

DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
REGION 9  
ALLEGHENY NATIONAL FOREST

Mud Drop Stewardship Project No. 002

Wintergreen Run Culvert Replacement (Aquatic Organism Passage Simulation) - FR 508 Wintergreen Run

Bradford Ranger District  
McKean County  
Pennsylvania

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The location and design elements of this facility have been correlated with the plans, policies and constraints of the approved Upper Kinzua Environmental Assessment.

Plans are to be used with "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03 with Special Project Specifications thereto included in this contract.

Prepared By:

*Ivan E. Martinez*

Approved By:

*M. Marshall*

District Ranger

7/2/14

Date

*Dave Larson*

Forest Engineer

7-7-2014

Date

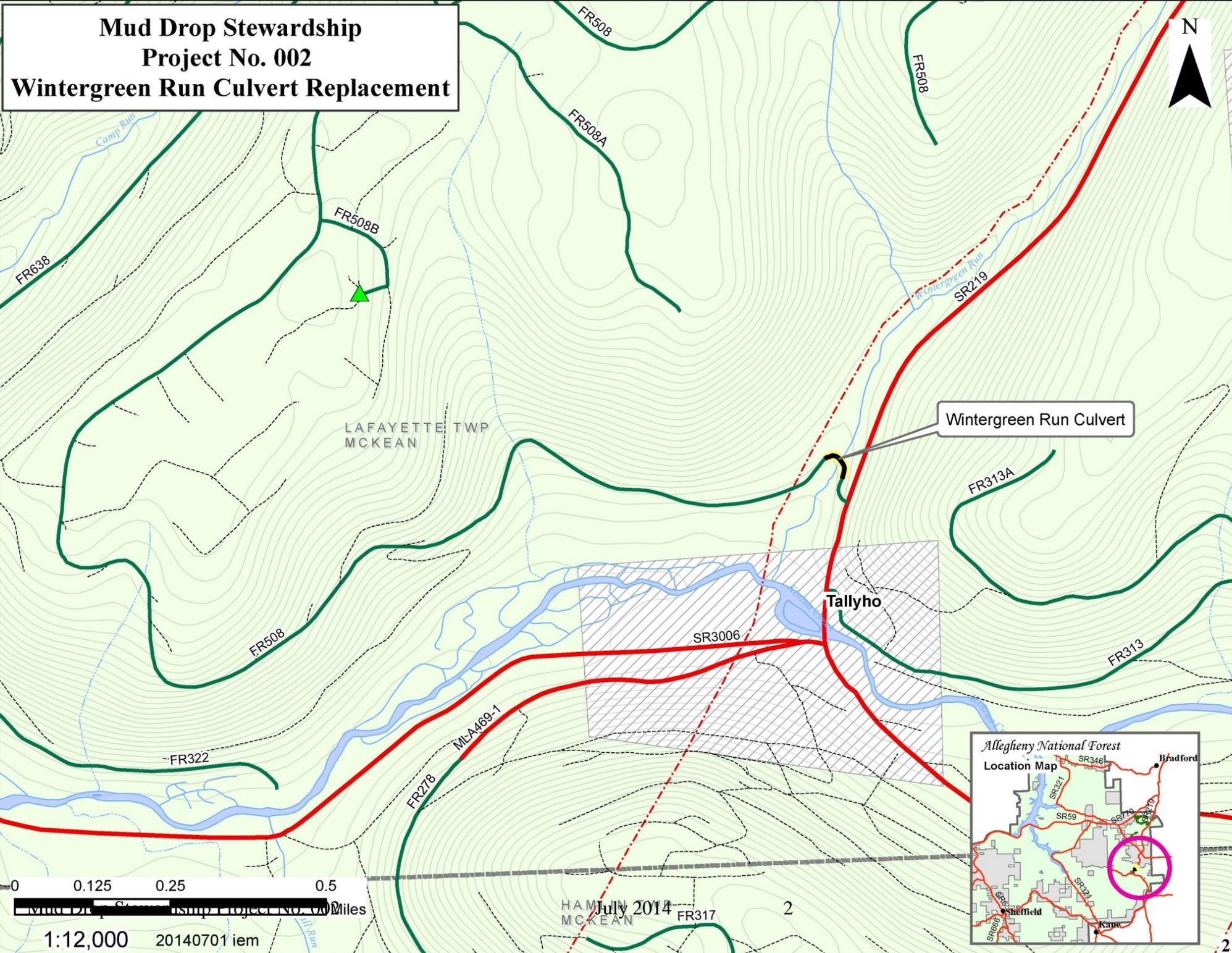
*Jim Seyh*

Forest Supervisor

7-7-14

Date

# Mud Drop Stewardship Project No. 002 Wintergreen Run Culvert Replacement



**Scope of Work:**

The work shall consist of what is shown on the plans, stated in the specifications, and summarized below:

- Initiate design and fabrication of plate structures.
- Install traffic control signs and restrict traffic on Forest Road 508.
- Install the stream-flow diversion system at existing culvert.
- Remove the existing culverts.
- Excavate for the footings.
- Place the footings.
- Construct the stream channel and stream channel banks.
- Erect the metal plate structure.
- Remove stream-flow diversion system and return flow to the channel.
- Remove signs and re-open Forest Road 508
- Seeding, planting, and final site work.

**Project Location:**

The Wintergreen Run culvert site is located approximately 15 miles south of Bradford, Pennsylvania. The culverts are located on Forest Road (FR) 508 in the Allegheny National Forest. The road has a gravel surface.

**Work Procedure:**

All work related to this project shall be done in accordance with all applicable OSHA and State of Pennsylvania regulations.

Construction staging areas shall be designated by the inspector.

**Referenced Specifications:**

Construction shall conform to the specifications in the “Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, U.S. Customary Units” publication FP-03, 2003 Edition. This publication may be obtained from:

Headquarters, Washington D.C.  
 David K. Green  
 Construction Standards Engineer  
 Internet: [david.green@fhwa.dot.gov](mailto:david.green@fhwa.dot.gov)  
 Mail: Federal Highway Administration  
 HFPD-3  
 400 Seventh Street, SW  
 Washington, D.C. 20590

**List of Required Submittals:**

The required submittals shall include, but are not limited to, the following:

	Submittal Type	Plan Sheet Reference	Specification Reference	Description
1	Equipment Inspection	N/A	Special Contract Requirement 107	Equipment Inspection
2	Testing	N/A	Special Contract Requirement 153	Proctor Test
3	Testing	N/A	Special Contract Requirement 153	Aggregate & Structural Backfill Testing
4	Written Plan	N/A	Special Contract Requirement 107	Hazardous Spill Plan
5	Written Plan	N/A	Standard Specification Section 153	Quality Control Plan
6	Written Plan	N/A	Special Contract Requirement 153	Proposal for Alternate Test Methods (if applicable)
7	Written Plan	N/A	Special Contract Requirement 156	Travel Management Safety Plan
8	Written Plan	N/A	Special Contract Requirement 157	Erosion Control Plan
9	Written Plan	N/A	Special Contract Requirement 208	Dewatering and Diversion Plan
10	Certification/Documentation	N/A	Special Contract Requirement 105	Certification of Weed-Free Material
11	Certification/Documentation	N/A	Special Contract Requirement 153	Certification of Testing Personnel
12	Certification/Documentation	N/A	Special Contract Requirement 153	Documentation of Testing Equipment
13	Certification/Documentation	N/A	Special Contract Requirement 208.12	Compaction Test Results

	Submittal Type	Plan Sheet Reference	Specification Reference	Description
14	Certification/Documentation	N/A	Standard & Special Contract Requirement 552	Concrete Test Results
15	Documentation	N/A	Standard Specification 109.01	Measurement notes
16	Documentation	N/A	Special Contract Requirement 155	Construction Schedule
17	Documentation	N/A	Standard Specification 203.05 (a) and (d)	Disposal Agreements, Statements, and Permits
18	Documentation	N/A	Special Contract Requirement 208.06	Cofferdam fill source, construction and restoration method, if applicable
19	Documentation	N/A	Standard Specification 301.03	Target Values for Aggregate
20	Drawings	N/A	Special Contract Requirement 104	As-Built Drawings
21	Drawings	N/A	Standard Specification 208	Working Drawings & Construction Details of Excavation Support Systems (if applicable)
22	Drawings	N/A	Special Contract Requirement 554	Rebar Shop Drawings
23	Drawings	N/A	Special Contract Requirement 603.03(a)	Plate structure Shop Drawings
24	Calculations	N/A	Special Contract Requirement 603.03(a)	Plate structure Calculations
25	Specifications	N/A	Special Contract Requirement 603.03(a)	Plate structure Specifications
26	Specifications	N/A	Standard Specification 603.04	Plate structure Assembly Instructions

## Road Summary

### SPECIFIED ROADS

a. Description of Work:

**FR 508 Wintergreen Run culvert removal and installation**

Mobilization, Construction Survey and Staking, Soil Erosion & Pollution Control, Clearing and Grubbing, Removal of Structures, Topsoil (stockpile) and Placing Conserved Topsoil, Embankment Construction, Structure Excavation, Structural Backfill, Placed Riprap, DSA Limestone, Road Reconditioning, Seeding & Mulching, Installation of Object Markers, Temporary Traffic Control and Placement of Streambed Simulation Rock, Box Culvert Installation and Precast structural concrete footings.

b. Construction Costs:

<u>Road No.</u>	<u>Miles</u>	<u>Engineer's Estimate</u>
508	0.1 ®	\$

c. Completion dates: 9/30/2015

## Schedule of Items

<b>Wintergreen Run Culvert (FR 508)</b>						
<b>Pay Item</b>	<b>Description</b>	<b>Method of Measure</b>	<b>Pay Unit</b>	<b>Estimated Quantity</b>	<b>Engineer's Estimate Unit Price</b>	<b>Engineer's Extended Total</b>
15101	Mobilization (Lump Sum)	LSQ	All	1		\$
15201	Construction survey and staking; method I, tolerance A (Lump Sum)	LSQ	All	1		\$
15713	Soil Erosion & Pollution Control (Lump Sum)	LSQ	All	1		\$
20102	Clearing & Grubbing (Lump Sum)	LSQ	All	1		\$
20305	Removal of structures and obstructions	LSQ	All	1		\$
20422	Topsoil (stockpiled)	CQ	CY	14		\$
20455	Embankment construction	CQ	CY	135		\$
20801	Structure excavation	CQ	CY	535		\$
20803	Structural backfill	CQ	CY	190		\$
20820	OPTION ITEM: Foundation fill including geotextile	AQ	CY	6		\$
20821	OPTION ITEM: Structure rock excavation	AQ	CY	17		\$
25102	Placed riprap, class R-4 limestone	CQ	Ton	46		\$
30115	Aggregate surface course, Type DSA Limestone, compaction method B	CQ	Ton	53		\$
30318	Road reconditioning, roadbed, compaction method B	CQ	Mile	0.1		\$
59001	Precast structural concrete footings, class A (AE)	CQ	LF	73.5		\$
60352	26'-7" span, 5"-5" rise, aluminum structure plate box culvert, 0.250 inch, type VI ribs, square ends	CQ	FT	36		\$
62406	Placing conserved topsoil	CQ	CY	14		\$
62502	Seeding, dry method	CQ	SY	170		\$
62901	Erosion control mat, type 3.B Biodegradable	CQ	SY	170		\$
63306	Object Markers, Type III	CQ	Each	4		\$
63501	Temporary Traffic Control (Lump Sum)	LSQ	All	1		\$

<b>Pay Item</b>	<b>Description</b>	<b>Method of Measure</b>	<b>Pay Unit</b>	<b>Estimated Quantity</b>	<b>Engineer's Estimate Unit Price</b>	<b>Engineer's Extended Total</b>
64867	Placed streambed simulation rock, class 10 method A	CQ	Ton	190		\$
64868	Placed streambed simulation rock, class CR-2 method A	CQ	Ton	81		\$
<b>TOTAL</b>						<b>\$</b>
55204	OPTION ITEM: Replaces item 59001. Structural concrete, cast in place footings (to include all form work, rebar and class A (AE) concrete)	CQ	CY	32		\$

## General Notes

- Prior to any earth disturbing activities, contractor shall call the Pennsylvania One Call System (800-242-1776) and all Oil & Gas Operators in the work area to determine locations of any underground utility lines.
- **OPTION ITEM: Precast structural footings can be installed as specified or they can be cast in place as long as Forest Road 508 closure does not exceed 28 calendar days.**
- Contractor is responsible for maintenance of all Forest Service roads over which pit run or commercial stone material is hauled. Roads shall be bladed or shaped to restore travel way to the condition found prior to haul.
- Culvert cleaning and repair will be considered incidental to road reconditioning.
- Contractor shall install “ROAD CLOSED, TRUCK TRAFFIC and ROAD CONSTRUCTION AHEAD” signs on all roads worked on in this project. Signs shall conform to the Manual on Uniform Traffic Control Devices (MUTCD). Signs shall be covered when construction activity is not taking place.
- Roads shall be completed in such a manner that water shall not pond on roadbed or in ditch lines.
- All removed corrugated metal pipe culverts shall be hauled off Federal lands and become the property of the contractor, unless otherwise indicated for salvage. Steel pipe casings shall be returned to the Sheffield Work Center unless otherwise directed by the Engineer.
- Contouring, topsoil re-spreading, seeding and mulching of disturbed areas as determined by the Forest Service is required.
- DSA limestone shall be shipped at optimum moisture content not exceeding 15%. Limestone loads that fail field test parameters will be rejected.
- When replacing culverts in live streams, contractor shall install silt fence and straw bales at approaches to live stream crossings to eliminate sediment in the stream course. When culverts are located on High Quality and Exceptional Value streams, contractor shall install compost filter socks. Any sediment collected will be removed and ground will be stabilized with seed and mulch. Dewatering pumps will be used to redirect water out of the stream course at the time of stream crossing installation. Silt fence and straw bales will be removed only after vegetation is clearly re-established as determined by the Engineer.
- Roadway sod encountered during road reconditioning operations will be spread and leveled outside the road template avoiding piles. Natural terrain depressions and openings are the preferred waste locations. Seeding and mulching may be required to supplement natural revegetation.
- Vegetation cut down during roadside brushing will be pulled beyond the clearing limits and the toe of any roadway template construction. Mixing of soil and cut vegetation shall be avoided. All material will be scattered and lopped within 3’ of the ground.
- Aggregate stockpiled for culvert replacement will be located on the existing road surface to assure maximum utilization of the material and eliminate disturbance of existing vegetated areas.
- **Contractor shall install silt fence and straw bales at live stream crossings to eliminate sediment in the stream course. Any sediment collected will be removed and stabilized with seed and mulch.**

## Road Log – Work Description

### FR 508 Wintergreen Run (Level C)

Station	Road Log/Work Description
0+00	Intersection State Route 219 and FR 508 <b>Coordinates: Latitude 41° 46' 10.74" N (41.7696)</b> <b>Longitude 78° 43' 5.18" W (-78.7181)</b>
<b>0+00 – 6+00</b>	<b>Recondition roadbed, see TYPICAL RECONDITION SECTION</b>
0+37	STOP sign left
0+45	Road number sign left
1+23	NO OUTLET sign right
1+37	WEIGHT LIMIT sign right
2+55	18" x 38' CMP
<b>3+00 – 4+00</b>	<b>Apply 4" DSA limestone surfacing (53 tons)</b>
<b>3+53</b>	<b>Remove three 83" x 57" x 48' CMPA, install 26'- 7" x 5'-5" x 36' aluminum structural plate box culvert; see Design Drawings for Details. OPTION: Install precast footings or cast footings in place, see Schedule of Items.</b>
3+80	Turnout right
5+54	18" x 24' CMP
<b>6+00</b>	<b>End road reconditioning, road continues</b>

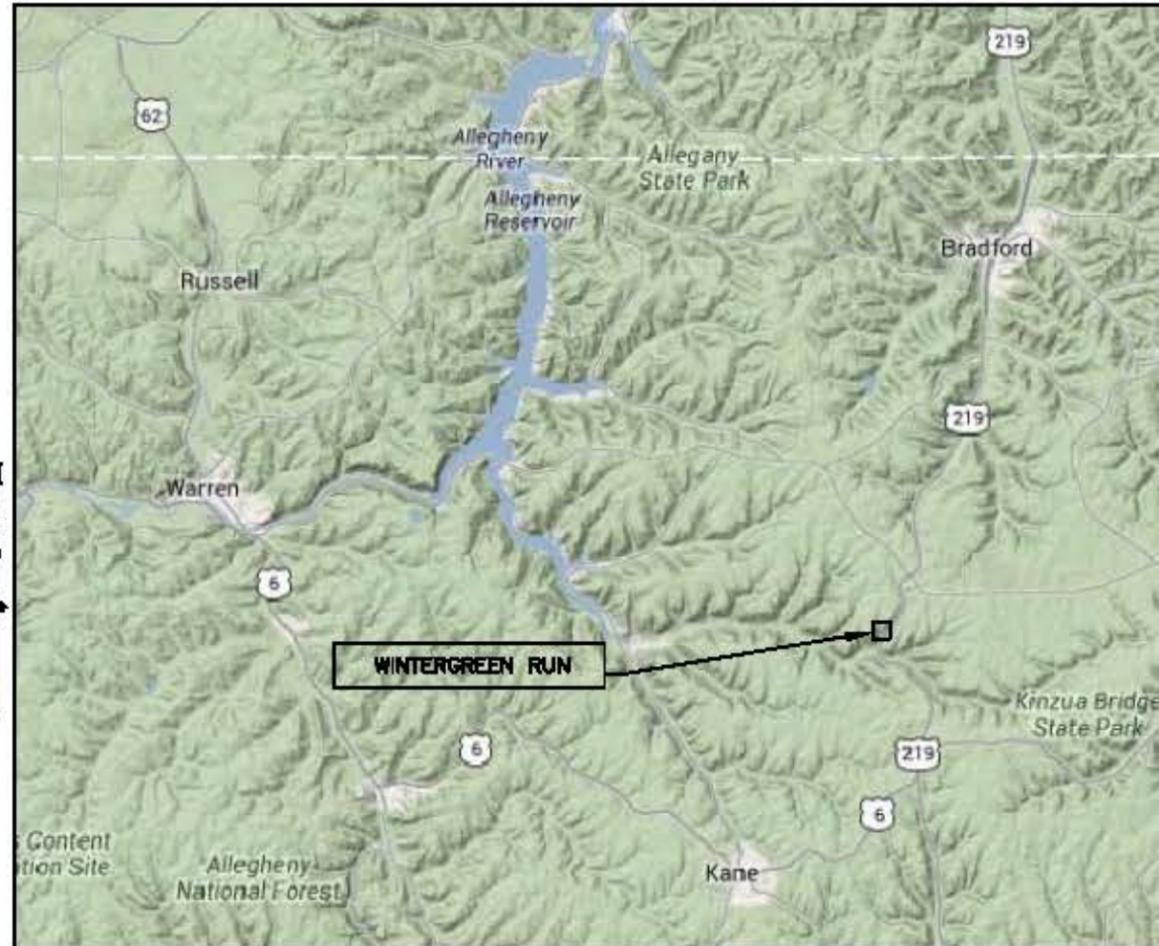
UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

REGION 9  
ALLEGHENY NATIONAL FOREST  
CONSTRUCTION DRAWINGS FOR

WINTERGREEN RUN



STATE VICINITY MAP  
(vms)



VICINITY MAP

INDEX TO SHEETS	
SHEET No.	DESCRIPTION
1	TITLE SHEET
2	BITE LOCATION MAP
3	GENERAL NOTES AND QUANTITIES
4	ROADWAY PLAN AND PROFILE
5	STRUCTURE PLAN AND PROFILE
6	PRECAST FOOTING DETAILS
7	CHANNEL DETAILS AND TYPICAL CROSS SECTIONS
8	MISCELLANEOUS DETAILS

PA One Call System Inc.  
1-800-242-1776  
OR 811  
CALL 3-BUSINESS DAYS IN ADVANCE  
BEFORE YOU DIG, GRADE, OR EXCAVATE  
FOR THE MARKING OF UNDERGROUND  
MEMBER UTILITIES.

APPROVAL SIGNATURES

THESE PLANS COMPLY WITH LAND AND RESOURCE MANAGEMENT PLANS.

*[Signature]* 7/2/14  
DISTRICT RANGER DATE

I APPROVE THIS PROJECT & CERTIFY THAT ADEQUATE FUNDING IS AVAILABLE.  
I APPROVE THE ENGINEERING ASPECT OF THESE PLANS.

