUMBER AND SIZE OF PIPES)

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TEMPORARY DIVERSION

TDOT - SR-29, PIN 101411.04
D/A No. LRN-2013-00712
Morgan / Roane County, TN
Sheet 79 of 79

Label	Station	Stream Replacement	Existing Structure	Proposed Structure	Total Structure	Net Structure	Ratio
STR-6	299+98 - 342+85	0	176	80	256	256	1
STR-19	328+39	0	117	143	240	240	1
STR-20	349+20	0	102	25	127	102	0
STR-21	349+25 - 352+00	275	53	33	33	0	1
STR-22	356+94	504	0	116	116	0	1
Total		**779**	**448**	**397**	**772**	**598**	

Existing Stream Length	Proposed Stream Length	Net Stream	Loss Ratio	Proposed Rip rap	Rip Rap Loss Ratio	Total ILF
275	275	0	1	19	0	$ 61,440.00
278	255	23	1	0	0	$ 63,120.00
137	137	0	1	10	0	$ -
328	308	20	1	0	0	$ 4,800.00
571	620	-49	1	0	0	$ (11,760.00)
1589	**1595**	**-6**		**--**		**$ 117,600.00**

Comments

TSMP for structure and stream loss; no loss of function for rip rap
Mitigation not required
Stream loss (TSMP)
More proposed stream than existing

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-3655

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

MEMORANDUM

TO: Freddy Miller
Region 1 Design

FROM: Keven Brown
Region 1 Ecology

DATE: June 11, 2014

SUBJECT: SR-29 from south of Whetstone Road to north of SR-328
Morgan County, TN
PIN: 101411.05 P.E. #65001-3268-14

An ecological evaluation of the subject project has been conducted with the following results:

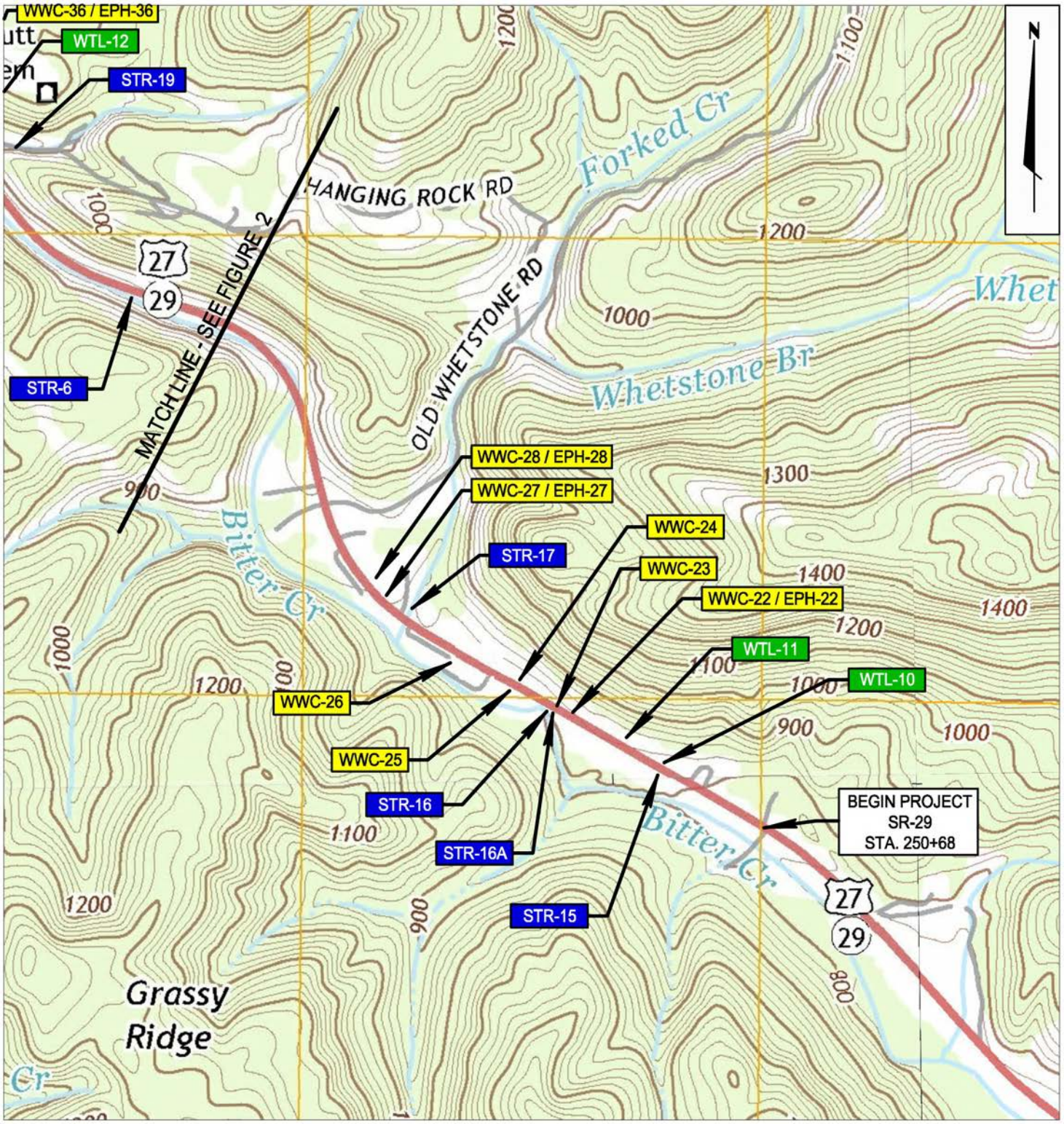
__X__ Wetlands identified in project impact area:

__X__ Streams present:

__X__ Protected species not present within project impact area:

Please incorporate this information into the project plans as needed. Thank you for your assistance with this project. If you have any questions or comments please contact me at Keven.Brown@tn.gov or 865-594-2437.

Copy: Ataur Rahman – Design, w/attachment
John Hewitt: - Permits/Ecology, w/attachments
Jon Zirkle – Structures, w/attachments
Kent Fox – Survey, w/attachments
Ann Andrews – Planning, w/attachments
Project File: - w/attachments



U.S.G.S QUADRANGLE TOPOGRAPHIC MAPS:
CAMP AUSTIN, TN (2013), PETROS, TN (2013),
HARRIMAN, TN (2013) AND ELVERTON, TN (2013)

0 1000' 2000'
SCALE IN FEET

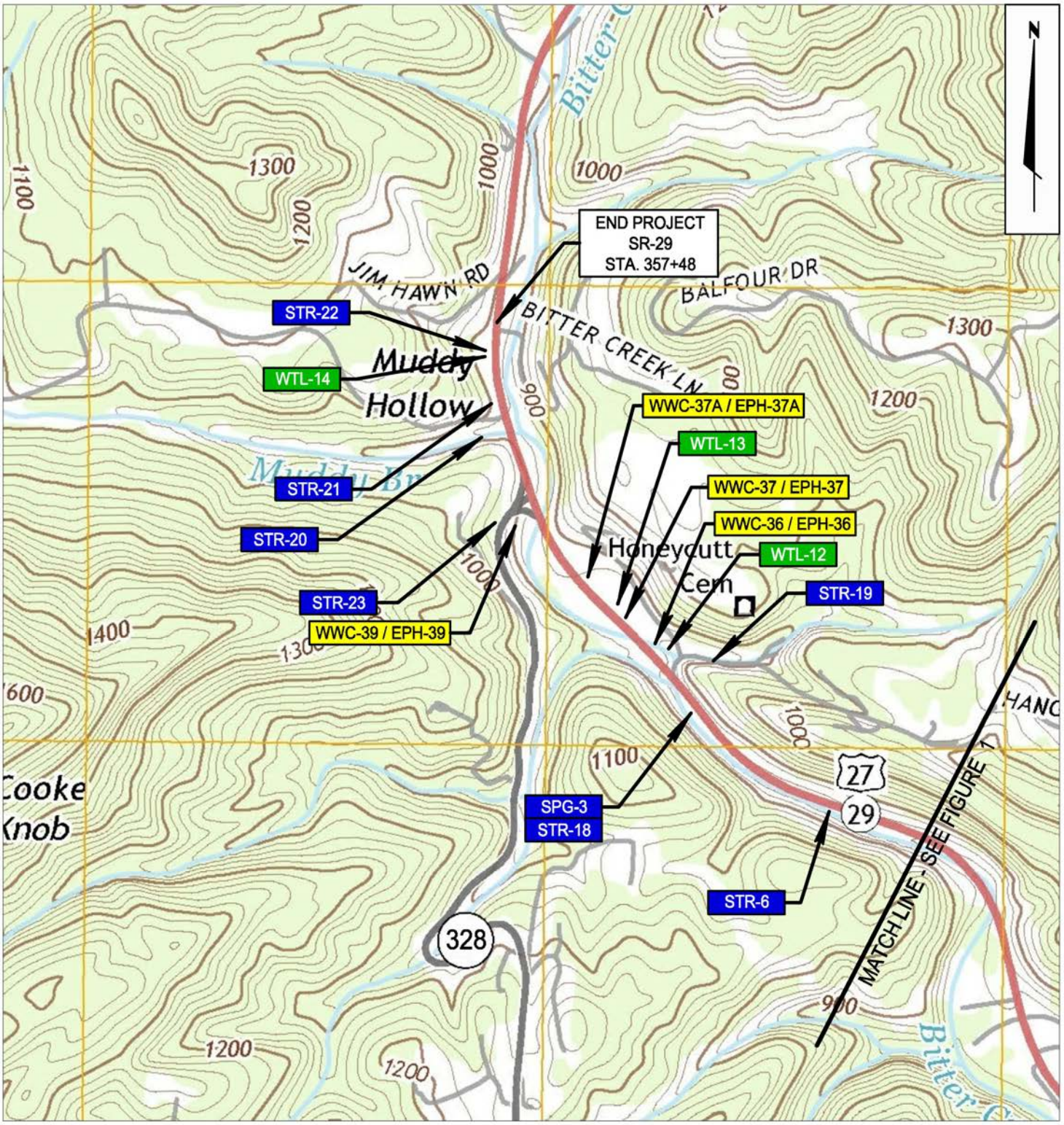
TDOT

ENVIRONMENTAL BOUNDARIES MAP

SR-29 (US-27); FROM SOUTH OF WHETSTONE ROAD TO NORTH OF SR-328
MORGAN COUNTY, TN

SURVEY DATES: AUG 20-24, 2007, SEPT 4-7, 2007, & NOV 14-15, 2013

DRAWN BY:	CHECKED BY:
R. CLOWDUS	T. BECKTOLD
PIN	101411.05
PROJECT NO.	65001-1256-14
FIGURE	DATE:
1 OF 2	12-6-2013



U.S.G.S QUADRANGLE TOPOGRAPHIC MAPS:
CAMP AUSTIN, TN (2013), PETROS, TN (2013),
HARRIMAN, TN (2013) AND ELVERTON, TN (2013)

0 1000' 2000'
SCALE IN FEET

TDOT

ENVIRONMENTAL BOUNDARIES MAP

SR-29 (US-27); FROM SOUTH OF WHETSTONE ROAD TO NORTH OF SR-328
MORGAN COUNTY, TN

SURVEY DATES: AUG 20-24, 2007, SEPT 4-7, 2007, & NOV 14-15, 2013

DRAWN BY:	CHECKED BY:
R. CLOWDUS	T. BECKTOLD
PIN	101411.05
PROJECT NO.	65001-1256-14
FIGURE	DATE:
2 OF 2	12-6-2013

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 8/22/2007; Re-evaluation 11/15/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 342+85
2-Map label and name	STR-6, Bitter Creek
3-Latitude/Longitude	36.01554N / -84.52555E
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Perennial stream
blue-line on topo? (y/n)	No ☐ Yes ☑
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☐ Meandering ☑
channel bottom width	15-20 ft.
top of bank width	17-25 ft.
bank height and slope ratio	1-3 ft.; 1:1 - 2:1
avg. gradient of stream (%)	3-5%
substratum	Cobble 40%; Boulder 20%; Pebble 15%; Granule 15%; Silt 10%
riffle/run/pool	40/40/20
width of buffer zone	LDB: 0-20 ft. RDB: 30-60 ft.
water flow	Yes
water depth	4 in.- 1.5 ft.
water width	8-20 ft.
general water quality	Good
OHWM indicators	Defined bed and bank; wrested vegetation; change in soil characteristics; wrack lines
groundwater connection	Yes
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: Tulip poplar, red maple, black walnut, mimosa RDB: Sycamore, black walnut, umbrella magnolia, American hornbeam, silky dogwood
overhead canopy (%)	70%
benthos	Baetidae, Heptageniidae, Gastropoda, Bivalvia
fish	Minnows - unidentified
algae or other aquatic life	Filamentous algae; salamander, water striders
habitat assessment score	149 - suboptimal; not impaired
photo number (s)	6, 21-22, 25
rainfall information	0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14; 0.06 on 11/15
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	
8-Mitigation	No ☐ Yes ☑ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☐ Yes ☑
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm A TDEC Hydrologic Determination Field Data Sheet was not completed for this feature.

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-6	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Bitter Creek	DATE: TIME:
STATION LOCATION: 342+85	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 18	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 16	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 15	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 14	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 13	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-6 Date 11/15/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 14	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 18	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 7 6	(5) 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0
Comments				

Total Score 149 **Comparison to Ecoregion Guidelines (circle):** **(ABOVE)** **or** **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 260+00L
2-Map label and name	STR-15, Unnamed tributary to Bitter Creek
3-Latitude/Longitude	36.00009N / -84.50606E
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Intermittent stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1-2.5 ft.
top of bank width	2-4 ft.
bank height and slope ratio	6 in - 2 ft.; 2:1
avg. gradient of stream (%)	2-3%
substratum	Gravel 90%; Silt 10% (Gravel 50%; Boulder 30%; Bedrock 10%; and Silt 10% within forested area, downstream of power line clearing)
riffle/run/pool	40/40/20
width of buffer zone	LDB: 0 ft. within powerline clearing; >100 ft downstream of powerline clearing RDB: 0 ft. within powerline clearing; >100 ft downstream of powerline clearing
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank; change in soil characteristics
groundwater connection	unknown
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue within powerline clearing; tulip poplar, sweetgum, red maple, dogwood, white pine downstream of powerline clearing RDB: fescue within powerline clearing; tulip poplar, sweetgum, red maple, dogwood, white pine downstream of powerline clearing
overhead canopy (%)	0-80%
benthos	None observed
fish	None observed
algae or other aquatic life	green algae; salamander; crayfish burrows observed
habitat assessment score	90 - marginal; impaired
photo number (s)	2
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WTL-10 exists on the up-gradient (inlet, RT side of centerline) end of the existing 30-inch RCP associated with STR-15. From the outlet of the existing 30-inch RCP, STR-15 runs perpendicularly through a power-line clearing which parallels the SR-29 alignment and then enters a forested area before converging with Bitter Creek. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score: 19.75).

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-15	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Unnamed tributary to Bitter Creek	DATE: TIME:
STATION LOCATION: 260+00L	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 9	20 19 18 17 16	15 14 13 12 11	10 **(9)** 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 **(6)**	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 **(6)**	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 14	20 19 18 17 16	15 **(14)** 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	**(5)** 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-15 Date 11/14/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 10	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 12	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 (3)	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 (3)	2 1 0
Comments				

Total Score 90 **Comparison to Ecoregion Guidelines (circle): ABOVE or (BELOW)**

If score is below guidelines , result of (circle): Natural Conditions or (Human Disturbance)

Describe Result of historic human disturbance (channelization; portion of riparian zone cleared for power line easement).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 269+00L to 270+75L
2-Map label and name	STR-16, Unnamed tributary to Bitter Creek
3-Latitude/Longitude	36.00138N / -84.50872E
4-Potential impact	Relocation
5-Feature description:	
what is it	Intermittent stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1-2.5 ft.
top of bank width	2-3 ft.
bank height and slope ratio	6 -10 in.; 1:1 - 2:1
avg. gradient of stream (%)	1-2%
substratum	Pebble 60%; Granule 20%; Silt 15%; Cobble 5%
riffle/run/pool	40/40/20
width of buffer zone	LDB: 0 ft. RDB: 0 ft.
water flow	Yes - present in pools
water depth	0-2 in.
water width	0-2 ft.
general water quality	Good
OHWM indicators	Defined bed and bank; change in soil characteristics
groundwater connection	unknown
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue - maintained lawn within Bitter Creek floodplain RDB: fescue - maintained lawn within Bitter Creek floodplain
overhead canopy (%)	0%
benthos	None observed
fish	None observed
algae or other aquatic life	green algae
habitat assessment score	73 - marginal; impaired
photo number (s)	6
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☐ Yes ☑ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm STR-16 is a short intermittent headwater stream located immediately adjacent to and within the floodplain of Bitter Creek. STR-16A converges with STR-16 approximately 45 feet downstream of its headwaters. STR-16 converges with Bitter Creek approximately 130 feet downstream of the confluence with STR-16A. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score: 21.00).

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-16	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Unnamed tributary to Bitter Creek	DATE: TIME:
STATION LOCATION: 269+00L to 270+75L	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 **(6)**	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 9	20 19 18 17 16	15 14 13 12 11	10 **(9)** 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 **(7)** 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 12	20 19 18 17 16	15 14 13 **(12)** 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 **(7)** 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-16 Date 11/14/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 11	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 7 (6)	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	2 (1) 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 3	2 (1) 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	2 (1) 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 3	2 (1) 0
Comments				

Total Score 73 **Comparison to Ecoregion Guidelines (circle): ABOVE or (BELOW)**

If score is below guidelines , result of (circle): Natural Conditions or (Human Disturbance)

Describe Result of historic human disturbance (channelization; riparian zone cleared/maintained lawn).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 270+29L
2-Map label and name	STR-16A, Unnamed tributary to Bitter Creek
3-Latitude/Longitude	36.00141N / -84.50881E
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Intermittent stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1-1.5 ft.
top of bank width	1.5-2 ft.
bank height and slope ratio	4-6 in.; 1:1
avg. gradient of stream (%)	2-3%
substratum	Granule 60%; Pebble 30%; Silt 10%
riffle/run/pool	20/80/0
width of buffer zone	LDB: 0 ft. RDB: 0 ft.
water flow	Yes
water depth	0-1 in.
water width	0-1 ft.
general water quality	Good
OHWM indicators	Defined bed and bank; change in soil characteristics
groundwater connection	unknown
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue - maintained lawn within Bitter Creek floodplain RDB: fescue - maintained lawn within Bitter Creek floodplain
overhead canopy (%)	0%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	65 - marginal; impaired
photo number (s)	6
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm STR-16A is a short intermittent headwater stream located immediately adjacent to and within the floodplain of Bitter Creek. STR-16A converges with STR-16 approximately 50 feet downstream of the RCP outlet beneath SR-29. WWC-23 exists on the up-gradient end of the RCP beneath SR-29. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score: 19.00).

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-16A	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Unnamed tributary to Bitter Creek	DATE: TIME:
STATION LOCATION: 270+29L	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 4	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 (4) 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 14	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-16A Date 11/14/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 9	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 7 (6)	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	2 (1) 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 3	2 (1) 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	2 (1) 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 3	2 (1) 0
Comments				

Total Score 65 **Comparison to Ecoregion Guidelines (circle): ABOVE or (BELOW)**

If score is below guidelines , result of (circle): Natural Conditions or (Human Disturbance)

Describe Result of historic human disturbance (channelization; riparian zone cleared/maintained lawn).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 280+54
2-Map label and name	STR-17, Forked Creek
3-Latitude/Longitude	36.00332N / -84.5122E
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Perennial stream
blue-line on topo? (y/n)	No ☐ Yes ☑
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	14-18 ft.
top of bank width	16-20 ft.
bank height and slope ratio	1-2.5 ft.; 2:1
avg. gradient of stream (%)	2-3%
substratum	Cobble 50%; Boulder 20%; Pebble 15%; Silt 15%
riffle/run/pool	40/20/40
width of buffer zone	LDB: 0-20 ft. RDB: 0-30 ft.
water flow	Yes
water depth	6 in.- 1.5 ft.
water width	6-18 ft.
general water quality	Good
OHWM indicators	Defined bed and bank; wrested vegetation; change in soil characteristics
groundwater connection	Yes
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: Inlet end: fescue, fern, microstegium, Carex spp., clover; Outlet end: sycamore, black locust, tulip poplar, hazel alder RDB: Inlet end: fescue, fern, microstegium, Carex spp., clover; Outlet end: sycamore, black locust, tulip poplar, hazel alder
overhead canopy (%)	0-40%
benthos	Baetidae; Gerridae
fish	Minnows - unidentified
algae or other aquatic life	Green algae; crayfish burrows
habitat assessment score	118 - suboptimal; impaired
photo number (s)	9-10
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☐ Yes ☑
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm Forked Creek, STR-17, is a tributary to Bitter Creek. SR-29 perpendicularly crosses over Forked Creek, STR-17. A TDEC Hydrologic Determination Field Data Sheet was not completed for this feature.

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-17	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Forked Creek	DATE: TIME:
STATION LOCATION: 280+54	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 17	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 15	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 11	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 12	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 15	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-17 Date 11/14/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 13	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 12	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	(2) 1 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 3	(2) 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	(2) 1 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 (3)	2 1 0
Comments				

Total Score 118 **Comparison to Ecoregion Guidelines (circle): ABOVE or (BELOW)**

If score is below guidelines , result of (circle): Natural Conditions or (Human Disturbance)

Describe Result of historic human disturbance (portion of riparian zone cleared/maintained lawn; existing culvert).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 324+59L
2-Map label and name	STR-18, Unnamed tributary to Bitter Creek; and SPG-3
3-Latitude/Longitude	36.01148N / -84.52173E
4-Potential impact	Runoff
5-Feature description:	
what is it	Intermittent stream and spring
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1 ft.
top of bank width	2 ft.
bank height and slope ratio	6 in.; 2:1
avg. gradient of stream (%)	3-5%
substratum	Silt 75%; Granule 25%
riffle/run/pool	0/100/0
width of buffer zone	LDB: 0 ft. RDB: 0 ft.
water flow	Yes
water depth	0.10 - 0.25 in.
water width	6 in. - 1 ft.
general water quality	Fair
OHWM indicators	Defined bed and bank; change in soil characteristics
groundwater connection	Yes - SPG-3
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue, cardinal flower, jewelweed, tulip poplar, hazel alder RDB: fescue, cardinal flower, jewelweed, tulip poplar, hazel alder
overhead canopy (%)	0-20%
benthos	None observed
fish	None observed
algae or other aquatic life	crayfish burrows
habitat assessment score	89 - marginal; impaired
photo number (s)	13-14
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm Plans depict a spring box beneath the existing SR-29 roadway. Surface flow was present within the culvert and stream channel at the time of the field study. STR-18 converges with Bitter Creek just outside of right-of-way. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Primary Field Indicator #7 satisfied).

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-18	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Unnamed tributary to Bitter Creek	DATE: TIME:
STATION LOCATION: 324+59L	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 10	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 14	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 12	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-18 Date 11/14/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 13	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 (9)	8 7 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	(2) 1 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 3	(2) 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	2 (1) 0
SCORE____(RB)	Right Bank 10 9	8 7 6	5 4 3	2 (1) 0
Comments				

Total Score 89 **Comparison to Ecoregion Guidelines (circle): ABOVE or (BELOW)**

If score is below guidelines , result of (circle): Natural Conditions or (Human Disturbance)

Describe Result of historic human disturbance (riparian zone cleared/maintained within a powerline easement; existing culvert).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/6/2007; Re-evaluation 11/15/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 328+50
2-Map label and name	STR-19, Unnamed tributary to Bitter Creek
3-Latitude/Longitude	36.01255N / -84.5222E
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Intermittent stream
blue-line on topo? (y/n)	No ☐ Yes ☑
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	6-8 ft.
top of bank width	8-10 ft.
bank height and slope ratio	8 in. - 2 ft.; 1:1 - 2:1
avg. gradient of stream (%)	3-5%
substratum	Cobble 50%; Boulder 5%; Pebble 25%; Bedrock 5%; Granule 10%; Silt 5%
riffle/run/pool	40/40/20
width of buffer zone	LDB: 0-20 ft. RDB: 20->100 ft.
water flow	Yes
water depth	1-4 in.
water width	1-5 ft.
general water quality	Good
OHWM indicators	Defined bed and bank; wrested vegetation; change in soil characteristics
groundwater connection	unknown
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: Chinese privet, mimosa, false nettle, multiflora rose, jewelweed, hazel alder RDB: box elder, black willow, jewelweed, mulberry, hazel alder, sweetgum, false nettle
overhead canopy (%)	30%
benthos	Trichoptera and cases
fish	None observed
algae or other aquatic life	Green algae; frogs
habitat assessment score	121 - suboptimal; impaired
photo number (s)	15-17
rainfall information	0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14; 0.06 on 11/15
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☐ Yes ☑ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm STR-19 converges with Bitter Creek within the present / proposed right-of-way, LT side of SR-29. WTL-12 directly abuts STR-19 on the right descending bank, RT side of SR-29. Hanging Rock Road parallels the left descending bank of STR-19, RT side of SR-29. A TDEC Hydrologic Determination Field Data Sheet was not completed for this feature.

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-19	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Unnamed tributary to Bitter Creek	DATE: TIME:
STATION LOCATION: 328+50	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 15	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 12	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 10	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 16	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 10	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-19 Date 11/15/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 10	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 16	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	(2) 1 0
SCORE____(RB)	Right Bank 10 9	8 7 6	(5) 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 3	2 (1) 0
SCORE____(RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
Comments				

Total Score 121 **Comparison to Ecoregion Guidelines (circle): ABOVE or (BELOW)**

If score is below guidelines , result of (circle): Natural Conditions or (Human Disturbance)

Describe Result of historic human disturbance (riparian zone cleared on LB; 2 existing culverts).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/7/2007; Re-evaluation 11/15/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 349+19
2-Map label and name	STR-20, Muddy Branch
3-Latitude/Longitude	36.01721N / -84.52649E
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Intermittent stream
blue-line on topo? (y/n)	No ☐ Yes ☑
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	10-14 ft.
top of bank width	12-16 ft.
bank height and slope ratio	1-2 ft.; 2:1
avg. gradient of stream (%)	3-5%
substratum	Cobble 75%; Boulder 5%; Pebble 10%; Granule 5%; Silt 5%
riffle/run/pool	60/20/20
width of buffer zone	LDB: 0->100 ft. RDB: 0->100 ft.
water flow	Yes
water depth	1-3 in.
water width	2-7 ft.
general water quality	Good
OHWM indicators	Defined bed and bank; wrested vegetation; change in soil characteristics
groundwater connection	unknown
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: box elder, sycamore, black willow, tulip poplar, black cherry, blackberry, mimosa, false nettle, jewelweed, hazel alder RDB: box elder, sycamore, black willow, tulip poplar, black cherry, blackberry, mimosa, false nettle, jewelweed, hazel alder
overhead canopy (%)	0-50%
benthos	Megaloptera; Plecoptera
fish	None observed
algae or other aquatic life	Frogs
habitat assessment score	127 - suboptimal; impaired
photo number (s)	25-27
rainfall information	0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14; 0.06 on 11/15
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☐ Yes ☑
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm STR-20 converges with Bitter Creek within the present / proposed right-of-way, RT side of SR-29. STR-21 converges with STR-20 near the existing RCBC inlet, LT side of SR-29. A TDEC Hydrologic Determination Field Data Sheet was not completed for this feature.

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-20	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Muddy Branch	DATE: TIME:
STATION LOCATION: 349+19	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 15	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 11	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 9	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 14	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 11	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-20 Date 11/15/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 11	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 14	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 7 (6)	5 4 3	2 1 0
Comments				

Total Score 127 **Comparison to Ecoregion Guidelines (circle): ABOVE or (BELOW)**

If score is below guidelines , result of (circle): Natural Conditions or (Human Disturbance)

Describe Result of historic human disturbance (some 4-wheel activity evident; riparian zone limited; existing culvert).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/7/2007; Re-evaluation 11/15/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 349+40L to 352+50L
2-Map label and name	STR-21, Unnamed tributary to Muddy Branch
3-Latitude/Longitude	36.01856N / -84.52731E
4-Potential impact	Relocation
5-Feature description:	
what is it	Intermittent stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☐ Meandering ☑
channel bottom width	2-4 ft. - braided in portions
top of bank width	2.5-5 ft.
bank height and slope ratio	6 in. - 1 ft.; 1:1 - 2:1
avg. gradient of stream (%)	5-10%
substratum	Cobble 20%; Pebble 30%; Granule 20%; Silt 30%
riffle/run/pool	40/40/20
width of buffer zone	LDB: 20-80 ft. RDB: 20->100 ft.
water flow	Yes
water depth	1-2 in.
water width	1-3 ft.
general water quality	Good
OHWM indicators	Defined bed and bank; wrested vegetation; change in soil characteristics
groundwater connection	unknown
bank stability: LDB, RDB	LDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: box elder, sycamore, Chinese privet, jewelweed, blackberry, tulip poplar, persimmon, beech, hemlock, false nettle RDB: box elder, sycamore, Chinese privet, jewelweed, blackberry, tulip poplar, persimmon, beech, hemlock, false nettle
overhead canopy (%)	30-70%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	114 - suboptimal; impaired
photo number (s)	28-31
rainfall information	0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☐ Yes ☑ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm STR-21 and STR-22 converge within the boundaries of WTL-14. STR-21 enters ROW from a steep forested hillside and becomes a lower gradient stream upon entering ROW and WTL-14. A stream relocation will be necessary for STR-21 and STR-22. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Primary Field Indicator #8 satisfied).