*[Signature]* 7-7-2014  
FOREST ENGINEER DATE

U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
**R-9**  
EASTERN REGION  
Mad Drop Stewardship Project No. 002

Forest  
**ALLEGHENY NATIONAL FOREST**  
**WINTERGREEN RUN**

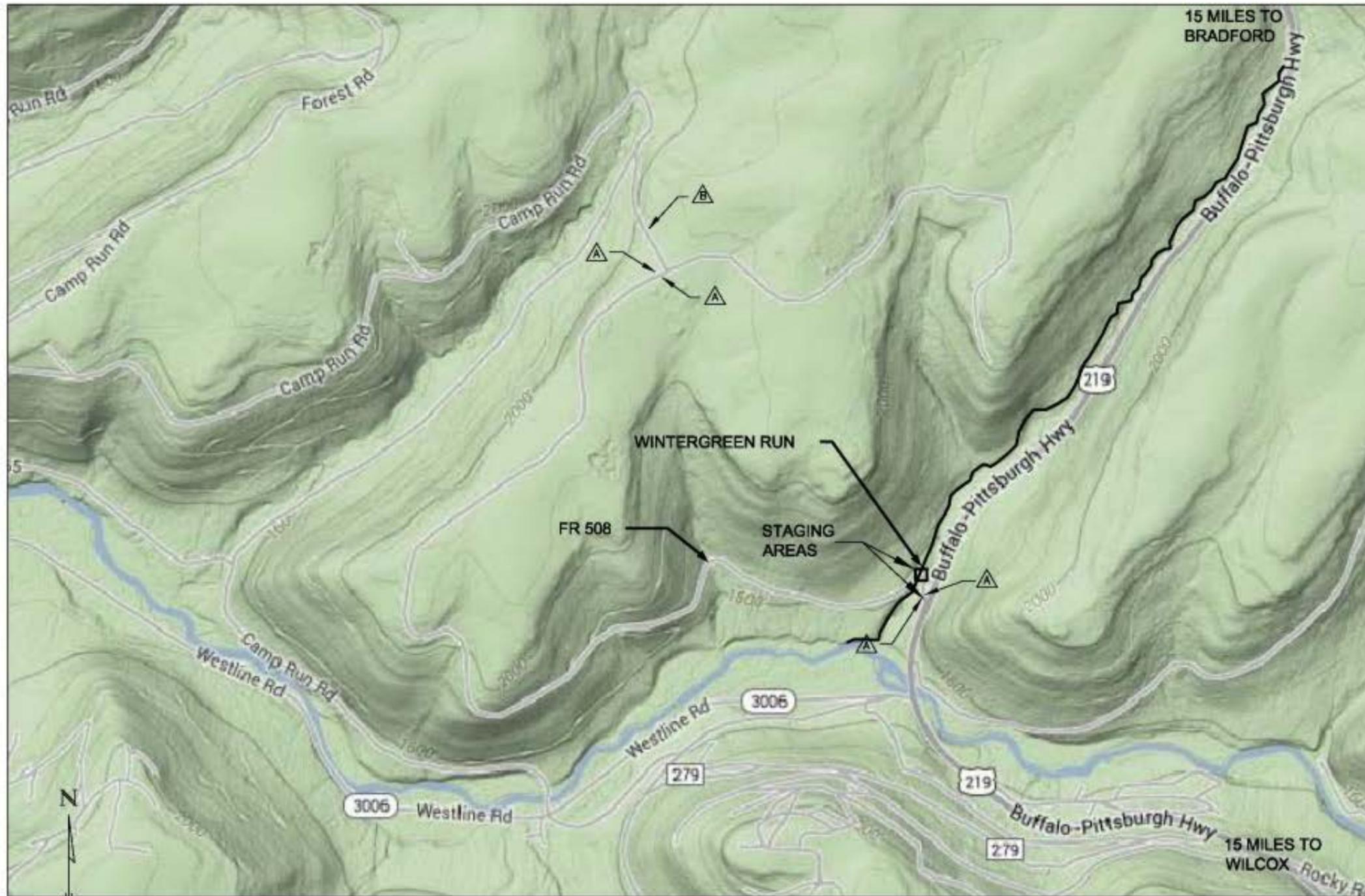
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Sub Sheet:

Project No:

Sheet 1 of 8



**NOTES :**

1. FOR SIGN DETAILS, SEE SHEET 8.
2. TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE CO FOR APPROVAL.
3. FR 508 MAY BE CLOSED DURING CONSTRUCTION. COORDINATE THE CLOSURE WITH THE CO AT LEAST 14 DAYS IN ADVANCE (SEE SPECIAL CONTRACT SPECIFICATION 156)

U.S. DEPARTMENT OF AGRICULTURE  
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**R-9**  
 EASTERN REGION

Forest **ALLEGHENY NATIONAL FOREST**  
**WINTERGREEN RUN**

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Sheet Title: **SITE LOCATION MAP**

Sub Sheet:

Project No:  
 Sheet **2** OF **8**

# GENERAL NOTES

**SPECIFICATIONS :** THE WORK SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP 03 - US CUSTOMARY UNITS) AS MODIFIED FOR THIS CONTRACT.

**UTILITIES :** THE CONTRACTOR IS RESPONSIBLE FOR LOCATING, PROTECTING, MAINTAINING SERVICE, AND COORDINATING OUTAGES OF EXISTING UTILITIES THROUGHOUT THE TERM OF THE CONTRACT.

Notify the Oil and Gas Company prior construction:  
 Dave White, EnerVest, (304) 539-3683 - Cell  
 Randy Spence, EnerVest (304) 539-3679 - Cell (814) 589-7093 - Office

**SALVAGE :** ALL EXISTING CULVERT MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM NATIONAL FOREST LAND IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS.

**EXCAVATION :** ANY EXCESS AND UNSUITABLE EXCAVATION SHALL BE DISPOSED OF IN LOCATIONS AS APPROVED BY THE CO.

**CONCRETE WASTE :** CONCRETE WASTE SHALL BE DISCHARGED AND DISPOSED OF AT THE DIRECTION OF THE CO. CONCRETE SHALL NOT BE DISCHARGED INTO ANY WATERWAY.

**TOPSOIL :** TOPSOIL SHALL BE STRIPPED FROM THE EXCAVATION LIMITS (OUTSIDE THE EXISTING CULVERT) TO A MINIMUM DEPTH OF 3" AND STOCKPILED AS DIRECTED BY THE CO. FINISHED SLOPES SHALL RECEIVE 2"-3" OF TOPSOIL TO THE EXTENT ALLOWED BY EVEN DISTRIBUTION OF THE STOCKPILE.

**REINFORCING STEEL :** REINFORCING STEEL SHALL CONFORM TO AASHTO M 31, 60 ksi (ASTM A615, GRADE 60). ALL REINFORCING SHALL BE BLACK. CLEARANCE TO REINFORCING IS 2" UNLESS NOTED OTHERWISE.

**REINFORCING STEEL LAP SPLICES :** MINIMUM LAP SPLICES SHALL BE AS SHOWN IN THE FOLLOWING CHART. ADJACENT BARS MAY BE LAP SPLICED AT THE SAME LOCATION.

BLACK BARS		
BAR	TOP BAR <sup>Δ</sup>	ALL OTHERS
#3	1'-0"	1'-0"
#4	1'-7"	1'-1"
#5	2'-4"	1'-8"
#6	3'-4"	2'-5"
#7	4'-7"	3'-3"
#8	6'-0"	4'-3"
#9	7'-7"	5'-5"
#10	9'-7"	6'-10"

<sup>Δ</sup> "TOP BAR" REFERS TO A HORIZONTAL BAR WHICH SHALL HAVE MORE THAN 1 FOOT OF CONCRETE CAST BELOW IT.

**CONCRETE :** PRECAST CONCRETE SHALL BE CLASS A(AE) AND SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI UNLESS NOTED OTHERWISE. ALL EDGES SHALL HAVE A 3/4" CHAMFER, UNLESS NOTED OTHERWISE. EXPOSED SURFACES SHALL BE GIVEN A CLASS 2 FINISH, UNLESS NOTED OTHERWISE.

**STRUCTURAL STEEL :** STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 36 (ASTM A709 GRADE 36) OR BETTER UNLESS NOTED OTHERWISE.

**ANCHOR STUDS :** MATERIAL FOR ANCHOR STUD SHAFTS SHALL CONFORM TO AASHTO M169 (ASTM A108 GRADES 1010 TO 1020). MATERIAL FOR THE CAPS SHALL CONFORM TO ASTM A109.

**LIFTING DEVICE :** LIFTING DEVICE, TYPE, LIFTING LOCATION AND DESIGN SHALL BE PROVIDED BY THE CONTRACTOR. REFER TO SPECIAL CONTRACT REQUIREMENT 590. LIFTING DEVICE SHALL BE APPROVED BY THE CO PRIOR TO INSTALLATION.

**PRECAST FOOTING SEGMENT CONNECTIONS (BOLTS) :** BOLTS SHALL BE ASTM A307, 3/4" DIAMETER. TIGHTEN NUTS/BOLTS 1/2 TURN (120°) PAST SNUG TIGHT

## DESIGN DATA

**DESIGN :** THIS STRUCTURE IS DESIGNED FOR HL-93 LOADING IN ACCORDANCE AASHTO LFRD BRIDGE DESIGN SPECIFICATIONS 6TH EDITION WITH CURRENT INTERIMS (REFER TO STANDARD AND SPECIAL SPECIAL PROJECT SPECIFICATION 603).

THE DESIGN DATA ARE AS FOLLOWS:  
 ALLOWABLE BEARING PRESSURE: 3000 PSF  
 STRUCTURAL BACKFILL UNIT WEIGHT: 130 PCF (DRY) AND 140 PCF (SATURATED)  
 LATERAL EARTH PRESSURES: 45 PCF (ACTIVE), 60 PCF (AT-REST) AND 400 PCF (PASSIVE)  
 ANGLE OF FRICTION: 32°  
 ALLOWABLE COEFFICIENT OF BASE SLIDING: 0.50  
 ROADWAY DESIGN SPEED: 15 MPH

**HYDROLOGY AND HYDRAULICS :** THESE STRUCTURES ARE DESIGNED TO PASS A 100-YEAR FREQUENCY FLOOD FOR WINTERGREEN RUN : ( $Q_{100} = 760$  cfs  $V_{100} = 12.5$  ft/sec  $d_{100} = 4.0$  ft.) ( $Q_2 = 182$  cfs,  $V_2 = 6.2$  fps,  $d_2 = 2.2$  ft)

## SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	* METHOD OF MEASUREMENT	PAY UNIT	QUANTITY
				WINTERGREEN RUN
15101	Mobilization	LSQ	LS	1
15201	Construction survey and staking; method I, tolerance A	LSQ	LS	1
15713	Soil erosion and pollution control	LSQ	LS	1
20102	Clearing and grubbing	LSQ	LS	1
20305	Removal of structures and obstructions	LSQ	LS	1
20422	Topsoil (stockpiled)	CQ	CY	14
20455	Embankment construction	CQ	CY	135*
20801	Structure excavation	CQ	CY	535**
20803	Structural backfill	CQ	CY	190
25102	Placed riprap, class R-4 limestone	CQ	TON	46
30115	Agg. surface course, type DSA limestone, compact meth. B	CQ	TON	53
59001	Precast structural concrete footings, class A (AE)	CQ	LF	73.5
60352	26'-7" span, 5'-5" rise, box culvert shell-plate, 0.25 inch	CQ	FT	36
62406	Placing conserved topsoil	CQ	CY	14
62502	Seeding, dry method	CQ	SY	170
62901	Erosion control mat, type 3.B	CQ	SY	170
63306	Object markers, Type III	AQ	EA	4
63501	Temporary traffic control	LSQ	LS	1
64867	Placed streambed simulation rock, class 10 method A	CQ	TON	190
64868	Placed streambed channel rock, class CR-2 method A	CQ	TON	81
20820	OPTION ITEM: Foundation fill including geotextile	AQ	CY	6
20821	OPTION ITEM: Structure rock excavation	AQ	CY	17

- \* AQ = ACTUAL QUANTITIES, CQ = CONTRACT QUANTITIES, LSQ = LUMP SUM QUANTITIES
- NOTE: QUANTITIES ARE FROM CALCULATIONS COMPLETE-IN-PLACE.
- \*\* THE CONTRACTOR MAY USE EXCESS EXCAVATION AS EMBANKMENT AND/OR STRUCTURAL BACKFILL IF THE MATERIAL MEETS THE REQUIREMENTS OF SPECIAL CONTRACT REQUIREMENTS 204 AND 648 RESPECTIVELY.

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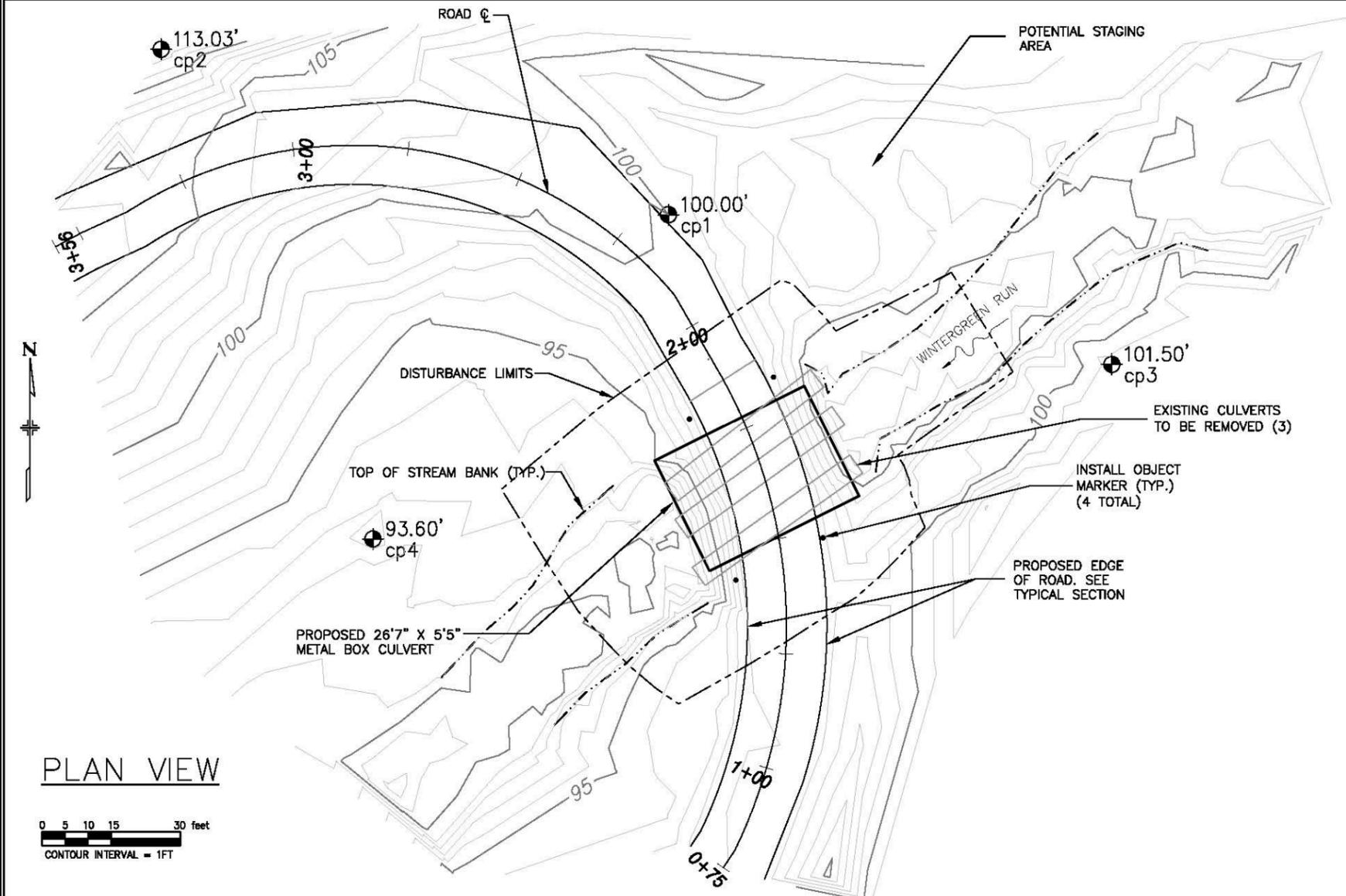
Forest  
**ALLEGHENY NATIONAL FOREST**  
**WINTERGREEN RUN**

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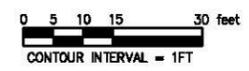
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**GENERAL NOTES AND QUANTITIES**

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Project No:  
 Sheet  
**3 OF 8**

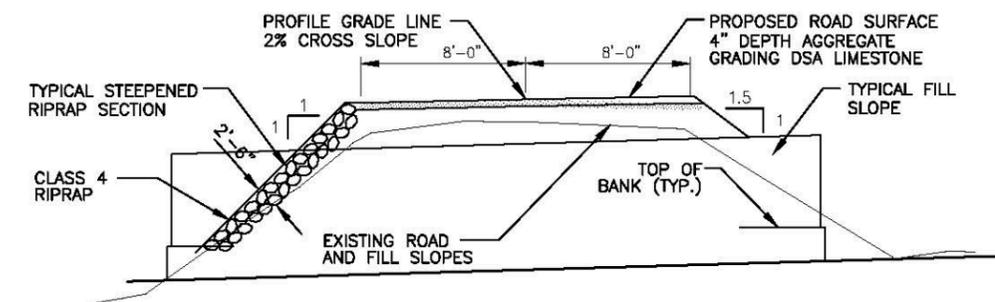


**PLAN VIEW**

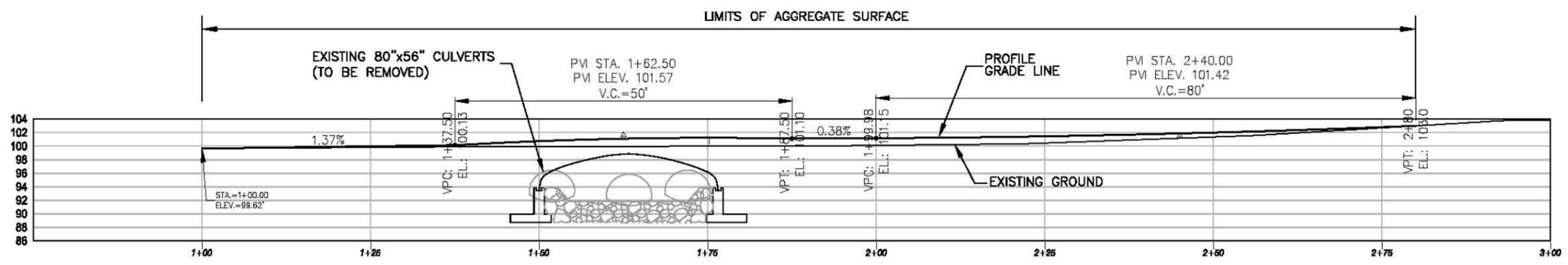


**NOTES :**

1. CONTOURS SHOWN ARE APPROXIMATE. IF THERE IS A DISCREPANCY BETWEEN THE ELEVATION SHOWN FOR A CONTROL POINT AND THE ADJACENT CONTOURS, THE ELEVATION SHOWN FOR THE CONTROL POINT SHALL BE CONSIDERED CORRECT.
2. CLEARING LIMITS SHALL BE 10' BEYOND TOES OF SLOPE AND LIMITS OF CHANNEL WORK UNLESS OTHERWISE DIRECTED BY THE CO.
3. STAGING AREAS SHALL BE APPROVED BY THE CO.
4. LOCATIONS OF SILT FENCE AND SEDIMENT BASINS SHALL BE APPROVED BY THE CO. REFER TO SPECIAL CONTRACT REQUIREMENTS 157.
5. VERTICAL STRUCTURAL EXCAVATION SLOPES SHALL BE USED TO ESTABLISH THE QUANTITY FOR PAYMENT. ACTUAL SLOPES MAY BE FLATTER, BUT NO ADJUSTMENT IN CONTRACT PRICE WILL BE MADE.
6. FOR UTILITY INFORMATION, SEE SHEET 3.
7. FOR RIPRAP REQUIREMENTS, SEE SHEET 4 AND SPECIAL PROJECT SPECIFICATION 251.
8. FOR CHANNEL DETAILS, SEE SHEET 7.



**TYPICAL ROAD SECTION**



**ROAD PROFILE VIEW**

CONTROL POINTS (FT)			
Point #	Northing	Easting	Elevation
cp1	10000.00	10000.00	100.00
cp2	10035.72	9990.06	113.03
cp3	9987.84	10008.08	101.50
cp4	9928.94	9935.85	93.80

ROAD ALIGNMENT INFO			
STA	Northing	Easting	Elevation
0+75	9953.93	10016.91	99.51
1+00	9975.97	10006.16	99.82
1+25	9994.73	9988.97	99.96
1+50	10007.82	9967.84	100.73
1+75	9958.99	10011.91	101.22
2+00	10014.22	9943.61	101.75
2+25	9980.49	10021.24	101.45
2+50	9905.09	10025.41	102.00
2+75	9929.99	10023.94	102.80

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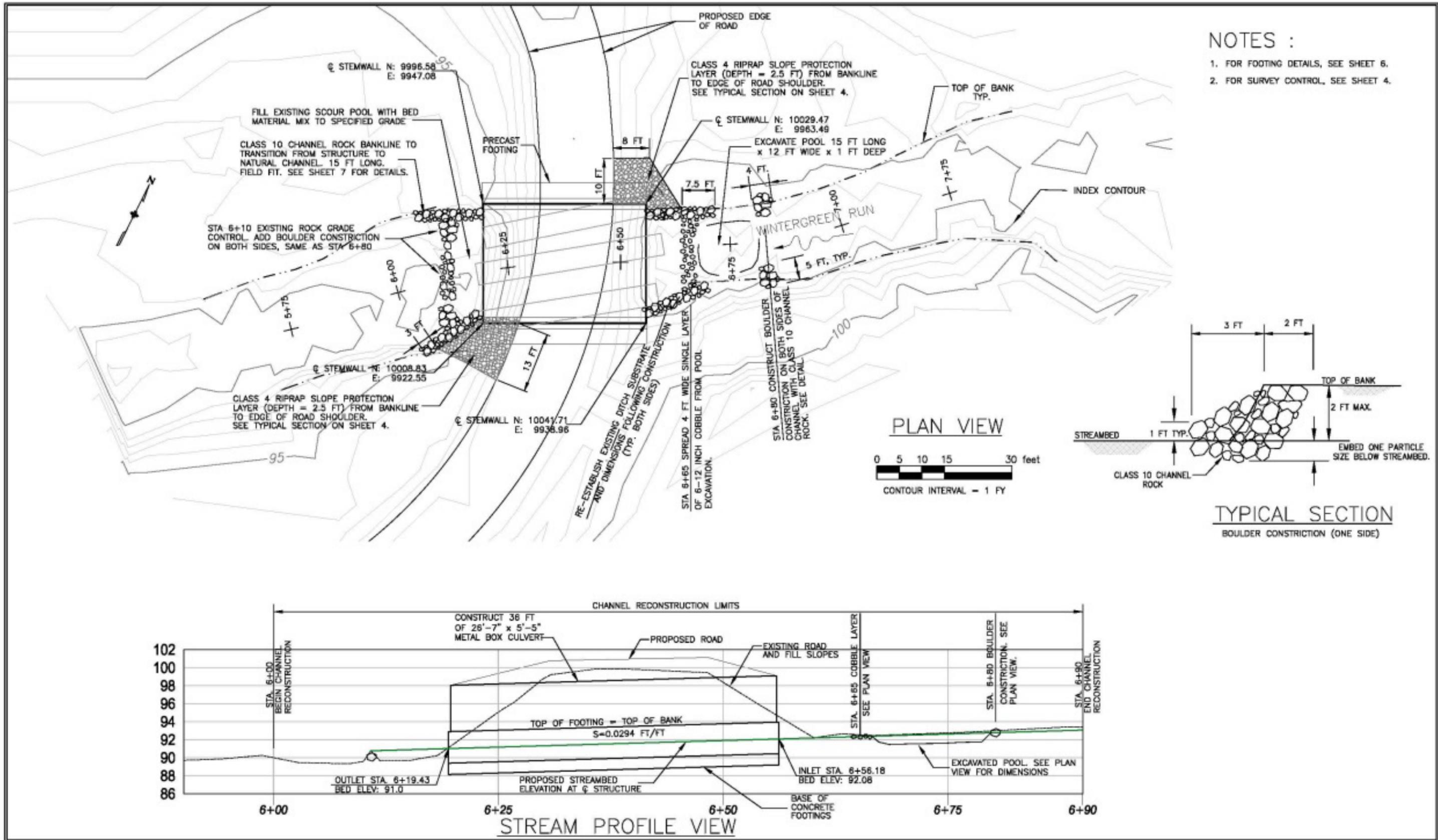
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**ALLEGHENY NATIONAL FOREST**  
**WINTERGREEN RUN**