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-21	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Unnamed tributary to Muddy Branch	DATE: TIME:
STATION LOCATION: 349+40L to 352+50L	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 11	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 10	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 10	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-21 Date 11/15/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 14	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 14	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 7 (6)	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 7 (6)	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0
Comments				

Total Score 114 **Comparison to Ecoregion Guidelines (circle): ABOVE or (BELOW)**

If score is below guidelines , result of (circle): Natural Conditions or (Human Disturbance)

Describe Result of historic human disturbance (riparian zone limited on LB by power-line easement; existing culvert on downstream end before confluence with Muddy Branch).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/7/2007; Re-evaluation 11/15/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 351+60L to 356+50L
2-Map label and name	STR-22, Unnamed tributary to Muddy Branch
3-Latitude/Longitude	36.01797N / -84.52658E
4-Potential impact	Relocation
5-Feature description:	
what is it	Intermittent stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1-2.5 ft.
top of bank width	2-3.5 ft.
bank height and slope ratio	6 in. - 1 ft.; 1:1 - 2:1
avg. gradient of stream (%)	3-5%
substratum	Silt 70%; Cobble 5%; Pebble 10%; Granule 15%
riffle/run/pool	20/60/20
width of buffer zone	LDB: 5-20 ft. RDB: >100 ft.
water flow	Yes
water depth	1-4 in.
water width	1-2.5 ft.
general water quality	Poor
OHWM indicators	Defined bed and bank; wrested vegetation; change in soil characteristics
groundwater connection	unknown
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: Sycamore, hazel alder, black willow, jewelweed, sedges, rushes, ironweed, blackberry RDB: Sycamore, hazel alder, black willow, jewelweed, sedges, rushes, ironweed, blackberry
overhead canopy (%)	50%
benthos	None observed
fish	None observed
algae or other aquatic life	Green algae; crayfish burrows
habitat assessment score	112 - suboptimal; impaired
photo number (s)	30, 32-33
rainfall information	0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14; 0.06 on 11/15
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☐ Yes ☑ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm STR-21 and STR-22 converge within the boundaries of WTL-14. A stream relocation will be necessary for STR-21 and STR-22. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Primary Field Indicator #8 satisfied).

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: STR-22	HABITAT ASSESSED BY: Becktold / Schmidt
STREAM NAME: Unnamed tributary to Muddy Branch	DATE: TIME:
STATION LOCATION: 351+60L to 356+50L	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 9	20 19 18 17 16	15 14 13 12 11	10 **(9)** 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 **(7)** 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 **(6)**	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 **(8)** 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE 15	20 19 18 17 16	**(15)** 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID STR-22 Date 11/15/2013 Initials TB

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE 14	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE 11	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE____(LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE____(LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE____(RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE____(LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 0
SCORE____(RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0
Comments				

Total Score 112 **Comparison to Ecoregion Guidelines (circle): ABOVE or (BELOW)**

If score is below guidelines , result of (circle): Natural Conditions or (Human Disturbance)

Describe Result of historic human disturbance (riparian zone limited on LB by power-line easement; existing culvert on downstream end before confluence with Muddy Branch).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 266+62
2-Map label and name	WWC-22 / EPH-22
3-Latitude/Longitude	36.00122N / 84.50859W
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Wet weather conveyance / ephemeral stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1 ft.
top of bank width	2 ft.
bank height and slope ratio	6 in; 2:1
avg. gradient of stream (%)	2-3%
substratum	Gravel 10%; Silt 90%
riffle/run/pool	N/A
width of buffer zone	LDB: 0 ft. within powerline clearing; >100 ft downstream of powerline clearing RDB: 0 ft. within powerline clearing; >100 ft downstream of powerline clearing
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank in portion immediately down-gradient of RCP outlet
groundwater connection	unknown
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue within powerline clearing; tulip poplar, sweetgum, red maple, sycamore, white pine downstream of powerline clearing RDB: fescue within powerline clearing; tulip poplar, sweetgum, red maple, sycamore, white pine downstream of powerline clearing
overhead canopy (%)	0-80%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	4
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Ephemeral stream designation made by Mark McIntosh, USACE, on 11/25/2013
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WTL-11 exists on the up-gradient (inlet, RT side of centerline) end of the existing 24-inch RCP associated with WWC-22 / EPH-22. From the outlet of the existing 24-inch RCP, WWC-22 / EPH-22 runs perpendicularly through a power-line clearing and then enters a forested area before converging with Bitter Creek. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score: 11.50).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 270+28R
2-Map label and name	WWC-23
3-Latitude/Longitude	36.00176N / 84.50898W
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Wet weather conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1 ft.
top of bank width	2 ft.
bank height and slope ratio	6 in; 2:1
avg. gradient of stream (%)	5-10%
substratum	Silt 100%
riffle/run/pool	N/A
width of buffer zone	LDB: 0 ft. RDB: 0 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank in portion
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: kudzu RDB: kudzu
overhead canopy (%)	0%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	5
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-23 parallels a gravel driveway on the RT side of SR-29, dropping off a steep slope covered in kudzu before entering an existing 18-inch CMP beneath SR-29 (STR-16A begins at the outlet of this pipe). A TDEC Hydrologic Determination Field Data Sheet was not completed for this feature.

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 270+76L to Sta. 276+90R
2-Map label and name	WWC-24
3-Latitude/Longitude	36.00186N / 84.50915W
4-Potential impact	Relocation / encapsulation
5-Feature description:	
what is it	Wet weather conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1 ft.
top of bank width	1.5 ft.
bank height and slope ratio	4 in; 2:1
avg. gradient of stream (%)	2-3%
substratum	Silt 80%; gravel 20%
riffle/run/pool	N/A
width of buffer zone	LDB: 0 ft. RDB: 0 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue RDB: fescue
overhead canopy (%)	0%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	6-7
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-24 eventually turns into STR-16 just before converging with Bitter Creek. Until then, WWC-24 parallels first the RT side of SR-29, crosses beneath SR-29 via an existing 36-inch RCP, then parallels the LT side of SR-29 before turning into STR-16 at Sta. 270+76L. Located within a maintained lawn and utility easement. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score of 11.50).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 272+50L to Sta. 275+50L
2-Map label and name	WWC-25
3-Latitude/Longitude	36.00169N / 84.50954W
4-Potential impact	Relocation
5-Feature description:	
what is it	Wet weather conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	<1 ft.
top of bank width	1 ft.
bank height and slope ratio	3 in; 2:1
avg. gradient of stream (%)	3-5%
substratum	Silt 90%; gravel 10%
riffle/run/pool	N/A
width of buffer zone	LDB: 0 ft. RDB: 0 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue RDB: fescue
overhead canopy (%)	0%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	7
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-25 parallels the LT side of SR-29, crosses a driveway tile, and then converges with WWC-24. Located within a maintained lawn and utility easement. A TDEC Hydrologic Determination Field Data Sheet was not completed for this feature.

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/5/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 276+50L
2-Map label and name	WWC-26
3-Latitude/Longitude	36.00224N / 84.51066W
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Wet weather conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1 ft.
top of bank width	2 ft.
bank height and slope ratio	8 in; 2:1
avg. gradient of stream (%)	3-5%
substratum	Grass 90%; Silt 10%
riffle/run/pool	N/A
width of buffer zone	LDB: 0 ft. RDB: 0 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	None
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue RDB: fescue
overhead canopy (%)	0%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	8
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Confirmed by Larry Everett, TDEC, and Ken Jones, USACE on 08-14-08
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-26 runs perpendicularly to SR-29 on the LT side of the existing alignment and converges with Bitter Creek just outside of the project limits. Located within a maintained lawn. A TDEC Hydrologic Determination Field Data Sheet was not completed for this feature.

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/6/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 280+75R to Sta. 290+00R
2-Map label and name	WWC-27 / EPH-27
3-Latitude/Longitude	36.00353N / 84.5125W
4-Potential impact	Relocation
5-Feature description:	
what is it	Wet weather conveyance / Ephemeral stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1-2 ft.
top of bank width	2-3 ft.
bank height and slope ratio	4-8 in; 2:1
avg. gradient of stream (%)	3-5%
substratum	Silt 70%; gravel 30%
riffle/run/pool	N/A
width of buffer zone	LDB: 0->100 ft. RDB: 0 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue; tulip poplar; persimmon; sweetgum; sycamore; red maple RDB: fescue
overhead canopy (%)	0-50%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	9 & 12
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Ephemeral stream designation made by Mark McIntosh, USACE, on 11/25/2013
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-27 / EPH-27 parallels SR-29, RT. WWC-27 is also designated as an ephemeral stream (EPH-27) by the USACE from the point at which WWC-28 / EPH-28 converges, until it discharges into Forked Creek (Sta. 280+75R to Sta. 285 +00R). Portion of WWC-27 / EPH-27 is located within a maintained lawn and the remaining portion is located on the edge of a forested area. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score 9.5).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/6/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 285+00R
2-Map label and name	WWC-28 / EPH-28
3-Latitude/Longitude	36.00377N / 84.51267W
4-Potential impact	Channel loss
5-Feature description:	
what is it	Wet weather conveyance / Ephemeral stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	2 ft.
top of bank width	3 ft.
bank height and slope ratio	4-8 in; 2:1
avg. gradient of stream (%)	3-5%
substratum	Silt 100%
riffle/run/pool	N/A
width of buffer zone	LDB: >100 ft. RDB: >100 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: tulip poplar; persimmon; sweetgum; sycamore; red maple; microstegium RDB: tulip poplar; persimmon; sweetgum; sycamore; red maple; microstegium
overhead canopy (%)	80%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	11
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Ephemeral stream designation made by Mark McIntosh, USACE, on 11/25/2013
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-28 / EPH-28 enters the proposed ROW perpendicularly from a forested area to the northeast and converges with WWC-27 / EPH-27 near the edge of the forested area and maintained roadway fill slope. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score 10.5).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/7/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 330+15R to Sta. 333+30R
2-Map label and name	WWC-36 / EPH-36
3-Latitude/Longitude	36.01266N / 84.52263W
4-Potential impact	Relocation
5-Feature description:	
what is it	Wet weather conveyance / Ephemeral stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1 ft.
top of bank width	2 ft.
bank height and slope ratio	6 in; 2:1
avg. gradient of stream (%)	3-5%
substratum	Silt 100%
riffle/run/pool	N/A
width of buffer zone	LDB: >100 ft. RDB: 20 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: sweetgum, box elder, tulip poplar, Chinese privet RDB: sweetgum, box elder, tulip poplar, Chinese privet
overhead canopy (%)	70%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	18
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Ephemeral stream designation made by Mark McIntosh, USACE, on 11/25/2013
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-36 / EPH-36 begins at a 24-inch CMP outlet (WWC-36 exists up-gradient of the CMP outlet to WTL-13), which carries overflow from WTL-13 beneath an abandoned dirt road during periods of heavy rain, and then flows parallel with SR-29 before entering WTL-12 and STR-19. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score 8.5).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/6/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 332+25R to Sta. 334+60R
2-Map label and name	WWC-37 / EPH-37
3-Latitude/Longitude	36.01318N / 84.52332W
4-Potential impact	Relocation
5-Feature description:	
what is it	Wet weather conveyance / Ephemeral stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1 ft.
top of bank width	2 ft.
bank height and slope ratio	6 in; 2:1
avg. gradient of stream (%)	3-5%
substratum	Silt 100%
riffle/run/pool	N/A
width of buffer zone	LDB: >100 ft. RDB: 20 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: sweetgum, box elder, tulip poplar, Chinese privet RDB: sweetgum, box elder, tulip poplar, Chinese privet
overhead canopy (%)	70%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	N/A
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Ephemeral stream designation made by Mark McIntosh, USACE, on 11/25/2013
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-37 / EPH-37 shares the same channel and characteristics as WWC-36 / EPH-36 (only labeled seperately due to prior labeling sequence from original field study). WWC-37 / EPH-37 extends within the roadside conveyance approximately 125 feet up-gradient of the 24-inch CMP outlet (where WWC-36 / EPH-36 begins) (Sta. 332+25R to 333+50R). WWC-37 (not EPH) extends another approximately 110 feet up-gradient of WWC-37 / EPH-37 within the roadside conveyance (Sta. 333+50R to 334+60R). A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score 8.5).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/6/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 335+75L/R to Sta. 338+00R
2-Map label and name	WWC-37A / EPH-37A
3-Latitude/Longitude	36.01387N / 84.52413W
4-Potential impact	Relocation / encapsulation
5-Feature description:	
what is it	Wet weather conveyance / Ephemeral stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1 ft.
top of bank width	2 ft.
bank height and slope ratio	6-10 in; 1:1 to 2:1
avg. gradient of stream (%)	3-5%
substratum	Silt 70%; gravel 30%
riffle/run/pool	N/A
width of buffer zone	LDB: >100 ft. RDB: 20 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: sweetgum, box elder, tulip poplar, Chinese privet RDB: sweetgum, box elder, tulip poplar, Chinese privet
overhead canopy (%)	60%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	20
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Ephemeral stream designation made by Mark McIntosh, USACE, on 11/25/2013
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-37A / EPH-37A parallels the RT side of SR-29 before entering an existing 36-inch RCP, which carries flow beneath SR-29 and daylights directly on the bank of Bitter Creek, LT side of SR-29. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Score 13.5).

Ecology Field Data Sheet: **Water Resources**

Project: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05

Date of survey: Original Survey 9/6/2007; Re-evaluation 11/14/2013 **Biologist:** T. Becktold / E. Schmidt **Affiliation:** ARCADIS on behalf of TDOT

1-Station: from plans	Sta. 80+84, SR-328
2-Map label and name	WWC-39 / EPH-39
3-Latitude/Longitude	36.01557N / 84.52572W
4-Potential impact	Relocation / encapsulation
5-Feature description:	
what is it	Wet weather conveyance / Ephemeral stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1-2 ft.
top of bank width	2-3 ft.
bank height and slope ratio	6 in; 2:1
avg. gradient of stream (%)	3-10%
substratum	Silt 90%; gravel 10%
riffle/run/pool	N/A
width of buffer zone	LDB: 0-30 ft. RDB: 0->100 ft.
water flow	No
water depth	N/A
water width	N/A
general water quality	N/A
OHWM indicators	Defined bed and bank
groundwater connection	no
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: grass; sycamore; black walnut; hornbeam; silky dogwood RDB: grass; sycamore; black walnut; hornbeam; silky dogwood
overhead canopy (%)	0-70%
benthos	None observed
fish	None observed
algae or other aquatic life	None observed
habitat assessment score	N/A
photo number (s)	24
rainfall information	0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14
6-HUC code & name (12-digit)	060102080405 - Little Emory River
7-Confirmed by:	Ephemeral stream designation made by Mark McIntosh, USACE, on 11/25/2013
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Rainfall Data Reference: Gage ID 0736 - Wartburg, TN (TVA): http://www.tva.gov/river/lakeinfo/precip.htm WWC-39 / EPH-39 is located adjacent to the intersection of SR-328 with SR-29. EPH-39 begins at the edge of the forested area and continues down the forested slope / riparian zone until its confluence with STR-6, Bitter Creek. A TDEC Hydrologic Determination Field Data Sheet was completed for this feature (Primary indicator #2 satisfied for portion of WWC-39 adjacent to SR-328).

ARCADIS

Environmental Boundaries
Photo Document

SR-29 (US-27); From South of Whetstone Road to North of SR-328, Morgan County, TN
PIN 101411.05
Project No. 65001-1256-14

August 20-24, 2007
September 4-7, 2007
November 14-15, 2013

Photograph No. 1

WTL-10
STA. 260+00R

Receiving Waters: Unnamed Tributary to Bitter Creek (STR-15)

View looking east.

Note: View of wetland (WTL-10) (located between wood line and ditch line, center background). WTL-10 is contiguous with STR-15, which begins at the existing 30-inch RCP inlet (center foreground). See following photo.

Photograph No. 2

STR-15
STA. 260+00L

Receiving Waters: Unnamed Tributary to Bitter Creek (STR-15)

View looking south.

Note: Downstream view of STR-15, located between the existing 30-inch RCP outlet and Bitter Creek. The channel of STR-15 widens upon entering the forested area depicted in the background.

ARCADIS

Environmental Boundaries
Photo Document

SR-29 (US-27); From South of Whetstone Road to North of SR-328, Morgan County, TN
PIN 101411.05
Project No. 65001-1256-14

August 20-24, 2007
September 4-7, 2007
November 14-15, 2013

Photograph No. 3

WTL-11
STA. 262+50R

Receiving Waters: Bitter Creek (STR-6)

View looking northwest.

Note: View of WTL-11, located in northbound roadway ditch line from STA. 262+11R to 266+57R.

Photograph No. 4

WWC-22 / EPH-22
STA. 266+62L

Receiving Waters: Bitter Creek (STR-6)

View looking northeast.

Note: Up-gradient view of WWC-22 / EPH-22. The existing 24-inch RCP outlet and SR-29 roadway fill slope are depicted in the background.

ARCADIS

Environmental Boundaries Photo Document

SR-29 (US-27); From South of Whetstone Road to North of SR-328, Morgan County, TN
PIN 101411.05
Project No. 65001-1256-14

August 20-24, 2007
September 4-7, 2007
November 14-15, 2013

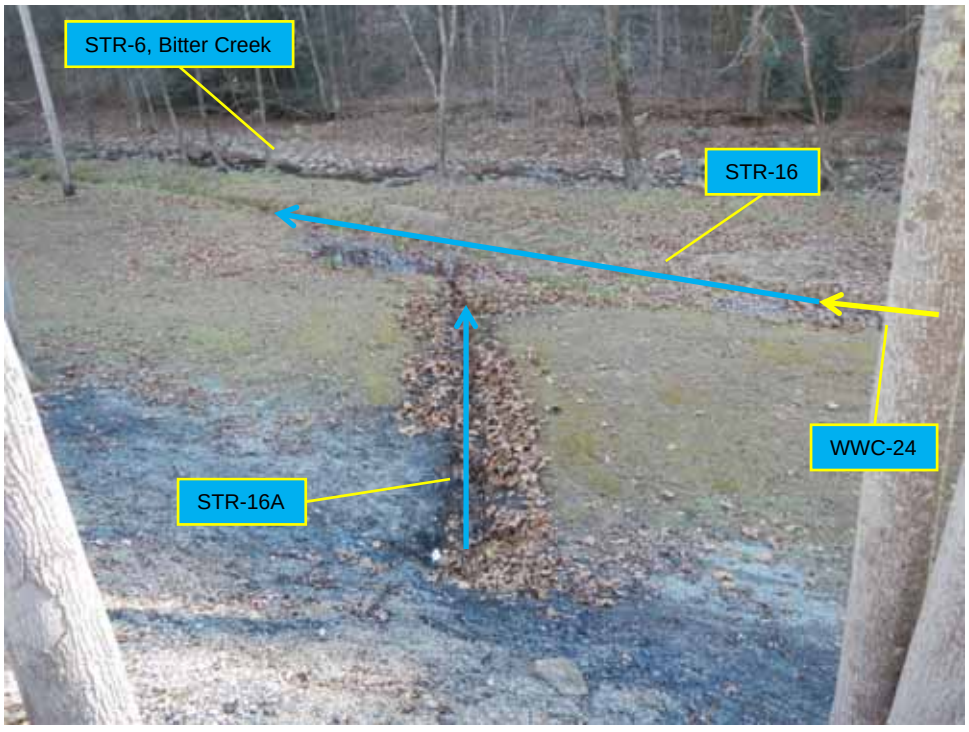
Photograph No. 5

WWC-23
STA. 270+29R

Receiving Waters: Unnamed Tributaries to Bitter Creek (STR-16 and STR-16A)

View looking south.

Note: Down-gradient view of WWC-23. The existing 18-inch CMP inlet beneath SR-29 is located in the background (obscured by vegetation). STR-16A begins at the outlet of the same 18-inch CMP (see next photo).



Photograph No. 6

STR-6/STR-16/STR-16A/WWC-24
STA. 270+29L

Receiving Waters: Unnamed Tributaries to Bitter Creek (STR-16 and STR-16A)

View looking south.

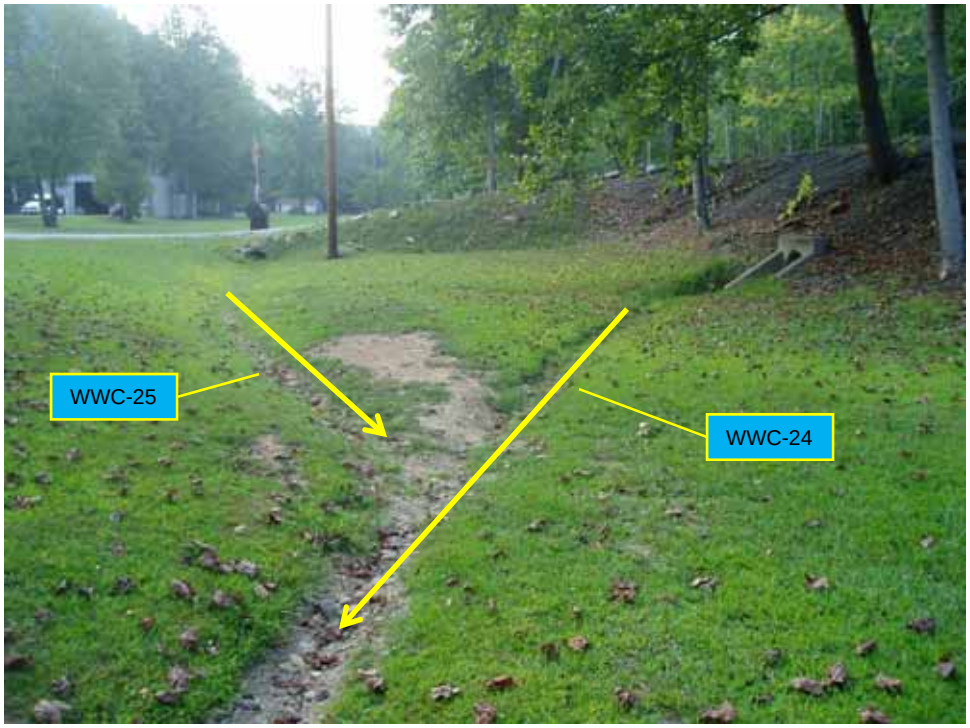
Note: Downstream view of the confluence of STR-16A and STR-16. These streams then converge with STR-6, Bitter Creek, in the upper left portion of the photo. WWC-24 exists up-gradient of the headwaters for STR-16.

ARCADIS

Environmental Boundaries Photo Document

SR-29 (US-27); From South of Whetstone Road to North of SR-328, Morgan County, TN
PIN 101411.05
Project No. 65001-1256-14

August 20-24, 2007
September 4-7, 2007
November 14-15, 2013



Photograph No. 7

WWC-24/WWC-25
STA. 272+25L

Receiving Waters: Unnamed Tributary to Bitter Creek (STR-16)

View looking northwest.

Note: Up-gradient view of the confluence of WWC-25 (conveyed through driveway side drain pipe depicted at upper left) and WWC-24 (conveyed through the 36-inch RCP depicted at upper right).

Photograph No. 8

WWC-26
STA. 276+50L

Receiving Waters: Bitter Creek (STR-6)

View looking southwest.

Note: Down-gradient view of WWC-26, as taken from the SR-29 southbound shoulder. The existing 18-inch RCP outlet is depicted in the foreground at the toe of slope.

Photograph No. 9

STR-17/WWC-27/EPH-27
STA. 280+50R

Receiving Waters: Forked Creek (STR-17)

View looking north.

Note: Upstream view of STR-17, Forked Creek. WWC-27 / EPH-27 is conveyed through the 18-inch driveway CMP depicted at center left.

Photograph No. 10

STR-17
STA. 280+50L

Receiving Waters: Forked Creek (STR-17)

View looking south.

Note: Downstream view of STR-17, as taken from the existing 3 @ 12-foot by 5-foot RCBC outlet. Confluence with Bitter Creek is depicted in background.

ARCADIS

Environmental Boundaries
Photo Document

SR-29 (US-27); From South of Whetstone Road to North of SR-328, Morgan County, TN
PIN 101411.05
Project No. 65001-1256-14

August 20-24, 2007
September 4-7, 2007
November 14-15, 2013

Photograph No. 11

WWC-28/EPH-28
STA. 285+00R

Receiving Waters: Forked Creek (STR-17)

View looking northeast.

Note: Up-gradient view of WWC-28 / EPH-28, which enters the proposed ROW in this location. WWC-28 / EPH-28 converges with WWC-27 / EPH-27 just down-gradient of this location.

Photograph No. 12

WWC-27
STA. 289+50R

Receiving Waters: Forked Creek (STR-17)

View looking southeast.

Note: Down-gradient view of WWC-27. This portion of WWC-27 was determined not to be an ephemeral stream in this location during the regulatory site confirmation.

Photograph No. 13

SPG-3
STA. 324+60L

Receiving Waters: Unnamed tributary to Bitter Creek (STR-18)

View looking southeast.

Note: View of SPG-3 located at the outlet of an existing spring box. SPG-3 provides hydrology for STR-18 depicted in following photo.

Photograph No. 14

STR-18
STA. 324+60L

Receiving Waters: Unnamed tributary to Bitter Creek (STR-18)

View looking south.

Note: Downstream view of STR-18, as taken just downstream of SPG-3.

ARCADIS

Environmental Boundaries
Photo Document

SR-29 (US-27); From South of Whetstone Road to North of SR-328, Morgan County, TN
PIN 101411.05
Project No. 65001-1256-14

August 20-24, 2007
September 4-7, 2007
November 14-15, 2013

Photograph No. 15

STR-19
STA. 328+90R

Receiving Waters: Unnamed tributary to Bitter Creek (STR-19)

View looking northeast.

Note: Upstream view of STR-19 and the outlet of an 86-inch driveway CMP. Hanging Rock Road parallels the left descending bank of STR-19 in this area.

Photograph No. 16

STR-19
STA. 328+60R

Receiving Waters: Unnamed tributary to Bitter Creek (STR-19)

View looking south.

Note: Downstream view of STR-19 at the existing RCBC inlet beneath SR-29. WTL-12 is adjacent to STR-19 in this location (right).

Photograph No. 17

WTL-12/STR-19
STA. 328+60R

Receiving Waters: Unnamed tributary to Bitter Creek (STR-19)

View looking north.

Note: Overall view of location of STR-19 and WTL-12, adjacent to intersection of Hanging Rock Road and SR-29.

Photograph No. 18

WWC-36/EPH-36
STA. 331+00R

Receiving Waters: Unnamed tributary to Bitter Creek (STR-19)

View looking northwest.

Note: Up-gradient view of WWC-36 / EPH-36, which discharges into WTL-12.

ARCADIS

Environmental Boundaries
Photo Document

SR-29 (US-27); From South of Whetstone Road to North of SR-328, Morgan County, TN
PIN 101411.05
Project No. 65001-1256-14

August 20-24, 2007
September 4-7, 2007
November 14-15, 2013

Photograph No. 19

WTL-13
STA. 334+00R

Receiving Waters: Unnamed tributary to Bitter Creek (STR-19)

View looking south.

Note: View of WTL-13. WTL-13 is connected with WTL-12 and STR-19 by WWC-36 / EPH-36.

Photograph No. 20

WWC-37A/EPH-37A
STA. 336+00R

Receiving Waters: Bitter Creek (STR-6)

View looking south.

Note: Down-gradient view of WWC-37A / EPH-37A, as taken near the 36-inch RCP inlet (background) beneath SR-29.

Photograph No. 21

STR-6
STA. 343+50R

Receiving Waters: Bitter Creek (STR-6)

View looking southwest.

Note: Downstream view of Bitter Creek, facing inlet of existing 3 @ 12-foot by 9-foot RCBC.

Photograph No. 22

STR-6
STA. 342+00L

Receiving Waters: Bitter Creek (STR-6)

View looking northeast.

Note: Upstream view of Bitter Creek, facing outlet of existing 3 @ 12-foot by 9-foot RCBC.