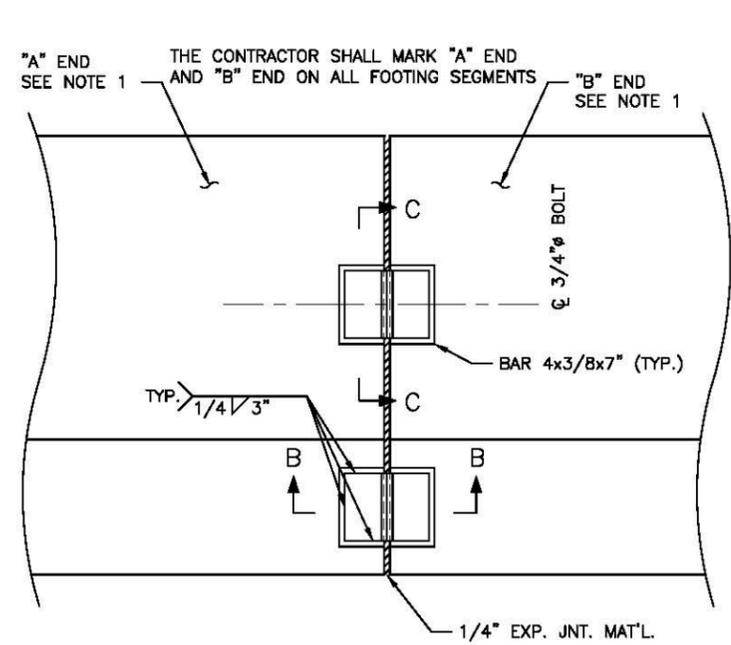
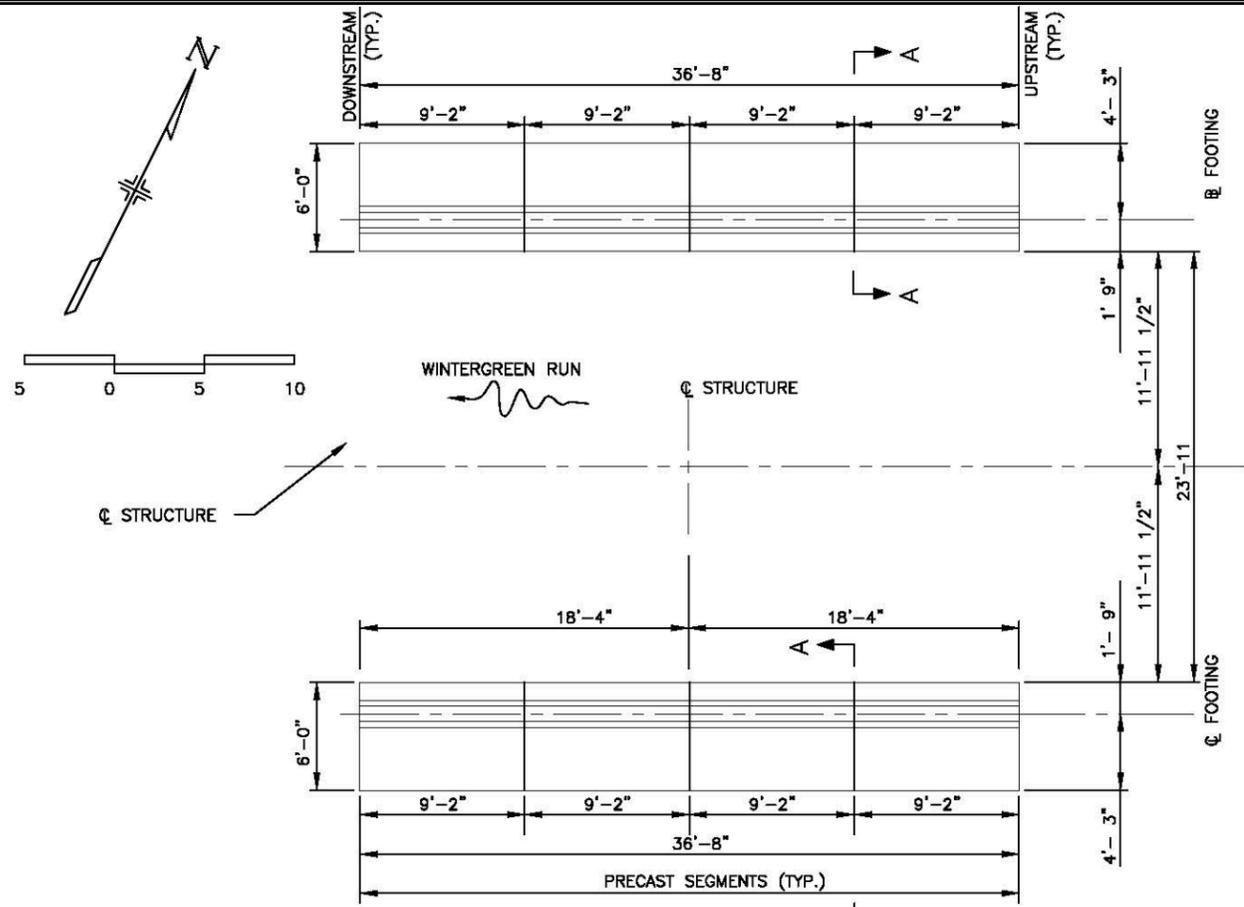
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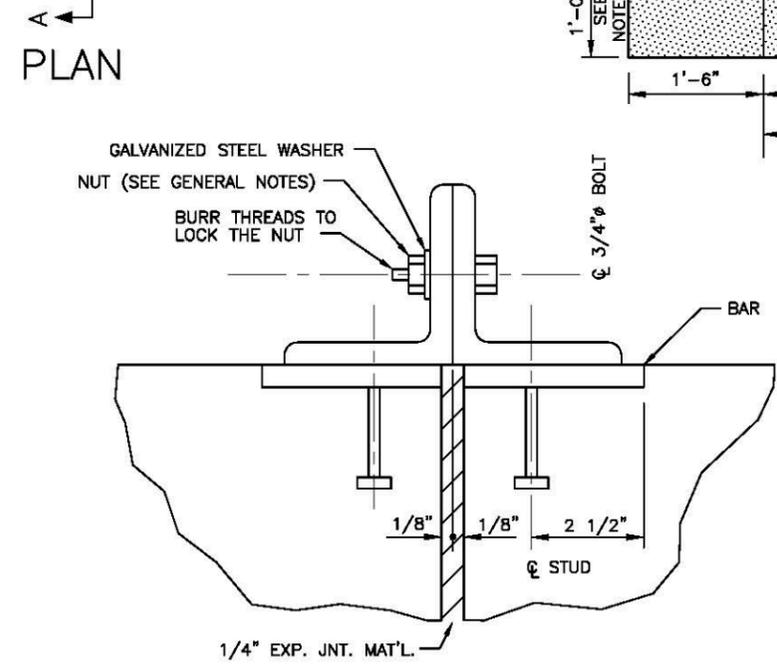
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Sheet **4** OF **8**

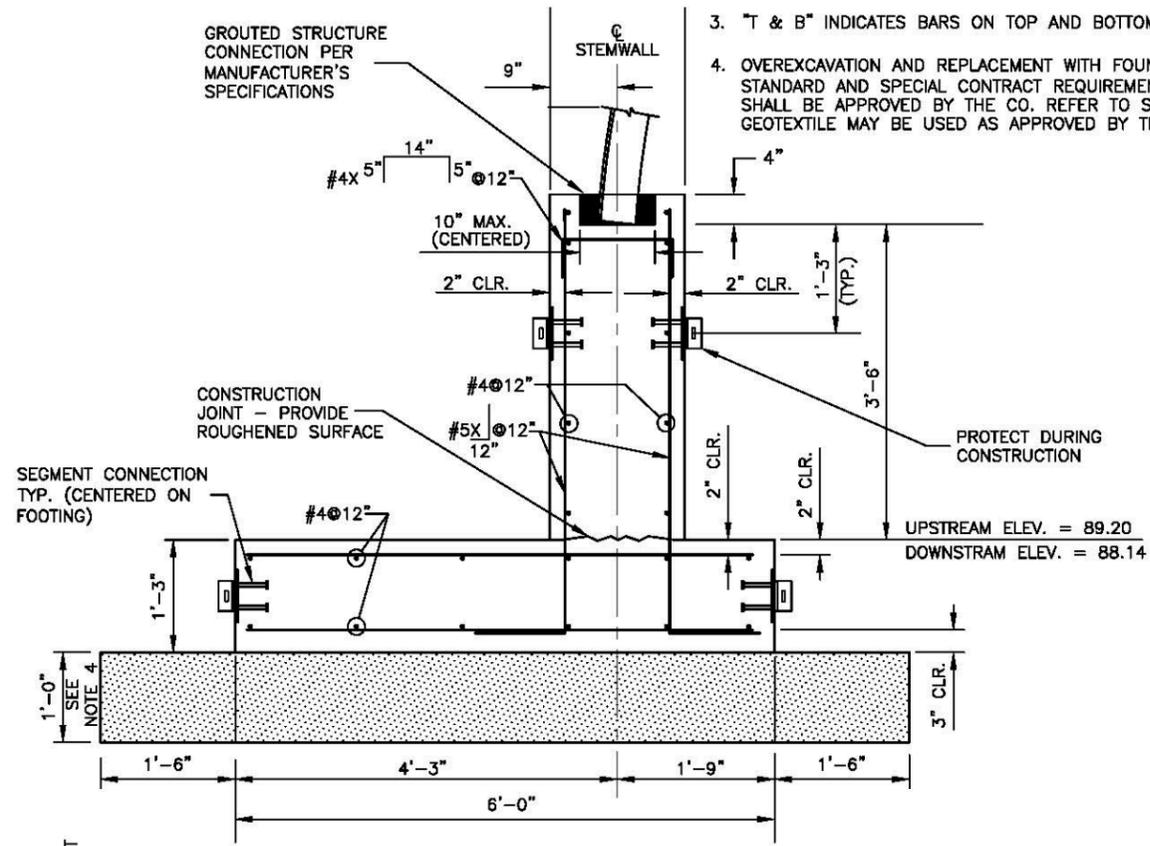




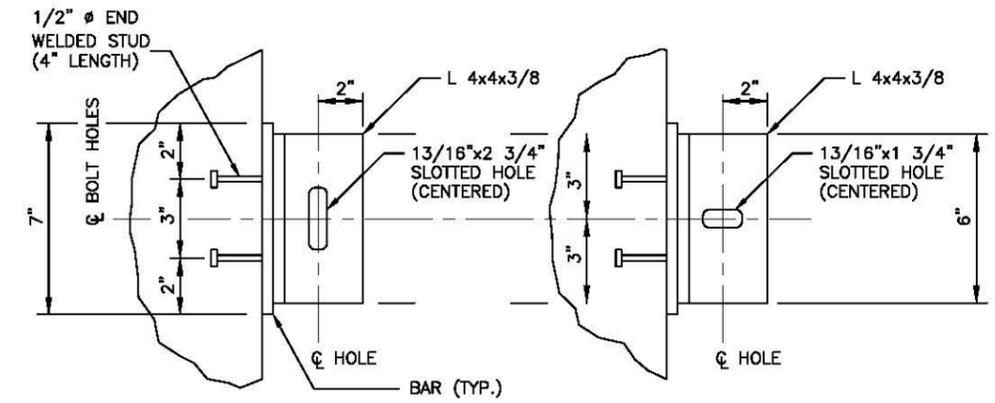
ELEVATION AT SEGMENT JOINT



SECTION B-B



SECTION A-A



SECTION C-C "A" END

SECTION C-C "B" END

NOTES:

1. PRIOR TO CONSTRUCTING THE FOOTINGS, THE CONTRACTOR SHALL VERIFY THAT THE DIMENSIONS OF THE STRUCTURE (AS SHOWN ON THESE PLANS) MATCH THOSE BEING PRODUCED BY ITS FABRICATOR. IF THEY DO NOT MATCH, AN ADJUSTMENT TO THE FOOTING LOCATIONS MAY BE REQUIRED. ANY SUCH ADJUSTMENTS SHALL BE SUBMITTED TO THE CO FOR APPROVAL.
2. FOR INFORMATION ON CHANNEL DIVERSION DURING CONSTRUCTION, SEE SPECIAL CONTRACT REQUIREMENT 208.
3. "T & B" INDICATES BARS ON TOP AND BOTTOM MATS.
4. OVEREXCAVATION AND REPLACEMENT WITH FOUNDATION FILL MAY BE REQUIRED PER STANDARD AND SPECIAL CONTRACT REQUIREMENT SECTION 208.09(d). FOUNDATION SHALL BE APPROVED BY THE CO. REFER TO SPECIAL CONTRACT REQUIREMENT 208. GEOTEXTILE MAY BE USED AS APPROVED BY THE CO.

U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
**R-9**  
Mud Drop Stewardship Project No. 002

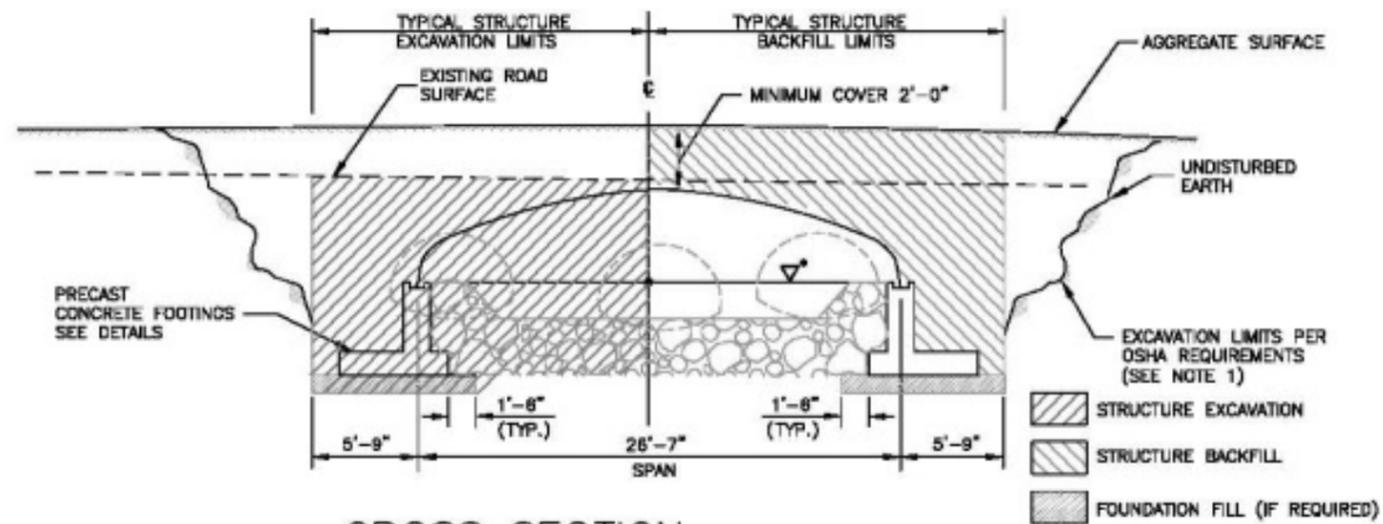
Forest  
**ALLEGHENY NATIONAL FOREST**  
**WINTERGREEN RUN**

Design: EWB  
Drawn: EWB  
Checked: ANF  
Date: MAY, 2014  
July 2014

Sheet Title:  
**PRECAST FOOTING DETAILS**

Sub Sheet:

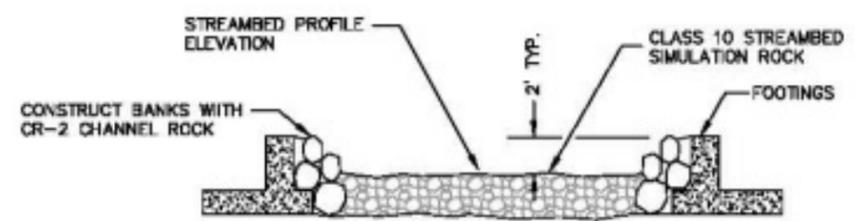
Project No:  
Sheet **6** of **8**



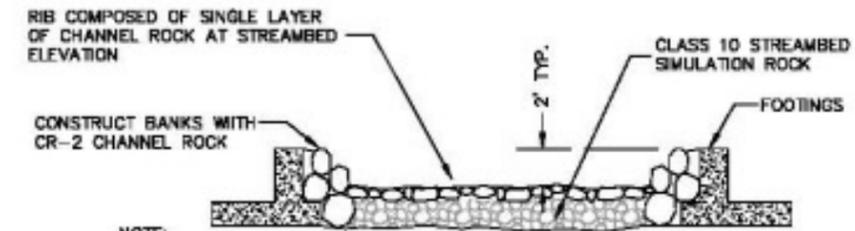
**CROSS SECTION**  
**26'-7" X 5'-5" METAL PLATE BOX CULVERT**

- STRUCTURE EXCAVATION
- STRUCTURE BACKFILL
- FOUNDATION FILL (IF REQUIRED)
- 2-YEAR WATER SURFACE ELEVATION

**NOTES :**  
 1. VERTICAL STRUCTURAL EXCAVATION SLOPES SHALL BE USED TO ESTABLISH THE QUANTITY FOR PAYMENT. ACTUAL SLOPES MAY BE FLATTER, BUT NO ADJUSTMENT IN CONTRACT PRICE WILL BE MADE.

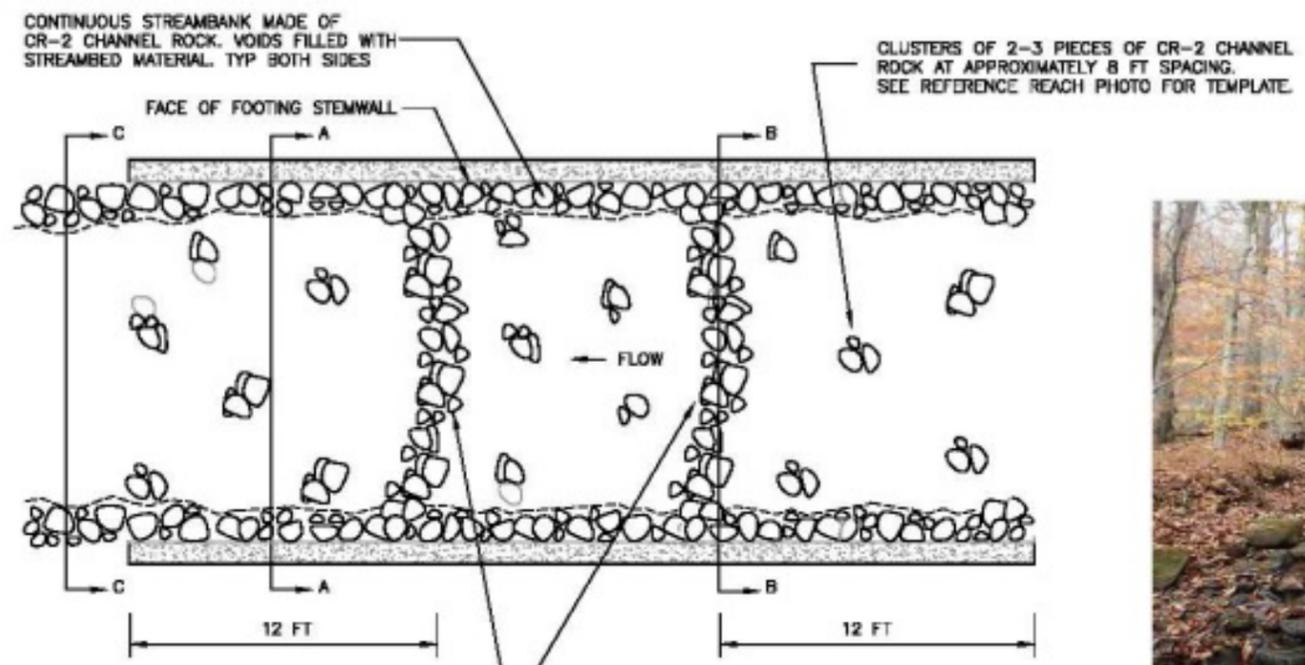


**SECTION A-A**



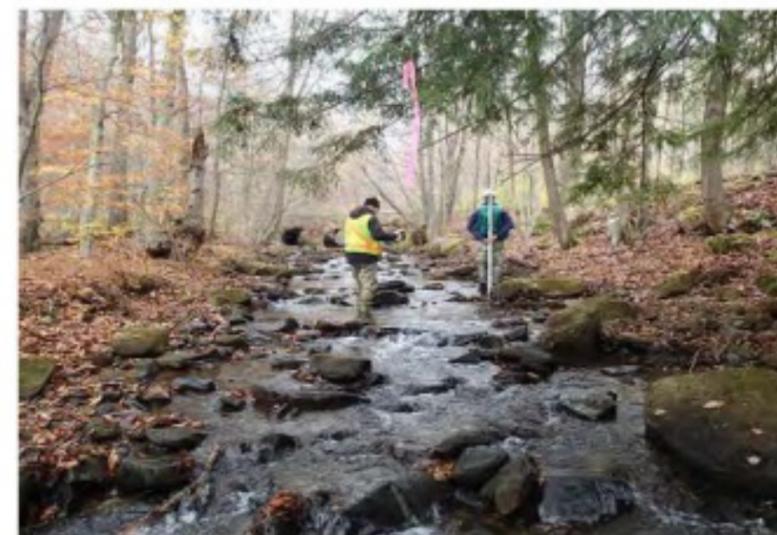
**SECTION B-B**

NOTE: SORT AND PLACE CHANNEL ROCK ALONG BANK LINES AS SHOWN SECTION B-B. FILL ALL VOIDS WITH STREAM SIMULATION ROCK

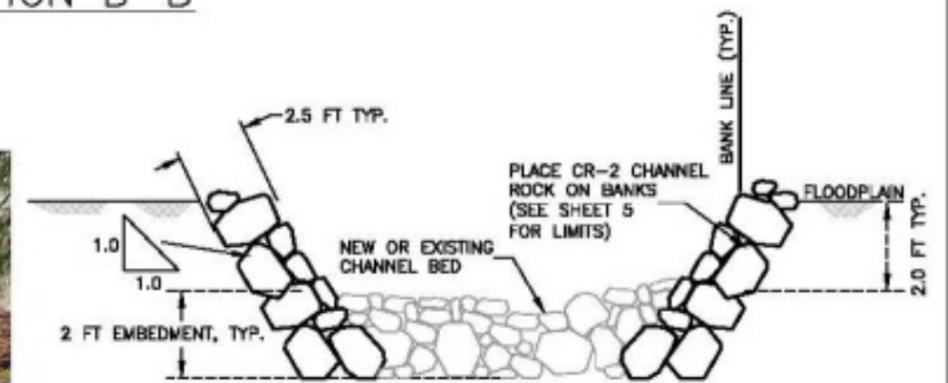


**PLAN VIEW**

CHANNEL SPANNING RIBS COMPOSED OF SINGLE LAYER OF CR-2 CHANNEL ROCK, TWO PARTICLES WIDE (IN FLOW DIRECTION), WITH SLIGHT UPSTREAM ARCHED SHAPE. USE SMALLER PARTICLES IN CHANNEL ROCK SIZE RANGE (15"-18" PREFERRED).



**REFERENCE REACH BED STRUCTURE**



**SECTION C-C**

CLASS 10		#6 - 1" GRADATION	
PROPORTIONS	SIZE	SIEVE SIZE	% PASSING
1 unit	9" - 24"	1"	85% - 100%
1 unit	6" - 9"	#4	30% - 65%
1 unit	3" - 6"	#8	25% - 55%
1 unit	3" - 1"	#200	3% - 6%
1 unit	#6 - 1" (see table)		

**STREAMBED SIMULATION ROCK**  
 FIELD HELPER

U.S. DEPARTMENT OF AGRICULTURE  
 FOREST SERVICE  
  
 R-9  
 EASTERN REGION  
 Multiple Use Stewardship Project No. 002

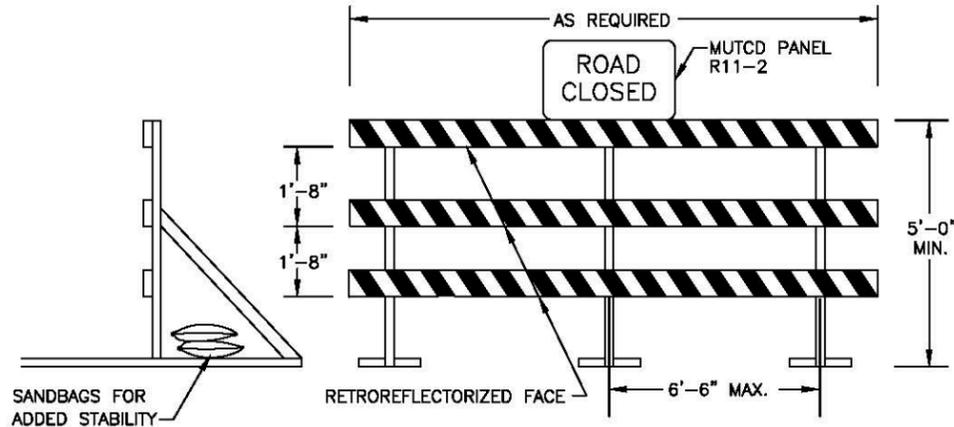
Forest  
**ALLEGHENY NATIONAL FOREST**  
**WINTERGREEN RUN**

Design: EWB  
 Drawn: EWB  
 Checked: ANF  
 Date: July 2014

Sheet Title:  
**CHANNEL DETAILS AND TYPICAL CROSS SECTIONS**

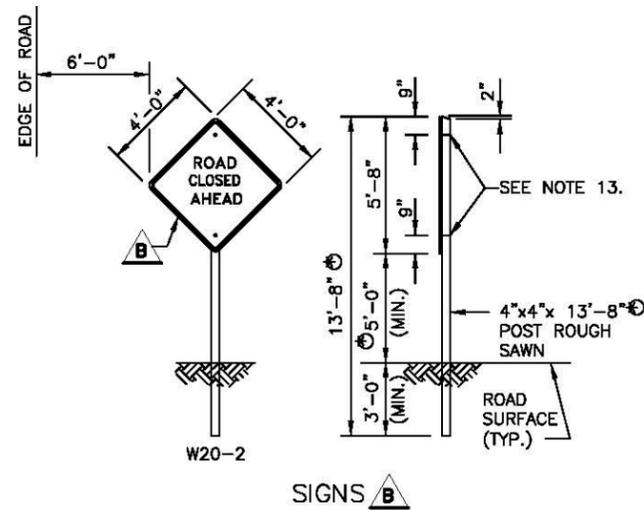
Sub Sheet:

Project No:  
 Sheet 7 of 8



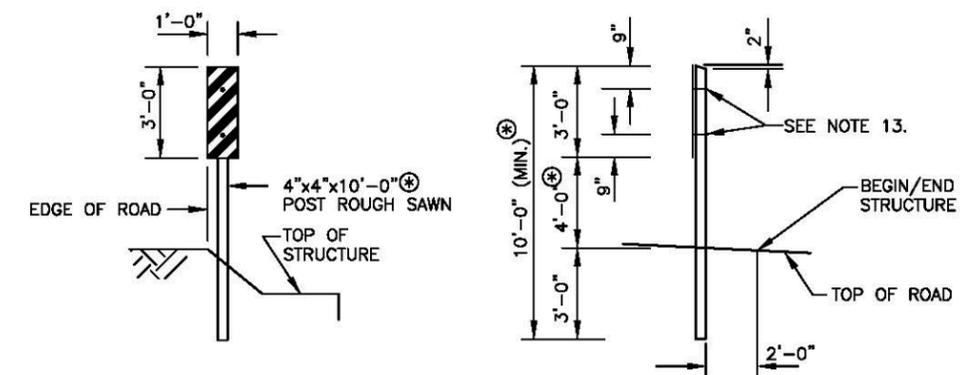
(R11-2 INSTALLED ON A TYPE III BARRICADE.)  
 LOCATE TYPE III BARRICADES AS SHOWN OR AS DIRECTED BY THE CO.

### BARRIER DETAILS



⊗ THE CONTRACTOR SHALL ADJUST POST LENGTH AS REQUIRED TO OBTAIN PROPER HEIGHT OF SIGN RELATIVE TO THE SURFACE OF THE ROAD.

### SIGN INSTALLATION (SEE SHEET 2 FOR LOCATIONS)



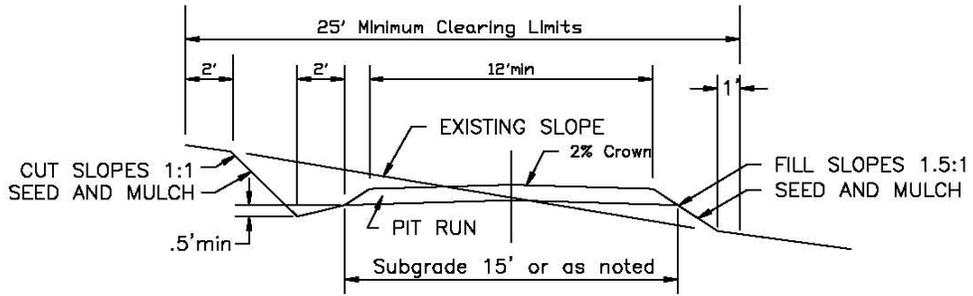
⊗ THE CONTRACTOR SHALL ADJUST POST LENGTH AS REQUIRED TO OBTAIN PROPER HEIGHT OF SIGN RELATIVE TO THE SURFACE OF THE ROAD.

### OBJECT MARKER

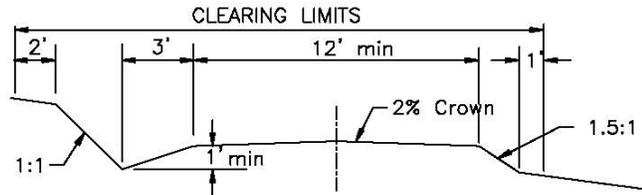
### NOTES :

1. ALL SIGN AND BARRICADE INSTALLATION SHALL MEET THE STANDARDS ESTABLISHED IN THE FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)", 2009 EDITION.
2. LETTERS ON SIGNS SHALL HAVE A MINIMUM HEIGHT OF 4" AND MINIMUM WIDTH OF 2".
3. WHERE TRAFFIC IS MAINTAINED THROUGH OR OVER ANY PART OF THE PROJECT, THE CONTRACTOR SHALL BE REQUIRED TO MARK ALL HAZARDS WITHIN THE LIMITS OF THE PROJECT (INCLUDING CONNECTING ROADS) WITH WELL-MAINTAINED SIGNS.
4. THE CONTRACTOR'S EQUIPMENT AND PARKING AREAS SHALL NOT INHIBIT THE VISIBILITY OF PROJECT SIGNS AND BARRICADES.
5. LOCATION AND INSTALLATION OF ALL TRAFFIC SIGNS, TRAFFIC CONTROL, AND BARRICADES SHALL BE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS AND APPROVED BY THE CO.
6. ALL SIGNS AND BARRICADES SHALL CONSIST OF A SMOOTH, RETROREFLECTIVE SURFACE UNLESS OTHERWISE SPECIFIED ON THE PLANS. SIGNS SHALL HAVE A SCREEN PROCESSED BLACK LEGEND AND BORDER ON ORANGE FLEXIBLE RETROREFLECTIVE SHEETING, NON-EXPOSED LENS BACKGROUND.
7. SIGN PANELS FURNISHED BY THE CONTRACTOR FOR USE ONLY DURING CONSTRUCTION SHALL BE FABRICATED FROM PLYWOOD, ALUMINUM, STEEL OR OTHER SUITABLE MATERIAL, BUT SHALL BE STABLE AND DURABLE ENOUGH TO MEET OTHER REQUIREMENTS OF THIS CONTRACT.
8. ALL MATERIAL SHALL BE SOUND AND DURABLE. BARRICADES, SIGNS, SYMBOLS AND LETTERING SHALL BE OF GOOD WORKMANSHIP. UNEVEN LETTERING SHALL NOT BE ACCEPTED.
9. ALTERNATE METHODS OF PROCESSING SIGNS OR THE SUBSTITUTION OF MATERIALS, SYMBOLS OR OTHER REFLECTING ELEMENTS SHALL BE PERMITTED ONLY AFTER APPROVAL OF SUCH METHODS OR MATERIALS BY THE CO IN WRITING.
10. SIGNS AND BARRICADES USED AS TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 63501.
11. ALL CONSTRUCTION TRAFFIC CONTROL SIGNING AND BARRICADES SHALL BE COMPLETED AND APPROVED PRIOR TO THE BEGINNING OF CONSTRUCTION, AND ITEM 15101 MOBILIZATION, SHALL NOT BE PAID UNTIL SIGNING IS APPROVED BY THE CO.
12. PROVIDE, INSTALL AND MAINTAIN SIGN TYPES "A" THROUGH "B" THROUGHOUT CONSTRUCTION. REMOVE SIGN TYPES "A" THROUGH "B" ONCE THE NEW STRUCTURES ARE OPEN TO TRAFFIC.
13. SIGN PANELS SHALL BE ATTACHED TO POSTS WITH 3/8"  $\phi$  MACHINE BOLTS THROUGH 1/2"  $\phi$  HOLES. FIBER WASHERS SHALL BE PLACED BETWEEN THE BOLT HEAD AND THE FACE OF THE SIGN PANEL. 2"  $\phi$  GALVANIZED WASHERS SHALL BE PLACED UNDER THE NUT ON THE BACK OF THE TIMBER POSTS.
14. SEE SHEET 2 FOR APPROXIMATE SIGN LOCATIONS. FINAL LOCATIONS SHALL BE APPROVED BY THE CO.
15. ALL TRAFFIC CONTROL DEVICES SHALL FOLLOW THE GUIDELINES ESTABLISHED IN THE REFERENCE TITLED "QUALITY GUIDELINES FOR WORK ZONE TRAFFIC CONTROL DEVICES" PUBLISHED BY THE ROADWAY SAFETY TRAINING INSTITUTE AND THE AMERICAN TRAFFIC SAFETY SERVICE ASSOCIATION AND BE IN ACCORDANCE WITH MUTCD.

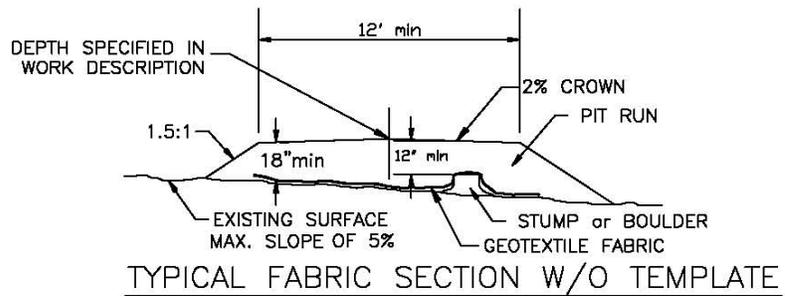
## Roadbed Details



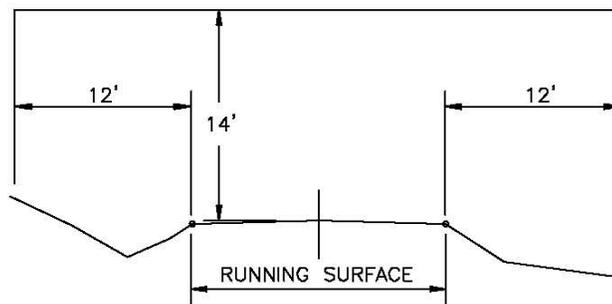
TYPICAL CONSTRUCTION SECTION



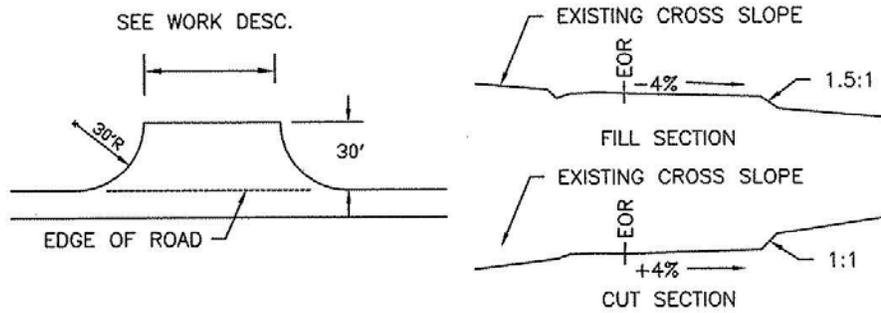
TYPICAL RECONDITION SECTION



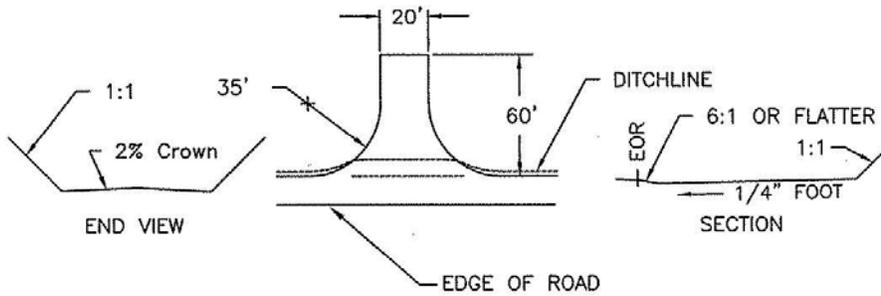
TYPICAL FABRIC SECTION W/O TEMPLATE



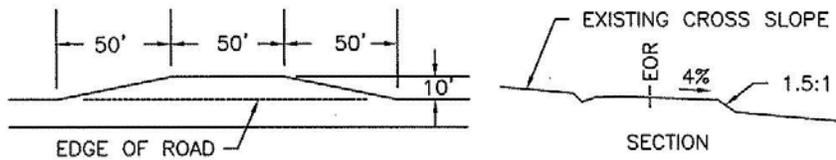
ROADSIDE BRUSHING DETAIL



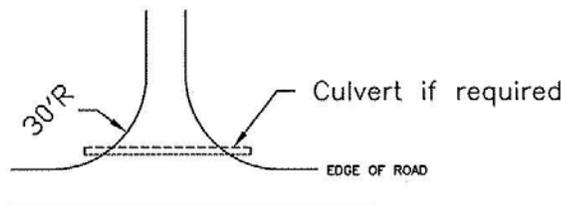
PARKING LOT DETAIL



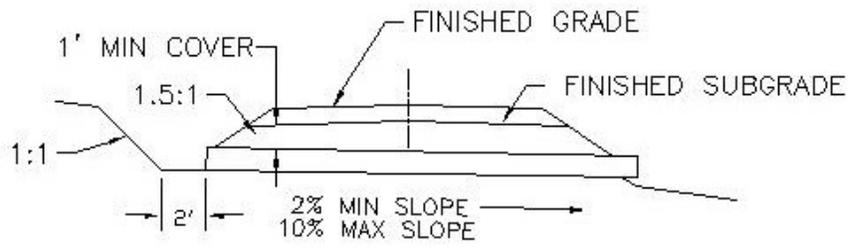
TURNAROUND DETAIL



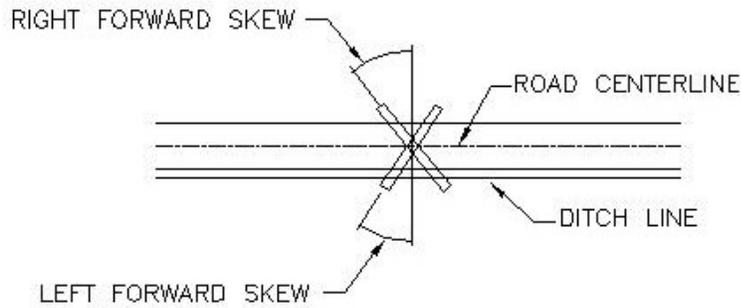
TURNOUT DETAIL



INTERSECTION DETAIL

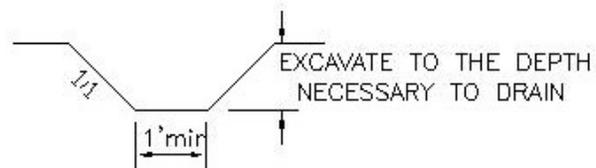


CULVERT SECTION



SKEW DETAIL

NOTE: Field locate ditch to minimize new clearing



OUTLET/LEAD OFF DITCH SECTION

# Specifications for Specified Roads

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## Specifications Description

The following specifications will be used for this contract:

Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects – FP-03 U.S. Customary Units. FP-03 is available on the internet at the following site:

<http://flh.fhwa.dot.gov/resources/pse/specs/>

Supplemental Specifications – The specifications identified in this contract were prepared by the Forest Service and are a supplement to or change the FHWA specifications.

Special Project Specifications (SPS) – Are specifications prepared on the Allegheny National Forest and pertain to Pennsylvania Department of Transportation nomenclature. These are designated SPS.

## Preface

Preface\_wo\_03\_15\_2004\_m

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-03 for construction of National Forest System Roads.

## 101 - Terms, Format, and Definitions

101.01\_nat\_04\_02\_2004

### 101.01 Meaning of Terms.

Add the following:

Delete all references in FP-03 to Transportation Acquisition Regulations (TAR). For Timber Sales, delete all references in FP-03 to Federal Acquisition Regulations (FAR).

101.03\_nat\_04\_02\_2004

### 101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	<a href="#">National Institute of Standards and Technology</a>
NEC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau
WWPA	Western Wood Products Association
ALSC	American Lumber Standards Committee
WWPI	Western Wood Preservers Institute
NLGA	National Lumber Grades Authority
NSLB	Northern Softwood Lumber Bureau
NLMA	Northeastern Lumber Manufacturer's Association
RIS	Redwood Inspection Service
SPIB	Southern Pine Inspection Bureau

101.04\_nat\_04\_29\_2004

### 101.03 Abbreviations.

Add the following to (b) SI Symbols:

mp	Milepost
ppm	Part Per Million

#### **101.04 Definitions.**

Delete the following definitions and substitute the following:

**Bid Schedule**--The Schedule of Items.

**Bridge**--No definition.

**Contractor**--The individual or legal entity contracting with the Government for performance of prescribed work. In a timber sale contract, the contractor is the “purchaser”.

**Culvert**--No definition.

**Right-of-Way**--A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) Real property necessary for the project, including roadway, buffer areas, access, and drainage areas.

Add the following:

**Adjustment in Contract Price**--“Equitable adjustment,” as used in the Federal Acquisition Regulations, or “construction cost adjustment,” as used in the Timber Sale Contract, as applicable.

**Change**--“Change” means “change order” as used in the Federal Acquisition Regulations, or “design change” as used in the Timber Sale Contract.

**Design Quantity**-- “Design quantity” is a Forest Service method of measurement from the FS-96 *Forest Service Specifications for the Construction of Roads and Bridges*. Under these FP specifications this term is replaced by the term “Contract Quantities”.

**Lump Sum Quantity**-- “Lump sum quantity” (“LSQ”) – These quantities denote one complete unit of work as required by or described in the contract, including necessary materials, equipment, and labor to complete the job.

**Forest Service**--The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

**Neat Line**--A line defining the proposed or specified limits of an excavation or structure.

**Pioneer Road**--Temporary construction access built along the route of the project.

**Purchaser**--The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

**Protected Streamcourse**--A drainage shown on the plans or timber sale area map that requires designated mitigation measures.

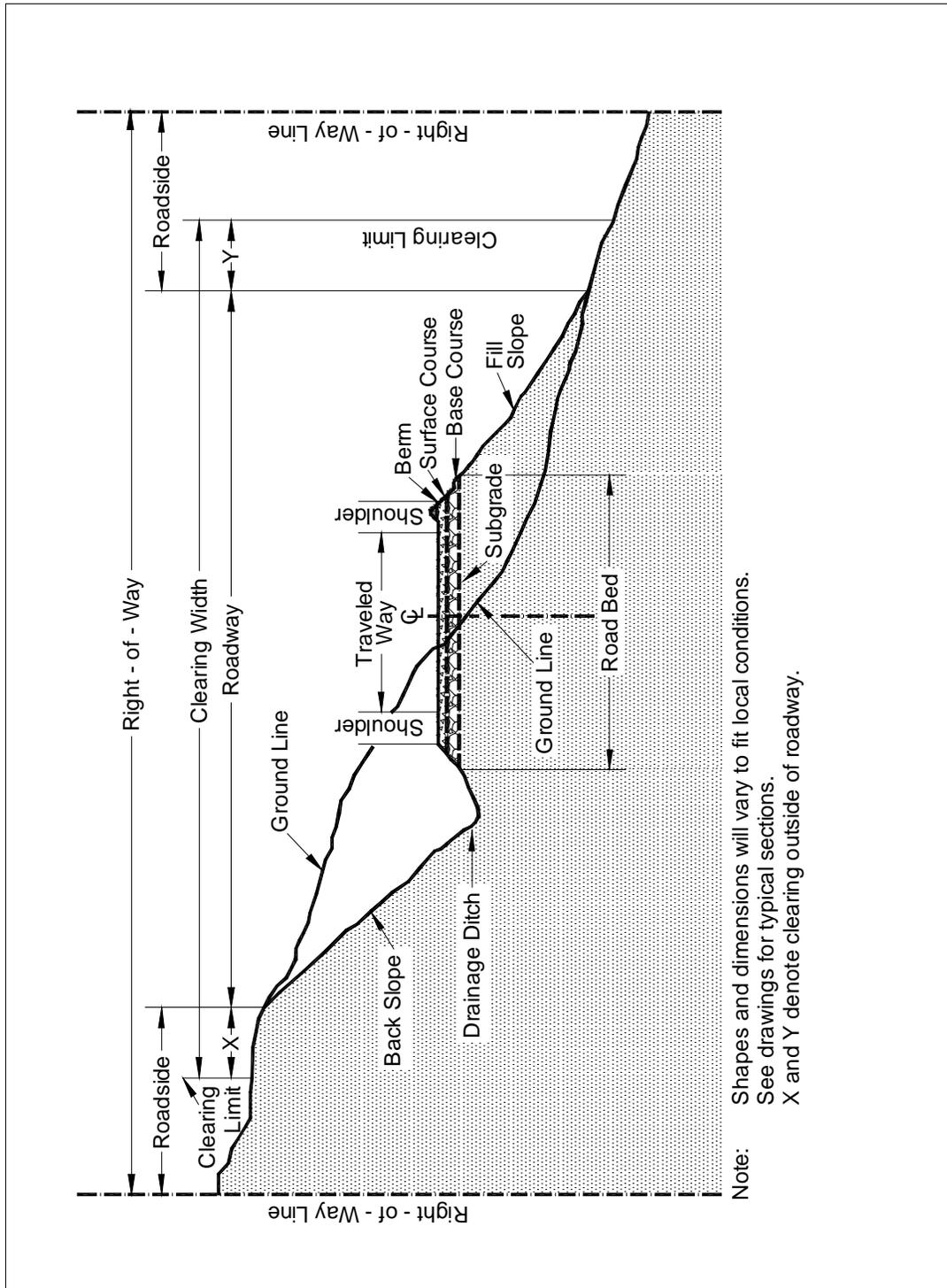
**Road Order**--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

**Schedule of Items**--A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, methods of measurement, unit price, and amount.