Photograph No. 23

STR-23
STA. 79+32R, SR-328

Receiving Waters: Unnamed tributary to Bitter Creek (STR-23)

View looking west.

Note: Upstream view of STR-23. This stream begins just upstream of the 24-inch RCP inlet (outlet depicted in upper right) beneath SR-328. This stream is located just outside of the project limits and is not anticipated to be impacted during the proposed SR-29 construction.

Photograph No. 24

WWC-39/EPH-39
STA. 80+84R, SR-328

Receiving Waters: Bitter Creek (STR-6)

View looking southeast.

Note: Down-gradient view of WWC-39, which begins at the 24-inch RCP outlet beneath SR-328 (foreground). EPH-39 begins at the edge of the forested area (background) and continues until its confluence with STR-6, Bitter Creek.

ARCADIS

Environmental Boundaries
Photo Document

SR-29 (US-27); From South of Whetstone Road to North of SR-328, Morgan County, TN
PIN 101411.05
Project No. 65001-1256-14

August 20-24, 2007
September 4-7, 2007
November 14-15, 2013

Photograph No. 25

STR-20
STA. 349+20R

Receiving Waters: Muddy Branch (STR-20)

View looking south.

Note: Downstream view of the confluence of STR-20, Muddy Branch (center and right) with STR-6, Bitter Creek (upper left). The outlet of a 2 @ 15-foot by 8-foot RCBC associated with STR-20, Muddy Branch, is depicted at right.

Photograph No. 26

STR-20
STA. 349+20L

Receiving Waters: Muddy Branch (STR-20)

View looking east.

Note: Downstream view of STR-20, Muddy Branch, at inlet of 2 @ 15-foot by 8-foot RCBC. Confluence with an unnamed tributary (STR-21) is located adjacent to the wingwall depicted at left.

Photograph No. 27

STR-20
STA. 349+20L

Receiving Waters: Muddy Branch (STR-20)

View looking west.

Note: Upstream view of STR-20. As depicted in photo, riparian vegetation within ROW has been impacted by utility easement maintenance.

Photograph No. 28

STR-21
STA. 349+40L

Receiving Waters: Unnamed tributary to Muddy Branch (STR-21)

View looking south.

Note: Downstream view of STR-21, just upstream of confluence with STR-20, Muddy Branch.

Photograph No. 29

STR-21
STA. 350+40L

Receiving Waters: Unnamed tributary to Muddy Branch (STR-21)

View looking southeast.

Note: Overall view of location of STR-21 between Muddy Branch and WTL-14. STR-21 is located where the maintained utility easement meets the wood line depicted in background.

Photograph No. 30

WTL-14/STR-21/STR-22
STA. 351+00L

Receiving Waters: Unnamed tributary to Muddy Branch (STR-21)

View looking northwest.

Note: Overall view from the south end of WTL-14, as taken near an existing driveway for property access. The confluence of STR-21, which originates as a high-gradient stream from the forested slope depicted at left, and STR-22, which originates within the wetland, is located in this area.

Photograph No. 31

STR-21
STA. 353+25L

Receiving Waters: Unnamed tributary to Muddy Branch (STR-21)

View looking southeast.

Note: Downstream view of STR-21. The gradient of this stream increases approximately 100 feet upstream of this location (originating from the adjacent steep, forested slope). The confluence with STR-22 is located approximately 175 feet downstream of this location.

Photograph No. 32

WTL-14/STR-22
STA. 355+00L

Receiving Waters: Unnamed tributary to Muddy Branch (STR-22)

View looking south.

Note: Downstream view of STR-22, as taken within the limits of WTL-14.

ARCADIS

Environmental Boundaries Photo Document

SR-29 (US-27); From South of Whetstone Road to North of SR-328, Morgan County, TN
PIN 101411.05
Project No. 65001-1256-14

August 20-24, 2007
September 4-7, 2007
November 14-15, 2013

Photograph No. 33

WTL-14/STR-22
STA. 356+22L

Receiving Waters: Unnamed tributary to Muddy Branch (STR-22)

View looking west.

Note: View of the headwaters for STR-22, located within the limits of WTL-14.

Photograph No. 34

WTL-14
STA. 357+25L

Receiving Waters: Unnamed tributaries to Muddy Branch (STR-21 and STR-22)

View looking south.

Note: Overall view from the north end of WTL-14. The headwaters for STR-22 (previous photo) is located near the depicted utility pole within WTL-14.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Unnamed Tributary to Bitter Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : STR-15
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long: 36.00009N / 84.50606W
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 32 acres	Photos: (Y) or N (circle) Number : 2	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; utility easement; rural residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe (Moderate) Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 19.75

Justification / Notes :

Secondary Field Indicator Evaluation

STR-15

A. Geomorphology (Subtotal = 10.25)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	0	(1)	2	3
3. In-channel structure: riffle-pool sequences	0	1	(2)	3
4. Sorting of soil textures or other substrate	0	1	(2)	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	0	(0.5)	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	0	(1)	2	3
11. Grade controls	0	0.5	1	(1.5)
12. Natural valley or drainageway	0	(0.5)	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = (0)		Yes = 3	

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain	0	(1)	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	0	(0.5)	1	1.5
18. Organic debris lines or piles (wrack lines)	(0)	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = (1.5)	

C. Biology (Subtotal = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	(2)	1	0
21. Rooted plants in channel [1]	(3)	2	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	0	0.5	1	(1.5)
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = ____19.75_____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Crayfish burrows observed ; multiple grade controls observed in portion of stream reach within forested area (immediately downstream of power-line easement). WTL-10 is located on the up-gradient end of the existing 30-inch RCP associated with STR-15.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Unnamed Tributary to Bitter Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : STR-16
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.00138N / 84.50872W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 8 acres	Photos: (Y) or N (circle) Number : 6	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; utility easement; rural residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe (Moderate) Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21.00

Justification / Notes :

Secondary Field Indicator Evaluation

STR-16

A. Geomorphology (Subtotal = 9.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel [2]	0	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = ____21.00_____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : STR-16 is located within a maintained power-line easement / residential lawn, as well as within the floodplain of Bitter Creek.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Unnamed Tributary to Bitter Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : STR-16A
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.00141N / 84.50881W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 6 acres	Photos: (Y) or N (circle) Number : 6	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; utility easement; rural residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe (Moderate) Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 19.00

Justification / Notes :

Secondary Field Indicator Evaluation

STR-16A

A. Geomorphology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel [2]	0	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = ____19.00_____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : STR-16A is located within a maintained power-line easement / residential lawn, as well as within the floodplain of Bitter Creek.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Unnamed Tributary to Bitter Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : STR-18
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.01148N / 84.52173W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 1 acre	Photos: (Y) or N (circle) Number : 14	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; utility easement; rural residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe (Moderate) Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection		(Stream)
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes : A spring (SPG-3 – spring box located beneath the existing SR-29 roadway) provides hydrology for STR-18. Additionally, STR-18 is located within 25-feet in elevation to Bitter Creek, STR-6.

Secondary Field Indicator Evaluation

STR-18

A. Geomorphology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel [2]	0	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Unnamed Tributary to Muddy Branch	Date/Time: 11/15/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : STR-21
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.01856N / 84.52731W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 21 acres	Photos: (Y) or N (circle) Number : 28-31	
Soil Type(s) / Geology :Gilpin-Bouldin-Petros complex, 25-80% slopes, very stony (GsF) Source: NRCS Web Soil Survey		
Surrounding Land Use : Roadway facility; utility easement; forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		(Stream)
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes : STR-21 and STR-22 converge within the boundaries of WTL-14. STR-21 enters ROW from a steep forested hillside and becomes a lower gradient stream upon entering ROW and WTL-14.

Secondary Field Indicator Evaluation

STR-21

A. Geomorphology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel [2]	0	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Unnamed Tributary to Muddy Branch	Date/Time: 11/15/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : STR-22
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.01797N / 84.52658W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 9 acres	Photos: (Y) or N (circle) Number : 30, 32-33	
Soil Type(s) / Geology :Gilpin-Bouldin-Petros complex, 25-80% slopes, very stony (GsF) Source: NRCS Web Soil Survey		
Surrounding Land Use : Roadway facility; utility easement; forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		(Stream)
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes : STR-22 begins within the boundaries of WTL-14. STR-22 converges with STR-21 within the boundaries of WTL-14.

Secondary Field Indicator Evaluation

STR-22

A. Geomorphology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel [2]	0	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Discharges directly into Bitter Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : WWC-22 / EPH-22
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.00122N / 84.50859W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 4 acres	Photos: (Y) or N (circle) Number : 4	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; utility easement; rural residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe (Moderate) Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11.5

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-22 / EPH-22

A. Geomorphology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	0	(1)	2	3
4. Sorting of soil textures or other substrate	0	(1)	2	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	0.5	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0.5	1	1.5
12. Natural valley or drainageway	0	(0.5)	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = (0)		Yes = 3	

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	(2)	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	(0)	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	(0)	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = (0)		Yes = 1.5	

C. Biology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	(2)	1	0
21. Rooted plants in channel [1]	3	(2)	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = ____11.5_____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Crosses maintained utility easement adjacent to SR-29 before entering forested area and discharging into Bitter Creek.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Discharges directly into unnamed trib to Bitter Ck	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : WWC-24
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.00186N / 84.50915W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 10 acres	Photos: (Y) or N (circle) Number : 6-7	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; utility easement; rural residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe (Moderate) Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11.5

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-24

A. Geomorphology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	0	(1)	2	3
4. Sorting of soil textures or other substrate	0	(1)	2	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	0	(0.5)	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0.5	1	1.5
12. Natural valley or drainageway	0	(0.5)	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = (0)		Yes = 3	

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain	(0)	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	(0)	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	(0.5)	1	1.5
19. Hydric soils in stream bed or sides of channel	No = (0)		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	(2)	1	0
21. Rooted plants in channel [1]	(3)	2	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = ____11.5_____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Parallels SR-29, RT, crosses beneath SR-29 and parallels again on the LT. Becomes STR-16 shortly before discharging into Bitter Creek. Located within a maintained lawn and utility easement.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Discharges directly into Forked Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : WWC-27 / EPH-27
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long: 36.00353N / 84.5125W
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 12 acres	Photos: (Y) or N (circle) Number : 9 & 12	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; rural residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-27 / EPH-27

A. Geomorphology (Subtotal = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	0	(1)	2	3
4. Sorting of soil textures or other substrate	0	(1)	2	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	0	(0.5)	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	(1)	1.5
13. At least second order channel on existing USGS or NRCS map	No = (0)		Yes = 3	

B. Hydrology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain	(0)	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	(0)	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	(0)	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = (0)		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	(1)	0
21. Rooted plants in channel [1]	3	(2)	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Parallels SR-29, RT. WWC-27 is also designated as an ephemeral stream by the USACE from the point at which WWC-28 / EPH-28 converges, until it discharges into Forked Creek. Portion of WWC-27 / EPH-27 is located within a maintained lawn and the remaining portion is located on the edge of a forested area.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Discharges indirectly into Forked Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : WWC-28 / EPH-28
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.00377N / 84.51267W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 7 acres	Photos: (Y) or N (circle) Number : 11	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; rural residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 10.5

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-28 / EPH-28

A. Geomorphology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	(0)	1	2	3
4. Sorting of soil textures or other substrate	0	(1)	2	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	0.5	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	(1)	1.5
13. At least second order channel on existing USGS or NRCS map	No = (0)		Yes = 3	

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain	(0)	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	(0)	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	(0.5)	1	1.5
19. Hydric soils in stream bed or sides of channel	No = (0)		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	(2)	1	0
21. Rooted plants in channel [1]	(3)	2	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = ____10.5_____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : WWC-28 / EPH-28 enters the proposed ROW perpendicularly from a forested area to the northeast and converges with WWC-27 / EPH-27 near the edge of the forested area and maintained roadway fill slope.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Discharges into unnamed tributary to Bitter Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : WWC-36 / EPH-36
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.01266N / 84.52263W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 6 acres	Photos: (Y) or N (circle) Number : 18	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; rural residential; forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8.5

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-36 / EPH-36

A. Geomorphology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	(0)	1	2	3
4. Sorting of soil textures or other substrate	0	1	(2)	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	0.5	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0.5	1	1.5
12. Natural valley or drainageway	0	(0.5)	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = (0)		Yes = 3	

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain	(0)	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	(0)	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	(0.5)	1	1.5
19. Hydric soils in stream bed or sides of channel	No = (0)		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	(1)	0
21. Rooted plants in channel [1]	3	(2)	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : WWC-36 / EPH-36 begins at a 24-inch CMP outlet (WWC-36 exists up-gradient of the CMP outlet to WTL-13), which carries overflow from WTL-13 beneath an abandoned dirt road during periods of heavy rain, and then flows parallel with SR-29 before entering WTL-12 and STR-19.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Discharges into unnamed tributary to Bitter Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : WWC-37 / EPH-37
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.01318N / 84.52332W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 2 acres	Photos: (Y) or N (circle) Number : N/A	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; rural residential; forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8.5

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-37 / EPH-37

A. Geomorphology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	(0)	1	2	3
4. Sorting of soil textures or other substrate	0	1	(2)	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	0.5	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0.5	1	1.5
12. Natural valley or drainageway	0	(0.5)	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = (0)		Yes = 3	

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain	(0)	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	(0)	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	(0.5)	1	1.5
19. Hydric soils in stream bed or sides of channel	No = (0)		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	(1)	0
21. Rooted plants in channel [1]	3	(2)	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = ____8.5_____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : WWC-37 / EPH-37 shares the same channel and characteristics as WWC-36 / EPH-36 (only labeled seperately due to prior labeling sequence from original field study). WWC-37 / EPH-37 extends within the roadside conveyance approximately 125 feet up-gradient of the 24-inch CMP outlet (where WWC-36 / EPH-36 begins) (Sta. 332+25R to 333+50R). WWC-37 (not EPH) extends another approximately 110 feet up-gradient of WWC-37 / EPH-37 within the roadside conveyance (Sta. 333+50R to 334+60R).

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Discharges directly into Bitter Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : WWC-37A / EPH-37A
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.01387N / 84.52413W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 10 acres	Photos: (Y) or N (circle) Number : 20	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; rural residential; forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 13.5

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-37A / EPH-37A

A. Geomorphology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel [2]	0	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = ____13.5_____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : WWC-37A / EPH-37A parallels the RT side of SR-29 before entering an existing 36-inch RCP, which carries flow beneath SR-29 and daylights directly on the bank of Bitter Creek, LT side of SR-29.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Morgan	Named Waterbody: Discharges directly into Bitter Creek	Date/Time: 11/14/2013
Assessors/Affiliation: T. Becktold / ARCADIS		Project ID : WWC-39 / EPH-39
Site Name/Description: SR-29 (US-27) From South of Whetstone Road to North of SR-328; PIN 101411.05		
Site Location: Between Harriman and Wartburg, Morgan County, TN		
USGS quad: Camp Austin	HUC (12 digit): 060102080405	Lat/Long:
Previous Rainfall (7-days) : 0.32 on 11/07; 0.00 on 11/08; 0.00 on 11/09; 0.00 on 11/10; 0.00 on 11/11; 0.00 on 11/12; 0.00 on 11/13; 0.00 on 11/14		36.01557N / 84.52572W
Precipitation this Season vs. Normal : very wet wet average (dry) drought unknown Source of recent & seasonal precip data : Gage ID 0736 - Wartburg, TN (TVA)		
Watershed Size : Approx. 2 acres	Photos: (Y) or N (circle) Number : 24	
Soil Type(s) / Geology : Allegheny-Cotaco complex, occasionally flooded (Ac)	Source: NRCS Web Soil Survey	
Surrounding Land Use : Roadway facility; forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		(WWC)
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NI	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	N/A	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) =

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-39 / EPH-39

A. Geomorphology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel [2]	0	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : WWC-39 / EPH-39 is located adjacent to the intersection of SR-328 with SR-29. EPH-39 begins at the edge of the forested area and continues down the forested slope / riparian zone until its confluence with STR-6, Bitter Creek.

Wetland Background Information

Name(s) of Field Personnel:	Tom Becktold, Evan Jermyn
Date Assessment was Conducted:	11/15/2013
Agency/Organization:	ARCADIS representing TDOT
Office Address:	James K. Polk Building, Suite 900, 505 Deaderick St., Nashville, TN, 37243-0334
Phone Number:	865.594.2437
e-mail address:	keven.brown@tn.gov

Wetland Location:

Include county, road or street address, distances from easily located points, nearby landmarks, etc. If possible, attach map showing location. Include north arrow and scale of miles.

See attached Environmental Boundaries Map and Plan Markups for SR-29 (US-27) from South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05.

Lat/Long or UTM Coordinate	WTL-10; 36.00013N, -84.50585E	
USGS Quad Name	Camp Austin	
National Wetland Inventory Map	N/A	
Hydrological Unit Code	060102080405 - Little Emory River	
Soil Survey Map Sheet	See attached	
Delineation Report Attached (Y/N)	Yes	

Wetland Description:

Include landscape position, hydrologic source, all plant communities present (e.g., young forest, mature forest, scrub/shrub, herbaceous, etc.), presence of open water, dominant plant species, size of overall wetland and of different communities, types of disturbance, and any other significant feature(s).

WTL-10 is located at the foot of Whetstone Mountain, immediately adjacent to the existing SR-29 alignment. An existing 30-inch RCP beneath SR-29, associated with the headwaters of STR-15, is located on the western edge of WTL-10. The majority of the herbaceous vegetation has been mowed/maintained within WTL-10. A small portion of the wetland extends into the adjacent forested area, just before the grade steepens to the forested slope of Whetstone Mountain. Approximate size: 0.069 acre

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

11/15/13 Date — Project Name: SR-29 – From S. of White Stone Ln to N of SR-328

T. BELKTOLD/E. JERMIN Field Personnel — Location/Address: Morgan Co., TN

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

WTL-10

V1: Hydroperiod (HYDRO)

1. Hydrology not altered (SI = 1.0)
   - __ no fill material or excessive sediment
   - __ no ditches/drainage tiles
   - __ no roads or other impediments to surface ground water
   - __ no excavation
2. Hydrology slightly altered (SI = 0.75)
   - __ portion of site with fill or excessive sediment
   - ✓ portion of site with drainage ditches/tiles
   - ✓ roads or other impediments, water flow slightly impeded
   - __ portion of site excavated
3. Hydrology moderately altered (SI = 0.5)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
4. Hydrology significantly altered (SI = 0.25)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
5. Hydrology severely altered (SI = 0.1)
   - __ entire site impacted by fill or excessive sediment
   - __ entire site with numerous drainage ditches/tiles
   - __ roads or other impediments, water flow completely blocked
   - __ entire site excavated

V2: Wetland Watershed Integrity (WSHEDINT)

1. Watershed not impacted (SI = 1.0)
   - ✓ watershed mostly to entirely forested
   - __ no impervious surfaces
2. Percent watershed slightly impacted __ (SI = 0.75)
   - __ orchards/tree farms
   - __ pasture/hayland
   - __ parks/golf courses
   - __ low density residential
   - __ other similar (list)
3. Percent watershed moderately impacted __ (SI = 0.5)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)
4. Percent watershed significantly impacted __ (SI = 0.25)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)
5. Percent watershed severely impacted __ (SI = 0.1)
   - __ commercial
   - __ industrial
   - __ parking lots
   - __ other similar (list)

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 4 in. DBH
   - __ ≥ 15 in. (SI = 1.0)
   - __ 10 – 14 in. (SI = 0.75)
   - __ 6 – 9 in. (SI = 0.5)
   - ✓ 4 – 5 in. (SI = 0.25)
   - __ < 4 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 4 in. DBH) per 30-ft. radius plot
   - __ 5 – 10 (SI = 1.0)
   - __ 11 – 15 (SI = 0.75)
   - __ > 15 (SI = 0.5)
   - ✓ 1 – 4 (SI = 0.5)

WTL-10 ; SR-29

V5: Shrub Cover (SCOV) N/A

1. Average percent cover of shrubs (woody stems < 4 in. DBH and taller than 3 ft.) per 30-ft. radius plot

__ ≥ 70 (SI = 1.0) __ 55 – 69 (SI = 0.75) __ 45 – 54 (SI = 0.5) __ 30 – 44 (SI = 0.25) __ 20 – 29 (SI = 0.1)
__ no shrubs present, go to V6

V6: Ground Vegetation Cover (GVC) N/A

1. Average percent cover of ground vegetation per 30-ft. radius plot

__ ≥ 20 (SI = 1.0) __ 15 – 19 (SI = 0.75) __ 10 – 14 (SI = 0.5) __ 5 – 9 (SI = 0.25) __ < 5 (SI = 0.1)
__ no ground vegetation present (SI = 0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant tree species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added as a Group 2 species. Native shrub and herbaceous species are assigned to Group 2. For both, write in the number of species.

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
__ Bur oak	__ Overcup oak	__ American elm	__ Sugarberry	✓ European/Chinese privet
__ Overcup oak	__ Shellbark hickory	__ Slippery elm	__ Boxelder	✓ Japanese honeysuckle
__ Pin oak	__ Water tupelo	__ Green ash	__ Pawpaw	__ Japanese stiltgrass
__ Swamp chestnut oak	__ S. black gum	✓ Red maple	✓ Black willow	__ Purple loosestrife
__ Water oak	__ Persimmon	__ Silver maple	__ Native shrub	__ Giant reed
__ Willow oak	__ Buttonbush	✓ Sweetgum	2 Native herbaceous	__ Tall fescue
__ Shumard oak	✓ Am. hornbeam	__ Silky dogwood		
__ Nuttall oak				

2. Using the checked dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = $[(1.0 \times 1) + (0.66 \times 5) + (0.0 \times 2)] / 8 = 0.5375$ (1, 3.3, 0)

3. Multiply Q above by one of the following constants that reflects species richness:[1]

a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 — 0.5375
b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75
c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50
d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25
e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0

4. Calculate the square root of the value from Step 3 above. This is the SI for V7 — 0.73

[1]In some Slope wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered
✓ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present due to one or more or the following:
__ land leveling __ construction/development __ fill __ other
__ grading __ excessive sediment deposits __ surface mining

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

WTL-10 ; SR-29

V9: Buffer (BUFFER)

1. Determine a Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
   __ 90% – 100% (CI = 1.0) __ 75% – 89% (CI = 0.75) ✓ 40% – 74% (CI = 0.5) __ 10% – 39% (CI = 0.25)
   __ < 10% (CI = 0.1)
2. Multiply the CI by one if the following values:
   a) if average buffer width is ≥ 492 ft., multiply by 1.0 ✓
   b) if average buffer is 98 ft to 491 ft., multiply by 0.66
   c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
   d) if average buffer width is < 33 ft., multiply by 0.1

   $0.5 \times 1.0 = \boxed{0.5}$
3. This value is the SI for V9.

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3 0.25 (TSIZE) V5 N/A (SCOV) V7 0.73 (COMP) V9 0.5 (BUFFER)

V2 1.0 (WSHEDINT) V4 0.5 (TDEN) V6 N/A (GVC) V8 1.0 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI: $V1 \times V2^{1/2} \Rightarrow 0.75 \times 1.0^{1/2} = 0.87$

FUNCTION 2: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI (trees present)= $V1 \times V2^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)^{1/2} \Rightarrow 0.75 \times 1.0^{1/2} \times \left(\frac{\frac{0.25+0.5}{2}+1.0}{2}\right)^{1/2} = 0.72$

$(0.87) \times \left(1.375/2\right)^{1/2} = 0.87 \times 0.83 = \uparrow$

FCI (shrubs present)= $V1 \times V2^{1/2} \times \left(\frac{V5+V8}{3}\right)^{1/2} \Rightarrow \_\_\_ \times \_\_\_^{1/2} \times \left(\frac{\_\_\_+\_\_\_}{3}\right)^{1/2} = \_\_\_$

FCI (ground cover)= $V1 \times V2^{1/2} \times \left(\frac{V6+V8}{5}\right)^{1/2} \Rightarrow \_\_\_ \times \_\_\_^{1/2} \times \left(\frac{\_\_\_+\_\_\_}{5}\right)^{1/2} = \_\_\_$

FUNCTION 3: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

FCI (trees present) = $\frac{V1 \times V2^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3} \Rightarrow \frac{0.75 \times 1.0^{1/2} + 2\left(\frac{0.25+0.5+0.73}{3}\right)}{3} = 0.62$

$\left[(0.87)+(0.99)\right]/3$

FCI (shrubs present) = $\frac{V1 \times V2^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6} \Rightarrow \frac{\_\_\_ \times \_\_\_^{1/2} + 2\left(\frac{\_\_\_+\_\_\_}{2}\right)}{6} = \_\_\_$

WTL-10; SR-29

FCI (groundcover) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V6+V7}{2}}{9}$ ⇨ $\dfrac{\_\_ \times \_\_^{1/2} + 2\,\frac{\_\_+\_\_}{2}}{9}$ = _____

FUNCTION 4: MAINTAIN CHARACTERISTIC WILDILFE COMMUNITY

FCI (trees) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V3+V4+V7}{3} + V9}{4}$ ⇨ $\dfrac{0.75 \times 1.0^{1/2} + 2\,\frac{0.25+0.5+0.73}{3} + 0.5}{4}$ = 0.59

$[(0.87)+(0.99)+(0.5)]/4$

FCI (shrubs present) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V5+V7}{2} + V9}{6}$ ⇨ $\dfrac{\_\_ \times \_\_^{1/2} + 2\,\frac{\_\_+\_\_}{2} + \_\_}{6}$ = _____

FCI (groundcover) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V6+V7}{2} + V9}{9}$ ⇨ $\dfrac{\_\_ \times \_\_^{1/2} + 2\,\frac{\_\_+\_\_}{2} + \_\_}{9}$ = _____

TRAM Summary Worksheet

WTL-10; SR-29

		Check if applicable
Red Flags	1. ORNW	
	2. Documented High Quality or State Natural Area	
	3. Federally or State Listed Species	
	4. Critical Habitat	
	5. Bog	
	6. Fen	
	7. Wet Prairie/Meadow	
	8. Old Growth/Mature Forested wetlands.	
	9. Regionally or Locally Significant Wildlife Concentration	
		Points
Value Added	12. Significant Size	
	13. Other Significant Value	
Quantitative Rating	Function: Hydrologic Regime	0.87
	Function: Biogeochemical Processes	0.72
	Function: Retain Particulates	—
	Function: Plant Community	0.62
	Function: Wildlife Community	0.59
Total of Quantitative and Value Added Scores	Quantitative Score (Average of FCIs x 100)	70.0
	Value Added Total	
	TOTAL SCORE	70.0

Wetland Background Information

Name(s) of Field Personnel:	Tom Becktold, Evan Jermyn
Date Assessment was Conducted:	11/15/2013
Agency/Organization:	ARCADIS representing TDOT
Office Address:	James K. Polk Building, Suite 900, 505 Deaderick St., Nashville, TN, 37243-0334
Phone Number:	865.594.2437
e-mail address:	keven.brown@tn.gov

Wetland Location:

Include county, road or street address, distances from easily located points, nearby landmarks, etc. If possible, attach map showing location. Include north arrow and scale of miles.

See attached Environmental Boundaries Map and Plan Markups for SR-29 (US-27) from South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05.

Lat/Long or UTM Coordinate	WTL-11; 36.00047N, -84.50636E	
USGS Quad Name	Camp Austin	
National Wetland Inventory Map	N/A	
Hydrological Unit Code	060102080405 - Little Emory River	
Soil Survey Map Sheet	See attached	
Delineation Report Attached (Y/N)	Yes	

Wetland Description:

Include landscape position, hydrologic source, all plant communities present (e.g., young forest, mature forest, scrub/shrub, herbaceous, etc.), presence of open water, dominant plant species, size of overall wetland and of different communities, types of disturbance, and any other significant feature(s).