**Utilization Standards**--The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

Add Figure 101-1—Illustration of road structure terms:

Figure 101-1—Illustration of road structure terms.



Note: Shapes and dimensions will vary to fit local conditions. See drawings for typical sections. X and Y denote clearing outside of roadway.

102 – Bid, Award, and Execution of Contract

102.00\_nat\_us\_02\_16\_2005

Delete Section 102 in its entirety.

## 103 – Scope of Work

103.00\_nat\_us\_02\_16\_2005

### 103. Delete

Delete all but subsection 103.01 Intent of Contract.

## 104 - Control of Work

104.00\_nat\_us\_06\_16\_2006

### 104. Control of Work.

Delete Sections 104.01, 104.02, and 104.04.

104.03\_nat\_us\_02\_22\_2005

### 104.03 Specifications and Drawings.

Delete subsection 104.03

### 104.04 Coordination of Contract Documents.

Replace with the following:

The special contract requirements, standard specifications, and plans are contract documents. A requirement in one document is binding as though occurring in all contract documents. The contract documents are intended to be complementary and to describe and provide for a complete contract. In case of discrepancy, calculated and shown dimensions govern over scaled dimensions. The contract documents govern in the following order:

- (a) Special contract requirements;
- (b) Standard specifications; and,
- (c) Plans.

104.06\_nat\_us\_02\_17\_2005

Add the following subsections:

### 104.06 Use of Roads by Contractor.

The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.

### 104.07 Other Contracts.

The contractor shall schedule activities to coordinate and cooperate with other contracts, when applicable.

## 105 – Control of Material

105.02\_nat\_03\_26\_2004

### **105.02 Material Sources.**

#### **105.02(a) Government Provided Sources.**

Add the following:

Comply with the requirements of 30 CFR 56, subparts B and H. Use all suitable material for aggregate regardless of size unless otherwise designated. When required, re-establish vegetation in disturbed areas according to section 625.

#### **105.02(b) Contractor-located sources.**

Add the following:

All certifiable material (e.g., soil, gravel, seed, mulch etc.) transported onto National Forest System land or incorporated into the work will be weed-free. The Contracting Officer may request written documentation of methods used to determine the weed-free status of any and all materials furnished by the contractor. Contractor-provided expertise and methods to establish weed-free status must be appropriate for the weeds of concern in the local area.

All seed and mulch materials must be certified weed free.

105.05\_nat\_us\_05\_12\_2004

### **105.05 Use of Material Found in the Work.**

Delete 105.05 (a) and (b) and the last sentence of the second paragraph and substitute the following:

Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.

## 106 – Acceptance of Work

106.01\_nat\_us\_07\_31\_2007

### 106.01 Conformity with Contract Requirements.

Delete Subsection 106.01 and substitute the following:

References to standard test methods of AASHTO, ASTM, GSA, and other recognized standard authorities refer to the methods in effect on the date of solicitation for bids.

Perform all work to the lines, grades, cross-sections, dimensions, and processes or material requirements shown on the plans or specified in the contract.

Incorporate manufactured materials into the work according to the manufacturer's recommendations or to these specifications, whichever is more strict.

Plan dimensions and contract specification values are the values to be strived for and complied with as the design values from which any deviations are allowed. Perform work and provide material that is uniform in character and reasonably close to the prescribed value or within the specified tolerance range. The purpose of a tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons.

When standard manufactured items are specified (such as fence, wire, plates, rolled shapes, pipe conduits, etc., that are identified by gauge, unit mass, section dimensions, etc.), the identification will be considered to be nominal masses or dimensions. Unless specific contract tolerances are noted, established manufacturing tolerances will be accepted.

The Government may inspect, sample, or test all work at any time before final acceptance of the project. When the Government tests work, copies of test reports are furnished to the Contractor upon request. Government tests may or may not be performed at the work site. If Contractor testing and inspection is verified by the Government, the Contractor's results may be used by the Government to evaluate work for acceptance. Do not rely on the availability of Government test results for process control.

Acceptable work conforming to the contract will be paid for at the contract unit bid price. Four methods of determining conformity and accepting work are described in Subsections 106.02 to 106.05 inclusive. The primary method of acceptance is specified in each Section of work. However, work may be rejected at any time it is found by any of the methods not to comply with the contract.

Remove and replace work that does not conform to the contract, or to prevailing industry standards where no specific contract requirements are noted, at no cost to the Government.

**(a) Disputing Government test results.** If the accuracy of Government test results is disputed, promptly inform the CO. If the dispute is unresolved after reasonable steps are taken to resolve the dispute, further evaluation may be obtained by written request. Include a narrative describing the dispute and a proposed resolution protocol that addresses the following:

- (1) Sampling method;
- (2) Number of samples;

- (3) Sample transport;
- (4) Test procedures;
- (5) Testing laboratories;
- (6) Reporting;
- (7) Estimated time and costs; and
- (8) Validation process.

If the evaluation requires additional sampling or testing be performed, mutually agree with the Government on witnessing procedures and on sampling and testing by a third party laboratory. Use a third party laboratory accredited by the AASHTO accreditation program. Provide proof of the laboratory's accreditation for the test procedures to be used. Do not use the same laboratory that produced the disputed Government test results or that produced the test results used as a basis for the dispute.

The CO will review the proposed resolution protocol and may modify it before final approval and execution.

The Government will use the approved resolution protocol test results to determine the validity of the disputed testing. If the Government test results are validated, the Contractor will be responsible for all costs associated with developing and performing the resolution protocol. If the Government test results are not validated, the Government will be responsible for all costs associated with developing and performing the resolution protocol. If the validity of the Government test results cannot be determined, the Contractor and Government will equally share all costs associated with developing and carrying out the resolution protocol.

**(b) Alternatives to removing and replacing non-conforming work.** As an alternative to removal and replacement, the Contractor may submit a written request to:

- (1) Have the work accepted at a reduced price; or
- (2) Be given permission to perform corrective measures to bring the work into conformity.

The request must contain supporting rationale and documentation. Include references or data justifying the proposal based on an evaluation of test results, effect on service life, value of material or work, quality, aesthetics, and other tangible engineering basis. The CO will determine disposition of the nonconforming work.

### **106.05 Statistical Evaluation of Work and Determination of Pay Factor (Value of Work).**

Replace the entire section with the following:

Statistical evaluation of the work will not be required. All specifications referring to this Subsection shall instead be referred to Subsections 106.02 through 106.04 as appropriate for the work performed.

106.07\_nat\_04\_02\_2004

### **106.07 Partial and Final Acceptance**

Delete subsection 106.07.

## 107 – Legal Relations and Responsibility to the Public

107.02\_nat\_us\_02\_17\_2005

### **107.02 Protection and Restoration of Property and Landscape.**

Add the following:

Work within the channel shall only be performed between May 1 and September 30.

Notify the Oil and Gas Company prior construction:

Dave White, EnerVest, (304) 539-3683 - Cell

Randy Spence, EnerVest (304) 539-3679 – Cell

(814) 589-7093 – Office

107.05\_nat\_us\_05\_11\_2004

### **107.05 Responsibility for Damage Claims.**

Delete the entire subsection

107.06\_nat\_us\_06\_16\_2006

### **107.06 Contractor’s Responsibility for Work.**

Delete the following from the first paragraph.

“except as provided in Subsection 106.07”.

107.08\_nat\_us\_05\_11\_2004

### **107.08 Sanitation, Health, and Safety.**

Add the following:

Perform all operations in a prudent, conscientious, safe and professional manner. Ensure that all personnel involved in handling and packaging the hazardous waste are trained for the level of expertise required for the proper performance of the task and, in particular, in the areas of chemical incompatibility, general first aid procedures, and spills. Provide handling and personal protective equipment appropriate to ensure safe handling of the hazardous waste according to 29 CFR 1910.120. Notify the Forest Service of all hazardous material that may be brought onto the National Forest.

107.09\_nat\_us\_06\_16\_2006

### **107.09 Legal Relationship of the Parties.**

Delete subsection 107.09.

107.10\_nat\_us\_06\_16\_2006

### **107.10 Environmental Protection.**

Add the following:

Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on Government land.

Before beginning any work, submit a Hazardous Spill Plan. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report and include the following:

- Description of the item spilled (including identity, quantity, manifest number, and other identifying information).
- Whether amount spilled is EPA or state reportable, and if so whether it was reported, and to whom.
- Exact time and location of spill including a description of the area involved.
- Containment procedures.
- Summary of any communications contractor had with news media, Federal, state and local regulatory agencies and officials, or Forest Service officials.
- Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue.

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.

## 108 – Prosecution and Progress

108.00\_nat\_us\_02\_16\_2005

Delete Section 108 in its entirety.

## 109 – Measurement and Payment

109.00\_nat\_us\_02\_17\_2005

Delete the following entire subsections:

**109.06 Pricing of Adjustments.**

**109.07 Eliminated Work.**

**109.08 Progress Payments.**

**109.09 Final Payment.**

109.02\_nat\_us\_06\_16\_2006

**109.02 Measurement Terms and Definitions.**

**(b) Contract quantity.**

Add the following:

Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

Change the following:

“(b) Cubic yard” to “(c) Cubic yard”.

**Measurement Terms and Definitions.**

Add the following definition:

**(p) Thousand Board Feet (Mbf).** 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.

**109.05 Scope of Payment.**

Replace the last paragraph with the following:

The quantities shown in the bid schedule are contract quantities unless designated otherwise. Limit pay quantities to those shown on the bid schedule or otherwise authorized before performing the work. Payment will be made for contract quantities unless designated otherwise on the bid schedule. For designated quantities to be measured for payment and for quantities to be adjusted according to Section 109.02(b), measure quantities as directed in each associated Standard Section or Special Contract Requirement.

## 151 - Mobilization

151.00\_01\_us\_10\_11\_2006

Delete Section 151 in its entirety and replace with the following.

### Description

**151.01** This work consists of moving personnel, equipment, material, and incidentals to the project and performing all work necessary before beginning work at the project site; obtaining of permits, insurance, and bonds. This work also includes washing and treating construction equipment and vehicles necessary for equipment transport to remove seeds, plants, and plant fragments before the equipment is used on Forest Service lands, according to the requirements within.

### Construction Requirements

Wash the sides, tops, and undercarriages of all construction equipment. Remove all seeds, plants, plant fragments, dirt, and debris from the construction equipment. Only equipment inspected by the Forest Service will be allowed to operate within the project area. All subsequent move-ins of equipment to the project area will be treated in the same manner as the initial move-in. This requirement does not apply to cars, pickup trucks, and other vehicles that regularly travel between the construction site and areas off the National Forest.

Equipment will be considered free of soil, seed, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment, components or the need for specialized inspection tools is not required.

Notify the CO in writing at least 72 hours before moving any construction equipment onto the national forest. Notification will include an agreed upon location where the equipment will be available for inspection by the Forest Service. Inspection will be required after every cleaning.

Use methods of cleaning and locations for cleaning approved by the CO.

For work at a commercial washing facility, use an approved facility.

New infestations of noxious weeds of concern to Forest Service and identified by either Contractor or Forest Service, in the Project Area or on the haul route, will be promptly reported to the other party. Contractor and Forest Service will agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found. A current list of noxious weeds of concern to Forest Service is available at each Forest Service office.

### Measurement

**151.02** Clean equipment prior to moving onto this project. The initial cleaning will not be included in the measurement for payment. Payment for cleaning will only be made if subsequent

cleanings are ordered by the CO. Measurement shall be on an “each” basis, meaning one complete cleaning of all equipment required for this contract. Subsequent cleanings necessitated by the Contractor’s actions but not directed by the CO will not be included in the measurement for payment.

Measure mobilization according to Subsection 109.02.

### **Payment**

151.03\_The accepted quantity, measured as provided in Subsection 109.02, will be paid at the contract price per unit of measurement for the Section 151 pay item shown in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Progress payments for mobilization lump sum will be paid as follows:

- (a) If applicable, bond premiums will be reimbursed according to FAR Clause 52.232-5 Payments Under Fixed-Price Construction Contracts, after receipt of the evidence of payment.
- (b) When 5 percent of the original contract amount is earned from other bid items, 50 percent of the mobilization item, or 5 percent of the original contract amount, whichever is less, will be paid.
- (c) When 10 percent of the original contract amount is earned from other bid items, 100 percent of the mobilization item, or 10 percent of the original contract amount, whichever is less, will be paid.
- (d) Any portion of the mobilization item in excess of 10 percent of the original contract amount will be paid after final acceptance.

Include all costs associated with the initial cleaning of equipment in the unit bid price for Mobilization. Cleaning for subsequent move-ins will not be paid for unless after a suspension ordered by the CO.

## 152 – Contractor Survey and Staking

152.00\_nat\_us\_08\_05\_2005

### Description

#### 152.01(c) Material.

Add the following:

Use required stake dimensions and materials. Pre-paint the top 2 inches of all stakes and lath, or mark them with plastic flagging. Use designated colors for paint or flagging. Mark all stakes with a stake pencil that leaves a legible imprint, or with waterproof ink.

Do not use aerosol spray paints.

Use moisture-resistant paper for survey notes. Keep notes in books with covers that will protect the contents and retain the pages in numerical sequence.

### Construction Requirements

#### 152.02 General.

Delete the first two sentences.

Add the following:

When indicated on the plans, a preliminary survey line has been established on the ground. The project location line (road centerline) is established by offsets from this preliminary line.

Delete second sentence in second paragraph and replace with the following:

Reestablish missing reference, control lines, or stakes as necessary to control subsequent construction staking operations

#### 152.03 Survey and Staking Requirements.

##### (b) Roadway cross-sections.

Replace the first two sentences with the following:

Take roadway cross-sections normal to centerline. When the centerline curve radius is less than or equal to 200 feet, take cross-sections at a maximum centerline spacing of 25 feet. When the centerline curve radius is greater than 200 feet take cross-sections at a maximum centerline spacing of 50 feet.

##### c) Slope Stakes & References:

Replace section with the following:

Slope stakes and references. When required, locate slope stakes on designated portions of the road. Locate the slope stake catch points and use them to establish clearing limits and slope stake references.

Mark slope stakes with the station, the amount of cut or fill, the horizontal distance to centerline, and the slope ratios.

Place slope reference stakes at least 10 feet outside the clearing limit and mark with the offset distance to the slope stake. Place sight stakes when required.

Prior to clearing and grubbing operations, move the slope stake outside the clearing limit to the slope reference stake. After clearing and grubbing and before excavation, reset the slope stakes in their original position.

Use the designated method to establish the slope stake catchpoint.

- **Method I**—Computed Method. Use the template information shown in the plans or other Government-provided data to calculate the actual location of the catchpoint. The slope stake “catchpoint distance” provided may be used as a trial location to initiate slope staking. Recatch slope stakes on any section that does not match the staking report within the tolerances established in Table 152-2.
- **Method II**—Catchpoint Measurement Method. Determine the location of slope stake catchpoints by measuring the catchpoint distances shown in the plans or other Government-provided data.

**(d) Clearing and grubbing limits.**

Add the following:

Establish clearing limits on each side of the location line (road centerline) by measuring the required horizontal or slope distances shown in the stake notes. Mark the clearing limits with flagging or tags on trees to be left standing, or on lath. Make markings intervisible, and no more than 90 feet apart.

After establishing clearing limits, move the location line (road centerline) stake outside the clearing limits for station identification purposes, and mark it with horizontal distance to location line (road centerline)

**(e) Centerline reestablishment.**

Replace with the following:

Reestablish centerline from instrument control points. The maximum spacing between centerline points is 25 feet when the centerline curve radius is less than or equal to 200 feet. When the centerline curve radius is greater than 200 feet, the maximum distance between centerline points is 50 feet.

**(g) Culverts.**

Replace subsection with the following:

Set culvert reference stakes at all culvert and/or metal arch locations. Set a culvert reference stake on the centerline of the culvert 10 feet from each end or beyond the clearing limit, whichever is greater. Record the following on culvert reference stakes:

- (1) Span, actual field measured length, and type of culvert/arch.
- (2) The vertical and horizontal distance from the reference stake to the invert at the ends of the culvert.
- (3) Station of actual point where centerline culvert/arch and arch intersects centerline road.
- (4) Reference points and lines for the center lines of all footing locations and elevations.

- (5) Reference points and lines for headwalls, wingwalls, and rock walls locations and elevations.
- (6) Coordinates for riprap.

When required, stake headwalls, wingwalls, and rock walls for culverts by setting a hub with a guard stake on each side of the culvert on line with the face of the headwalls, wingwalls, and rock walls. Perform this work after clearing is completed.

Perform this work after clearing is completed and within the tolerances established in Table 152-1 under Precision Class A (Bridges). The structural component's control is established as a local network and the tolerances are relative to that network.

**(h) Bridges.**

Delete this section

**(i) Miscellaneous Survey and Staking.**

Add the following:

- (11) Cattleguards
- (12) Drain Dips
- (13) Erosion Control Measures

Replace Table 152-1 with the following two tables:

**Table 152-1 Tolerances for reestablishing P-line, traverse, and elevations.**

<b>Precision Class</b>	<b>Minimum Position Closure</b>	<b>Angular Accuracy (±)</b>	<b>L-Line Tangent Control Points<sup>a</sup> (±)</b>	<b>Vertical Closure<sup>b</sup> (±)</b>
A (Bridges)	1/10,000	2 sets, direct/reverse 10 second rejection limit	N/A	0.02 ft or 0.02ft/1000ft <sup>c</sup>
B	1/5,000	2 sets, direct/reverse 20 second rejection limit	0.1 ft	0.02 ft or 0.02ft/1000ft <sup>c</sup>
C	1/1,000	1 set, direct/reverse 1 minute rejection limit	0.2 ft	0.5ft/1000ft <sup>c</sup>
D	1/300	Foresight and backsight; 15 minute rejection limit <sup>c</sup>	0.4 ft	1.0ft/1000ft <sup>c</sup>
E	1/100	Foresight and backsight; 30 minute rejection limit <sup>c</sup>	0.8 ft	1.0ft/1000ft <sup>c</sup>

<b>Precision Class</b>	<b>Minimum Position Closure</b>	<b>Angular Accuracy (<math>\pm</math>)</b>	<b>L-Line Tangent Control Points<sup>a</sup> (<math>\pm</math>)</b>	<b>Vertical Closure<sup>b</sup> (<math>\pm</math>)</b>
<p>a. Accuracy of offset measurement.</p> <p>b. Determine vertical closures at intervals not to exceed 2000 ft as measured along centerline.</p> <p>c. Use greater value.</p>				

**Table 152-2 Cross section and slope stake tolerances.**

Item	Tolerances				
	A	B	C	D	E
Allowable deviation of cross-section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves	(±)2°	(±)3°	(±)3°	(±)5°	(±)5°
Take cross-sections topography measurements so that variations in ground from a straight line connecting the cross-section points will not exceed	0.5 ft	1.0 ft	2.0 ft	2.0 ft	3.0 ft
Horizontal and vertical accuracy for cross-sections, in feet or percentage of horizontal distance measured from traverse line, whichever is greater.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%	0.2 ft or 1.0%	0.3 ft or 1.0%
Horizontal and vertical accuracy for slope stake, slope stake references, and clearing limits. In feet or percentage of horizontal distance measured from centerline or reference stake, whichever is greater: Slope reference stakes and slope stakes. Clearing limits	0.1 ft or 0.4% 1.0 ft	0.15 ft or 0.6% 1.0 ft	0.2 ft or 1.0% 1.0 ft	0.2 ft or 1.0% 1.5 ft	0.3 ft or 1.0% 2.5 ft

**152.06 Payment**

Add the following:

All surveying required to establish grade finishing stakes shall not be measured separately, but shall be included in the following item:

*15201 Construction survey and staking; method I, tolerance A*

*Lump Sum*

## 153 – Contractor Quality Control

153.02\_nat\_us\_02\_17\_2005

### 153.02 Contractor Quality Control Plan.

#### Add the following:

Submit written proposals for approval of alternate AASHTO or State approved test methods. Alternate methods may be allowed based on documented equivalence to the specified method.

### 153.02 (d) Personnel Qualifications

#### Add the following:

(3) The contractor shall submit to the CO certifications of testing and sampling personnel. Testing and sampling personnel shall be either certified as NICET level 2 in highway materials or an equivalent state or industry certification such as Western Alliance Quality Technician Construction Certification (WAQTC).

### 153.03 Testing

#### Add the following:

The contractor shall submit to the CO current documentation of the calibration and inspection of the testing equipment to be used for the project. The documentation shall include inspection date, inspector, calibration number, and the method of calibration. All testing equipment shall be calibrated and inspected tagged with the inspection date, inspector, and calibration number. The lab testing equipment and density testing equipment shall be calibrated and inspected on a yearly basis. The concrete testing equipment shall be calibrated and inspected every four months.

Material testing shall be performed at the frequency required in the subsection titled *Acceptance* within each applicable standard specification section.

The Contractor shall provide testing of the structural backfill and foundation fill material to determine optimum moisture content and maximum density according to the method required within each applicable standard specification section. The Contractor shall provide testing of the structural backfill and surface aggregate materials to determine plasticity index, gradation, liquid limit, and/or soil classification.

The Contractor shall also provide testing of the surface aggregate material to determine Los Angeles abrasion, sodium soundness loss, durability indexes, and fractured faces for comparison with the requirements of the standard specifications.

All retests shall be performed at the Contractor's expense and are incidental to this pay item.

153.04\_nat\_us\_10\_24\_2007

### 153.04 Records.

#### Delete all but the first paragraph.

## 154 – Contractor Sampling And Testing

Delete this section in its entirety.

## 155 – Schedules for Construction Contracts

155.00\_nat\_03\_23\_2004

Replace Section 155 with the following.

**155.01** This work consists of scheduling and monitoring all construction activities. See FAR Clause 52.236-15 Schedules for Construction Contracts.

**155.02** Submit the construction schedule at least 7 days before work commences.

## SPS 156 – Public Traffic

Delete Section 156 in its entirety and replace with the following:

### Section 156.—PUBLIC TRAFFIC

#### Description

**156.01** This work consists of controlling and protecting public traffic adjacent to and within the project.

#### Material

**156.02** Conform to the “Manual on Uniform Traffic Control Devices” (MUTCD) and applicable Subsections within the following Sections:

Permanent Traffic Control	633
Temporary Traffic Control	635
Traffic Signing and Marking Materials	718

**156.03 Roads to be Constructed.** Unless otherwise indicated within the plans or specifications, keep existing roads open to all traffic during road improvement work, and maintain them in a condition that will adequately accommodate traffic. Perform no work that interferes or conflicts with traffic or existing access to the roadway surface until a plan for the satisfactory handling of traffic has been approved by the CO.

Specific requirements for temporary closures, detours, part-width construction, and access to adjacent or intersecting facilities will be indicated within the plans or specifications. Post construction signs and traffic control devices in conformance with the MUTCD and the project requirements. Do not proceed with work on the project until all required signs and barricades are in place and approved by the CO.

Before shutting down any operations, take all necessary precautions to prevent damage to the project, such as temporary detours, approaches, crossings, or intersections; and provide for normal drainage and minimization of erosion. Leave all travel ways in a condition suitable for traffic.

When indicated on the plans or described in the specifications, road segments may be closed to all traffic during the period(s) when construction is in progress. If any of the listed roads are to be closed during construction operations, give the CO at least 14 days advance notice.

**156.04 Maintaining Roadways during Work.** Do not construct detours outside of the clearing limits or use alternate route detours without the approval of the CO.

Unless otherwise indicated within the plans or specifications, keep existing roads open to all traffic during road improvement work, and maintain them in a condition that will adequately accommodate traffic. Perform no work that interferes or conflicts with traffic or existing access to the roadway surface until a “Travel Management Safety Plan” for the satisfactory handling of traffic has been approved by the CO. Submit the plan to the CO for approval at least 14 days prior to starting work. The plan shall address how the Contractor intends to perform hauling operations to the site while allowing for public traffic on the same access road.

## 157 – Soil Erosion Control

### 157.03 General.

Delete the entire subsection and replace with the following:

Prior to the start of construction, review the permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction. Do not begin work until the necessary controls for that particular phase of work have been implemented. Do not modify the type, size, or location of any control. An alternate erosion control plan with all necessary permits may be submitted 30 days before intended use.

Incorporate all permanent erosion control features into the project at the earliest practicable time, as outlined in the approved plan.

When erosion control measures are not functioning as intended, immediately take corrective action.

### EROSION & SEDIMENTATION CONTROL PLAN FOR FR 508 Culvert Replacement Project- Wintergreen Run

The limits of earth disturbance are shown on the plan map. All construction activities must be performed within the designated disturbance limits. All erosion and sediment control practices will be inspected at least every 7 days and after rainfall events. Needed repairs will be made immediately.

#### CONSTRUCTION SEQUENCE:

1. Close FR 508. Stage necessary equipment and materials to begin work.
2. Install filter sock as necessary to prevent sediment from entering the stream.
3. Maintain stream flow through the existing center culvert using a coffer dam during footer construction. In order to pass the 2-yr flood (182 cfs) with about a 1 foot head, the upstream coffer dam should be built to an elevation of 99 to provide 1 foot of freeboard. Various methods (e.g. pump around bypass system, sandbag headwall dam) will be used by the contractor to divert the clean stream water around the disturbed areas during construction of the streambed. The project will be scheduled during low flows and instream work will be completed as quickly as possible. Suitable excavated material will be stockpiled and protected from rain away from the stream. Filter sock will be placed around stockpile. All unsuitable material will be hauled off-site.
4. Sump holes shall be constructed on the downstream end of each footer excavation in order to drain any water from the area. The water shall be pumped to a filter bag located in a well vegetated area on the edge of the road. This shall be done prior to placement of the gravel bedding and footings. Install footers in accordance with Contract Drawings, backfill sump hole and place CR-2 channel rock along inside edge of footing.
5. Construct stream channel, rock clusters, boulder constrictions, transitions, and cross-channel

ribs following Channel Details and Typical Cross Sections (Sheet 7 of 8) and 648.10 and 648.11. Once instream construction is completed, remove dewatering pump and filter.

6. Assemble the structural plate low profile box culvert following manufacturer's specifications. Backfill and compact fill material around the pipe. Place riprap as indicated on the contract drawings for slope protection.

7. Haul the removed pipe off-site and properly dispose of it.

8. Permanently seed and mulch all disturbed areas outside of the roadway.

**NOTE: Site stabilization is achieved when a minimum of 70% perennial vegetated cover is established on all disturbed areas.**

9. After site stabilization is achieved, contractor is to remove temporary erosion control measures (e.g. Filter sock). Clean up and reopen FR 508

#### **157.05 Filter Barriers.**

Add the following:

Silt fence shall be straw wattles, logs, or rolls.

#### **157.09 Diversions**

Add the following:

For diversion requirements, refer to Special Contract Requirement 208.08.

#### **157.10 Waterway and Slope Protection and Stabilization.**

##### **(e) Temporary slope drains.**

Replace with the following:

If dewatering is required, the pumped water discharge from dewatering activities shall not be allowed to flow overland back into the creek. Pumped water shall be treated by a sediment basin or geotextile sediment bag.

#### **157.15 Measurement.**

Add the following:

Do not measure silt fence, sediment basins, straw bales, or any other erosion control feature separately.

#### **157.16 Payment.**

Add Section (D) as follows:

Payment for all erosion control materials and for all installation, monitoring, and repair activities shall be included in the following item:

*15713 Soil erosion and pollution control*

*Lump sum*

## 201 – Clearing and Grubbing

201.00\_nat\_us\_08\_05\_2009

### **201.01 Description.**

#### Replace with the following

This work consists of clearing and grubbing within clearing limits and other designated areas.

### **201.02 Material.**

Delete: Tree wound dressing material reference.

### **201.03 General.**

Delete the last sentence.

### **201.04 Clearing.**

Delete subsection (d) and replace with the following:

(d) Do not cut vegetation less than 3 feet tall and less than 3 inches in diameter, that is within the clearing limits but beyond the roadway and not in a decking area, and that does not interfere with sight distance along the road.

Add the following:

(e) Trim branches of remaining trees or shrubs to give a clear height of 14 feet above the roadbed unless otherwise indicated. Trim tree limbs as near flush with the trunk as practicable.

## 203 – Removal of Structures and Obstructions

203.01\_nat\_us\_02\_25\_2005

### 203.01 Description.

Add the following:

This work shall consist of the removal and disposal of the existing culverts.

Unless otherwise noted on the plans, all materials shall become the property of the contractor and removed from National Forest lands in accordance with all federal, state, and local laws.

203.05\_nat\_us\_02\_24\_2005

### 203.05 Disposing of Material.

Add the following:

**(e): Scattering.** Scatter construction slash outside the clearing limits without damaging trees. Limb all logs. Place logs and stumps away from trees, positioned so they will not roll, and are not on top of one another. Limb and scatter other construction slash to reduce slash concentrations (i.e., piles less than 18 inches in height). Do not place construction slash in lakes, meadows, streams, or streams' water influence zone. Immediately remove construction slash that interferes with drainage structures.

203.08\_nat\_us\_02\_24\_2005

### 203.08 Payment

Add the following:

Disposal of construction slash will be compensated under the designated pay item in Section 201.

## 204 – Excavation and Embankment

204.00\_nat\_us\_03\_26\_2009

**Replace Section 204 in its entirety with the following:**

### Description

**204.01** This work consists of excavating material and constructing embankments. This includes furnishing, hauling, stockpiling, placing, disposing, sloping, shaping, compacting, and finishing earthen and rocky material.

### 204.02 Definitions.

**(a) Excavation.** Excavation consists of the following:

**(1) Roadway excavation.** All material excavated from within the right-of-way or easement areas, except subexcavation covered in (2) below and structure excavation covered in Sections 208 and 209. Roadway excavation includes all material encountered regardless of its nature or characteristics.

**(2) Subexcavation.** Material excavated from below subgrade elevation in cut sections or from below the original groundline in embankment sections. Subexcavation does not include the work required by Subsections 204.05, 204.06(b), and 204.06(c).

**(3) Borrow excavation.** Material used for embankment construction that is obtained from outside the roadway prism. Borrow excavation includes unclassified borrow, select borrow, and select topping.

**(b) Embankment construction.** Embankment construction consists of placing and compacting roadway or borrow excavation. This work includes:

- (1) Preparing foundation for embankment;
- (2) Constructing roadway embankments;
- (3) Benching for side-hill embankments;
- (4) Constructing dikes, ramps, mounds, and berms; and
- (5) Backfilling subexcavated areas, holes, pits, and other depressions.

**(c) Conserved topsoil.** Excavated material conserved from the roadway excavation and embankment foundation areas that is suitable for growth of grass, cover crops, or native vegetation.

**(d) Waste.** Excess and unsuitable roadway excavation and subexcavation that cannot be used.

## Material

**204.03** Conform to the following Subsections:

Backfill material	704.03
Select borrow	704.07
Select topping	704.08
Topping	704.05
Unclassified borrow	704.06
Water	725.01

## Construction Requirements

**204.04 Preparation for Roadway Excavation and Embankment Construction.** Clear the area of vegetation and obstructions according to Sections 201 and 203.

**204.05 Reserved.**

**204.06 Roadway Excavation.** Excavate as follows:

**(a) General.** Do not disturb material and vegetation outside the construction limits. Incorporate only suitable material into embankments. Replace any shortage of suitable material caused by premature disposal of roadway excavation. Dispose of unsuitable or excess excavation material according to Subsection 204.14.

At the end of each day's operations, shape to drain and compact the work area to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

Retrieve material deposited outside of the clearing limits as directed by the CO. Place unsuitable material in designated areas.

**(b) Rock cuts.** Blast rock according to Section 205. Excavate rock cuts to 6 inches below subgrade within the roadbed limits. Backfill to subgrade with topping or with other suitable material. Compact the material according to Subsection 204.11

**(c) Earth cuts.** Scarify earth cuts to 6 inches below subgrade within the roadbed limits. Compact the scarified material according to Subsection 204.11.

**(d) Pioneer Roads.** Road pioneering, slash disposal, and grubbing of stumps may proceed concurrently with excavation. Conduct excavation and placement operations so material to be treated under Section 201 will not be incorporated into the roadway unless specified in the slash treatment method. Maintain drainage during pioneering operations.

Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material or generate sediment. Do not incorporate snow and ice into embankments. Place snow or ice in a manner to prevent resource damage.

**204.07 Subexcavation.** Excavate material to the limits designated by the CO. Take cross-sections according to Section 152. Prevent unsuitable material from becoming mixed with the backfill. Dispose of unsuitable material according to Subsection 204.14. Backfill the subexcavation with topping, or other suitable material. Compact the material according to Subsection 204.11.

**204.08 Borrow Excavation.** Use all suitable roadway excavation in embankment construction. Do not use borrow excavation when it results in excess roadway excavation. Deduct excess borrow excavation from the appropriate borrow excavation quantity.

Obtain borrow source acceptance according to Subsection 105.02. Develop and restore borrow sources according to Subsection 105.03. Do not excavate beyond the established limits. When applicable, shape the borrow source to permit accurate measurements when excavation is complete.

**204.09 Preparing Foundation for Embankment Construction.** Prepare foundation for embankment construction as follows:

(a) **Embankment less than 4 feet high over natural ground.** When designated, remove topsoil and break up the ground surface to a minimum depth of 6 inches by plowing or scarifying. Compact the ground surface according to Subsection 204.11.

(b) **Embankments over an existing asphalt, concrete, or gravel road surface.** Scarify gravel roads to a minimum depth of 6 inches. Scarify or pulverize asphalt and concrete roads to 6 inches below the pavement. Reduce all particles to a maximum size of 6 inches and produce a uniform material. Compact the surface according to Subsection 204.11.

(c) **Embankment across ground not capable of supporting equipment.** Dump successive loads of embankment material in a uniformly distributed layer to construct the lower portion of the embankment. Limit the layer thickness to the minimum depth necessary to support the equipment.

(d) **Embankment on an existing slope steeper than 1V:3H.** Cut horizontal benches in the existing slope to a sufficient width to accommodate placement and compaction operations and equipment. Bench the slope as the embankment is placed and compacted in layers. Begin each bench at the intersection of the original ground and the vertical cut of the previous bench.

**204.10 Embankment Construction.** Incorporate only suitable roadway excavation material into the embankment. When the supply of suitable roadway excavation is exhausted, furnish unclassified borrow to complete the embankment. Obtain written approval before beginning construction of embankments over 6 feet high at subgrade centerline. Construct embankments as follows:

(a) **General.** At the end of each day's operations, shape to drain and compact the embankment surface to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

During all stages of construction, route and distribute hauling and leveling equipment over the width and length of each layer of material.

Compact embankment side slopes flatter than 1V:1.75H with a tamping type roller or by walking with a dozer. For slopes 1V:1.75H or steeper, compact the slopes as construction of the embankment progresses.

Where placing embankment on one side of abutments, wing walls, piers, or culvert headwalls, compact the material using methods that prevent excessive pressure against the structure.

Where placing embankment material on both sides of a concrete wall or box structure, conduct operations so compacted embankment material is at the same elevation on both sides of the structure.

Where structural pilings are placed in embankment locations, limit the maximum particle size to 4 inches.

**(b) Embankment within the roadway prism.** Place embankment material in horizontal layers not exceeding 12 inches in compacted thickness. Incorporate oversize boulders or rock fragments into the 12-inch layers by reducing them in size or placing them individually as required by (c) below. Compact each layer according to Subsection 204.11 before placing the next layer.

Material composed predominately of boulders or rock fragments too large for 12-inch layers may be placed in layers up to 24 inches thick. Incorporate oversize boulders or rock fragments into the 24-inch layer by reducing them in size or placing them individually according to (c) below. Place sufficient earth and smaller rocks to fill the voids. Compact each layer according to Subsection 204.11 before placing the next layer.

**(c) Individual rock fragments and boulders.** Place individual rock fragments and boulders greater than 24 inches in diameter as follows:

- (1) Reduce rock to less than 48 inches in the largest dimension.
- (2) Distribute rock within the embankment to prevent nesting.
- (3) Place layers of embankment material around each rock to a depth not greater than that permitted by (b) above. Fill all the voids between rocks.
- (4) Compact each layer according to Subsection 204.11 before placing the next layer.

**(d) Embankment outside of roadway prism.** Where placing embankment outside the staked roadway prism, place material in horizontal layers not exceeding 24 inches in compacted thickness. Compact each layer according to Subsection 204.11.

**204.11 Compaction.** Compact the embankment using one of the following methods as specified:

**(a) Compaction A.** Use AASHTO T 27 to determine the amount of material retained on a Number 4 sieve. If there is more than 80 percent retained on the No. 4 sieve use procedure (1).

If there is 50 to 80 percent retained on the No. 4 sieve use procedure (2). If there is less than 50 percent retained on the No. 4 sieve use procedure (3).

(1) Adjust the moisture content to a level suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Use compression-type rollers at speeds less than 6 feet per second and vibratory rollers at speeds less than 3 feet per second. Compact each layer of material full width with one of the following and until there is no visible evidence of further consolidation.

(a) Four roller passes of a vibratory roller having a minimum dynamic force of 40,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

(b) Eight roller passes of a 20-ton compression-type roller.

(c) Eight roller passes of a vibratory roller having a minimum dynamic force of 30,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

Increase the compactive effort for layers deeper than 12 inches as follows:

- For each additional 6 inches or fraction thereof, increase the number of roller passes in (a) above by four passes.
- For each additional 6 inches or fraction thereof, increase the number of roller passes in (b) and (c) above, by eight passes.

(2) Use AASHTO T 99 to determine the optimum moisture content of the portion of the material passing a No. 4 sieve. Multiply this number by the percentage of material passing a No. 4 sieve, and add 2 percent to determine the optimum moisture content of the material. Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type rollers at speeds less than 6 feet per second and vibratory rollers at speeds less than 3 feet per second. Compact each layer of material full width according to (1) above.

(3) Classify the material according to AASHTO M 145. For material classified A-1 or A-2-4, determine the maximum density according to AASHTO T 180, method D. For other material classifications, determine the optimum moisture content and maximum density according to AASHTO T 99, method C.

Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type or vibratory rollers. Compact each layer of material full width to at least 95 percent of the maximum density. Determine the in-place density and moisture content according to AASHTO T 310 or other approved test procedures. When required, use AASHTO T 224 to correct for coarse particles.

**(b) Compaction B.** Place material by end dumping to the minimum depth needed for operation of spreading equipment. Adjust the moisture content of the material to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Operate compaction equipment over the full width of each layer until there is no visible evidence of further consolidation or, if when a sheepsfoot roller is used, the roller “walks out” of the layer. Make at least three complete passes.

**(c) Compaction C.** Place material by end dumping to the minimum depth needed for operation of spreading equipment. Level and smooth each embankment layer before placing the next layers. Operate hauling and spreading equipment uniformly over the full width of each layer. Construct a solid embankment with adequate compaction by working smaller rock and fines in with the larger rocks to fill the voids, and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

**204.12 Ditches.** Slope, grade, and shape ditches. Remove all projecting roots, stumps, rock, or similar matter. Maintain all ditches in an open condition and free from leaves, sticks, and other debris.

Form furrow ditches by plowing or using other acceptable methods to produce a continuous furrow. Place all excavated material on the downhill side so the bottom of the ditch is approximately 18 inches below the crest of the loose material. Clean the ditch using a hand shovel, ditcher, or other suitable method. Shape to provide drainage without overflow.

**204.13 Sloping, Shaping, and Finishing.** Complete slopes, ditches, culverts, riprap, and other underground minor structures before placing aggregate courses. Slope, shape, and finish as follows:

**(a) Sloping.** Leave all earth slopes with uniform roughened surfaces, except as described in (b) below, with no noticeable break as viewed from the road. Except in solid rock, round tops and bottoms of all slopes including the slopes of drainage ditches. Round material overlaying solid rock to the extent practical. Scale all rock slopes. Slope rounding is not required on tolerance class D though M roads.

If a slide or slipout occurs on a cut or embankment slope, remove or replace the material, and repair or restore all damage to the work. Bench or key the slope to stabilize the slide. Reshape the cut or embankment slope to an acceptable condition.

**(b) Stepped slopes.** Where required by the contract, construct steps on slopes of  $1\frac{1}{3}V:1H$  to  $1V:2H$ . Construct the steps approximately 18 inches high. Blend the steps into natural ground at the end of the cut. If the slope contains nonrippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

**(c) Shaping.** Shape the subgrade to a smooth surface and to the cross-section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of

cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground.

**(d) Finishing.** Finish the roadbed to be smooth and uniform, and shaped to conform to the typical sections. Remove unsuitable material from the roadbed and replace it with suitable material. Finish roadbeds to the tolerance class shown in table 204-2. Ensure that the subgrade is visibly moist during shaping and dressing. Scarify to 6 inches below the bottom of low sections, holes, cracks, or depressions and bring back to grade with suitable material. Maintain proper ditch drainage.

For surfaced roads, remove all material larger than 6 inches from the top 6 inches of the roadbed.

For unsurfaced roads, use one of the following methods to finish the roadbed:

- (1) **Method A.** Remove all material larger than 6 inches from the top 6 inches of the roadbed and replace with suitable material.
- (2) **Method B.** Use a vibratory grid roller or approved equal with a minimum weight of 10 tons. Roll at least 5 full-width passes or until there is no visible evidence of further consolidation.
- (3) **Method C.** For roads designated as Construction Tolerance Class K, L, or M, finish the roadbed by spreading the excavation. Eliminate rock berms.

**204.14 Disposal of Unsuitable or Excess Material.** Dispose of unsuitable or excess material at designated sites or legally off of the project.

When there is a pay item for waste, shape and compact the waste material in its final location. Do not mix clearing or other material not subject to payment with the waste material.

**204.15 Acceptance.** See Table 204-1 for sampling and testing requirements.

Material for embankment and conserved topsoil will be evaluated under Subsections 106.02 and 106.04.

Excavation and embankment construction will be evaluated under Subsections 106.02 and 106.04.

Clearing and removal of obstructions will be evaluated under Sections 201 and 203.

Placing of conserved topsoil will be evaluated under Section 624.

### **Measurement**

**204.16** Measure the Section 204 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

- (a) **Roadway excavation.** Measure roadway excavation in its original position as follows:

- (1) Include the following volumes in roadway excavation:
- (a) Roadway prism excavation;
  - (b) Rock material excavated and removed from below subgrade in cut sections;
  - (c) Unsuitable material below subgrade and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
  - (d) Ditches, except furrow ditches measured under a separate bid item;
  - (e) Topsoil;
  - (f) Borrow material used in the work when a pay item for borrow is not shown in the bid schedule;
  - (g) Loose scattered rocks removed and placed as required within the roadway;
  - (h) Conserved material taken from stockpiles and used in Section 204 work; and
  - (i) Slide and slipout material not attributable to the Contractor's method of operation.
- (2) Do not include the following in roadway excavation:
- (a) Overburden and other spoil material from borrow sources;
  - (b) Overbreakage from the backslope in rock excavation;
  - (c) Water or other liquid material;
  - (d) Material used for purposes other than required;
  - (e) Roadbed material scarified in place and not removed;
  - (f) Material excavated when stepping cut slopes;
  - (g) Material excavated when rounding cut slopes;
  - (h) Preparing foundations for embankment construction;
  - (i) Material excavated when benching for embankments;
  - (j) Slide or slipout material attributable to the Contractor's method of operation;
  - (k) Conserved material taken from stockpiles constructed at the option of the Contractor; and
  - (l) Material excavated outside the established slope limits.
- (3) When both roadway excavation and embankment construction pay items are shown in the bid schedule, measure the following as roadway excavation only:
- (a) Unsuitable material below subgrade in cuts and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
  - (b) Slide and slipout material not attributable to the Contractor's method of operations; and
  - (c) Drainage ditches, channel changes, and diversion ditches.