WTL-11 is located at the foot of Whetstone Mountain, immediately adjacent to and parallel with the existing SR-29 alignment (within the existing roadside ditch). WTL-11 drains to Bitter Creek, STR-6, via WWC-22 / EPH-22. Dominated by herbaceous vegetation (regularly maintained due to its location within the SR-29 roadside ditch). Approximate size: 0.17 acre

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

11/15/13 Project Name — SR-29; From S of Whetstone Rd to N of SR-32
Date

T. BECKTOLD / E. JERMYN Location/Address — Morgan County, TN
Field Personnel

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

WTL-11

V1: Hydroperiod (HYDRO)

1. Hydrology not altered (SI = 1.0)
   - __ no fill material or excessive sediment
   - __ no ditches/drainage tiles
   - __ no roads or other impediments to surface ground water
   - __ no excavation
2. Hydrology slightly altered (SI = 0.75)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow slightly impeded
   - __ portion of site excavated
3. Hydrology moderately altered (SI = 0.5)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
4. Hydrology significantly altered (SI = 0.25)
   - __ portion of site with fill or excessive sediment
   - ✓ portion of site with drainage ditches/tiles
   - ✓ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
5. Hydrology severely altered (SI = 0.1)
   - __ entire site impacted by fill or excessive sediment
   - __ entire site with numerous drainage ditches/tiles
   - __ roads or other impediments, water flow completely blocked
   - __ entire site excavated

V2: Wetland Watershed Integrity (WSHEDINT)

1. Watershed not impacted (SI = 1.0) 80%.
   - ✓ watershed mostly to entirely forested
   - __ no impervious surfaces
2. Percent watershed slightly impacted __ (SI = 0.75)
   - __ orchards/tree farms
   - __ pasture/hayland
   - __ parks/golf courses
   - __ low density residential
   - __ other similar (list)
3. Percent watershed moderately impacted __ (SI = 0.5)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)

   $[(80 \times 1.0) + (20 \times 0.1)]/100$

   $(80 + 2)/100$

   $\Rightarrow SI = 0.82$
4. Percent watershed significantly impacted __ (SI = 0.25)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)
5. Percent watershed severely impacted __ (SI = 0.1) 20%.
   - __ commercial
   - __ industrial
   - __ parking lots
   - ✓ other similar (list) SR-29 roadway

V3: Canopy Tree Size Class (TSIZE) N/A

1. Average size of canopy trees > 4 in. DBH
   - __ ≥ 15 in. (SI = 1.0)
   - __ 10 – 14 in. (SI = 0.75)
   - __ 6 – 9 in. (SI = 0.5)
   - __ 4 – 5 in. (SI = 0.25)
   - __ < 4 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN) N/A

1. Average number of canopy trees (> 4 in. DBH) per 30-ft. radius plot
   - __ 5 – 10 (SI = 1.0)
   - __ 11 – 15 (SI = 0.75)
   - __ > 15 (SI = 0.5)
   - __ 1 – 4 (SI = 0.5)

WTL-11 ; SR-29

V5: Shrub Cover (SCOV) N/A

1. Average percent cover of shrubs (woody stems < 4 in. DBH and taller than 3 ft.) per 30-ft. radius plot

__ ≥ 70 (SI = 1.0) __ 55 – 69 (SI = 0.75) __ 45 – 54 (SI = 0.5) __ 30 – 44 (SI = 0.25) __ 20 – 29 (SI = 0.1)
__ no shrubs present, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

✓ ≥ 20 (SI = 1.0) __ 15 – 19 (SI = 0.75) __ 10 – 14 (SI = 0.5) __ 5 – 9 (SI = 0.25) __ < 5 (SI = 0.1)
__ no ground vegetation present (SI = 0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant tree species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added as a Group 2 species. Native shrub and herbaceous species are assigned to Group 2. For both, write in the number of species.

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
__ Bur oak	__ Overcup oak	__ American elm	__ Sugarberry	__ European/Chinese privet
__ Overcup oak	__ Shellbark hickory	__ Slippery elm	__ Boxelder	__ Japanese honeysuckle
__ Pin oak	__ Water tupelo	__ Green ash	__ Pawpaw	__ Japanese stiltgrass
__ Swamp chestnut oak	__ S. black gum	__ Red maple	__ Black willow	__ Purple loosestrife
__ Water oak	__ Persimmon	__ Silver maple	__ Native shrub	__ Giant reed
__ Willow oak	__ Buttonbush	__ Sweetgum	2 Native herbaceous	__ Tall fescue
__ Shumard oak	__ Am. hornbeam	__ Silky dogwood		
__ Nuttall oak				

2. Using the checked dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = (1.0 × 0) + (0.66 × 2) + (0.0 × 0) / 2 = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]
   a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0
   b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75
   c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 — 0.33
   d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25
   e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0

4. Calculate the square root of the value from Step 3 above. This is the SI for V7 — 0.57

[1]In some Slope wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered
   ✓ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present due to one or more or the following:
   __ land leveling __ construction/development __ fill __ other
   __ grading __ excessive sediment deposits __ surface mining

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

WTL-11 ; SR-29

V9: Buffer (BUFFER)

1. Determine a Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
   __ 90% – 100% (CI = 1.0) __ 75% – 89% (CI = 0.75) ✓ 40% – 74% (CI = 0.5) __ 10% – 39% (CI = 0.25)
   __ < 10% (CI = 0.1)
2. Multiply the CI by one if the following values:
   a) if average buffer width is ≥ 492 ft., multiply by 1.0 → 0.5 × 1.0 = 0.5
   b) if average buffer is 98 ft to 491 ft., multiply by 0.66
   c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
   d) if average buffer width is < 33 ft., multiply by 0.1
3. This value is the SI for V9.

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.25 (HYDRO) V3 – (TSIZE) V5 – (SCOV) V7 0.57 (COMP) V9 0.5 (BUFFER)
V2 0.82 (WSHEDINT) V4 – (TDEN) V6 1.0 (GVC) V8 1.0 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI: $V1 \times V2^{1/2}$ ⇨ 0.25 x 0.82 $^{1/2}$ = 0.45

FUNCTION 2: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI (trees present)= $V1 \times V2^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)^{1/2}$ ⇨ ____ x ____ $^{1/2}$ x $\left(\frac{\frac{\_\_+\_\_}{2}+\_\_\_\_}{2}\right)^{1/2}$ = ____

FCI (shrubs present)= $V1 \times V2^{1/2} \times \left(\frac{V5+V8}{3}\right)^{1/2}$ ⇨ ____ x ____ $^{1/2}$ x $\left(\frac{\_\_+\_\_}{3}\right)^{1/2}$ = ____

FCI (ground cover)= $V1 \times V2^{1/2} \times \left(\frac{V6+V8}{5}\right)^{1/2}$ ⇨ 0.25 x 0.82 $^{1/2}$ x $\left(\frac{1.0+1.0}{5}\right)^{1/2}$ = 0.28
(0.45) × (0.63)

FUNCTION 3: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

FCI (trees present) = $\frac{V1 \times V2^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$ ⇨ $\frac{\_\_ \times \_\_^{1/2} + 2\left(\frac{\_\_+\_\_+\_\_}{3}\right)}{3}$ = ____

FCI (shrubs present) = $\frac{V1 \times V2^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$ ⇨ $\frac{\_\_ \times \_\_^{1/2} + 2\left(\frac{\_\_+\_\_}{2}\right)}{6}$ = ____

WTL-11 ; SR-29

FCI (groundcover) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V6+V7}{2}}{9}$ ⇨ $\dfrac{0.25 \times 0.82^{1/2} + 2\,\frac{1.0+0.57}{2}}{9}$ = 0.22

[(0.45) + (1.57)] / 9

FUNCTION 4: MAINTAIN CHARACTERISTIC WILDLIFE COMMUNITY

FCI (trees) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V3+V4+V7}{3} + V9}{4}$ ⇨ $\dfrac{\_\_ \times \_\_^{1/2} + 2\,\frac{\_\_+\_\_+\_\_}{3} + \_\_}{4}$ = _____

FCI (shrubs present) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V5+V7}{2} + V9}{6}$ ⇨ $\dfrac{\_\_ \times \_\_^{1/2} + 2\,\frac{\_\_+\_\_}{2} + \_\_}{6}$ = _____

FCI (groundcover) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V6+V7}{2} + V9}{9}$ ⇨ $\dfrac{0.25 \times 0.82^{1/2} + 2\,\frac{1.0+0.57}{2} + 0.5}{9}$ = 0.28

[(0.45) + (1.57) + (0.5)] / 9

TRAM Summary Worksheet

WTL-11 ; SR-29

		Check if applicable
Red Flags	1. ORNW	
	2. Documented High Quality or State Natural Area	
	3. Federally or State Listed Species	
	4. Critical Habitat	
	5. Bog	
	6. Fen	
	7. Wet Prairie/Meadow	
	8. Old Growth/Mature Forested wetlands.	
	9. Regionally or Locally Significant Wildlife Concentration	
		Points
Value Added	12. Significant Size	
	13. Other Significant Value	
Quantitative Rating	Function: Hydrologic Regime	0.45
	Function: Biogeochemical Processes	0.28
	Function: Retain Particulates	—
	Function: Plant Community	0.22
	Function: Wildlife Community	0.28
Total of Quantitative and Value Added Scores	Quantitative Score (Average of FCIs x 100)	30.75
	Value Added Total	
	TOTAL SCORE	30.75

Wetland Background Information

Name(s) of Field Personnel:	Tom Becktold, Evan Jermyn
Date Assessment was Conducted:	11/15/2013
Agency/Organization:	ARCADIS representing TDOT
Office Address:	James K. Polk Building, Suite 900, 505 Deaderick St., Nashville, TN, 37243-0334
Phone Number:	865.594.2437
e-mail address:	keven.brown@tn.gov

Wetland Location:

Include county, road or street address, distances from easily located points, nearby landmarks, etc. If possible, attach map showing location. Include north arrow and scale of miles.

See attached Environmental Boundaries Map and Plan Markups for SR-29 (US-27) from South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05.

Lat/Long or UTM Coordinate	WTL-12; 36.01269N, -84.52259E	
USGS Quad Name	Camp Austin	
National Wetland Inventory Map	N/A	
Hydrological Unit Code	060102080405 - Little Emory River	
Soil Survey Map Sheet	See attached	
Delineation Report Attached (Y/N)	Yes	

Wetland Description:

Include landscape position, hydrologic source, all plant communities present (e.g., young forest, mature forest, scrub/shrub, herbaceous, etc.), presence of open water, dominant plant species, size of overall wetland and of different communities, types of disturbance, and any other significant feature(s).

WTL-12 directly abuts STR-19 and is located adjacent to (confined by) Hanging Rock Road, SR-29, and an abandoned dirt road / gravel driveway. WWC-36 / EPH-36 flows into WTL-12 from the northwest. The plant community within WTL-12 consists of a young deciduous hardwood forest, as well as a thick stand of Chinese privet within the understory. Approximate size: 0.18 acre

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

11/15/13 Project Name: SR-29, From S of Wheeler Rd. to N of SR-328
Date
T. BECKTOLD/E. JERMYN Location/Address: Morgan County, TN
Field Personnel

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

WTL-12

V1: Hydroperiod (HYDRO)

1. Hydrology not altered (SI = 1.0)
   - __ no fill material or excessive sediment
   - __ no ditches/drainage tiles
   - __ no roads or other impediments to surface ground water
   - __ no excavation
2. Hydrology slightly altered (SI = 0.75)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - ✓ roads or other impediments, water flow slightly impeded
   - __ portion of site excavated
3. Hydrology moderately altered (SI = 0.5)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
4. Hydrology significantly altered (SI = 0.25)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
5. Hydrology severely altered (SI = 0.1)
   - __ entire site impacted by fill or excessive sediment
   - __ entire site with numerous drainage ditches/tiles
   - __ roads or other impediments, water flow completely blocked
   - __ entire site excavated

V2: Wetland Watershed Integrity (WSHEDINT)

1. Watershed not impacted (SI = 1.0)
   - ✓ watershed mostly to entirely forested
   - __ no impervious surfaces
2. Percent watershed slightly impacted __ (SI = 0.75)
   - __ orchards/tree farms
   - __ pasture/hayland
   - __ parks/golf courses
   - __ low density residential
   - __ other similar (list)
3. Percent watershed moderately impacted __ (SI = 0.5)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)
4. Percent watershed significantly impacted __ (SI = 0.25)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)
5. Percent watershed severely impacted __ (SI = 0.1)
   - __ commercial
   - __ industrial
   - __ parking lots
   - __ other similar (list)

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 4 in. DBH
   - __ ≥ 15 in. (SI = 1.0)
   - __ 10 – 14 in. (SI = 0.75)
   - ✓ 6 – 9 in. (SI = 0.5)
   - __ 4 – 5 in. (SI = 0.25)
   - __ < 4 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 4 in. DBH) per 30-ft. radius plot
   - __ 5 – 10 (SI = 1.0)
   - __ 11 – 15 (SI = 0.75)
   - __ > 15 (SI = 0.5)
   - ✓ 1 – 4 (SI = 0.5)

WTL-12, SR-29

V5: Shrub Cover (SCOV) N/A

1. Average percent cover of shrubs (woody stems < 4 in. DBH and taller than 3 ft.) per 30-ft. radius plot

__ ≥ 70 (SI = 1.0) __ 55 – 69 (SI = 0.75) __ 45 – 54 (SI = 0.5) __ 30 – 44 (SI = 0.25) __ 20 – 29 (SI = 0.1)
__ no shrubs present, go to V6

V6: Ground Vegetation Cover (GVC) N/A

1. Average percent cover of ground vegetation per 30-ft. radius plot

__ ≥ 20 (SI = 1.0) __ 15 – 19 (SI = 0.75) __ 10 – 14 (SI = 0.5) __ 5 – 9 (SI = 0.25) __ < 5 (SI = 0.1)
__ no ground vegetation present (SI = 0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant tree species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added as a Group 2 species. Native shrub and herbaceous species are assigned to Group 2. For both, write in the number of species.

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
__ Bur oak	__ Overcup oak	__ American elm	__ Sugarberry	✓ European/Chinese privet
__ Overcup oak	__ Shellbark hickory	__ Slippery elm	__ Boxelder	__ Japanese honeysuckle
__ Pin oak	__ Water tupelo	__ Green ash	__ Pawpaw	__ Japanese stiltgrass
__ Swamp chestnut oak	__ S. black gum	__ Red maple	✓ Black willow	__ Purple loosestrife
__ Water oak	__ Persimmon	__ Silver maple	__ Native shrub	__ Giant reed
__ Willow oak	__ Buttonbush	__ Sweetgum	✓ Native herbaceous	__ Tall fescue
__ Shumard oak	✓ Am. hornbeam	__ Silky dogwood		
__ Nuttall oak				

2. Using the checked dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ **total # of** checked dominants in all groups = (1.0 × 1) + (0.66 × 2) + (0.0 × 1) / 4 = 2.32/4 = 0.58

3. Multiply Q above by one of the following constants that reflects species richness:[1]
   a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 → 0.58
   b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75
   c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50
   d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25
   e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0
4. Calculate the square root of the value from Step 3 above. This is the SI for V7 → 0.76

[1] In some Slope wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered
   ✓ 100 percent cover of O and/or A horizon present (SI = 1.0)
2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present due to one or more or the following:
   __ land leveling __ construction/development __ fill __ other
   __ grading __ excessive sediment deposits __ surface mining
3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

WTL-12 ; SR-29

V9: Buffer (BUFFER)

1. Determine a Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
   __ 90% – 100% (CI = 1.0) ✓75% – 89% (CI = 0.75) __ 40% – 74% (CI = 0.5) __ 10% – 39% (CI = 0.25)
   __ < 10% (CI = 0.1)
2. Multiply the CI by one if the following values:
   a) if average buffer width is ≥ 492 ft., multiply by 1.0
   b) if average buffer is 98 ft to 491 ft., multiply by 0.66 – 0.75 × 0.66 = 0.495
   c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
   d) if average buffer width is < 33 ft., multiply by 0.1
3. This value is the SI for V9.

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3 0.5 (TSIZE) V5 – (SCOV) V7 0.76 (COMP) V9 0.5 (BUFFER)

V2 1.0 (WSHEDINT) V4 0.5 (TDEN) V6 – (GVC) V8 1.0 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI: $V1 \times V2^{1/2} \Rightarrow 0.75 \times 1.0^{1/2} = 0.87$

FUNCTION 2: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI (trees present)= $V1 \times V2^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)^{1/2} \Rightarrow 0.75 \times 1.0^{1/2} \times \left(\frac{\frac{0.5+0.5}{2}+1.0}{2}\right)^{1/2} = 0.76$

$(0.87) \times [(1.5)/2]^{2}\,{}^{1/2} = 0.87 \times 0.87 = \uparrow$

FCI (shrubs present)= $V1 \times V2^{1/2} \times \left(\frac{V5+V8}{3}\right)^{1/2} \Rightarrow \_\_ \times \_\_^{1/2} \times \left(\frac{\_\_+\_\_}{3}\right)^{1/2} = \_\_$

FCI (ground cover)= $V1 \times V2^{1/2} \times \left(\frac{V6+V8}{5}\right)^{1/2} \Rightarrow \_\_ \times \_\_^{1/2} \times \left(\frac{\_\_+\_\_}{5}\right)^{1/2} = \_\_$

FUNCTION 3: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

FCI (trees present) = $\frac{V1 \times V2^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3} \Rightarrow \frac{0.75 \times 1.0^{1/2} + 2\left(\frac{0.5+0.5+0.76}{3}\right)}{3\left[(0.87)+(1.17)\right]/3} = 0.68$

FCI (shrubs present) = $\frac{V1 \times V2^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6} \Rightarrow \frac{\_\_ \times \_\_^{1/2} + 2\left(\frac{\_\_+\_\_}{2}\right)}{6} = \_\_$

WTL-12; SR-29

FCI (groundcover) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V6+V7}{2}}{9}$ ⇨ $\dfrac{\_\_ \times \_\_^{1/2} + 2\,\frac{\_\_+\_\_}{2}}{9}$ = _____

FUNCTION 4: MAINTAIN CHARACTERISTIC WILDLIFE COMMUNITY

FCI (trees) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V3+V4+V7}{3} + V9}{4}$ ⇨ $\dfrac{0.75 \times 1.0^{1/2} + 2\,\frac{0.5+0.5+0.76}{3} + 0.5}{[(0.87)+(1.17)+(0.5)]/4}$ = 0.64

FCI (shrubs present) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V5+V7}{2} + V9}{6}$ ⇨ $\dfrac{\_\_ \times \_\_^{1/2} + 2\,\frac{\_\_+\_\_}{2} + \_\_}{6}$ = _____

FCI (groundcover) = $\dfrac{V1 \times V2^{1/2} + 2\,\frac{V6+V7}{2} + V9}{9}$ ⇨ $\dfrac{\_\_ \times \_\_^{1/2} + 2\,\frac{\_\_+\_\_}{2} + \_\_}{9}$ = _____

TRAM Summary Worksheet

WTL-12 ; SR-29

		Check if applicable
Red Flags	1. ORNW	
	2. Documented High Quality or State Natural Area	
	3. Federally or State Listed Species	
	4. Critical Habitat	
	5. Bog	
	6. Fen	
	7. Wet Prairie/Meadow	
	8. Old Growth/Mature Forested wetlands.	
	9. Regionally or Locally Significant Wildlife Concentration	
		Points
Value Added	12. Significant Size	
	13. Other Significant Value	
Quantitative Rating	Function: Hydrologic Regime	0.87
	Function: Biogeochemical Processes	0.76
	Function: Retain Particulates	—
	Function: Plant Community	0.68
	Function: Wildlife Community	0.64
Total of Quantitative and Value Added Scores	Quantitative Score (Average of FCIs x 100)	73.75
	Value Added Total	
	TOTAL SCORE	73.75

Wetland Background Information

Name(s) of Field Personnel:	Tom Becktold, Evan Jermyn
Date Assessment was Conducted:	11/15/2013
Agency/Organization:	ARCADIS representing TDOT
Office Address:	James K. Polk Building, Suite 900, 505 Deaderick St., Nashville, TN, 37243-0334
Phone Number:	865.594.2437
e-mail address:	keven.brown@tn.gov

Wetland Location:

Include county, road or street address, distances from easily located points, nearby landmarks, etc. If possible, attach map showing location. Include north arrow and scale of miles.

See attached Environmental Boundaries Map and Plan Markups for SR-29 (US-27) from South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05.

Lat/Long or UTM Coordinate	WTL-13; 36.01398N, -84.52379E	
USGS Quad Name	Camp Austin	
National Wetland Inventory Map	N/A	
Hydrological Unit Code	060102080405 - Little Emory River	
Soil Survey Map Sheet	See attached	
Delineation Report Attached (Y/N)	Yes	

Wetland Description:

Include landscape position, hydrologic source, all plant communities present (e.g., young forest, mature forest, scrub/shrub, herbaceous, etc.), presence of open water, dominant plant species, size of overall wetland and of different communities, types of disturbance, and any other significant feature(s).

WTL-13 is located at the toe of a slope and confined by an abandoned dirt road. A wet weather conveyance (WWC-36) and 24-inch CMP beneath the abandoned dirt road connect WTL-13 with WWC-36 / EPH-36 and ultimately WTL-12 and STR-19. The plant community within WTL-13 consists of a semi-mature deciduous hardwood forest with a relatively thin understory. Approximate size: 0.25 acre

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

11/15/13 Date — Project Name: SR-29; From S of Whitestone Rd to N of SR-328

T. BELKTOLD/E. JERMYN Field Personnel — Location/Address: Morgan County, TN

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

WTL-13

V1: Hydroperiod (HYDRO)

1. Hydrology not altered (SI = 1.0)
   - __ no fill material or excessive sediment
   - __ no ditches/drainage tiles
   - __ no roads or other impediments to surface ground water
   - __ no excavation
2. Hydrology slightly altered (SI = 0.75)
   - __ portion of site with fill or excessive sediment
   - ✓ portion of site with drainage ditches/tiles
   - ✓ roads or other impediments, water flow slightly impeded
   - __ portion of site excavated
3. Hydrology moderately altered (SI = 0.5)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
4. Hydrology significantly altered (SI = 0.25)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
5. Hydrology severely altered (SI = 0.1)
   - __ entire site impacted by fill or excessive sediment
   - __ entire site with numerous drainage ditches/tiles
   - __ roads or other impediments, water flow completely blocked
   - __ entire site excavated

V2: Wetland Watershed Integrity (WSHEDINT)

1. Watershed not impacted (SI = 1.0)
   - ✓ watershed mostly to entirely forested
   - __ no impervious surfaces
2. Percent watershed slightly impacted __ (SI = 0.75)
   - __ orchards/tree farms
   - __ pasture/hayland
   - __ parks/golf courses
   - __ low density residential
   - __ other similar (list)
3. Percent watershed moderately impacted __ (SI = 0.5)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)
4. Percent watershed significantly impacted __ (SI = 0.25)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)
5. Percent watershed severely impacted __ (SI = 0.1)
   - __ commercial
   - __ industrial
   - __ parking lots
   - __ other similar (list)

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 4 in. DBH
   - __ ≥ 15 in. (SI = 1.0)
   - __ 10 – 14 in. (SI = 0.75)
   - ✓ 6 – 9 in. (SI = 0.5)
   - __ 4 – 5 in. (SI = 0.25)
   - __ < 4 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 4 in. DBH) per 30-ft. radius plot
   - __ 5 – 10 (SI = 1.0)
   - ✓ 11 – 15 (SI = 0.75)
   - __ > 15 (SI = 0.5)
   - __ 1 – 4 (SI = 0.5)

WTL-13; SR-29

V5: Shrub Cover (SCOV) N/A

1. Average percent cover of shrubs (woody stems < 4 in. DBH and taller than 3 ft.) per 30-ft. radius plot

__ ≥ 70 (SI = 1.0) __ 55 – 69 (SI = 0.75) __ 45 – 54 (SI = 0.5) __ 30 – 44 (SI = 0.25) __ 20 – 29 (SI = 0.1)
__ no shrubs present, go to V6

V6: Ground Vegetation Cover (GVC) N/A

1. Average percent cover of ground vegetation per 30-ft. radius plot

__ ≥ 20 (SI = 1.0) __ 15 – 19 (SI = 0.75) __ 10 – 14 (SI = 0.5) __ 5 – 9 (SI = 0.25) __ < 5 (SI = 0.1)
__ no ground vegetation present (SI = 0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant tree species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added as a Group 2 species. Native shrub and herbaceous species are assigned to Group 2. For both, write in the number of species.

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
__ Bur oak	__ Overcup oak	__ American elm	__ Sugarberry	✓ European/Chinese privet
__ Overcup oak	__ Shellbark hickory	__ Slippery elm	__ Boxelder	__ Japanese honeysuckle
__ Pin oak	__ Water tupelo	__ Green ash	__ Pawpaw	__ Japanese stiltgrass
__ Swamp chestnut oak	__ S. black gum	✓ Red maple	__ Black willow	__ Purple loosestrife
__ Water oak	__ Persimmon	__ Silver maple	__ Native shrub	__ Giant reed
__ Willow oak	__ Buttonbush	__ Sweetgum	__ Native herbaceous	__ Tall fescue
__ Shumard oak	✓ Am. hornbeam	__ Silky dogwood	✓ Am. holly	
__ Nuttall oak				

2. Using the checked dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = (1.0 × 1) + (0.66 × 2) + (0.0 × 1) / 4 = 0.58

3. Multiply Q above by one of the following constants that reflects species richness:[1]
   a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 → 0.58
   b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75
   c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50
   d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25
   e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0

4. Calculate the square root of the value from Step 3 above. This is the SI for V7 → 0.76

[1]In some Slope wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered
   ✓ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present due to one or more or the following:
   __ land leveling __ construction/development __ fill __ other
   __ grading __ excessive sediment deposits __ surface mining

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

WTL-13; SR-29

V9: Buffer (BUFFER)

1. Determine a Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
   ✓ 90% – 100% (CI = 1.0) __ 75% – 89% (CI = 0.75) __ 40% – 74% (CI = 0.5) __ 10% – 39% (CI = 0.25)
   __ < 10% (CI = 0.1)
2. Multiply the CI by one if the following values:
   a) if average buffer width is ≥ 492 ft., multiply by 1.0 $1.0 \times 0.66 = 0.66$
   b) if average buffer is 98 ft to 491 ft., multiply by 0.66
   c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
   d) if average buffer width is < 33 ft., multiply by 0.1
3. This value is the SI for V9.

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3 0.5 (TSIZE) V5 – (SCOV) V7 0.76 (COMP) V9 0.66 (BUFFER)
V2 1.0 (WSHEDINT) V4 0.75 (TDEN) V6 – (GVC) V8 1.0 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI: $V1 \times V2^{1/2} \Rightarrow 0.75 \times 1.0^{1/2} = 0.87$

FUNCTION 2: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI (trees present)= $V1 \times V2^{1/2} \times \frac{\frac{V3+V4}{2}+V8}{2}^{1/2} \Rightarrow 0.75 \times 1.0^{1/2} \times \frac{\frac{0.5+0.75}{2}+1.0}{2}^{1/2} = 0.78$

$(0.87) \times (1.625/2)^{1/2} = 0.87 \times 0.90 = \uparrow$

FCI (shrubs present)= $V1 \times V2^{1/2} \times \frac{V5+V8}{3}^{1/2} \Rightarrow$ ____ x ____ $^{1/2} \times \frac{+}{3}^{1/2} =$ ____

FCI (ground cover)= $V1 \times V2^{1/2} \times \frac{V6+V8}{5}^{1/2} \Rightarrow$ ____ x ____ $^{1/2} \times \frac{+}{5}^{1/2} =$ ____

FUNCTION 3: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

FCI (trees present) = $\frac{V1 \times V2^{1/2} + 2\frac{V3+V4+V7}{3}}{3} \Rightarrow \frac{0.75 \times 1.0^{1/2} + 2\frac{0.5+0.75+0.76}{3}}{3}$ $[(0.87)+(1.34)]/3$ = 0.74

FCI (shrubs present) = $\frac{V1 \times V2^{1/2} + 2\frac{V5+V7}{2}}{6} \Rightarrow \frac{\_\_ \times \_\_ ^{1/2} + 2\frac{+}{2}}{6} =$ ____

WTL-13; SR-29

FCI (groundcover) = $\frac{V1 \times V2^{1/2} + 2\frac{V6+V7}{2}}{9}$ ⇨ $\frac{\_\_ \times \_\_^{1/2} + 2\frac{\_\_+\_\_}{2}}{9}$ = _____

FUNCTION 4: MAINTAIN CHARACTERISTIC WILDLIFE COMMUNITY

FCI (trees) = $\frac{V1 \times V2^{1/2} + 2\frac{V3+V4+V7}{3} + V9}{4}$ ⇨ $\frac{0.75 \times 1.0^{1/2} + 2\frac{0.5+0.75+0.76}{3} + 0.66}{4}$ = 0.72

$[(0.87)+(1.34)+(0.66)]/4$

FCI (shrubs present) = $\frac{V1 \times V2^{1/2} + 2\frac{V5+V7}{2} + V9}{6}$ ⇨ $\frac{\_\_ \times \_\_^{1/2} + 2\frac{\_\_+\_\_}{2} + \_\_}{6}$ = _____

FCI (groundcover) = $\frac{V1 \times V2^{1/2} + 2\frac{V6+V7}{2} + V9}{9}$ ⇨ $\frac{\_\_ \times \_\_^{1/2} + 2\frac{\_\_+\_\_}{2} + \_\_}{9}$ = _____

TRAM Summary Worksheet

WTL-13, SR-29

		Check if applicable
Red Flags	1. ORNW	
	2. Documented High Quality or State Natural Area	
	3. Federally or State Listed Species	
	4. Critical Habitat	
	5. Bog	
	6. Fen	
	7. Wet Prairie/Meadow	
	8. Old Growth/Mature Forested wetlands.	
	9. Regionally or Locally Significant Wildlife Concentration	
		Points
Value Added	12. Significant Size	
	13. Other Significant Value	
Quantitative Rating	Function: Hydrologic Regime	0.87
	Function: Biogeochemical Processes	0.78
	Function: Retain Particulates	–
	Function: Plant Community	0.74
	Function: Wildlife Community	0.72
Total of Quantitative and Value Added Scores	Quantitative Score (Average of FCIs x 100)	77.75
	Value Added Total	
	TOTAL SCORE	77.75

Wetland Background Information

Name(s) of Field Personnel:	Tom Becktold, Evan Jermyn
Date Assessment was Conducted:	11/15/2013
Agency/Organization:	ARCADIS representing TDOT
Office Address:	James K. Polk Building, Suite 900, 505 Deaderick St., Nashville, TN, 37243-0334
Phone Number:	865.594.2437
e-mail address:	keven.brown@tn.gov

Wetland Location:

Include county, road or street address, distances from easily located points, nearby landmarks, etc. If possible, attach map showing location. Include north arrow and scale of miles.