**(b) Unclassified borrow, select borrow, and select topping.** When measuring by the cubic yard measure in its original position. If borrow excavation is measured by the cubic yard in place, take initial cross-sections of the ground surface after stripping overburden. Upon completion of excavation and after the borrow source waste material is returned to the source, retake cross-sections before replacing the overburden.

Do not measure borrow excavation used in place of excess roadway excavation.

**(c) Embankment construction.** Measure embankment construction in its final position. Do not make deductions from the embankment construction quantity for the volume of minor structures.

**(1)** Include the following volumes in embankment construction:

- (a)* Roadway embankments;
- (b)* Material used to backfill subexcavated areas, holes, pits, and other depressions;
- (c)* Material used to restore obliterated roadbeds to original contours; and
- (d)* Material used for dikes, ramps, mounds, and berms.

**(2)** Do not include the following in embankment construction:

- (a)* Preparing foundations for embankment construction;
- (b)* Adjustments for subsidence or settlement of the embankment or of the foundation on which the embankment is placed; and
- (c)* Material used to round fill slopes.

**(d) Rounding cut slopes.** Measure rounding cut slopes horizontally along the centerline of the roadway if a pay item for slope rounding is included in the bid schedule. If a pay item for slope rounding is not included in the bid schedule slope rounding will be considered subsidiary to excavation.

**(e) Waste.** Measure waste by the cubic yard in its final position. Take initial cross-sections of the ground surface after stripping over burden. Upon completion of the waste placement, retake cross-sections before replacing overburden.

**(f) Slope scaling.** Measure slope scaling by the cubic yard in the hauling vehicle.

### **Payment**

**204.17** The accepted quantities will be paid at the contract price per unit of measurement for the Section 204 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 204-1  
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Topping (704.05) & unclassified borrow (704.06)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type	Processed material before incorporating in work	Yes, when requested	Before using in work
		Moisture-density	—	AASHTO T 180, method D <sup>(1)</sup> or T 99, method C <sup>(1)</sup>	1 per soil type but not less than 1 per 13,000 yd <sup>3</sup>	“	“	“
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd <sup>2</sup> but not less than 1 per layer	In-place	—	Before placing next layer
Select borrow (704.07) & Select topping (704.08)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type but not less than 1 for each day of production	Processed material before incorporating in work	Yes, when requested	Before using in work
		Gradation	—	AASHTO T 27 & T 11	“	“	“	“
		Liquid limit	—	AASHTO T 89	“	“	“	“
		Moisture-density	—	AASHTO T 180, method D <sup>(1)</sup> or T 99, method C <sup>(1)</sup>	1 per soil type but not less than 1 per 13,000 yd <sup>3</sup>	“	“	“
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd <sup>2</sup> but not less than 1 per layer	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor

Table 204-1 (continued)  
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Earth embankment (204.11, Compaction A)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type	Source of Material	Yes, when requested	Before using in work
		Moisture-density	—	AASHTO T 180, method D <sup>(1)</sup> or T 99, method C <sup>(1)</sup>	1 per soil type but not less than 1 per 13,000 yd <sup>3</sup>	“	“	“
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 3500 yd <sup>2</sup> but not less than 1 per layer	In-place	—	Before placing next layer
Top of subgrade (204.11 Compaction A)	Measured and tested for conformance (106.04)	Compaction	—	AASHTO T 310 or other approved procedures	1 per 2500 yd <sup>2</sup>	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

**Table 204-2  
Construction Tolerances**

	Tolerance Class <sup>(a)</sup>												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Roadbed width (ft)	+0.5	+0.5	+1.0	+1.0	+1.0	+1.0	+1.5	+1.0	+2.0	+2.0	+2.0	+2.0	+2.0
Subgrade elevation (ft)	±0.1	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±2.0	±3.0	±2.0	±3.0	(c)
Centerline alignment (ft)	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±1.5	±2.0	±3.0	±3.0	±5.0	(c)
Slopes, excavation, and embankment (% slope <sup>(b)</sup> )	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10	±20	±20	±20

(a) Maximum allowable deviation from construction stakes and drawings.

(b) Maximum allowable deviation from staked slope measured from slope stakes or hinge points.

(c) Unless otherwise shown the centerline alignment and subgrade elevation, as built, have no horizontal curves with a radius of less than 80 feet, and no vertical curves with a curve length of less than 80 feet when the algebraic difference in the grade change is less than 10 percent, or a curve length of less than 100 feet when the algebraic difference of the grade change is greater than or equal to 10 percent. The centerline grade is not to exceed 20 percent in 100 feet of length.

## 208 – Structure Excavation and Backfill for Selected Major Structures

### 208.02 Material.

Add the following:

Geotextile and Geocomposite Drain Material 714

208.04\_nat\_us\_08\_05\_2009

### 208.04 General.

Replace the second sentence of the sixth paragraph with the following:

Dispose of excavated material in accordance with the plans, specifications, and as directed by the CO.

Add the following:

Stockpile the material as directed by the CO.

Add the following to the end of the second sentence of the third paragraph:

"... to the CO a minimum of 5 days prior to beginning excavation work."

Add the following to the end of the third sentence of the third paragraph:

"...to the CO a minimum of 15 days prior to installation."

### 208.06 Cofferdams.

Add the following:

Cofferdams may include sandbag dikes. The Contractor shall provide information relative to a source site for any fill material within the cofferdams, a construction method for the cofferdams, and a restoration method for the cofferdams to the CO 14 days prior to construction for review and approval. Dredging of channel material outside of the limits of riprap for use in cofferdams shall not be permitted.

### 208.08 Dewatering.

Add the following:

The contractor shall submit a dewatering plan to the CO a minimum of 15 days prior to commencement of the work. The plan shall include all means and methods for diverting the flow in the channel as required to construct the footings and reconstruct the channel. Outflow from diversion/dewatering shall not be discharged directly into the creek, but shall be discharged with best management practices for erosion control (refer to Special Contract Requirement 157).

### 208.09 Foundation Preparation.

Add the following:

The Contractor shall have the foundation subgrade approved by the CO prior to placement of the footings.



## 251 – Riprap

### **251.02 Material.**

Add the following:

The material for riprap shall be approved by the CO.

Obtain the riprap from a commercial source.

The contractor shall incorporate on-site material into the riprap when possible. The CO will approve any existing rock material and the method to which it will be incorporated into the riprap.

### **251.03 General**

Replace the first sentence with the following:

Perform the work under section 208.

### **251.04 Placed Riprap**

Add the following:

Place riprap on slopes above the structure according to Standard Specification Section 252.03

### **251.07 Acceptance**

Delete the 4<sup>th</sup> sentence regarding structure excavation and backfill.

## 301 – Untreated Aggregate Courses

301.00\_nat\_us\_03\_03\_2005

### 301 Title Change

Change the title to: **Section 301 Aggregate Courses**

301.02\_nat\_03\_24\_2004

### 301.02. Material.

Add the following:

The Contractor shall provide aggregate surface material that meets the Standard Specification Table 703-3 for Grading DSA Limestone. As an alternate, the Contractor may substitute aggregate surface material from a source that is approved by a local public works agency such as the Pennsylvania Department of Transportation. The CO shall approve the material prior to ordering. Existing road surface material may be stockpiled and reused if approved by the CO.

301.03\_nat\_us\_02\_28\_2013

### 301.03 General.

Add the following:

Written approval of the roadbed before placing aggregate.

For pit run or grid-rolled material, furnish material smaller than the maximum size. No gradation other than maximum size will be required for pit-run or grid-rolled material. For grid rolling, use all suitable material that can be reduced to maximum size. After processing on the road, remove all oversize material from the road and dispose of it as directed by the CO.

Provide additives or binder, if required, at the proportions specified.

Develop and use Government furnished sources according to Section 105.

If the aggregate is produced and stockpiled before placement, handle and stockpiled according to Section 320. Establish stockpile sites at locations approved by the CO. Clear and grub stockpile sites according to Section 201.

Delete the following segment of the second paragraph:

“along with a representative 300-pound sample”

301.04\_nat\_us\_03\_03\_2005

### 301.04 Mixing and Spreading.

Delete the first sentence of the first paragraph and add the following:

Ensure that aggregate and any required additives, water, mineral filler, and binder are mixed by the specified method except, if crushed aggregate products are being produced and mineral filler, binder, or additives are required, uniformly blend during crushing. Control additive proportions to 0.5 percent dry weight.

**Stationary Plant Method.** Mix the aggregate with other required materials in an approved mixer. Add water during the mixing operation in the amount necessary to provide the moisture content for compacting to the specified density. After mixing, transport the aggregate to the

jobsite while it contains the proper moisture content, and place it on the roadbed or base course using an aggregate spreader.

**Travel Plant Method.** After placing the aggregate for each layer with an aggregate spreader or windrow-sizing device, uniformly mix it with other required materials using a traveling mixing plant. During mixing, add water to provide the necessary moisture content for compacting.

**Road Mix Method.** After placing the aggregate for each layer, mix it with other required materials at the required moisture content until the mixture is uniform throughout. Mix aggregate, water, and all other materials until a uniform distribution is obtained.

Spread the aggregate in a uniform layer, with no segregation of size, and to a loose depth that will provide the required compacted thickness.

When placing aggregate over geotextile, place aggregate in a single lift to the full depth specified.

Route and distribute hauling and leveling equipment over the width and length of each layer.

301.05\_nat\_us\_10\_14\_2011

### **301.05 Compacting.**

Delete and replace with the following:

Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and all places not accessible to the roller, compact the material with approved tampers or compactors.

Compact the aggregate using one of the following methods as specified:

**Compaction A.** Operate spreading and hauling equipment over the full width of the travelway.

**Compaction B.** Operate rollers and compact as specified in Subsection 204.11(a)(1).

**Compaction C.** Moisten or dry the aggregate to a uniform moisture content between 5 and 7 percent based on total dry weight of the mixture. Operate rollers and compact as specified in Subsection 204.11(a)(1).

**Compaction D.** Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

**Compaction E.** Removed.

**Compaction F.** Compact to a density of at least 95 per-cent of the maximum density, as determined by AASHTO T 180, method C or D.

**Compaction G.** Removed.

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

301.06\_nat\_us\_03\_03\_2005

### **301.06 Surface Tolerance.**

Add the following:

Thickness and Width requirements:

The maximum variation from the compacted specified thickness is ½ inch. The compacted thickness is not consistently above or below the specified thickness and the average thickness of 4 random measurements along the reconstructed road segment is within + ¼ inch of the specified thickness.

The maximum variation from the specified width will not exceed +12 inches at any point. The compacted width is not consistently above the specified width and the average of any four random measurements along the reconstructed road segment is within +4 inches of the specified width.

301.08\_nat\_us\_03\_30\_2005

### **301.08(b) Plasticity Index.**

Add the following to the first sentence: “and under Special Contract Requirement 703.05(c)(3)”.

301.09\_nat\_us\_07\_07\_2005

### **301.09 Measurement.**

Replace the second paragraph with the following: Measure aggregate by tons compacted in place when payment is by contract quantities.

301.10\_nat\_us\_03\_03\_2005

### **301.10 (Payment).**

Delete the following:

...”adjusted according to Subsection 106.05”...

Table 301-1: Add the following:

**Table 301-1—Acceptance Sampling and Testing Requirements.**

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Subbase & Base Courses L, M, N, O, P, Q, R	Measured and tested conformance (Subsection 106.04)	Plastic Limit	-	AASHTO T 90	3 per each abutment approach road	From the windrow or roadbed after processing	Yes	4 Hours

**Table 301-1—Acceptance Sampling and Testing Requirements.**

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Aggregate Width	Measured and tested conformance (Subsection 106.04)	Width	-	-	3 per each abutment approach road	Roadbed after processing	-	4 Hours
Aggregate Thickness	Measured and tested conformance (Subsection 106.04)	Thickness	-	-	3 per each abutment approach road	Roadbed after processing	-	4 Hours
Additive	Measured and tested conformance (Subsection 106.04)	Amount of Additive	-		3 per each abutment approach road	From the windrow or roadbed after processing	No	4 Hours

**Table 301-1 Field Density Requirements.**

Table 301-1: Delete laboratory and field density requirements for base, subbase, and surfacing and replace with the following:

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Base and Subbase	Measured and tested conformance (Subsection 106.04)	Moisture Density	---					
		Method C	---	AASHTO T 99	1 per type and source of material	Source of material	Yes	Before using in work
		Method C-1	---	R-1 Marshall	“	“	“	“
		Method D	---	AASHTO T 180	“	“	“	“
		Method D-1	---	R-1 Marshall	“	“	“	“
		Compaction	---					
		Method C, C-1, D, D-1	---	AASHTO T 310 or other approved procedures	3 per each abutment approach road	In-place	---	Before placing the next layer
Surfacing	Measured and tested conformance (Subsection 106.04)	Moisture Density						
		Method C-1	---	R-1 Marshall	“	“	“	Before using in work
		Method D	---	AASHTO T 180	“	“	“	“
		Method D-1	---	R-1 Marshall	“	“	“	“
		Compaction						
		Method C, C-1, D, D-1	---	AASHTO T 310 or other approved procedures	3 per each abutment approach road	In-place	---	Before placing the next layer

## 320 – Stockpiled Aggregates

320.00\_nat\_us\_02\_01\_2012

### Description

**320.01** This work shall consist of furnishing and placing aggregate in a stockpile at an existing site or constructing a new site and placing the aggregate at the new site.

### Material

**320.02** Conform to the following Section:

Aggregate	703
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Provide the gradation and quality requirements specified in the Section 301 and identified in the pay items.

### Construction Requirements

**320.03 Stockpile Site.** Prepare existing sites as necessary to accommodate the quantity of aggregate to be stockpiled.

For new sites, clear and grub according to Section 201. Grade and shape the site to a uniform cross-section that drains. Compact the site subgrade of the site with at least three passes using compaction equipment conforming to Subsection 204.11. Place, compact, and maintain a minimum 6 inches of crushed aggregate over the stockpile site and access roads. Prevent contamination of the stockpiles.

**320.04 Stockpile.** After a representative quantity of aggregate is produced, submit proposed target values for the appropriate sieve sizes.

Set target values within the gradation ranges shown in Table 703-2 or 703-3 for the required grading.

Obtain site approval from the CO before stockpiling aggregates. Make the stockpiles neat and regular in shape outside the stream's water influence zone to avoid sediment input into the watercourse or to avoid the loss/damage of riparian vegetation and associated filtering. Make the side slopes no flatter than 1:1.5.

Build the stockpiles in layers not exceeding 3 feet thick. Complete each layer before depositing aggregates in the next layer. Do not allow aggregates from the one layer to run down over lower layers of the stockpile. Do not drop aggregates from a bucket or spout in one location to form a cone-shaped pile.

Construct stockpile layers by spreading aggregates with trucks or other approved pneumatic-tired equipment. Do not push aggregates into piles.

When operating trucks on stockpiles, avoid tracking dirt or other deleterious material onto the stockpiled material.

Space stockpiles far enough apart or separate stockpiles by suitable walls or partitions to prevent the mixing of the different aggregate gradations.

Depose of excess stockpiled materials as directed by the CO.

**320.05 Acceptance.** Aggregate for stockpiling will be evaluated under Subsection 301.08 and Table 301-1. The point of sampling will be the belt or stockpile.

Preparation of stockpile sites and construction of stockpiles will be evaluated under Subsections 106.02 and 106.04.

Clearing will be evaluated under Section 201.

#### **Measurement**

**320.06** Measure the Section 320 items per 301 items listed in the bid schedule according to subsection 109.02.

#### **Payment**

**320.07** The accepted quantities, measured as provided in subsection 109.02 and above, will be paid at the contract price per unit of measurement for the Section 301 pay items listed in the bid schedule and no direct payment shall be made for stockpiled aggregate.

## 552 – Structural Concrete

552.02\_nat\_us\_06\_20\_2007

### Material

#### 552.02 Add the following:

Anchor bolts	717.01
Dowels	717.17
Epoxy resin adhesives	725.21
High strength non-shrink grout	701.02
Mortar	701.02
Portland cement	701.01
Sealants, fillers, seal, and sleeves	712.01

### Construction Requirements

#### 552.03 Composition (Concrete Mix Design).

Delete Table 552-1 and substitute the following:

**Table 552-1  
Composition of Concrete**

Class of Concrete	Minimum Cement Content (pound per cubic yard)	Maximum W/C Ratio	Slump <sup>(1)</sup> (inches)	Maximum Nominal Coarse Aggregate Size <sup>(5)</sup> (inches)
A	611	0.49	2 to 4	1½
A(AE)	611	0.44	1 to 4	1½
B	517	0.58	2 to 4	2½
B(AE)	517	0.58	2 to 4	2½
C	658	0.49	2 to 4	¾
C(AE)	658	0.44	1 to 3	¾
D(AE) <sup>(2)</sup>	611	0.40	1 to 3	1½
E(AE) <sup>(3)</sup>	611	0.40	4 to 6 <sup>(4)</sup>	¾
P (Prestressed)	658	0.44	0 to 4	1
P(AE)	658	0.44	0 to 4	1
Seal	658	0.54	4 to 8	1½

<sup>(1)</sup> Maximum slump is 8 inches if approved mix design includes a high-range water reducer.

<sup>(2)</sup> Concrete with a water reducing and retarding admixture conforming to AASHTO M 194, type D.

<sup>(3)</sup> A latex modified concrete with 0.037 gallons of modifier per pound of cement.

<sup>(4)</sup> Measure the slump 4 to 5 minutes after the concrete is discharged from the mixer.

<sup>(5)</sup> Meeting the processing requirements of AASHTO M43, Table 1 – Standard Sizes of Processed Aggregate.

Delete Tables 552-2 and 552-3 and substitute the following:

**Table 552-2 Minimum Air Content for Air Entrained Concrete**

Nominal Maximum Aggregate Size <sup>(1)</sup>	As Delivered Minimum Air Content <sup>(2) (3)</sup> (%)
2 ½ inch	3.5
2 inch	3.5
1 ½ inch	4.0
1 inch	4.5
¾ inch	4.5
½ inch	5.5

<sup>(1)</sup> Meeting the processing requirements of AASHTO M43, Table 1 - Standard Sizes of Processed Aggregate.

<sup>(2)</sup> These air contents apply to the total mix. When testing these concretes, aggregates larger than 1 ½ inches is removed by handpicking or sieving, and air content is determined on the minus 1 ½ inch fraction of the mix. Air content of the total mix is computed from the value determined on the minus 1 ½ inch fraction.

<sup>(3)</sup> For P(AE) concrete, the as delivered minimum air contents may be reduced 1.0% and the maximum air content is 6.0%.

**Table 552-3  
Required Average Compressive Strength<sup>(1)</sup>**

Specified Compressive Strength ( $f'_c$ ) (pounds per square inch)	Required Average Compressive Strength ( $f'_{cr}$ ) (pounds per square inch)
Less than 3000	$f'_c + 1000$
3000 to 5000	$f'_c + 1200$
Over 5000	$1.10f'_c + 700$

(1) Use this table when there is not enough data available to establish a standard deviation

Delete the first paragraph after Table 552-2 and replace with the following:

Submit written concrete mix designs for approval at least 30 calendar days before production.

Add the following under the list of items to be included in the mix design submittal:

(y) Evaluation of potential aggregate reactivity

## **552.08 Delivery.**

### **(a) Truck mixer/agitator.**

Add the following:

Do not exceed 130 total revolutions at mixing speed, including both initial mixing and remixing. Do not exceed 300 total revolutions, including both mixing and agitating speed.

## **552.09 Quality Control of Mix.**

### **(b) Delivery and Sampling.**

**(4)**

Add the following:

Report test results immediately following 7-day and 28-day tests.

## **552.11 Handling and Placing Concrete.**

Add the following:

**(g) Forms.** For exposed concrete surfaces, use U.S. Product Standard 1 for Exterior B-B (Concrete Form) class I plywood or other approved material that will produce a smooth and uniform concrete surface. Use only form panels in good condition and free of defects on exposed surfaces. If form panel material other than plywood is used, ensure that it has flexural strength, modulus of elasticity, and other physical properties equal to or greater than the physical properties for the type of plywood specified.

Furnish and place form panels for exposed surfaces in uniform widths of not less than 3-feet and in uniform lengths of not less than 6-feet, except where the width of the member formed is less than 3-feet.

Arrange panels in symmetrical patterns conforming to the general lines of the structure. Place panels for vertical surfaces with the long dimension horizontal and with horizontal joints level and continuous.

Precisely align form panels on each side of the panel joint by means of supports or fasteners common to both panels. Provide  $\frac{3}{4}$  inch triangular fillets at all sharp edges of the concrete, unless otherwise shown on the plans.

Do not use driven devices for fastening forms or form supports to concrete. Use form ties consisting of form bolts, clamps, or other devices necessary to prevent spreading of the forms during concrete placement. Do not use form ties consisting of twisted wire loops. Use form ties and anchors that can be removed without damaging the concrete surface.

Construct metal ties or anchorages within the forms to permit their removal to a depth of at least 1-inch from the face without damage to the concrete. Fill cavities with cement mortar in accordance with Subsection 701.02(b), and finish to a sound, smooth, uniform colored surface. Construct all exposed concrete surfaces that shall not be completely enclosed or hidden below the permanent ground surface so the formed surface of the concrete does not undulate more than 0.1-inch or 1/360 of the center-to-center distance between studs, joists, form stiffeners, form fasteners, or wales. Form all exposed surfaces for each element of a concrete structure with the same forming material or with material that produces similar surface textures, color, and appearance.

Construct concrete forms mortar-tight, true to the dimensions, lines, and grades of the structure, and of sufficient strength to prevent appreciable deflection during placement of concrete. Place all material required to be embedded in the concrete before concrete placement. Clean inside surfaces of forms of all dirt, mortar, and foreign material.

When architectural treatment is required, make the angle points for chords in wall stems fall at vertical rustication joints.

Coat with form oil all forms to be removed. Use commercial-quality form oil or an equivalent coating that permits release of the forms and does not discolor the concrete. Do not place concrete in forms until the forms have been inspected and approved by the CO.

#### **552.12 Construction Joints.**

Add the following at the end of the first paragraph:

Provide form cleanout ports at construction joints.

#### **552.19 Acceptance**

Add the following to the first paragraph:

Sampling and testing of unit mass is not required.

Replace “Statistical (106.05)” in the last row and second column of Table 552-9 with “106.04”.

Replace “106.05” in the first sentence of the fourth paragraph with “106.04”.

#### **552.20 Measurement.**

Concrete shall not be measured separately for payment.

#### **552.21 Payment.**

Replace with the following:

Payment for concrete shall not be made separately.