See attached Environmental Boundaries Map and Plan Markups for SR-29 (US-27) from South of Whetstone Road to North of SR-328; Morgan County, TN; PIN 101411.05.

Lat/Long or UTM Coordinate	WTL-14; 36.01834N, -84.52676E	
USGS Quad Name	Camp Austin	
National Wetland Inventory Map	N/A	
Hydrological Unit Code	060102080405 - Little Emory River	
Soil Survey Map Sheet	See attached	
Delineation Report Attached (Y/N)	Yes	

Wetland Description:

Include landscape position, hydrologic source, all plant communities present (e.g., young forest, mature forest, scrub/shrub, herbaceous, etc.), presence of open water, dominant plant species, size of overall wetland and of different communities, types of disturbance, and any other significant feature(s).

WTL-14 is located between the toe of a forested slope (to the west) and toe of the existing SR-29 roadway fill slope (to the east). The majority of the vegetation within WTL-14 has historically been maintained due to its location within a power-line easement along SR-29. STR-21 enters WTL-14 from the adjacent forested slope and STR-22 begins within the boundaries of WTL-14 (directly abutting; contiguous). The plant community within WTL-14 consists primarily of shrub and herbaceous species. Approximate size: 0.33 acre

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

11/15/13 Project Name — SR-29; From S of Whetstone Rd to N of SR-328
Date

T. OELKTOLD/E. JERMYN Location/Address — Morgan County, TN
Field Personnel

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

WTL-14

V1: Hydroperiod (HYDRO)

1. Hydrology not altered (SI = 1.0)
   - __ no fill material or excessive sediment
   - __ no ditches/drainage tiles
   - __ no roads or other impediments to surface ground water
   - __ no excavation
2. Hydrology slightly altered (SI = 0.75)
   - __ portion of site with fill or excessive sediment
   - ✓ portion of site with drainage ditches/tiles
   - ✓ roads or other impediments, water flow slightly impeded
   - __ portion of site excavated
3. Hydrology moderately altered (SI = 0.5)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
4. Hydrology significantly altered (SI = 0.25)
   - __ portion of site with fill or excessive sediment
   - __ portion of site with drainage ditches/tiles
   - __ roads or other impediments, water flow moderately impeded
   - __ portion of site excavated
5. Hydrology severely altered (SI = 0.1)
   - __ entire site impacted by fill or excessive sediment
   - __ entire site with numerous drainage ditches/tiles
   - __ roads or other impediments, water flow completely blocked
   - __ entire site excavated

V2: Wetland Watershed Integrity (WSHEDINT)

1. Watershed not impacted (SI = 1.0)
   - ✓ watershed mostly to entirely forested 90%
   - __ no impervious surfaces
2. Percent watershed slightly impacted __ (SI = 0.75)
   - __ orchards/tree farms
   - __ pasture/hayland
   - __ parks/golf courses
   - __ low density residential
   - __ other similar (list)
3. Percent watershed moderately impacted __ (SI = 0.5)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)

   $[(90 \times 1.0) + (10 \times 0.10)]/100$

   $(90 + 1)/100$

   SI = 0.91
4. Percent watershed significantly impacted __ (SI = 0.25)
   - __ cropland
   - __ construction areas
   - __ high density residential
   - __ other similar (list)
5. Percent watershed severely impacted __ (SI = 0.1) 10%
   - __ commercial
   - __ industrial
   - __ parking lots
   - ✓ other similar (list) SR-29 roadway

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 4 in. DBH N/A
   - __ ≥ 15 in. (SI = 1.0)
   - __ 10 – 14 in. (SI = 0.75)
   - __ 6 – 9 in. (SI = 0.5)
   - __ 4 – 5 in. (SI = 0.25)
   - __ < 4 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN) N/A

1. Average number of canopy trees (> 4 in. DBH) per 30-ft. radius plot
   - __ 5 – 10 (SI = 1.0)
   - __ 11 – 15 (SI = 0.75)
   - __ > 15 (SI = 0.5)
   - __ 1 – 4 (SI = 0.5)

WTL-14; SR-29

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 4 in. DBH and taller than 3 ft.) per 30-ft. radius plot

✓ ≥ 70 (SI = 1.0) __ 55 – 69 (SI = 0.75) __ 45 – 54 (SI = 0.5) __ 30 – 44 (SI = 0.25) __ 20 – 29 (SI = 0.1)
__ no shrubs present, go to V6

V6: Ground Vegetation Cover (GVC) N/A

1. Average percent cover of ground vegetation per 30-ft. radius plot

__ ≥ 20 (SI = 1.0) __ 15 – 19 (SI = 0.75) __ 10 – 14 (SI = 0.5) __ 5 – 9 (SI = 0.25) __ < 5 (SI = 0.1)
__ no ground vegetation present (SI = 0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant tree species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added as a Group 2 species. Native shrub and herbaceous species are assigned to Group 2. For both, write in the number of species.

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
__ Bur oak	__ Overcup oak	__ American elm	__ Sugarberry	✓ European/Chinese privet
__ Overcup oak	__ Shellbark hickory	__ Slippery elm	__ Boxelder	✓ Japanese honeysuckle
__ Pin oak	__ Water tupelo	__ Green ash	__ Pawpaw	__ Japanese stiltgrass
__ Swamp chestnut oak	__ S. black gum	__ Red maple	✓ Black willow	__ Purple loosestrife
__ Water oak	__ Persimmon	__ Silver maple	✓ Native shrub	__ Giant reed
__ Willow oak	__ Buttonbush	__ Sweetgum	2 Native herbaceous	__ Tall fescue
__ Shumard oak	__ Am. hornbeam	__ Silky dogwood		
__ Nuttall oak				

2. Using the checked dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = (1.0 × 0) + (0.66 × 4) + (0.0 × 2) / 6 = 0.44

3. Multiply Q above by one of the following constants that reflects species richness:[1]

a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 — 0.44
b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75
c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50
d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25
e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0

4. Calculate the square root of the value from Step 3 above. This is the SI for V7 — 0.66

[1]In some Slope wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

✓ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present due to one or more or the following:

__ land leveling __ construction/development __ fill __ other
__ grading __ excessive sediment deposits __ surface mining

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

WTL-14, SR-29

V9: Buffer (BUFFER)

1. Determine a Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
   __ 90% – 100% (CI = 1.0) __ 75% – 89% (CI = 0.75) ✓40% – 74% (CI = 0.5) __ 10% – 39% (CI = 0.25)
   __ < 10% (CI = 0.1)
2. Multiply the CI by one if the following values:
   a) if average buffer width is ≥ 492 ft., multiply by 1.0
   b) if average buffer is 98 ft to 491 ft., multiply by 0.66
   c) if average buffer width is 33 ft to 97 ft., multiply by 0.33 – 0.5 × 0.33 = 0.165
   d) if average buffer width is < 33 ft., multiply by 0.1
3. This value is the SI for V9.

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3 – (TSIZE) V5 1.0 (SCOV) V7 0.66 (COMP) V9 0.165 (BUFFER)

V2 0.91 (WSHEDINT) V4 – (TDEN) V6 – (GVC) V8 1.0 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI: $V1 \times V2^{1/2} \Rightarrow 0.75 \times 0.91^{1/2} = 0.83$

FUNCTION 2: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI (trees present)= $V1 \times V2^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)^{1/2} \Rightarrow$ ____ x ____ $^{1/2}$ x $\left(\frac{\frac{\_\_+\_\_}{2}+\_\_\_}{2}\right)^{1/2}$ = ____

FCI (shrubs present)= $V1 \times V2^{1/2} \times \left(\frac{V5+V8}{3}\right)^{1/2} \Rightarrow$ 0.75 x 0.91 $^{1/2}$ x $\left(\frac{1.0+1.0}{3}\right)^{1/2}$ = 0.68

(0.83) × (0.82) =

FCI (ground cover)= $V1 \times V2^{1/2} \times \left(\frac{V6+V8}{5}\right)^{1/2} \Rightarrow$ ____ x ____ $^{1/2}$ x $\left(\frac{\_\_+\_\_}{5}\right)^{1/2}$ = ____

FUNCTION 3: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

FCI (trees present) = $\frac{V1 \times V2^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3} \Rightarrow \frac{\_\_ \times \_\_^{1/2} + 2\left(\frac{\_\_+\_\_+\_\_}{3}\right)}{3}$ = ____

FCI (shrubs present) = $\frac{V1 \times V2^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6} \Rightarrow \frac{0.75 \times 0.91^{1/2} + 2\left(\frac{1.0+0.66}{2}\right)}{6}$ = 0.42

[(0.83) + (1.66)] / 6 =

WTL-14, SR-29

FCI (groundcover) = $\frac{V1 \times V2^{1/2} + 2\frac{V6+V7}{2}}{9}$ ⇨ $\frac{\_\_ \times \_\_^{1/2} + 2\frac{\_\_+\_\_}{2}}{9}$ = _____

FUNCTION 4: MAINTAIN CHARACTERISTIC WILDILFE COMMUNITY

FCI (trees) = $\frac{V1 \times V2^{1/2} + 2\frac{V3+V4+V7}{3} + V9}{4}$ ⇨ $\frac{\_\_ \times \_\_^{1/2} + 2\frac{\_\_+\_\_+\_\_}{3} + \_\_}{4}$ = _____

FCI (shrubs present) = $\frac{V1 \times V2^{1/2} + 2\frac{V5+V7}{2} + V9}{6}$ ⇨ $\frac{0.75 \times 0.91^{1/2} + 2\frac{1.0+0.66}{2} + 0.165}{6}$ = 0,44

$[(0.83) + (1.66) + (0.165)] / 6$

FCI (groundcover) = $\frac{V1 \times V2^{1/2} + 2\frac{V6+V7}{2} + V9}{9}$ ⇨ $\frac{\_\_ \times \_\_^{1/2} + 2\frac{\_\_+\_\_}{2} + \_\_}{9}$ = _____

TRAM Summary Worksheet

WTL-14; SR-29

		Check if applicable
Red Flags	1. ORNW	
	2. Documented High Quality or State Natural Area	
	3. Federally or State Listed Species	
	4. Critical Habitat	
	5. Bog	
	6. Fen	
	7. Wet Prairie/Meadow	
	8. Old Growth/Mature Forested wetlands.	
	9. Regionally or Locally Significant Wildlife Concentration	
		Points
Value Added	12. Significant Size	
	13. Other Significant Value	
Quantitative Rating	Function: Hydrologic Regime	0.83
	Function: Biogeochemical Processes	0.68
	Function: Retain Particulates	—
	Function: Plant Community	0.42
	Function: Wildlife Community	0.44
Total of Quantitative and Value Added Scores	Quantitative Score (Average of FCIs x 100)	59.25
	Value Added Total	
	TOTAL SCORE	59.25

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County Map Label: WTL-10

P.E. and PIN: P.E. 65001-1256-14; PIN 101411.05 Date: 9/5/07 original survey; 11/14/13 re-evaluation Station: 259+25R to 260+12R

Investigator(s): E. Schmidt, T. Becktold HUC 12 (code and name): 060102080405 - Little Emory River

Landform (hillslope, terrace, etc.): Natural drainage Local relief (concave, convex, none): Concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR N Lat: 36.00013N Long: -84.50585E Datum: GCS_NAD 83

Soil Map Unit Name: Allegheny-Cotaco complex, occasionally flooded (Ac) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No _____ Hydric Soil Present? Yes ✓ No _____ Wetland Hydrology Present? Yes ✓ No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Remarks: Photos: 1 Buffer (ft.): 0->100 ft (SR-29 to south; forest to north) Approximate Size (ac.): 0.069 Portion Affected (permanent) (ac.): 0.069 Portion Affected (temporary) (ac.): 0.00	Confirmation (by, date): _____ Mitigation (to be included in design): Yes Notes:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ✓ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 8 in

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

First field survey conducted in drought conditions; Second survey conducted in normal climatic conditions. WTL-10 is located at the foot of Whetstone Mountain, immediately adjacent to the existing SR-29 alignment. An existing 30-inch RCP beneath SR-29, associated with the headwaters of STR-15, is located on the western edge of WTL-10.

TRAM Score: 70.0

VEGETATION (Four Strata) – Use scientific names of plants.

Map Label: WTL-10

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua (sweetgum)	10	Y	FAC
2. Acer rubrum (red maple)	5	Y	FAC
3. Carpinus caroliniana (American hornbeam)	5	Y	FAC
4. Pinus virginiana (Virginia pine)	2	N	Not listed
5.			
6.			
7.			
8.			
	22	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Salix nigra (black willow)	15	Y	OBL
2. Liquidambar styraciflua (sweetgum)	10	Y	FAC
3. Acer rubrum (red maple)	10	Y	FAC
4. Ligustrum sinense (Chinese privet)	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	40	= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. Juncus effusus (lamp rush)	50	Y	FACW
2. Cyperus odoratus (Rusty flat sedge)	30	Y	FACW
3. Carex frankii (Frank's sedge)	5	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1. Lonicera japonica (Japanese honeysuckle)	10	N	FAC
2.			
3.			
4.			
5.			
6.			
	10	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Map Label: WTL-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5Y 7/1	70	10YR 6/8	30	D	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

The majority of the herbaceous vegetation has been mowed/maintained within WTL-10. A small portion of the wetland extends into the adjacent forested area, just before the grade steepens to the forested slope of Whetstone Mountain.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County Map Label: WTL-11

P.E. and PIN: P.E. 65001-1256-14; PIN 101411.05 Date: 9/5/07 original survey; 11/14/13 re-evaluation Station: 262+11 to 266+57

Investigator(s): E. Schmidt, T. Becktold HUC 12 (code and name): 060102080405 - Little Emory River

Landform (hillslope, terrace, etc.): Roadside drainage / Toe of slope Local relief (concave, convex, none): Concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR N Lat: 36.00047N Long: -84.50636E Datum: GCS_NAD 83

Soil Map Unit Name: Allegheny-Cotaco complex, occasionally flooded (Ac) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No _____ Hydric Soil Present? Yes ✓ No _____ Wetland Hydrology Present? Yes ✓ No _____	**Is the Sampled Area within a Wetland?** **Yes ✓ No _____**
Remarks: Photos: 3 Buffer (ft.): 0->100 ft (SR-29 to south; forest to north) Approximate Size (ac.): 0.17 Portion Affected (permanent) (ac.): 0.17 Portion Affected (temporary) (ac.): 0.00	Confirmation (by, date): _____ Mitigation (to be included in design): Yes Notes:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ✓ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 2 in

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

First field survey conducted in drought conditions; Second survey conducted in normal climatic conditions. WTL-11 is located at the foot of Whetstone Mountain, immediately adjacent to and parallel with the existing SR-29 alignment (within the existing roadside ditch). WTL-11 drains to Bitter Creek, STR-6, via WWC-22 / EPH-22.

TRAM Score: 30.75

VEGETATION (Four Strata) – Use scientific names of plants.

Map Label: WTL-11

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Juncus effusus (lamp rush)	40	Y	FACW
2. Carex frankii (Frank's sedge)	20	Y	OBL
3. Cyperus odoratus (Rusty flat sedge)	15	N	FACW
4. Typha latifolia (broad-leaf cat-tail)	15	N	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Map Label: WTL-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5Y 6/1	90	7.5YR 5/8	10	D	M	Clay loam	
12-20	2.5Y 7/1	95	7.5YR 5/8	5	D	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County Map Label: WTL-12

P.E. and PIN: P.E. 65001-1256-14; PIN 101411.05 Date: 9/6/07 original survey; 11/15/13 re-evaluation Station: 328+62R to 330+33R

Investigator(s): E. Schmidt, T. Becktold HUC 12 (code and name): 060102080405 - Little Emory River

Landform (hillslope, terrace, etc.): Toe of slope Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRR N Lat: 36.01269N Long: -84.52259E Datum: GCS_NAD 83

Soil Map Unit Name: Allegheny-Cotaco complex, occasionally flooded (Ac) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No _____ Hydric Soil Present? Yes ✓ No _____ Wetland Hydrology Present? Yes ✓ No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Remarks: Photos: 17 Buffer (ft.): 20->100 ft Approximate Size (ac.): 0.18 Portion Affected (permanent) (ac.): 0.18 Portion Affected (temporary) (ac.): 0.00	Confirmation (by, date): _____ Mitigation (to be included in design): Yes Notes:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ✓ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1 in.

Water Table Present? Yes ✓ No _____ Depth (inches): 0-6 in.

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0 in

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

First field survey conducted in drought conditions; Second survey conducted in normal climatic conditions. WTL-12 directly abuts STR-19 and is located adjacent to (confined by) Hanging Rock Road, SR-29, and an abandoned dirt road / gravel driveway. WWC-36 / EPH-36 flows into WTL-12 from the northwest.

TRAM Score: 73.75

VEGETATION (Four Strata) – Use scientific names of plants.

Map Label: WTL-12

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra (black willow)	35	Y	OBL
2. Carpinus caroliniana (American hornbeam)	15	Y	FAC
3. Acer rubrum (red maple)	10	N	FAC
4. Asimina triloba (paw paw)	5	N	FAC
5.			
6.			
7.			
8.			
	65	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Ligustrum sinense (Chinese privet)	70	Y	FACU
2. Salix nigra (black willow)	10	N	OBL
3. Acer rubrum (red maple)	5	N	FAC
4. Hamamelis virginiana (witchhazel)	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	90	= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. Boehmeria cylindrica (small-spike false nettle)	30	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Map Label: WTL-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 7/2	100					Sandy clay loam	
6-12	2.5Y 6/1	100					Sandy clay loam	
12-20	5Y 6/2	75	2.5Y 7/6	25	D	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County Map Label: WTL-13

P.E. and PIN: P.E. 65001-1256-14; PIN 101411.05 Date: 9/6/07 original survey; 11/15/13 re-evaluation Station: 333+00R to 335+14R

Investigator(s): E. Schmidt, T. Becktold HUC 12 (code and name): 060102080405 - Little Emory River

Landform (hillslope, terrace, etc.): Toe of slope Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRR N Lat: 36.01398N Long: -84.52379E Datum: GCS_NAD 83

Soil Map Unit Name: Allegheny-Cotaco complex, occasionally flooded (Ac) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ____ Hydric Soil Present? Yes ✓ No ____ Wetland Hydrology Present? Yes ✓ No ____	**Is the Sampled Area within a Wetland?** **Yes ✓ No ____**
Remarks: Photos: 19 Buffer (ft.): 80->100 ft Approximate Size (ac.): 0.25 Portion Affected (permanent) (ac.): 0.017 Portion Affected (temporary) (ac.): 0.18	Confirmation (by, date): ____ Mitigation (to be included in design): Yes Notes:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 8 in

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

First field survey conducted in drought conditions; Second survey conducted in normal climatic conditions. WTL-13 is located at the toe of a slope and confined by an abandoned dirt road. A wet weather conveyance (WWC-36) and 24-inch CMP beneath the abandoned dirt road connect WTL-13 with WWC-36 / EPH-36 and ultimately WTL-12 and STR-19.

TRAM Score: 77.75

VEGETATION (Four Strata) – Use scientific names of plants.

Map Label: WTL-13

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum (red maple)	40	Y	FAC
2. Carpinus caroliniana (American hornbeam)	15	Y	FAC
3. Liquidambar styraciflua (sweetgum)	5	N	FAC
4. Asimina triloba (paw paw)	5	N	FAC
5. Ilex opaca (American holly)	5	N	FACU
6.			
7.			
8.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Acer rubrum (red maple)	10	Y	FAC
2. Ilex opaca (American holly)	5	Y	FACU
3. Ligustrum sinense (Chinese privet)	3	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	18	= Total Cover	

Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1. Vitis rotundifolia (muscadine)	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

Buttressing observed on multiple trees within WTL-13.

SOIL

Map Label: WTL-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 6/2	100					clay loam	
4-20	2.5Y 6/1	95	10YR 6/6	5	D	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: SR-29 (US-27); From South of Whetstone Road to North of SR-328; Morgan County Map Label: WTL-14

P.E. and PIN: P.E. 65001-1256-14; PIN 101411.05 Date: 9/7/07 original survey; 11/15/13 re-evaluation Station: 350+76L to 357+16L

Investigator(s): E. Schmidt, T. Becktold HUC 12 (code and name): 060102080405 - Little Emory River

Landform (hillslope, terrace, etc.): Toe of slope Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRR N Lat: 36.01834N Long: -84.52676E Datum: GCS_NAD 83

Soil Map Unit Name: Gilpin-Bouldin-Petros complex, 25-80% slopes, very stony (GsF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ____ Hydric Soil Present? Yes ✓ No ____ Wetland Hydrology Present? Yes ✓ No ____	**Is the Sampled Area within a Wetland?** **Yes ✓ No ____**
Remarks: Photos: 30, 32-34 Buffer (ft.): 10->100 ft Approximate Size (ac.): 0.33 Portion Affected (permanent) (ac.): 0.33 Portion Affected (temporary) (ac.): 0.00	Confirmation (by, date): ____ Mitigation (to be included in design): Yes Notes:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ✓ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ✓ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): 0-2

Water Table Present? Yes ✓ No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

First field survey conducted in drought conditions; Second survey conducted in normal climatic conditions. WTL-14 is located between the toe of a forested slope (to the west) and toe of the existing SR-29 roadway fill slope (to the east). The majority of the vegetation within WTL-14 has historically been maintained due to its location within a power-line easement. STR-21 enters WTL-14 from the adjacent forested slope and STR-22 begins within the boundaries of WTL-14 (directly abutting; contiguous).

TRAM Score: 59.25

VEGETATION (Four Strata) – Use scientific names of plants.

Map Label: WTL-14

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra (black willow)	10	Y	OBL
2. Platanus occidentalis (sycamore)	2	N	FACW
3. Diospyros virginiana (persimmon)	2	N	FAC
4.			
5.			
6.			
7.			
8.			
	14	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Alnus serrulata (hazel alder)	50	Y	OBL
2. Salix nigra (black willow)	20	Y	OBL
3. Ligustrum sinense (Chinese privet)	2	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	72	= Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. Juncus effusus (lamp rush)	40	Y	FACW
2. Impatiens capensis (jewelweed)	15	Y	FACW
3. Vernonia gigantea (ironweed)	5	N	FAC
4. Lobelia cardinalis (cardinal flower)	2	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	62	= Total Cover	
Woody Vine Stratum (Plot size: 30' radius)			
1. Lonicera japonica (Japanese honeysuckle)	2	N	FAC
2.			
3.			
4.			
5.			
6.			
	2	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Map Label: WTL-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	90	7.5YR 4/6	10	D	M	Silt loam	
4-10	2.5Y 6/2	100					Silty clay loam	
10-20	2.5Y 5/1	100					Silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

FOR INDEX SEE SHEET IA

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING

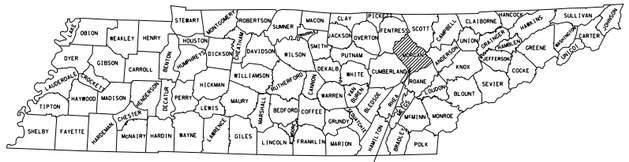
TENN.	YEAR	SHEET NO.
	2014	1
MORGAN COUNTY FED. AID PROJ. NO.	NH-29(86)	
MORGAN COUNTY STATE PROJ. NO.	65001-3268-14	

MORGAN COUNTY

STATE ROUTE 29 (US-27)
FROM SOUTH OF WHETSTONE ROAD TO
NORTH OF STATE ROUTE 328
MORGAN COUNTY

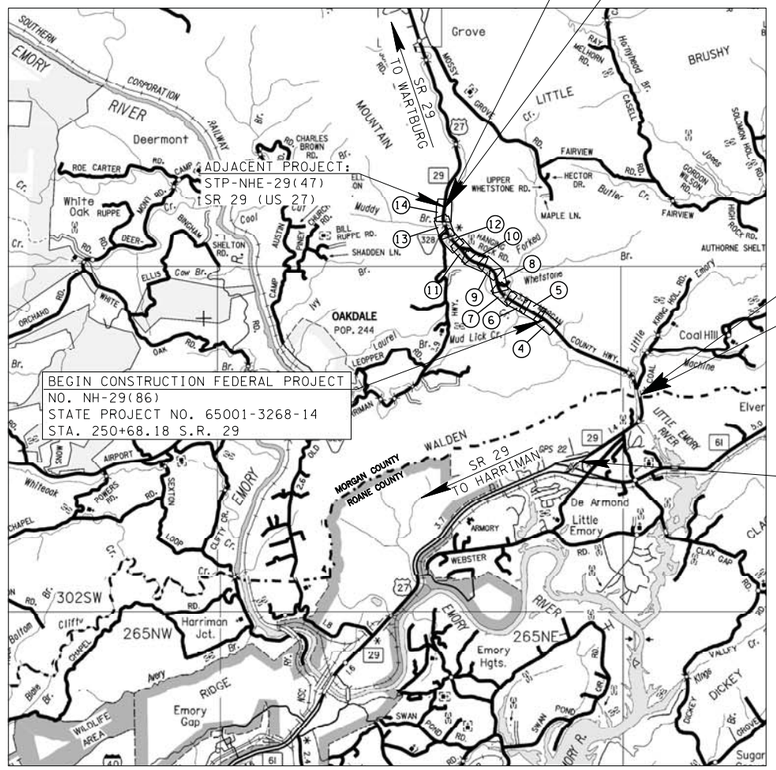
CONSTRUCTION

STATE HIGHWAY NO. 29 F.A.H.S. NO. 29



END RIGHT-OF-WAY FEDERAL PROJECT
NO. HPP-NH-29(35)
STATE PROJECT NO. 65001-2257-14
PIN 101411.01
STA. 357+48.09 S.R. 29

END CONSTRUCTION FEDERAL PROJECT
NO. NH-29(86)
STATE PROJECT NO. 65001-3268-14
STA. 357+48.09 S.R. 29



SCALE: 1"= 1 MILE

BEGIN RIGHT-OF-WAY FEDERAL PROJECT
NO. HPP-NH-29(35)
STATE PROJECT NO. 65001-2257-14
PIN 101411.01
STA. 162+35.01 S.R. 29

END RIGHT-OF-WAY FEDERAL PROJECT
NO. HPP-NH-29(36)
STATE PROJECT NO.73008-2238-14
PIN 101411.01
STA. 162+35.01 S.R. 29

BEGIN RIGHT-OF-WAY FEDERAL PROJECT
NO. HPP-NH-29(36)
STATE PROJECT NO.73008-2238-14
PIN 101411.01
STA. 17+41.77 S.R. 29 RAMP B

NO EXCEPTION
NO EXCLUSION

APPROVED: Paul D. Degges
PAUL D. DEGGES, CHIEF ENGINEER

DATE:

APPROVED:
JOHN SCHROER, COMMISSIONER

SPECIAL NOTES

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED MARCH 1, 2006 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT

TDOT TRANSPORTATION MANAGER FREDERICK MILLER,P.E.

DESIGNED BY ARCADIS U.S.

DESIGNER CLINT BUTLER, P.E. CHECKED BY CHARLES WRIGHT, P.E.

P.E. NO. 65001-1256-14

PIN 101411.05

ARCADIS
Infrastructure · Water · Environment · Buildings

Survey & Design Division

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11/20/2013 2:20:13 PM

CONSTRUCTION PROJECT LENGTH

ROADWAY LENGTH	2.023 MILES
BRIDGE LENGTH	0.000 MILES
BOX BRIDGE LENGTH	0.000 MILES
PROJECT LENGTH	2.023 MILES

TRAFFIC DATA

ADT (2013)	4,270
ADT (2033)	5,130
DHV (2033)	564
D	65 - 35
T (ADT)	6 %
T (DHV)	4 %
V	60 mph

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

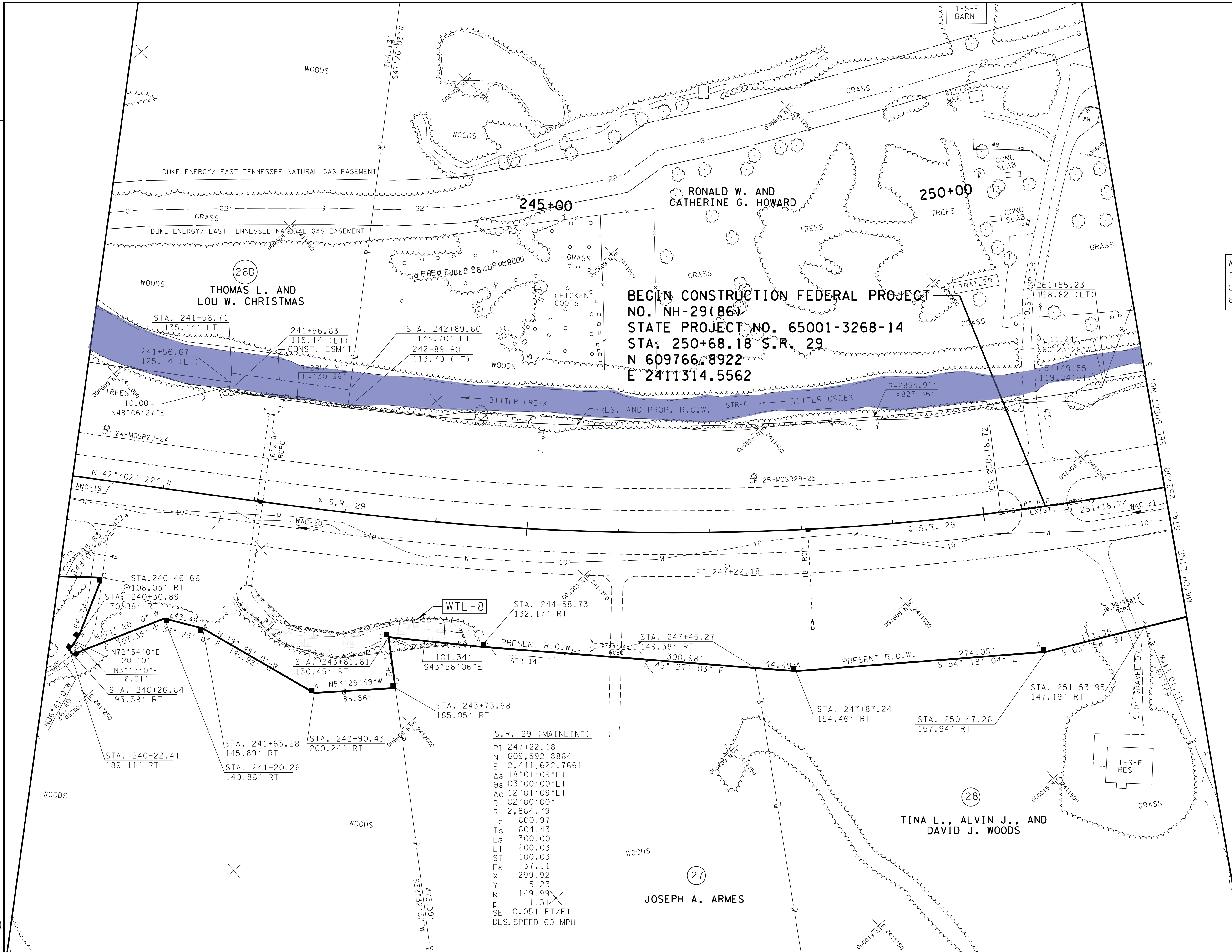
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	17
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	4

06/18/2010 RENUMBERED TRACT 26 LEFT AS TRACT 26D AND REVISED OWNERSHIP.

1/26/2011: ADDED BEARING LABEL TO PROPERTY LINE AT STA. 247+30.09.

WWC-19, WWC-20 AND WWC-21 WILL BE IMPACTED BY STATE ROUTE 29 CONSTRUCTION PROJECT 65001-3266-14.



S.R. 29 (MAINLINE)

PI	247+22.18
N	609,592.8864
E	2,411,622.7661
Δs	18°01'09"LT
θs	03°00'00"LT
Δc	12°01'09"LT
D	02°00'00"
R	2,864.79
Lc	600.97
Ts	604.43
Ls	300.00
LT	200.03
ST	100.03
Es	37.11
X	299.92
Y	5.23
k	149.99
p	1.31
SE	0.051 FT/FT
DES. SPEED	60 MPH

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 240+00 TO STA. 252+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	17A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	4A

06/18/2010: INCREASED PROPOSED WIDTH OF VARIOUS DRIVES.

245+00

250+00

BEGIN CONSTRUCTION FEDERAL PROJECT
NO. NH-29(86)
STATE PROJECT NO. 65001-3268-14
STA. 250+68.18 S.R. 29
N 609766.8922
E 2411314.5562

BITTER CREEK

STR-6

TOP OF BANK

SEE SHEET NO. 5A

ICS 250+18.72

N 42° 02' 22" W

℄ S.R. 29

16' x 4' RCBC

24'R.

18" RCP EXIST.

PI 251+18.74

STA. 252+00

MATCH LINE

PI 247+22.18

18" RCP

STA. 250+90.00

WWC-21

6' x 4' x 35' RCBC

WWC-20

WTL-8

STR-14

WTL-8

S.R. 29 (MAINLINE)

PI	247+22.18
N	609,592.8864
E	2,411,622.7661
Δs	18°01'09"LT
Θs	03°00'00"LT
Δc	12°01'09"LT
D	02°00'00"
R	2,864.79
Lc	600.97
Ts	604.43
Ls	300.00
LT	200.03
ST	100.03
Es	37.11
X	299.92
Y	5.23
k	149.99
p	1.31
SE	0.051 FT/FT
DES. SPEED	60 MPH

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Survey & Design Division

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 240+00 TO STA. 252+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	18
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	5

12/16/2011: ADDED TRACT 8030 AND REMOVED DRIVEWAYS AT STA. 256+05.92 AND STA. 256+94.04

END CONSTRUCTION FEDERAL PROJECT NO. NH-29(84)
STATE PROJECT NO. 65001-3266-14
STA. 259+00.00 S.R. 29
N 610184.6893
E 2410595.3063

255+00
260+00
WILLIAM A. NEWCOMB
WOODS
BITTER CREEK
STR-6
STR-15
N59°53'34"W 1173.52'
END STR-15 IMPACT STA. 259+74
INV. EL. OUT 795.30
PRES. AND PROP. R.O.W.
CUT
263+30.75 126.25 (LT)
263+48.97 126.26 (LT)
18.23' N60°04'51"W
GATE
1-S-BL BLDG
INV=795.42
INV=799.95
CP 27-MGSR29-27
CP-S01195
EL-807.95
(TO BE REMOVED)
INV=804.13
ST 253+18.72
CP 26-MGSR29-26
N 60° 03' 31" W
WTL-11
WTL-10
WWC-21 @ S.R. 29
GRADED SOLID ROCK 300'X100'X2.5'
27' OF 18" PERFORATED PIPE INV. EL. IN 797.19
INV=796.44
BEGIN STR-15 IMPACT STA. 260+02 518.07 N59°56'34"W
262+61.90 52.32 (RT)
STA. 258+34.52 103.72' RT
STA. 258+94.79 148.04' RT
262+47.28 91.42 (RT)
B101
B102
TEMP. DRAINAGE DITCH CLASS A-1 RIP-RAP (TO BE REMOVED)
PROPOSED R.O.W.
385.14' S 63° 37' 36" E
210.10'
88.98'
STA. 257+45.71 109.26' RT
74.81' S 23° 44' 04" E
195.09' S28°06'36"W
202.44' S28°06'50"W
STA. 255+36.02 122.34' RT
GRAVEL
TO BE REMOVED
SHED
8030
OWEN HARRIS AND WIFE, CLARA HARRIS
210.01' S61°53'24"E
STA. 259+31.28 238.54' RT
N 15° 34' 23" E 121.26' PROP. R.O.W.
261.45' S 58° 27' 10" E
PROPOSED R.O.W.
STA. 262+22.72 363.34' RT
68.27' S 5° 7' 23" W
STA. 262+51.37 425.30' RT
PROPOSED R.O.W. N 20° 1' 56" E 622.47'
348.57'
97.59' N7° 58' 58" E
1105.66' N85°01'32"W
29
DON E. WHITUS
28
31
JOSEPH A. ARMES
WOODS
MATCH LINE STA. 252+00 SEE SHEET NO. 4
MATCH LINE STA. 264+00 SEE SHEET NO. 6
MATCH LINE SEE SHEET NO. 19C

APR AREAS	ESTIMATED VOLUMES (CUYD) STA. 261+00 - 270+75 SR 29,
- APR - Encapsulation Required	4,200
- APR - Encapsulation or Partial Blending Required	4,700
- APR - Blending Required	2,500

WWC-21 WILL BE IMPACTED BY STATE ROUTE 29 CONSTRUCTION PROJECT 65001-3266-14.

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PROPOSED R.O.W.

WTL-10 STA 259+66	
LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.069 AC.
	VOLUME OF PERMANENT IMPACT = 112 C.Y.
	AREA OF TEMPORARY IMPACT = 0.000 AC.
	VOLUME OF TEMPORARY IMPACT = 0.000 C.Y.

WTL-11 STA 262+11 TO 266+57	
LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.17 AC.
	VOLUME OF PERMANENT IMPACT = 276 C.Y.
	AREA OF TEMPORARY IMPACT = 0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-15 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

N

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 252+00 TO STA. 264+00

SCALE: 1"= 50'

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	18A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	5A

06/18/2010: INCREASED PROPOSED WIDTH OF VARIOUS DRIVES.

12/16/2011: REMOVED DRIVEWAYS AT STA 256+05.92 AND STA 256+94.04.

RIP-RAP SHALL BE PLACED AS TO MIMIC THE EXISTING CONTOURS OF THE STREAM CHANNEL. THE TOP OF THE PROPOSED RIP-RAP SHALL BE AT GRADE WITH THE BOTTOM OF THE EXISTING STREAM CHANNEL. VOIDS WITHIN THE RIP-RAP SHALL BE FILLED WITH CREEK GRAVEL TO PREVENT LOSS OF STREAM WITHIN RIP-RAP AREAS. CREEK GRAVEL CAN BE REMOVE FROM CULVERT EXCAVATION AREA.

255+00

260+00

END CONSTRUCTION FEDERAL PROJECT NO. NH-29(84)
STATE PROJECT NO. 65001-3266-14
STA. 259+00.00 S.R. 29
N 610184.6893
E 2410595.3063

BITTER CREEK
STR-6
TOP OF BANK
STR-15

SEE SHEET NO. 4A
MATCH LINE STA. 252+00

SEE SHEET NO. 6A
MATCH LINE STA. 264+00

℄ S.R. 29

LIMIT OF CONST.
STA. 11+95.00

STA. 253+58.00
12.0' FIELD ENT.
6'X4'X37' R.C.B.C.

INV.EL.
OUT 784.12
45 EW

INV. EL.
OUT 782.46

WWC-21

INV. EL.
IN 783.08

RELOCATED WWC-21. SEE PROJ. NO. 65001-3266-14 CONST. PLANS FOR MORE DETAILS.

LIST 253+18.72

44 *38
STA. 254+07.17
MEDIAN DRAIN
GR. EL. 793.00
INV. EL. 788.75

OBLITERATE, TOPSOIL AND SOD

18" RCP

R 15'

BEGIN SP. DT. RT.
3' "T" CLASS C RIP-RAP
STA. 258+80 SR-29

END SP. DT. RT.
3' "T" CLASS C RIP-RAP
BEGIN SP. DT. RT.
CONCRETE
STA. 259+00 SR-29

END STR-15 IMPACT
STA. 259+74

CLASS B RIP-RAP
18'X12'X2.5'

INV. EL.
OUT 795.30

69' OF 36" RCP

24'

N 60° 03' 31" W

GRADED SOLID ROCK
300'X100'X2.5'

27' OF 18" PERFORATED PIPE INV. EL. IN 797.15
BEGIN STR-15 IMPACT
STA. 259+77

36" RCP

BEGIN RETAINING WALL 1
STA. 259+39.15, 63.61 RT.
TOP ELEV. 804.60'

STA. 259+50

STA. 260+38.16
12.0' FIELD ENT.
26' OF 18" S.D. REQD.

LIMIT OF CONST.
STA. 11+29.10

STA. 260+00.00
DITCH DRAIN
OFFSET 70.25 RT.
GR. EL. 813.22
INV. EL. OUT 796.50
46 *39

STA. 260+00.00
OFFSET 60.0' RT.
GR. EL. 802.32
INV. EL. IN 796.46
OUT 795.93
47 *41

STA. 260+00.00
MEDIAN DRAIN
OFFSET 0.0'
GR. EL. 800.49
INV. EL. IN 795.67 36" RCP
OUT 795.64 36" RCP
IN 797.15 18" RCP
IN 797.15 18" PERFORATED PIPE
44A *38

18" RCP

STA. 262+00
MEDIAN DRAIN
OFFSET 0.0'
GR. EL. 802.91
INV. EL. IN 798.26
OUT 798.06
49 *38

STA. 262+00
OFFSET 60.0' RT.
GR. EL. 804.85
INV. EL. IN 799.63
OUT 799.43
48 *41

INV. EL.
OUT 804.13
50 EW

LIMIT OF CONST.
STA. 11+27.22

STA. 263+50.00
15.0' PVT. DR.
26' OF 18" S.D. REQD.

R 25'
R 20'

24' R.

STA. 263+25.00

STA. 263+75.00

INV. EL.
IN 804.72
51 EW

STA. 264+00
OFFSET 60.0' RT.
GR. EL. 807.27
INV. EL. OUT 802.05
52 *41

N

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 252+00 TO STA. 264+00

SCALE: 1"= 50'

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	19
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	6

06/18/2010: REVISED OWNER NAME FOR TRACT 33.

1/26/2011: ADDED BEARING AND DISTANCE LABEL FOR PRESENT AND PROPOSED R.O.W. FROM STA. 269+08.91 121.32 (LT) TO STA. 277+15.55 104.28 (LT)

12/16/2011: REVISED PROPERTY LINES ON TRACT 32 AND ADDED TRACT 8032.

- APR - Encapsulation Required
- APR - Encapsulation or Partial Blending Required
- APR - Blending Required

SEE SHEET 5 FOR ESTIMATED APR MATERIAL QUANTITIES FOR THIS SHEET

WTL-11 STA 262+11 TO 266+57	
LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.17 AC.
	VOLUME OF PERMANENT IMPACT = 276 C.Y.
	AREA OF TEMPORARY IMPACT = 0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6 AND STR-16 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

MATCH LINE STA. 264+00 SEE SHEET NO. 5

MATCH LINE STA. 275+00 SEE SHEET NO. 7

MATCH LINE SEE SHEET NO. 19C

S.R. 29 (MAINLINE)
PI 267+57.22
N 610612.538
E 2409852.495
Δ 01 °36'20"LT
D 00 °15'00"
R 22918.31
T 321.11
Lc 642.18
SE NC
DES. SPEED 60 MPH
TRANS. LENGTH 0 FT.

S.R. 29 (MAINLINE)
PI 273+99.43
N 610917.377
E 2409287.196
Δ 01 °36'20"RT
D 00 °15'00"
R 22920.78
T 321.14
Lc 642.25
SE NC
DES. SPEED 60 MPH
TRANS. LENGTH 0 FT.

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 264+00 TO STA. 276+00

SCALE: 1"= 50'

Survey & Design Section

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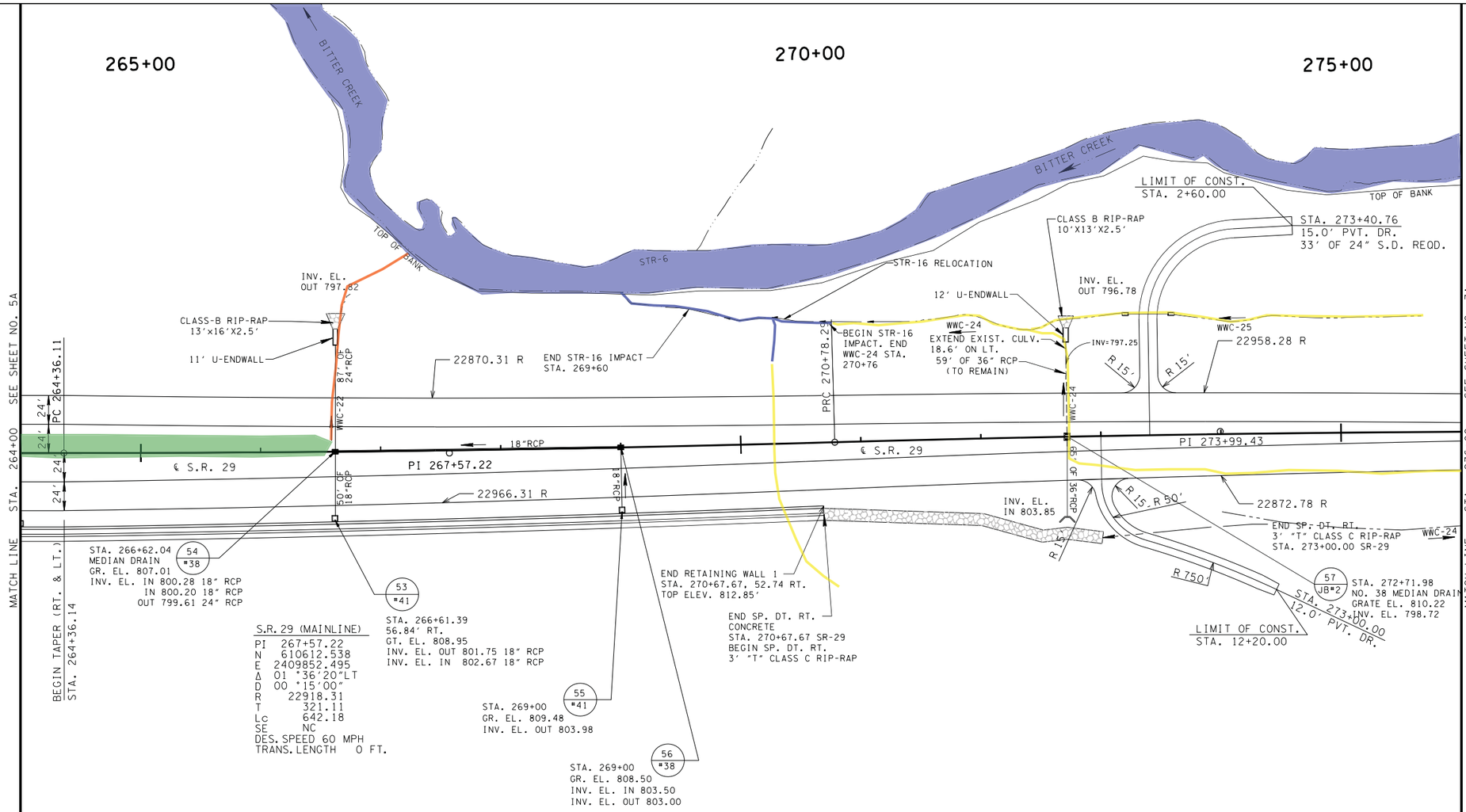
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	19A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	6A

06/18/2010: INCREASED PROPOSED WIDTH OF VARIOUS DRIVES.

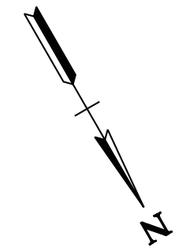
12/16/2011: DELETED PRIVATE DRIVE STA. 270+67.61.

STREAM 16 IS IN MAINTAINED LAWN, REPLACE IN-KIND.



S.R. 29 (MAINLINE)
PI 267+57.22
N 610612.538
E 2409852.495
Δ 01 °36'20"LT
D 00 °15'00"
R 22918.31
T 321.11
Lc 642.18
SE NC
DES. SPEED 60 MPH
TRANS. LENGTH 0 FT.

S.R. 29 (MAINLINE)
PI 273+99.43
N 610917.377
E 2409287.196
Δ 01 °36'20"RT
D 00 °15'00"
R 22920.78
T 321.14
Lc 642.25
SE NC
DES. SPEED 60 MPH
TRANS. LENGTH 0 FT.



COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 264+00 TO STA. 276+00

SCALE: 1"= 50'

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Survey & Design Division

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	20
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	7

06/18/2010: ADDED TRACT 57 LEFT OF 281+00. REVISED OWNER NAME FOR TRACTS 33 AND 33A.

1/26/2011: REVISED DRAINAGE EASEMENT DIMENSIONS ON EACH SIDE OF SR-29.

12/16/2011: ADDED TRACT 8032 AND UPDATED DRAINAGE EASEMENT LABELS ON TRACT 33 AND 33A. REVISED DRAINAGE EASEMENT DIMENSIONS TO BREAK AT PROPERTY LINE BETWEEN TRACT 57 AND 58. ADDED INSERT OF TRACT 8032.

04/20/2012: REVISED PROPOSED ROW LINES TRACT 33A IN ORDER TO AVOID SEPTIC TANK.

07/20/2012: ADDED TRACT 8057

280+00

285+00

287+00

276+00

WOODS

18
CNX GAS CO., LLC

8057 57
WILLIAM TURNER
(IMPAIRED ACCESS)

STA. 276+34.08
105.01' LT

25.00
S 30° 24' 32" W

30.00
N 59° 40' 04" W

STA. 276+64.20
129.71' LT

25.00
N 30° 24' 28" E

BITTER CREEK

205.09'
N72° 11' 01" W

STA. 276+34.38
130.01' LT
PERMANENT
DRAINAGE
EASEMENT

STA. 276+63.94
104.71' LT

58
DONALD G. JONES

1-S-M BLDG

49
DONALD G. JONES

30.50'
N59° 50' 29" W

S22° 47' 17" W
134.88'

CONST. ESM'T.

PRES. AND PROP. R.O.W.

GRASS

277+15.55
104.28 (LT)

INV. EL.
OUT 801.04

51.85'
N59° 46' 56" W

30.00'
N59° 46' 56" W

SEE SHEET NO. 6

STA. 276+00

MATCH LINE

N 60° 03' 31" W

S.R. 29

PI 277+20.54

END EPH-27

362.90'
S 59° 18' 01" E

INV. EL.
IN 804.27

277+45.53
75.84 (RT)

STA. 277+48.98
94.73' RT

PROPOSED R.O.W.

FILL R=3921.51'
L=322.94'

CUT

299.06'
S57° 52' 00" E

INV. EL.
IN 807.08

WWC-24
EXTEND EXIST. RCBC.
54' ON RIGHT

STA. 279+91.06
98.69' RT

GRASS
CONST. ESM'T.

STA. 279+92.01
139.30' RT

BEGIN STR-17
IMPACT
STA. 280+71

STA. 280+57.13
96.28' RT

15.00
S 20° 08' 19" W

STA. 280+61.33
110.75' RT

19.28'
S57° 52' 00" E

15.91
S57° 51' 59" E

PERMANENT
DRAINAGE
EASEMENT

24.98
S 57° 51' 59" E

223.38'
S45° 00' 00" E

77.01'
S25° 53' 00" E

137.35'
S12° 37' 00" E

052119 NE 2408250

052119 NE 2408750

000119 NE 2408600

PERMANENT
DRAINAGE
EASEMENT

25.70'
N 57° 05' 06" W

25.27'
N 19° 06' 53" E

STA. 280+38.58
129.58' LT

25.00'
N 20° 08' 19" E

STA. 280+44.54
105.40' LT
EXTEND EXIST. RCBC.
25' ON LEFT

281+37.30
107.89 (LT)

STR-6/BITTER CREEK

TOP OF BANK

15.32'
N 57° 05' 06" W

STA. 280+00.10
128.68' LT

100.00'
N48° 04' 07" W

N 13° 14' 27" W
166.63'

TRAILER

SHED

1-S-BL BLDG

GRAVEL DR

STA. 279+99.59
119.48' LT

STA. 280+05.65
104.38' LT

1-S-BL BLDG

STA. 279+99.59
104.48' LT

R=3656.43'
L=266.61'

GRASS FILL

END STR-17
IMPACT
STA. 280+28

INV=804.85

R=3656.42'
L=15.82

280+20.68
104.52 (LT)

CP 29-MGSR29-29
N33° 6' 0" E
21.26'

R=3921.51'
L=57.69'

PI 279+95.48

INV=800.67

INV=807.26

INV=807.96

INV=806.26

INV=801.66

STA. 282+37.22
76.69' RT

STA. 283+29.09
85.06' RT

WWC-27

STA. 284+50.00
109.47' RT

END EPH-28
BEGIN EPH-27

284+94.21
71.80 (RT)

PRESENT R.O.W.

R=1390.15'

L=339.42'
87.07'

S40° 21' 39" E

STA. 281+00.44
93.47' RT

281+36.91
71.21 (RT)

ASP DR

15.00
N 20° 08' 19" E

STA. 281+05.08
107.83' RT
21.61'
S57° 52' 00" E

RES2-S-E

TO BE REMOVED

SEPTIC TANK

S29° 24' 09" E
716.28'

WOODS

GRASS 29.96'
S 34° 06' 57" E
41.50'
S61° 48' 25" W

L=276.68

PROPOSED R.O.W.

STA. 284+82.38
111.79' RT

BEGIN EPH-28

273.97'
S34° 06' 57" E

WOODS & CR

33A
RAYMOND W. AND
ANNIE T. CURTIS

N33° 6' 0" E
14.67'

STA. 280+78.33
109.75' RT

STA. 280+79.8
137.04' RT

MOBILE HOME

SHED

WOODS

S67° 48' 25" W
407.46'

S.R. 29 (MAINLINE)

PI 285+49.98
N 611,491.6548
E 2,408,290.1643
Δs 46° 46' 48" (RT)
θs 8° 00' 00"
Δc 30° 46' 48" (RT)
D 4° 00' 00"
R 1,432.39
Lc 769.50
Ts 821.44
Ls 400.00
LT 266.94
ST 133.58
Es 133.32
X 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH

34
MICHAEL YEARY

SHED

N 25° 13' 0" E
328.30'

EAST TENNESSEE / DUKE ENERGY NATURAL GAS EASEMENT

G-150'

SHED

SHED

N18° 21' 01" W
24.01'

316.68'
S79° 19' 12" W

36

33
DONALD G. JONES

8032
LANDON KEITH BASS

TRAIL

52.74'
N05° 29' 00" E

185.24'
S10° 43' 00" W

43.69'

052119 NE 2409250

005119 NE 2409000

052119 NE 2409000

005119 NE 2408250

005119 NE 2408000

000119 NE 2408580

285+15.05
109.70 (LT)

WOODS

286+84.94
108.08 (LT)
GRASS

204.53'
S46° 44' 30" W

PI 285+45.98
PRES. AND PROP. R.O.W.

DOG PEN
R=1397.06'
L=553.97'

FILL

TRAILER

SEE SHEET NO. 8

14.92'
N09° 01' 54" E

110.00'
S03° 12' 02" E

240.00'
N60° 02' 18" W

168.52'
S52° 12' 23" E

34.32'
S02° 55' 36" W

87.34'
S85° 14' 56" W

97.07'
S17° 09' 00" E

S27° 42' 00" E
129.56'

S36° 00' 00" E
155.19'

643.05'
S00° 36' 10" E

223.38'
S45° 00' 00" E

S25° 53' 00" E
137.35'

77.01'
S12° 37' 00" E

52.74'
N05° 29' 00" E

195.24'
S10° 43' 00" W

394.25'
S02° 1' 00" E

157.65'
S05° 57' 00" E

238.32'
N53° 27' 00" E

389.13'
N75° 42' 00" E

43.69'
S10° 58' 00" W

8032
LANDON KEITH BASS

N

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

INSERT
NOT TO SCALE

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 276+00 TO STA. 287+00

SCALE: 1"= 50'

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	20A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	7A

06/18/2010: INCREASED PROPOSED WIDTH OF VARIOUS DRIVES.

RIP-RAP SHALL BE PLACED AS TO MIMIC THE EXISTING CONTOURS OF THE STREAM CHANNEL. THE TOP OF THE PROPOSED RIP-RAP SHALL BE AT GRADE WITH THE BOTTOM OF THE EXISTING STREAM CHANNEL. VOIDS WITHIN THE RIP-RAP SHALL BE FILLED WITH CREEK GRAVEL TO PREVENT LOSS OF STREAM WITHIN RIP-RAP AREAS. CREEK GRAVEL CAN BE REMOVE FROM CULVERT EXCAVATION AREA.

TDOT STANDARD DRAWING STD-15-16A, LOW FLOW CHANNEL CONSTRUCTION DETAILS FOR CULVERT INLET AND OUTLET, SHALL BE APPLICABLE TO THE CONSTRUCTION OF THE BOX CULVERT ON STR-17.

280+00

285+00

BITTER CREEK
TOP OF BANK
STA. 279+88.86
T.O. PVT. DR.
LIMIT OF CONST.
STA. 1+83.56
STR-6
WWC-26
CLASS-B RIP-RAP
19'X22'X2.5'
14' U-ENDWALL
INV. EL.
OUT 801.04
END STR-17
IMPACT
STA. 280+28
22'X55'X3.5' CLASS C RIP RAP. EXCAVATED STREAM BED/COBBLE SHALL BE PLACED ON TOP OF RIP-RAP TO FILL VOIDS.
EXTEND EXIST. RCBC.
25' ON LEFT
STR-6/BITTER CREEK
TOP OF BANK
STR-17
TYPE 13
INV. EL.
OUT 804.32
INV=804.85
TYPE INLINE
TYPE 2
TYPE 38
R 15'
3067'x12'x5'
RCBC
(TO REMAIN)
END SP. DT. RT.
5' "T" RIP RAP CLASS B
STA. 281+36.00 SR-29
PI 279+95.48
PI 285+45.98
MATCH LINE
STA. 276+00
SEE SHEET NO. 6A
N 60° 03' 31" W
℄ S.R. 29
30'
TS 277+18.54
SC 281+81.54
INV=806.26
INV. EL.
IN 807.08
TYPE 13
TYPE 2
TYPE 38
TYPE INLINE
R 15'
BEGIN SP. DT. RT.
5' "T" RIP RAP CLASS A1
STA. 280+00.00 SR-29
END SP. DT. RT.
5' "T" RIP RAP CLASS A1
STA. 280+40.00 SR-29
EXTEND EXIST. RCBC.
54' ON RIGHT
BEGIN STR-17
IMPACT
STA. 280+71
140' OF 30" RCP
WWC-24
INV. EL.
IN 804.27
END TAPER (RT. & LT.)
STA. 277+20.53
STA. 279+76.38
12.0' PVT. DR.
LIMIT OF CONST.
STA. 11+70.00
STR-17 FORKED CREEK
TOP OF BANK
STA. 281+53.14
12.0' PVT. DR.
25° OF 36" S.D. REQD.
BEGIN SP. DT. RT.
5' "T" GRASS
W/ E.C. BLANKET TYPE II
STA. 281+72.00 SR-29
END SP. DT. RT.
5' "T" GRASS
W/ E.C. BLANKET TYPE II
STA. 283+50.00 SR-29
LIMIT OF CONST.
STA. 1+32.85
BEGIN SP. DT. RT.
5' "T" RIP RAP CLASS B
STA. 281+00.00 SR-29
22'X55'X3.5' CLASS C RIP RAP. EXCAVATED STREAM BED/COBBLE SHALL BE PLACED ON TOP OF RIP-RAP TO FILL VOIDS.
WWC-28
WWC-27
LIMIT OF CONST.
STA. 1+52.00
STA. 286+09.25
12.0' FIELD ENT.
38° OF 36" S.D. REQD.
SEE SHEET NO. 8A
STA. 287+00
MATCH LINE

S.R. 29 (MAINLINE)

PI 285+49.98
N 611,491.6546
E 2,408,290.1643
Δs 46° 46' 48" (RT)
θs 8° 00' 00"
Δc 30° 46' 48" (RT)
D 4° 00' 00"
R 1,432.39
Lc 769.50
Ts 821.44
Ls 400.00
LT 266.94
ST 133.58
Es 133.32
X 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH

N

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 276+00 TO STA. 287+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	21
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	8

06/18/2010: ADDED PRESENT R.O.W. LABELS.

1/26/2011: CHANGED TRACT 38 TO 8038. ADDED TRACT 38A AND INSERT OF TRACT NUMBER 38A AND 8038.

12/16/2011: RENAMED TRACT 38A TO 38 AND REVISED OWNER NAME.

APR AREAS	ESTIMATED VOLUMES (CUYD) STA. 293+50 - 297+50 SR 29,
- APR - Encapsulation Required	3,100
- APR - Encapsulation or Partial Blending Required	1,400
- APR - Blending Required	2,600

290+00
295+00
PAUL W. AND LESLIE YEARY
EDDY AND CORDELIA T. YEARY
JUDITH C. LEE
ANDREW V. AND ETHEL YEARY
POS STA. 290+51.96 S.R. 29 = POT STA. 50+00.00 WHETSTONE ROAD
N 612052.6872
E 2408162.2162
BITTER CREEK
TOP OF BANK
SEE SHEET NO. 7
SEE SHEET NO. 9
MATCH LINE STA. 281+00
MATCH LINE STA. 298+00
PRES. AND PROP. R.O.W.
PRESENT R.O.W.
PROPOSED R.O.W.
S.R. 29
WHETSTONE ROAD
STEVEN BRUCE LANE AND MARSHA CAROL LANE
WILLIAM R. AND WANDA D. TURNER
STEPHANIE YEARY PINKERTON
JOSEPH A. ARMES
LIMIT OF CONST. WHETSTONE ROAD STA. 52+53.55 N 612027.0451 E 2408405.8009

WHETSTONE ROAD (RT.)
PI 51+11.94
N 612,082.8230
E 2,408,270.0229
Δ 37°57'02"RT
D 28°00'00"
R 204.63
T 70.36
Lc 135.54
SE 0.067 FT/FT
DES. SPEED 20 MPH

INSERT (NOT TO SCALE)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 287+00 TO STA. 298+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	21A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	8A

06/18/2010: INCREASED PROPOSED WIDTH OF VARIOUS DRIVES.

290+00

295+00

POS STA. 290+51.96 S.R. 29 =
POT STA. 50+00.00 WHETSTONE ROAD
N 612052.6872
E 2408162.2162

STA. 287+80.72
15.0' PVT. DR.

STA. 289+90.00
12.0' PVT. DR.

STA. 290+64.60
12.0' PVT. DR.

STA. 292+07.14
12.0' PVT. DR.
25' OF 18" S.D. REQD.

STA. 294+15.74
12.0' FIELD ENT.

LIMIT OF CONST.
STA. 1+08.22

LIMIT OF CONST.
STA. 1+51.00

LIMIT OF CONST.
STA. 11+20.00

LIMIT OF CONST.
STA. 1+28.00

LIMIT OF CONST.
STA. 1+07.00

TOP OF BANK

CLASS B RIP-RAP
10'X13'X2.5'

INV. EL.
OUT 842.47

TYPE 3S

18" RCP

TS 294+72.07

R 15'

PI 290+31.63

N 13° 16' 43" W

30'

℄ S.R. 29

PI 297+12.81

SEE SHEET NO. 9A

MATCH LINE STA. 298+00

MATCH LINE STA. 287+00

SEE SHEET NO. 7A

PC 50+41.58

STA. 50+69.98
35' ø 36" RCP
SKEW 75°

INV. EL.
IN 830.16

WWC-27

INV. EL.
OUT 828.74

STA. 288+98.05

ST 298+98.05

292+50.00

18" RCP

BEGIN TAPER STA. 52+13.55
9.0' LT. & RT.

END TAPER STA. 52+53.55
MATCH EXIST. LT. & RT.

PT 51+77.12

9'

WHETSTONE ROAD

PI 51+11.94

N 74° 22' 57" E

N 67° 40' 01" E

STA. 288+02.06
12.0' PVT. DR.
32' OF 36" S.D. REQD.

LIMIT OF CONST.
STA. 1+02.39

BEGIN RETAINING WALL 2
STA. 291+70.20, 56.45' RT.
TOP ELEV. 842.35'

END SP. DT. RT.
5' "T" RIP RAP CLASS B
STA. 291+70.20 SR-29

BEGIN SP. DT. RT.
5' "T" RIP RAP CLASS B
STA. 290+83.00 SR-29

STA. 297+00.00
GT. EL. 855.61
OFFSET 42.0' RT.
INV. EL. OUT: 843.66
INV. EL. IN: 844.16

59
#41

STA. 295+00.00
GT. EL. 849.66
OFFSET 42.0' RT.
INV. EL. OUT: 845.66

58
#41

LIMIT OF CONST.
WHETSTONE ROAD
STA. 52+53.55
N 612027.0451
E 2408405.8009

WHETSTONE ROAD

WHETSTONE ROAD (RT.)
PI 51+11.94
N 612,082.8230
E 2,408,270.0229
Δ 37°57'02"RT
D 28°00'00"
R 204.63
T 70.36
Lc 135.54
SE 0.067 FT/FT
DES. SPEED 20 MPH

N

COORDINATE VALUES ARE NAD/83(1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 287+00 TO STA. 298+00

SCALE: 1"= 50'

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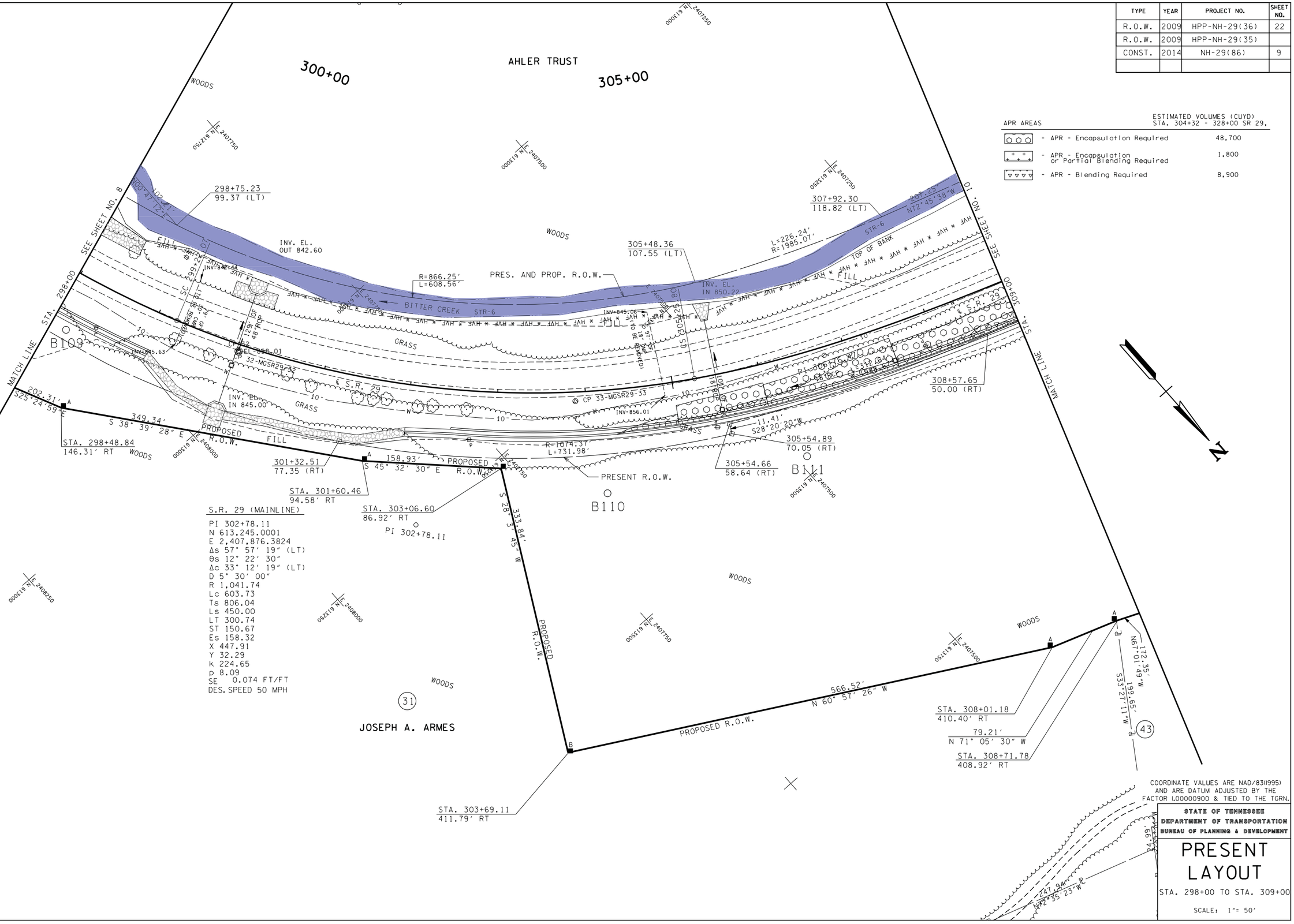
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	22
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	9

APR AREAS

ESTIMATED VOLUMES (CUYD)
STA. 304+32 - 328+00 SR 29.

	- APR - Encapsulation Required	48,700
	- APR - Encapsulation or Partial Blending Required	1,800
	- APR - Blending Required	8,900



S.R. 29 (MAINLINE)

PI 302+78.11
N 613,245.0001
E 2,407,876.3824
Δs 57° 57' 19" (LT)
Θs 12° 22' 30"
Δc 33° 12' 19" (LT)
D 5° 30' 00"
R 1,041.74
Lc 603.73
Ts 806.04
Ls 450.00
LT 300.74
ST 150.67
Es 158.32
X 447.91
Y 32.29
k 224.65
p 8.09
SE 0.074 FT/FT
DES. SPEED 50 MPH

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 298+00 TO STA. 309+00

SCALE: 1"= 50'

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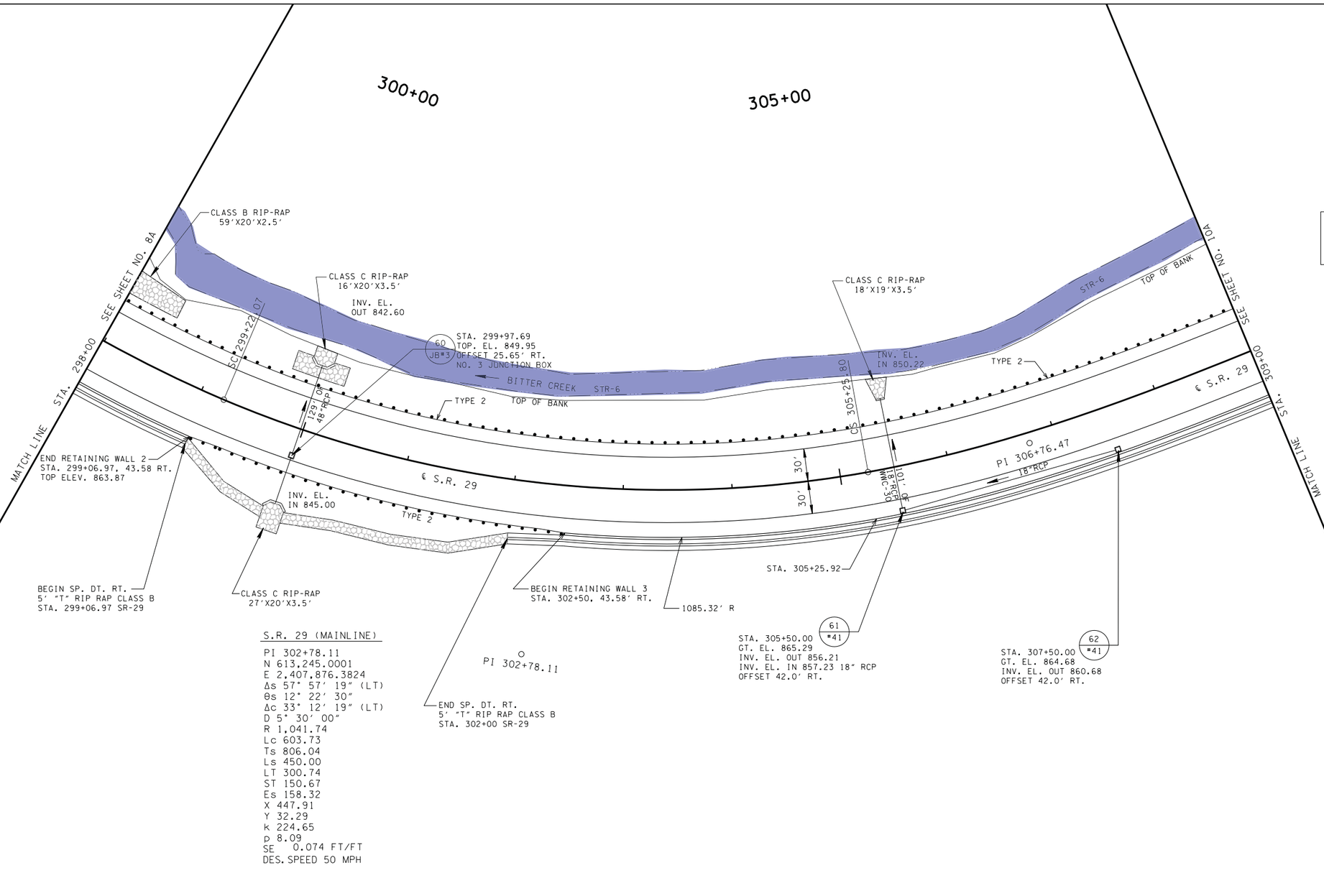
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	22A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	9A

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6 AND ITS VEGETATIVE BUFFER WILL NOT BE DISTURBED AND ARE PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS EXCEPT AT PERMITTED SITES.



S.R. 29 (MAINLINE)

PI 302+78.11
N 613,245.0001
E 2,407,876.3824
Δs 57° 57' 19" (LT)
θs 12° 22' 30"
Δc 33° 12' 19" (LT)
D 5° 30' 00"
R 1,041.74
Lc 603.73
Ts 806.04
Ls 450.00
LT 300.74
ST 150.67
Es 158.32
X 447.91
Y 32.29
k 224.65
p 8.09
SE 0.074 FT/FT
DES. SPEED 50 MPH

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 298+00 TO STA. 309+00

SCALE: 1"= 50'

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	23
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	10

310+00

315+00

AHLER TRUST

WOODS

WOODS

WOODS

WOODS

WOODS

SEE SHEET NO. 9

SEE SHEET NO. 11

MATCH LINE STA. 309+00

MATCH LINE STA. 320+00

310+03.77
126.47 (LT)

313+32.84
109.65 (LT)

314+62.01
119.54 (LT)

316+47.28
119.06 (LT)

318+86.23
123.21 (LT)

319+54.64
133.82 (LT)

PRES. AND PROP. R.O.W.

207.25'
N72°45'38"W

329.83'
N68°18'07"W

132.74'
N74°40'38"W

196.00'
N67°00'30"W

258.81'
STR-6
BITTER CREEK N60°27'19"W

75.29'
N61°29'31"W

INV. EL.
OUT 855.10
INV=850.55

INV. EL.
OUT 857.91

INV. EL.
OUT 857.45

INV. EL.
OUT 858.83

24" RCP(FIELD LOCATED BY ECOLOGIST TOP OF BANK

CUT

PI 318+69.31
CP 14-MGSB29-34"

PI 315+41.41

N74°14'02"W

S.R. 29

PRESENT R.O.W.

N71°27'25"W

INV=859.40

INV=858.29

18" RCP

312+86.54
47.73 (RT)

312+86.54
69.15 (RT)

21.42'
N19°15'47"E

B112

B113

B114

B115

B116

EXTEND EXIST. CULV.
39.6' @ 24 " RCP (RT)

L=1325.86'
R=1743.21'

S.R. 29 (MAINLINE)

PI 318+69.31
N 613,791.7584
E 2,406,267.1809
Δs 30° 44' 12" (RT)
Θs 8° 00' 00"
Δc 14° 44' 12" (RT)
D 4° 00' 00"
R 1,432.39
Ts 594.85
Lc 368.42
Ls 400.00
LT 266.94
ST 133.58
Es 57.94
X 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH

- APR - Encapsulation Required
- APR - Encapsulation or Partial Blending Required
- APR - Blending Required

SEE SHEET 9 FOR ESTIMATED APR MATERIAL QUANTITIES FOR THIS SHEET

31

JOSEPH A. ARMES

310+38.94
421.12 (RT)

312+07.28
433.49 (RT)

313+92.10
446.24 (RT)

316+27.16
450.64 (RT)

319+05.10
425.21 (RT)

172.35'
N67°01'49"W

PROPOSED R.O.W.

168.79'
N67°01'49"W

179.92'
N67°01'49"W

191.73'
N67°01'49"W

195.20'
N67°01'49"W

PROPOSED R.O.W.

179.93'
N67°01'49"W

43

HOUSTON AND
LIANNE HULING

42

RICHARD AND
PATRICIA CLAYTON

199.34'
S33°40'34"W

193.48'
S35°18'48"W

183.12'
S36°09'15"W

172.53'
S37°21'05"W

168.20'
S35°42'35"W

2.30'
N57°27'49"W

63.09'
N70°24'49"W

139.76'
N66°54'49"W

105.00'

50.46'

114.00'
N70°24'49"W

179.80'
N70°24'49"W

191.00'
N70°24'49"W

133.56'

31.50'

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 309+00 TO STA. 320+00

SCALE: 1"= 50'

Survey & Design Division

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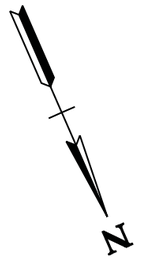
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	23A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	10A

310+00

315+00

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6 AND ITS VEGETATIVE BUFFER WILL NOT BE DISTURBED AND ARE PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS EXCEPT AT PERMITTED SITES.



CLASS B RIP-RAP 23'X20'X2.5'

INV. EL. OUT 855.10

TOP OF BANK

CLASS C RIP-RAP 31'X20'X3.5'

INV. EL. OUT 857.91

BITTER CREEK

67 JB#2 STA. 314+00.00 TOP. EL. 866.99 INV. EL. 858.23 OFFSET 0.0' RT.

INV. EL. OUT 857.45

CLASS B RIP-RAP

STR-6 18'X13'X2.5'

BITTER CREEK

TOP OF BANK

24" RCP (TO REMAIN)

INV. EL. OUT 858.83

SEE SHEET NO. 9A

SEE SHEET NO. 11A

ST 309+75.80

TYPE 2

112' OF 36" RCP

PI 318+69.31

CLASS B RIP-RAP 21'X15'X2.5'

24" RCP MIC-34

PI 315+41.41

N 71° 14' 02" W

℄ S.R. 29

30'

30'

℄ S.R. 29

18"RCP

TS 312+74.47

SC 316+74.47

18"RCP

126' OF 24" RCP

EXTEND EXIST. CULV. 39.6' @ 24 " RCP (RT)

STA. 309+00

STA. 320+00

MATCH LINE

MATCH LINE

63 #41 STA. 309+94.57 GT. EL. 864.66 INV. EL. OUT: 857.37 INV. EL. IN: 858.07 OFFSET 42.0' RT.

64 #41 STA. 312+00.00 GT. EL. 865.79 INV. EL. OUT: 861.79 OFFSET 42.0' RT.

66A #39 STA. 314+15.00 GRATE. EL. 888.10 INV. EL. 884.50 OFFSET 52.25' RT.

18" RCP

66 #41 STA. 314+00.00 GRATE. EL. 866.91 INV. EL. 860.48 OFFSET 42.0' RT.

64A #41 STA. 313+85.00 GT. EL. 888.10 INV. EL. 884.50 OFFSET 52.25' RT.

18" RCP

65 #39 STA. 314+00.00 TOP. EL. 887.99 INV. EL. 861.15 OFFSET 52.25' RT.

68 #41 STA. 317+00.00 GRATE. EL. 867.36 INV. EL. 858.66 OFFSET 42.0' RT.

69 #41 STA. 319+31.50 GT. EL. 869.50 INV. EL. 861.51 OFFSET 42.0' RT.

S.R. 29 (MAINLINE)

PI 318+69.31
N 613,791.7584
E 2,406,267.1809
Δs 30° 44' 12" (RT)
θs 8° 00' 00"
Δc 14° 44' 12" (RT)
D 4° 00' 00"
R 1,432.39
Ts 594.85
Lc 368.42
Ls 400.00
LT 266.94
ST 133.58
Es 57.94
X 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 309+00 TO STA. 320+00

SCALE: 1"= 50'

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Survey & Design Division

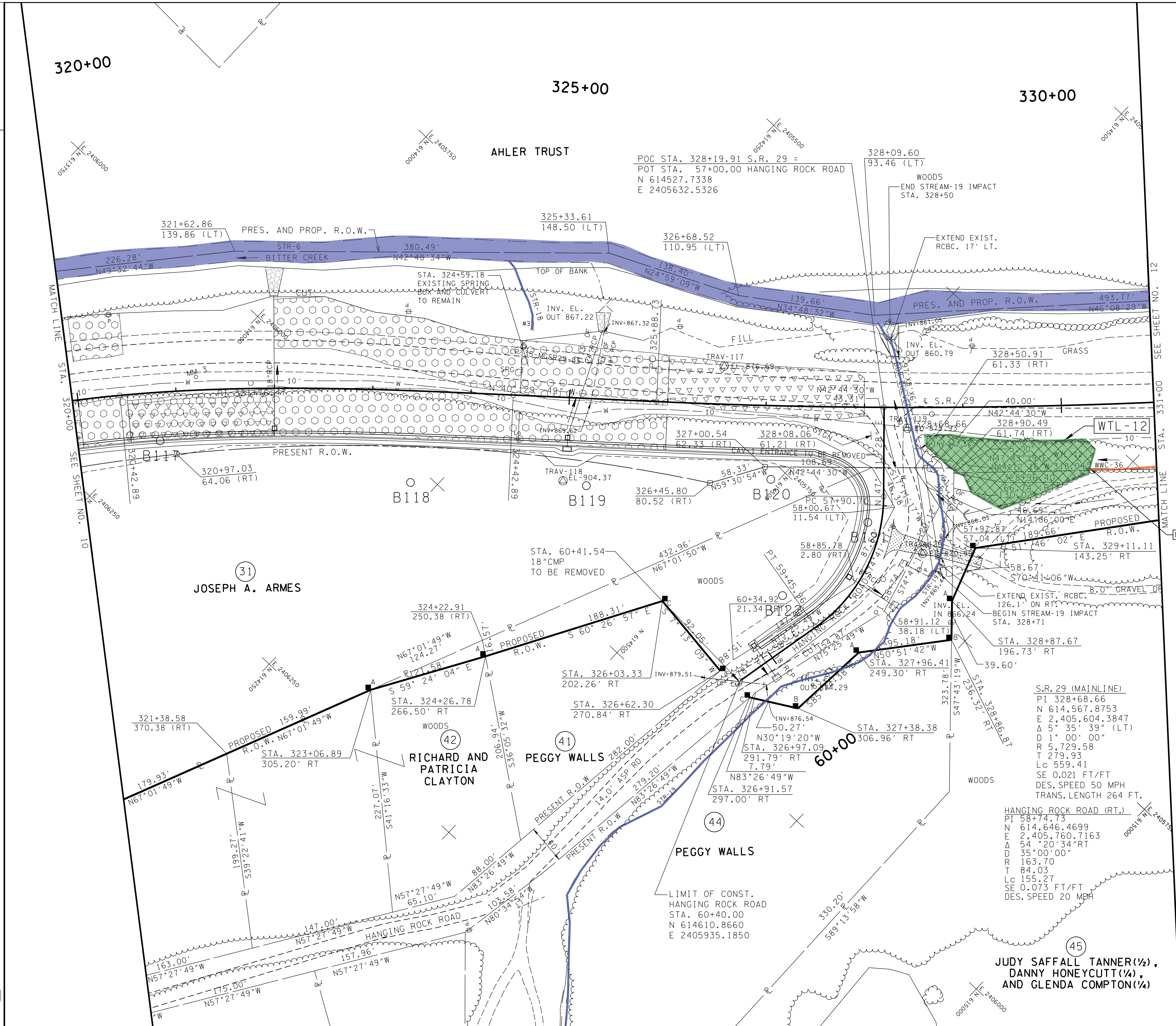
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	24
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	11

06/18/2010: REVISED OWNER NAME FOR TRACT 45

1/26/2011: ADDED PRESENT R.O.W. LABEL (STA 326+97.09 291.79' RT). REVISED BEARING NEAR STA. 328+50.91 61.33 RT. REMOVED PRESENT R.O.W. DIMENSION LABEL (162.59') NEAR STATION 326+91.51 297.00' RT.

2/21/2012: INCREASED WIDTH OF THE PROPOSED DRIVEWAY OFF OF HANGING ROCK ROAD.



WTL-12 STA 328+62 TO 330+33	
LEGEND	WETLAND IMPACTS
(cross-hatch)	AREA OF PERMANENT IMPACT = 0.18 AC.
	VOLUME OF PERMANENT IMPACT = 294 C.Y.
(single hatch)	AREA OF TEMPORARY IMPACT = 0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

- APR - Encapsulation Required
- APR - Encapsulation or Partial Blending Required
- APR - Blending Required

SEE SHEET 9 FOR ESTIMATED APR MATERIAL QUANTITIES FOR THIS SHEET

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6 & STR-19 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 320+00 TO STA. 331+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	24A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	11A

2/21/2012: INCREASED WIDTH OF THE PROPOSED DRIVEWAY OFF OF HANGING ROCK ROAD.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6, STR-18 AND STR-19 AND THEIR VEGETATIVE BUFFER WILL NOT BE DISTURBED AND ARE PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS EXCEPT AT PERMITTED SITES.

TDOT STANDARD DRAWING STD-15-16A, LOW FLOW CHANNEL CONSTRUCTION DETAILS FOR CULVERT INLET AND OUTLET, SHALL BE APPLICABLE TO THE CONSTRUCTION OF THE CULVERT ON STR-19.

320+00

325+00

330+00

POC STA. 328+19.91 S.R. 29 =
POT STA. 57+00.00 HANGING ROCK ROAD
N 614527.7338
E 2405632.5326

END STREAM-19 IMPACT
STA. 328+50

CLASS C RIP-RAP
15'X20'X3.5'

EXTEND EXIST.
RCBC. 17' LT.

END RETAINING WALL 3
STA. 327+72.15, 50.79' RT. S.R. 29
BEGIN RETAINING WALL 3A
STA. 57+50.58, 48.18' RT. HANGING ROCK RD

STR-6
BITTER CREEK

CLASS B RIP-RAP
28'X18'X2.5'

TOP OF BANK

STA. 324+59.18
EXISTING SPRING
BOX AND CULVERT
TO REMAIN

STR-18

INV. EL.
OUT 867.22

CLASS B RIP-RAP
18'X15'X2.5'

TOP OF BANK

INV=861.05

INV. EL.
OUT 860.79

MATCH LINE
STA. 320+00
SEE SHEET NO. 10A

TYPE 38

TYPE 38
SPG-3

TYPE 2

18" RCP

PI 321+76.47

N 40° 29' 49" W

PI 325+88.73

97'X8'X6' RCBC
(TO REMAIN)

℄ S.R. 29

PI 328+68.66

STA. 331+00
SEE SHEET NO. 12A
MATCH LINE

CB 320+42.89

STA. 324+42.89

STA. 322+00.00
GRATE EL. 873.12 (69A #39)
INV. EL. 864.96
OFFSET 42.0' RT.

STA. 325+00.00
GRATE. EL. 876.33 (71 #41)
INV. EL. 869.39
OFFSET 42.0' RT.

STA. 325+00.00
TOP. EL. 889.02 (70 #40)
INV. EL. 869.94
OFFSET 52.25' RT.

STA. 60+83.28
GRATE. EL. 876.33
INV. EL. 870.77 (73 #41)
OFFSET 12.0' RT.

STA. 60+08.00
TOP. EL. 882.08 (72 #39)
INV. EL. 874.90
OFFSET 20.75' RT.

INV. EL.
OUT 864.02 (74 BOX)

PC 57+90.70

N 47° 11' 28" E

BEGIN SP. DT. RT. "V" SOD
STA. 329+00.00 SR-29

END SP. DT. RT. "V" SOD
STA. 330+50.00 SR-29

WWC-36

51' OF 36" RCP

INV. EL.
IN 864.90 (75 EW)

R 15

LIMIT OF CONST.
STA. 11+08.00

STA. 58+31.68
10.0' PVT. DR.

PI 59+45.96

PI 58+74.73

R 15

STR-19

EXTEND EXIST. RCBC.
126.1' ON RT.
BEGIN STREAM-19 IMPACT
STA. 328+71

INV. EL.
IN 866.24

END TAPER STA. 60+40.00
9' LT. & RT.

MATCH EXISTING 8' LT. & RT.

BEGIN TAPER STA. 60+00.00
9' LT. & RT.

HANGING ROCK ROAD

INV=879.51
18" RCP
(TO REMAIN)

18" CMP

18" RCP

INV. EL.
OUT 874.29

CLASS B RIP-RAP
5'X8'X2.5'

INV=876.54

CLASS B RIP-RAP
5'X8'X2.5'

60+00

STR-19

END RETAINING WALL 3A
STA. 60+04.00
HANGING ROCK RD. 13.75 LT.
TOP ELEV. 883.26

LIMIT OF CONST.
HANGING ROCK ROAD
STA. 60+40.00
N 614610.8660
E 2405935.1850

HANGING ROCK ROAD

S.R. 29 (MAINLINE)
PI 328+68.66
N 614,567.8753
E 2,405,604.3847
Δ 5° 35' 39" (LT)
D 1° 00' 00"
R 5,729.58
T 279.93
Lc 559.41
SE 0.021 FT/FT
DES. SPEED 50 MPH
TRANS. LENGTH 264 FT.

HANGING ROCK ROAD (RT.)
PI 58+74.73
N 614,646.4699
E 2,405,760.7163
Δ 54 °20'34"RT
D 35°00'00"
R 163.70
T 84.03
Lc 155.27
SE 0.073 FT/FT
DES. SPEED 20 MPH

N

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 320+00 TO STA. 331+00

SCALE: 1"= 50'

Survey & Design Division

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	25
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	12

06/18/2010: REVISED PRESENT ROW LINE AND PROPERTY LINES FOR TRACTS 45 & 46 LEFT OF STA 338+45.45 TO 342+00 AND REVISED OWNER NAME FOR TRACT 45.

WTL-13 STA 333+00 TO 335+14	
LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.017 AC.
	VOLUME OF PERMANENT IMPACT = 28 C.Y.
	AREA OF TEMPORARY IMPACT = 0.18 AC.
	VOLUME OF TEMPORARY IMPACT = 289 C.Y.

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT WTL-13 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

S.R. 29 (MAINLINE)
PI 340+22.35
N 615,368.2894
E 2,404,772.8918
Δs 28° 01′ 36″ (RT)
θs 8° 00′ 00″
Δc 12° 01′ 36″ (RT)
D 4° 00′ 00″
R 1,432.39
Lc 300.67
Ts 558.52
Ls 400.00
LT 266.94
ST 133.58
Es 48.73
X 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 331+00 TO STA. 342+00

SCALE: 1"= 50'

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Survey & Design Division

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

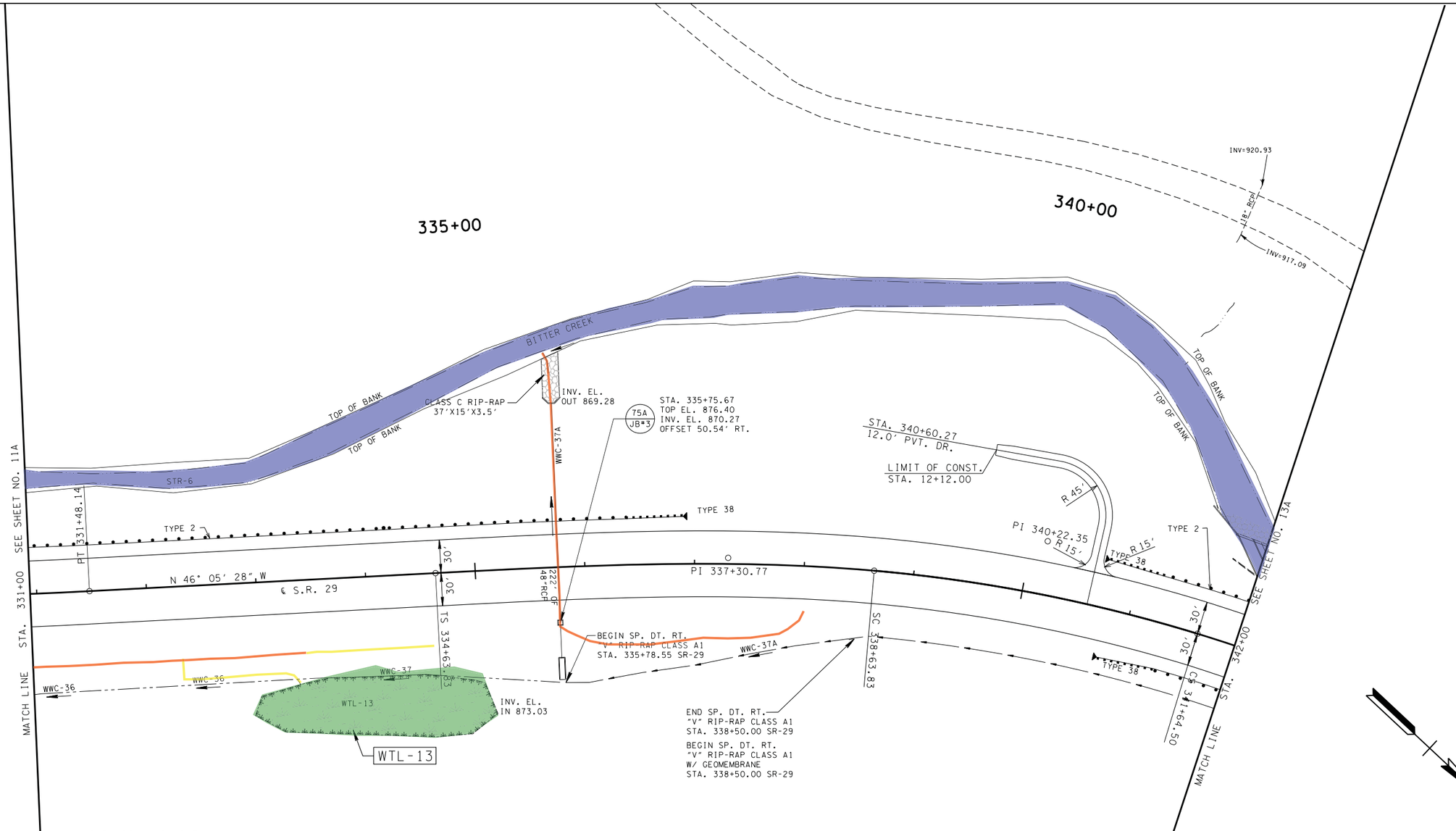
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	25A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	12A

06/18/2010: INCREASED PROPOSED WIDTH OF PRIVATE DRIVE.

RIP-RAP SHALL BE PLACED AS TO MIMIC THE EXISTING CONTOURS OF THE STREAM CHANNEL. THE TOP OF THE PROPOSED RIP-RAP SHALL BE AT GRADE WITH THE BOTTOM OF THE EXISTING STREAM CHANNEL. VOIDS WITHIN THE RIP-RAP SHALL BE FILLED WITH CREEK GRAVEL TO PREVENT LOSS OF STREAM WITHIN RIP-RAP AREAS. CREEK GRAVEL CAN BE REMOVE FROM CULVERT EXCAVATION AREA.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS EXCEPT AT PERMITTED SITES.

SEE SHEET NS-2 FOR TREE PLANTING SCHEME AND SPECIAL NOTES FOR WETLAND MITIGATION ASSOCIATED WITH WETLAND-13.



S.R. 29 (MAINLINE)

PI 340+22.35
N 615,368.2894
E 2,404,772.8910
Δs 28° 01' 36" (RT)
θs 8° 00' 00"
Δc 12° 01' 36" (RT)
D 4° 00' 00"
R 1,432.39
Lc 300.67
Ts 558.52
Ls 400.00
LT 266.94
ST 133.58
Es 48.73
X 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 331+00 TO STA. 342+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	26
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	13

06/18/2010: REVISED PRESENT ROW FROM STA 342+00 TO THE INTERSECTION OF SR-328, OWNERS NAME FOR TRACT 45 AND PROPERTY LINES FOR TRACTS 45 AND 59, AND NOTED CONTROLLED ACCESS R.O.W.

1/26/2011: REVISED PRESENT AND PROPOSED C.A.R.O.W. BEGIN AND END STATION AND ADDED PROPERTY DIMENSIONS ACCORDINGLY.

12/16/2011: REVISED EXISTING R.O.W. DISTANCE BETWEEN STA. 349+22.50 AND STA. 351+11.06 TO 184.51' REVISED OFFSET DIMENSION FOR BEGIN PRES. C.A. R.O.W. ON TRACT 48.

WTL-14 STA 350+76 TO 357+16

LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.33 AC.
	VOLUME OF PERMANENT IMPACT = 523 C.Y.
	AREA OF TEMPORARY IMPACT = 0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6, STR-20, STR-21 AND STR-22 WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

APR AREAS	ESTIMATED VOLUMES (CUYD) STA. 304+32 - 328+00 SR 29,
- APR - Encapsulation Required	100
- APR - Encapsulation or Partial Blending Required	500
- APR - Blending Required	400

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 342+00 TO STA. 353+00

SCALE: 1"= 50'

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	26A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	13A

19'X80'X3.5' CLASS B RIP RAP. EXCAVATED STREAM BED/COBBLE SHALL BE PLACED ON TOP OF RIP-RAP TO FILL VOIDS.

END STR-6 IMPACT STA. 342+12

EXTEND EXIST. SLAB BRIDGE 42' LT.

LIMITS OF CONST. STATE ROUTE 328 STA. 80+18.08 N 615641.8600 E 2404457.7718

BEGIN RETAINING WALL 4A STA. 80+37.06 SR 328, 47.80' LT. TOP ELEV. 916.25'

S.R 328 (LT.)
PI 79+93.54
N 615,611.3428
E 2,404,305.1179
Δ 84°01'17"RT
D 16°15'00"
R 352.59
T 317.59
Lc 517.05
SE 0.074 FT/FT
DES. SPEED 30 MPH

PI 79+93.54

345+00

STA. 80+47.40 34.50' LT.

77 #39 STA. 80+46.63 SR-328 GT EL. 913.46 INV. EL. OUT 894.67 OFFSET 43.94' LT

INV=902.24

24" RCP (TO REMAIN)

INV=899.25

INV. EL. 901.60

S.R. 328

78" RCP

24" RCP

76 JB#2 STA. 80+47.27 SR-328 TOP EL. 897.99 INV. EL. IN 895.48 18" RCP INV. EL. OUT 894.36 24" RCP OFFSET 28.48' LT

BEGIN 3' T-CHANNEL CLASS A-1 RIP-RAP DITCH 342+26

INV. EL. OUT 892.69

END 3' T-CHANNEL CLASS A-1 RIP-RAP DITCH 343+37

85' OF 24" RCP

WWC-39

2'R

30'

100'R

20

TYPE 21

INV. EL. OUT 871.79

INV. EL. OUT 872.00

SHOP CURVE

PT 81+93.00

2'R.

TYPE INLINE

TYPE 2

37'

19'

N 64° 50' 58" E

18

2'R

BEGIN RETAINING WALL 4 STA. 348+02.77, 43.58' LT. TOP ELEV. 909.24'

BEGIN SP. DITCH RT. 3' "T" RIP-RAP CLASS B STA. 348+02.77 S.R. 29

POS STA. 344+41.25 S.R. 29 = POT STA. 82+50.00 S.R. 328 N 615782.2823 E 2404638.4357

2'R.

2'R.

BEGIN STR-20 IMPACT STA. 349+20

END SP. DITCH RT. 3' "T" RIP-RAP CLASS B STA. 349+10.00 S.R. 29

STR-20 MUDDY BRANCH

EXTEND EXIST. BOX CULVERT 20' LT.

END STR-21 IMPACT STA. 349+33

350+00

2029 DHV PM [AM]

140 [140]

59 [81]

81 [59]

S.R. 328

22 [34]

37 [47]

34 [22]

47 [37]

426 [302] 404 [268] 404 [268] 451 [305]

728 [728]

S.R. 29 (U.S. 27)

302 [426] 268 [404] 305 [451]

756 [756]

STA. 350+53.26 14.0' PVT. DR. 10'X4'X33' R.C.B.C.

LIMIT OF CONST. STA. 11+40.35

BEGIN STR-21 IMPACT STA. 352+23

STR-21 RELOCATED STREAM CHANNEL

STR-21

INV. EL. IN 883.5

INV. EL. OUT 883.44

10'X4'X33' RCBC

TYPE 13

TYPE INLINE

INV. EL. IN 880.94

R 15'

TYPE INLINE

TYPE 2

TYPE 38

STR-22 RELOCATED STREAM CHANNEL

SEE SHEET NO. 12A

STA. 342+00

MATCH LINE

N 18° 03' 51" W

℄ S.R. 29

30'

TS 348+88.20

3@176'x12'x9' SLAB BRIDGE (TO REMAIN)

2@15'X8'X102' SLAB BRIDGE (TO REMAIN)

PI 351+55.14

INV. EL. OUT 879.02

TYPE 38

CLASS B RIP-RAP 10'X49'X3.5' PLACE EXCAVATED STREAM BED/COBBLE SHALL BE PLACED ON TOP OF RIP-RAP TO FILL VOIDS.

SC 352+88.20

SEE SHEET NO. 14A

STA. 353+00

MATCH LINE

INV. EL. IN 872.83

INV. EL. IN 873.02

TYPE 2

ST 345+64.50

EXTEND EXIST. SLAB BRIDGE 38' RT. BEGIN STR-6 IMPACT STA. 343+75

BEGIN STR-6 IMPACT STA. 243+75

STR-6

BITTER CREEK

TOP OF BANK

TOP OF BANK

END STR-20 IMPACT STA. 349+20

STR-6

EXTEND EXIST. BOX CULVERT 5' RT.

END SP. DT. RT. "V" RIP-RAP CLASS A1 W/ GEOMEMBRANE STA. 342+50.00 SR-29

END RETAINING WALL 4A STA. 82+39.33 SR 328, 212.69 LT. BEGIN RETAINING WALL 4 STA. 346+49.60 SR 29, 43.58' LT.

N

RIP-RAP SHALL BE PLACED AS TO MIMIC THE EXISTING CONTOURS OF THE STREAM CHANNEL. THE TOP OF THE PROPOSED RIP-RAP SHALL BE AT GRADE WITH THE BOTTOM OF THE EXISTING STREAM CHANNEL. VOIDS WITHIN THE RIP-RAP SHALL BE FILLED WITH CREEK GRAVEL TO PREVENT LOSS OF STREAM WITHIN RIP-RAP AREAS. CREEK GRAVEL CAN BE REMOVE FROM CULVERT EXCAVATION AREA.

SEE SHEETS NS-2 - NS-4 FOR STREAM RELOCATION DETAILS AND SHEET NS-1 FOR STR-21/22 RELOCATION PLAN AND PROFILE.

THE CONTRACTOR SHALL USE ANY MEASURE NECESSARY TO ENSURE THAT STR-6 AND ITS VEGETATIVE BUFFER WILL NOT BE DISTURBED BEYOND THE LIMITS OF DISTURBANCE AND IS PROTECTED FROM SEDIMENT AND OTHER POLLUTANTS.

TDOT STANDARD DRAWING STD-15-16A, LOW FLOW CHANNEL CONSTRUCTION DETAILS FOR CULVERT INLET AND OUTLET, SHALL BE APPLICABLE TO THE CONSTRUCTION OF THE CULVERTS ON STR-6 & STR-20.

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Survey & Design Division

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 342+00 TO STA. 353+00

SCALE: 1"= 50'

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	27
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	14

06/18/2010: REVISED PROPERTY LINES FOR TRACT 31

1/26/2011: REVISED PRESENT AND PROPOSED C.A.R.O.W. LABELS AND ADDED BEARING AND DISTANCE LABEL BETWEEN STA. 355+95.11 AND STA. 356+86.39.

WTL-14 STA 350+76 TO 357+16	
LEGEND	WETLAND IMPACTS
	AREA OF PERMANENT IMPACT = 0.33 AC.
	VOLUME OF PERMANENT IMPACT = 523 C.Y.
	AREA OF TEMPORARY IMPACT = 0 AC.
	VOLUME OF TEMPORARY IMPACT = 0 C.Y.

END RIGHT-OF-WAY FEDERAL PROJECT
NO. HPP-NH-29(35)
STATE PROJECT NO. 65001-2257-14
STA. 357+48.09 S.R. 29 101.52 (LT)

BEGIN PROJECT NO. STP-NHE-29(47) CONST.
STA. 357+48.09 S.R. 29
N 617050.5241
E 2404382.7436

END CONSTRUCTION FEDERAL PROJECT
NO. NH-29(86)
STATE PROJECT NO. 65001-3268-14
STA. 357+48.09 S.R. 29
N 617050.5241
E 2404382.7436

48 GEORGE EDWARDS, III AND JOHN TALIAFERRO

59 NICK AND JUDY TANNER

31 JOSEPH A. ARMES

355+00

360+00

STA. 355+17.69
145.00' LT

STA. 356+46.00
130.00' LT

STA. 357+48.09
101.52' LT

R= 1577.39
S 5° 28' 28" E
L.=252.72

TRAV-131 EL-888.17

TRAV-130 EL-897.90

139.46' S 07° 34' 01" W

110.41' S 19° 34' 45" W

467.93' S 29° 16' 15" E (TOTAL 1177.83' R)

PROPOSED R.O.W.
PROPOSED STR-22 RELOCATION
CUT
PRESENT ROW
FILL
TOP OF BANK
BITTER CREEK
BALFOUR DR.
MATCH LINE STA. 353+00
SEE SHEET NO. 13

355+96.03
73.38 (LT)

355+95.11
63.41 (LT)

356+86.39
58.17 (LT)

WTL-14

PI 354+09.02

℄ S.R. 29

PI 356+51.27

BEGIN STR-22
IMPACT STA.
356+22

CP-128 EL-897.59
CP-129 EL-895.93

B131 B132 B133

10.01' INV. EL. 882°37'01"E OUT 888.73

INV. EL. N 890.78

INV-890.08 20" CMP (TO BE REMOVED)

INV-890.78

351.80' N06°26'23"E

INV=920.34

INV=918.67

360+35.50
58.65 (LT)

360+35.19
15.75 (LT)

42.89' S82°27'42"E

N 7°-06'-55" E

INV=905.08

485.09' N07°10'41"E

PRESENT R.O.W.

N 7° 06' 55" E

365+20.28
15.22 (LT)

S25°55'48"E 425.89'

365+47.20
50.80 (RT)

(23' ASP.)
3' ASP.
SHLD

511.11' N06°53'36"E

PRESENT R.O.W.

INV=900.38

24" RCP

10" GRAVEL DRIVE

SHED

MOBILE HOME (REMOVED)

INV=888.70

INV=889.68

358+15.38
97.07 (RT)

N 83° 33' 36" W
46.57'

N 7° 18' 35" E
118.25'

359+17.69 BACK
359+20.43 AHEAD

360+36.10
52.78 (RT)

359+34.52
97.77 (RT)

N 18° 36" E
101.25'

45.33' N82°28'20"W

360+35.77
98.12 (RT)

355+74.15
141.83 (RT)

356+34.43
141.41 (RT)

R=1367.02'
L=404.98'

N 5° 52' 27" E
55.79'

N 76° 34' 27" W
42.01'

INV=890.51

N 5° 52' 27" E
121.96'

358+15.51
143.64 (RT)

N 76° 34' 27" W
104.89'

356+88.26
143.22 (RT)

INV=896.65

S.R. 29 (MAINLINE)

PI 354+09.02
N 616,702.1747
E 2,404,337.8298
Δs 25° 10' 46" (RT)
θs 8° 00' 00"
Δc 9° 10' 46" (RT)
D 4° 00' 00"
R 1,432.39
Lc 229.49
Ts 520.82
Ls 400.00
LT 266.94
ST 133.58
Es 40.06
X 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH

NO EQUIPMENT IS TO BE OPERATED IN WETLAND AREAS AND STREAMS LOCATED BEYOND THE PERMITTED LIMITS.

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PRESENT LAYOUT

STA. 353+00 TO STA. 364+74

SCALE: 1"= 50'

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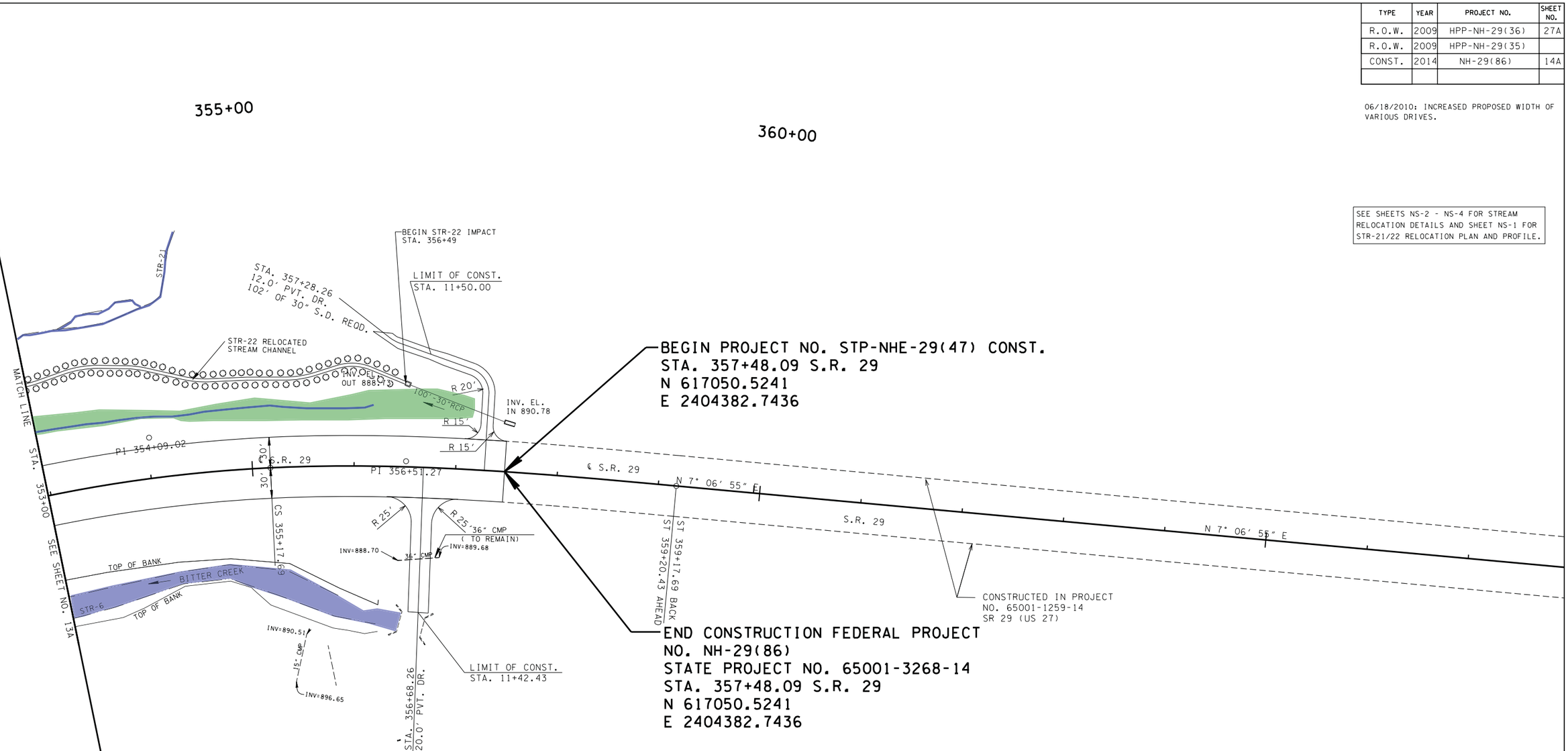
Survey & Design Division

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2009	HPP-NH-29(36)	27A
R.O.W.	2009	HPP-NH-29(35)	
CONST.	2014	NH-29(86)	14A

06/18/2010: INCREASED PROPOSED WIDTH OF VARIOUS DRIVES.

SEE SHEETS NS-2 - NS-4 FOR STREAM RELOCATION DETAILS AND SHEET NS-1 FOR STR-21/22 RELOCATION PLAN AND PROFILE.



BEGIN PROJECT NO. STP-NHE-29(47) CONST.
STA. 357+48.09 S.R. 29
N 617050.5241
E 2404382.7436

END CONSTRUCTION FEDERAL PROJECT
NO. NH-29(86)
STATE PROJECT NO. 65001-3268-14
STA. 357+48.09 S.R. 29
N 617050.5241
E 2404382.7436

S.R. 29 (MAINLINE)

PI 354+09.02
N 616,702.1747
E 2,404,337.8298
Δs 25° 10' 46" (RT)
θs 8° 00' 00"
Δc 9° 10' 46" (RT)
D 4° 00' 00"
R 1,432.39
Lc 229.49
Ts 520.82
Ls 400.00
LT 266.94
ST 133.58
Es 40.06
X 399.22
Y 18.59
k 199.87
p 4.65
SE 0.063 FT/FT
DES. SPEED 50 MPH

N

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00000900 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT

STA. 353+00 TO STA. 360+00

SCALE: 1"= 50'

Survey & Design Division

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NO TMDL Consultation Required