## 554 – Reinforcing Steel

### 554.03 Order Lists

Replace the first sentence with the following:

On reinforcing steel order lists, use the same respective bent bar marks for labeling as shown on the plans.

Add the following:

Reinforcing shall be fabricated as shown on the plans. Shop drawings for all reinforcing shall be submitted to the CO for approval prior to fabrication. Shop drawings shall include, but not be limited to, bar and bend dimensions, hook lengths, bar material, bar schedule and markings, and bar layout (plans, sections, elevations, details, etc.).

### 554.11 Measurement.

Reinforcing shall not be measured separately for payment.

### 554.12 Payment.

Replace with the following:

Payment for reinforcing shall not be made separately.

## SPS 590 – Precast Concrete Structures

### Description

#### 590.01

The work consists of fabricating and transporting the precast concrete footings of the shape shown on the plans.

### Materials

#### 590.02

Provide materials that meet the requirements specified in the following subsections:

Joint Material.....	712
Nonshrink Grout.....	725.22(c)
Reinforcing Steel.....	554 & 709.01
Structural Concrete .....	552

Provide precast concrete members of the size and shape that are shown on the plans. Concrete shall be Class A(AE) and finish shall be according to Standard Specification Section 552.16 (b).

### Construction Requirements

**590.03 General.** Transport the finished footing segments to the project location.

**590.04 Fabrication.** The Contractor/fabricator of the precast concrete footings shall determine and recommend the segment lengths. The concrete shall conform to the specification for Class A(AE) as defined in Section 552 as modified for this contract. The Contractor/fabricator shall submit 1 electronic copy of the shop plans (11x17 in size) to the Forest Service 30 days prior to the planned date of fabrication. The shop drawings shall include the reinforcing layout, lifting devices (including capacity), segment connections, structure connections, miscellaneous details, and the concrete design mix. The shop drawings shall include lifting procedure instructions/specifications. Shop drawings shall also include, but not be limited to, bar and bend dimensions, hook lengths, bar material, bar schedule and markings, and bar layout (plans, sections, elevations, details, etc.).

**590.05 Storing, Handling, Transporting, & Erecting.** Provide additional reinforcement, as needed, to meet the requirements of handling and transporting the precast members. Store and transport the precast units in the upright position, unless otherwise shown on approved shop drawings. Prevent cracking or damage during storage, hoisting, and handling of the precast units. Replace units damaged by improper storage or handling. Use lifting devices for all handling of the footing segments.

**590.06 Delivering & Placement of Members.** Advise the Forest Service a minimum of 48 hours before precast units are to be delivered. Provide the expansion joint material with the footings.

**590.07 Acceptance.**

Replace or repair, at no cost to the Government, any structural component that is damaged (resulting from operating equipment over or near the structure or from transport, loading, or unloading), or that is ruptured or broken.

Provide concrete test results to the Forest Service.

Precast segments and material for concrete will be evaluated under Subsection 106.03. Furnish production certifications for hydraulic cement.

Concrete for precast, concrete members will be evaluated under Subsections 106.02, 106.03, and 106.04.

**Measurement**

**590.08** Measure the Section 590 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Do not measure reinforcing steel or concrete or for precast, concrete members.

**Payment**

**590.09** The accepted quantities will be paid for at the contract unit price of measurement for the Section 590 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

All necessary equipment, labor, material, and incidentals required to fabricate, transport, and deliver the precast concrete footings shall be included in the following item:

*59001 Precast concrete footing* *ft*

## 603 – Structural Plate Structures

### 603.01 Description.

Add the following:

The work also consists of designing, fabricating, transporting, and installing the bottomless galvanized metal arch/box culvert as well as providing a dulled surface to headwalls and wingwalls.

603.03\_nat\_03\_23\_2004

### 603.02 Material.

Add the following:

Material used for headwalls and wingwalls shall be dulled to reduce the “shine” of the material. Treatment may be “pickling,” etc. The proposed method and the results thereof (in the form of a 12”x12” treated material sample) shall be submitted to the CO for approval at least 3 weeks prior to fabrication/treatment.

### 603.03 General

Add the following:

Do not place or backfill structure until the CO has approved in writing the excavation and foundation.

**(a) Design & Fabrication.** The Contractor/fabricator of the bottomless metal arch/box culvert shall also provide the structural design of the structure and any required supporting or reinforcing elements (such as the anchorages at the support) in accordance with the minimum cover and other requirements as shown on the plans and indicated within these specifications. The Contractor/fabricator shall verify that the required dimensions of the anchorage device(s) can be obtained within the footing stem as shown on the plans. The design shall be required to meet the specifications shown on the plans. The Contractor/fabricator shall submit 4 copies of the shop plans, calculations, and supplemental specifications to the CO 30 days prior to the planned date of fabrication. The Contractor/fabricator shall ensure the shop plans, supplemental specifications, and calculations are sealed by a registered Pennsylvania Professional Engineer. The design life shall be 75 years.

603.04\_nat\_03\_25\_2004

### 603.04 Erecting

Add to the third paragraph:

Torque all bolts before beginning the backfill. The structure shall be protected from unbalanced loads and from any structural loads or hydraulic forces that might bend or distort the structure.

## SPS 624 – Topsoil

### 624.03 Preparing Areas

Replace with the following:

Shape all slopes and disturbed areas to be covered with topsoil. Roughen slopes to a depth of 4 inches. The prepared area shall include locations disturbed during construction activities.

### 624.04 Placing Topsoil

Add the following:

Place conserved topsoil in the same amount as originally stockpiled according to Section 204.

## 625 – Turf Establishment

### 625.01 Description.

Add the following:

Provide seeding on disturbed areas near the structure.

Fertilizer is not required.

### 625.03 General.

Delete the first subsection and add the following:

Apply turf establishment to areas on top of the structure that are not designated to receive surface aggregate, and to finished slopes and ditches as directed by the CO. Do not seed during windy weather or when the ground is excessively wet, frozen, snow covered, extremely dry, cloddy, hard pan, or is otherwise untillable.

Scheduling of the seeding shall be approved by the CO. Seeding shall occur before slopes become crusted or polished and within one week of slope finishing. Depending on the month of seed application, the appropriate seed mixture shall be applied between June – September, if soil moisture is adequate, or October – November.

### 625.04 Preparing Seedbed.

Delete “2 inches in diameter and larger,” from the second sentence.

### 625.05 Watering.

Delete subsection 625.05.

### 625.06 Fertilizing.

Delete subsection 625.06.

### 625.07 Seeding

#### (a) Dry Method

Add the following:

The seed mix shall be as follows:

The seed mix shall be as shown below, applied at a rate of 20 pounds per acre, and shall be certified weed free. Use mechanical, landscape, or cultipacker seeders, seed drills, fertilizer spreaders, or other approved mechanical seeding equipment to apply the seed.

No limestone or fertilizer shall be applied unless directed by the CO.

**See Application: June – September (if soil moisture is adequate)**

Seed species	QUANTITY POUNDS/ACRE	PERCENT PURE LIVE SEED
Oats – <i>Avena sativa</i>	18	90
Autumn Bentgrass- <i>Agrostis perennans</i>	2	10
<b>TOTAL</b>	20	100

Small seeds – 8,000,000 per pound

**Seed Application: October – November**

Seed species	QUANTITY POUNDS/ACRE	PERCENT PURE LIVE SEED
Winter Wheat – <i>Triticum aestivum</i>	18	90
Autumn Bentgrass- <i>Agrostis perennans</i>	2	10
<b>TOTAL</b>	20	100

Small seeds – 8,000,000 per pound

*Sources for seeds:*

*Ernst Conservation Seeds, 8884 Mercer Pike, Meadville, PA 16335*

*(800) 873-3321*

*(814) 336-2404*

**625.08 Mulching**

Delete the entire subsection and replace with the following:

Mulching is not required. Place erosion control mat on all surfaces to be seeded.

**625.09 Protecting and Caring for Seeded Areas**

Delete the entire subsection and replace with the following:

Protect and care for the seeded areas until final acceptance (75% vegetated and approved by the CO). Reseed all seeded areas damaged by construction, without additional compensation.

**625.11 Measurement.**

Replace the second paragraph with the following:

Measure seeding by the square yard on the ground surface.

## **629 – Rolled Erosion Control Products and Cellular Confinement Systems**

### **629.03 General**

Add the following:

Install erosion control blanket on all slopes and other disturbed areas adjacent to the structure and outside of the traveled way (but not on top of the structure), within 48 hours after seeding. Erosion control blankets shall be certified weed-free and 100% biodegradable.

## 635 – Temporary Traffic Control

635.03\_nat\_04\_05\_2004

### **635.03 General.**

Add the following:

Install temporary traffic control signs to temporary posts or approved temporary sign mounts.

The work includes all traffic control for all phases of work.

## 648 – Streambed Simulation

### Description

**648.01** This work consists of furnishing and installing alluvium, rock, logs, trees, rootwads and specified fill to simulate natural stream profile, grade control structures, and streambed through culverts, bridge structures, and existing stream channels. Work includes developing materials; hauling materials; dewatering; sediment control; placing bedding and backfill to construct stream simulation channels inside and outside of the structures (culverts, bridges, existing channels); placing, keying, sealing, and compacting designed streambed fill; constructing instream structures (steps, pools, riffles, ribs, banks); reconstructing existing channels; and all other streambed work to complete the project.

### Material

**648.02 Conform to the following Section and Subsections:**

Foundation Fill.....	704.01
Streambed Simulation Rock .....	705.07
Channel Rock .....	705.08

Furnish instream structures materials (boulders, boulder clusters, ribs, steps, riffles, etc) and stream simulation streambed mix with the sizes and gradations as required in the contract.

Provide native log materials that are green, sound, and free of cracks or defects that would affect structural integrity or accelerate decay.

Sort material for streambed simulation rock by screening (power screen or grizzly/stationary screen) as shown on the plans. Large particles may be machine sorted by heavy equipment or hand labor.

Mix streambed simulation rock in proportions based on Table 705-4. All streambed material will be similar in shape / angularity as those found in the natural stream channel or as designated in the specifications. Tolerance for material gradation is + or – 5% for each screen size listed in the gradation.

Provide streambed simulation rock and channel rock that is durable and at least as angular as those found in the natural stream channel or as SHOWN ON THE PLANS.

Do not use rounded channel rock in the construction of banks or steps within the culvert or bridge structure. Rounded channel rocks may be used outside the culvert or bridge structure if approved by the CO in the field.

Request approval of rock to be used for steps, banks and all grade control structures 3 days prior to scheduled placement.

### Construction

**648.03 General.** Place streambed simulation rock on a prepared surface to form a well-graded, low permeability mass, similar in appearance and form to the natural stream channel or as required in the contract.

**648.04 Equipment Operations.**

An oil spill containment kit is required on each job site when working in and around the stream. Composition of the kit is dependent on the job; determine contents of the kit as needed for each job. At a minimum, include tarps and oil-absorbent pads. Provide floating oil boom downstream of the work site.

**648.05 Equipment Limitations.**

Do not drive metal track or rubber tired equipment directly on metal or concrete structure surfaces. Place a layer of streambed mix material on the structure bottom before operating metal track or rubber tired equipment directly on metal or concrete structure surfaces.

**648.06 Excavation.** Control excavated material to minimize disturbance to the adjacent channel and banks. Incorporate suitable streambed materials into the project if required gradations are accordance with contract specifications.

Specific culvert installation time restrictions and installation plan requirements are indicated in the contract.

**648.07 Dewatering.** Dewatering or diversions are required for construction and adjacent instream work in addition to complete reconstruction of the channel. Dewatering is not required when constructing isolated or infrequent structures such as single rock or log step and other instream structures in channel reconstruction areas outside 25 feet from the inlet or outlet of the structure. Customize dewatering to the site depending on flow, ground water depths at the time of installation, terrain configuration, and culvert embedment depths. Submit a dewatering plan 15 days in advance of construction. Include in the plan the method (bypass or pumping), number of pumps and capacity required, pump and bypass culvert calculations, location/layout of dewatering operations and equipment, and erosion control measures for dealing with the return flow back to the existing stream channel. The plan will be approved by the CO within 14 calendar days of plan submission.

The existing 6'7"x4'7" culvert should be used for by-passing flows during construction of the footers. In order to pass the 2-yr flood (182 cfs) with about a 1 foot head, the upstream coffer dam should be built to an elevation of 99 to provide 1 foot of freeboard.

The July-Sep mean monthly flows for Wintergreen are about 3.5-4.0 cfs (about 1,6000-1,800 gal/min). The by-pass pump while constructing the bed needs to be capable to pump this amount. If it is wetter or dryer than average during the construction period it could be a few cfs higher or lower.

Maintain the dewatering pumping operations to ensure return flow does not exceed State water quality standards. Water pumped from the construction site may require additional filtration by filter bags or other methods (settling basins, gravel filters, etc) to prevent turbid water from directly entering the stream.

Place additional measures or cease operations until the discharge reaches allowable levels when turbidity exceeds State water quality standards.

Relocate fish contained within the cofferdams before the site is completely dewatered. Place relocated fish in the closest pool upstream of the construction zone.

If trash pumps are used during construction, the intake must be operated and maintained to prevent fish entrapment, entrainment, or injury with the use of perforated or slotted plate and woven wire with a mesh size not greater than 3/32 inch or a profile bar and wedgewire with openings not greater than 1/16 inch. Approach velocities shall not exceed a passive velocity of 0.2 feet per second (fps) or an active velocity 0.4 fps.

**648.08. Rewatering.** Conduct rewatering activities to minimize sediment movement downstream of the site upon completion of instream work. Prior to rerouting stream flow into the new channel, rinse the surface of the streambed to removed fine-grained sediment. After the initial sediment pulse is removed, slowly breach the coffer/diversion dams to avoid a large pulse of water being sent through the newly constructed channel.

**648.09 Blasting and Rock Removal.** Remove bedrock encountered during excavation to the lines and grades required in the contract. Remove rock by either mechanical means with hydraulic impact hammers / rock breakers, by ripping, or blasting. When explosives are used, do not cause mortality to juvenile fish by transmitting excessive blasting overpressures through the ground to the fish habitat. Limit blasting overpressures to a maximum of 2 psi in fish habitat.

**648.10 Placed Streambed Simulation Material.** Begin construction from the downstream end working upstream. Changes to this sequence will be allowed on a case by case basis due to poor stream to culvert alignment, traffic requirements, limited access, and preservation of existing trees reinforcing the banks.

Place streambed simulation rock in one or more layers with a maximum layer depth less than 1 ½ times the average dimension of the B-axis of the streambed simulation rock, but no greater than 2ft. Place streambed simulation rock by methods that do not cause segregation or damage to the prepared surface. Place or rearrange individual rocks to obtain a uniformly dense, compact, low permeability mass, matching streambed simulation details. Fill voids by machine or hand tamping before placing the next lift. Compact streambed materials by mechanical means such as hand or excavator operated vibratory plate compactors.

Fill all voids left during placement of streambed simulation rock, boulders, steps, ribs, banks and streambed materials adjacent to footings, concrete structures or corrugated pipes with foundation fill. Use water pressure, metal tamping rods, and similar hand operated equipment to force material into all surfaces and subsurface voids between the structure and rocks, and between individual rocks. Ensure the streambed is sealed to limit permeability.

Notify the CO at least 48 hours in advance of the streambed material installation.

**648.11 Rock Bedforms (steps, ribs, riffles), Forcing Features (boulders, boulder clusters), and Bank Construction.** Construct bedforms and banks as specified in the contract. Construction will proceed from downstream to upstream. Machine or hand place banks, steps, and ribs and key in place with select key pieces of the required size class, along with smaller materials of varying sizes to fill voids. Construct low flow channel through the center of the

channel AS SHOWN ON THE DRAWINGS. Place steps and ribs so the tops are uneven, containing several high and low points to concentrate water during low flows. Place step and rib surfaces so they are higher at the outside edge of the culvert (culvert wall) and slope down to the outside edge of the constructed low flow channel AS SHOWN ON THE PLANS.

Construct steps with footer rocks placed before the top step rocks are installed. Use footer rocks which are the same size class as the top step rocks. Fill all voids with smaller materials as construction progresses to minimize permeability.

Construct banks out of large blocky key pieces of the required size class AS SHOWN ON THE DRAWINGS. Key and lock smaller materials of varying sizes to fill voids. Bank materials will be hand keyed in place and compacted depending on the size of materials used as designated in the field by the CO. Construct bank faces to be uneven, protrude into the channel, and be rough in appearance. Construct the top of the bank to be fairly uniform. Tie back constructed banks and margins at the edge of the structure walls into the existing stream banks at dimensions similar to those found in the reference reach or AS SHOWN ON THE DRAWINGS.

When single rocks are used as roughness elements and habitat diversity, bury to 50% of the diameter or as SHOWN ON THE PLANS. Fill and compact voids around these structures. When constructed as clusters of particles, key pieces within the cluster will be buried 50% of the diameter or as SHOWN ON THE PLANS.

Notify the CO at least 48 hours in advance of the installation of any streambed, bedform, roughness feature, log structure, or bank construction.

**648.12 Log and Root Wad Structures.** Locate and place log structures as required in the contract, and/or designated in the field by the CO.

Construct log weirs with cross slope gradients not less than 5(H):1(V), unless SHOWN ON THE DRAWINGS or staked in the field by the CO, and maximum tolerance of 6(H):1(V), unless approved in writing by the CO.

Embed log weirs to a minimum depth of 10 feet beyond bank full widths or half bankfull width on each side, whichever is greater or AS SHOWN ON THE DRAWINGS. When placing habitat logs (overhanging a portion of the stream) that lay on the banks, ensure 2/3 of the log remain behind bankfull width on top of the bank.

Embed rootwad revetment trunks a minimum of 10 feet behind bankfull width limits or as SHOWN ON THE DRAWINGS. Bury the root to a point where the base of the bol is resting in the bottom of the bank or as required in the contract, and/or designated in the field by the CO.

### **Measurement**

**648.13 Method.** Measure the Section 648 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Channel construction per linear unit includes furnishing and installing all rock and work associated with simulation streambed construction and includes the installation of rock steps, ribs, pools, banks, riffles, boulders/boulder clusters and miscellaneous rock structures.

All log structures and rootwad revetment will be measured separately for payment if designated on the schedule of items.

Instream structures composed of rock and wood will be measured separately for payment if designated on the schedule of items.

Do not measure dewatering and diversions, they are considered incidental to construction of the structures unless measured separately for payment if designated on the schedule of items.

Work and materials required for stream simulation are considered incidental to installation of the structure unless designated on the schedule of items.

### **Payment**

**648.14 Basis.** The accepted quantities, measured as provided in Subsection 109.02, will be paid at the contract price per unit of measurement for the Section 648 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Payment of foundation fill that is described in Subsection 648.13 shall not be paid for separately, but shall be included in the Section 648 pay item for Channel Rock.

## 703 – Aggregate

### 703.20 Driving Surface Aggregate.

Add the following:

All Driving Surface Aggregate (DSA) is to be derived from natural limestone formations. Stone is defined as rock that has been crushed; rock is defined as consolidated mineral material. All components of the aggregate mix are to be derived from crushed rock material that meets program specification for abrasion resistance, pH and freedom from contaminants.

#### Minus #200 fine composition:

The fines passing the #200 sieve must be rock material. No clay or silt soil may be added. Limestone material passing the #200 sieve may be used to make up a deficit in the distribution of sandstone aggregate rock, and vice versa. All added material passing the #200 sieve must be derived from rock material that conforms to program specifications. Lime kiln dust and cement kiln dust may be added to DSA to account for up to 50% of the fines passing the #200 sieve. The amount of particles passing the #200 sieve shall be determined using the washing procedures specified in PTM No. 100.

Size: The required amounts and allowed ranges, determined by % weight, for various size particles:

PASSING SIEVE	LOWER%	HIGH%
1 ½ inch	100%	
¾ inch	65%	95%
#4	30%	65%
#16	15%	30%
#200	10%	15%

LA Abrasion: The acceptable limit is measured by weight loss is “less than 40% loss”. Los Angeles Abrasion test, AASHTO T-96 (ASTM C 131) shall be used to determine this property. Existing tests made for and approved by PennDOT will be accepted.

Sulfate Test: Soundness or resistance to freeze/thaw (i.e. sulfate test) is not specified for this application because a gravel road driving surface aggregate is not bound within a concrete or asphalt mix.

pH: Aggregate must be within the range of pH 6 to pH 12.5 as measured by EPA 9045C.

Optimum Moisture: Material is to be delivered and placed at optimum moisture content +/- 1% as determined for that particular source. The optimum percentage moisture is to be determined using Proctor Test ASTM D698, procedure C, Standard. The optimum percentage moisture is to be identified by the supplier in the bid purchasing documents. Loads with excessive moisture shall be rejected. Water draining from the tailgate, excess material sticking to the roller drum or the

inability to compact the material are field indicators of excess moisture. In addition, if a load is too dry or does not have enough fines it will be rejected. Visual inspection of the load and poorly consolidated material after compactive effort are field indicators of low moisture or poor product gradation.

Plasticity Index:

Material must not exceed Plasticity Index (PI) rating of 6. The laboratory test required for these results is the ASTM D4318 – Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

Transport: Tarps are to be used to cover 100% of the load’s exposed surface from the time of loading until immediately before dumping. This requirement includes standing time waiting to dump.

**Aggregate producers are required by the program to certify that the aggregate they deliver conforms to the program specifications.** To eliminate segregation of material, stockpiling of material at jobsite will not be permitted unless authorized by COR.

The following are “Local” sources for this material:

Hawbaker – Turtlepoint, PA. 814-237-1444 or 814-642-2500

New Enterprise Stone & Lime Co. Tyrone, PA 814-695-4405

Road Preparation Specifications: The road surface to receive the aggregate should have template with crown of 2% or ¼ inch per foot. The receiving surface is to be scarified to permit knitting of the aggregate.

Driving Surface Aggregate Placement: Minimum compacted depth of four inches is to be established for driving surface. Driving Surface Aggregate is to be applied by tailgate spreading unless spreader box is specified. Material when placed shall be compacted as follows: Beginning on the lower or berm side of the crown, begin rolling and work your way to the top of the crown by overlapping the successive longitudinal passes. Do not run the roller lengthwise directly on the crown. Compaction with truck tires is not accepted. Steel wheel rollers other than vibratory shall be capable of exerting a force of not less than 250 pounds per inch of width of the compression roller or rollers. Rollers shall be self-propelled with a minimum weight of 6 tons. Contractor must have certification in writing that material placed is Driving Surface Aggregate meeting this specification.

**1” Minus Aggregate (DSA Gravel non limestone) Size:** The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%	
1 ½ inch	100%		
¾ inch	65%	95%	
#4	30%	65%	LA Abrasion < 40%
#16	15%	30%	Sulfate Test – Not Applicable
#200	10%	15%	PH between 6 and 9

Material available at Glenn O. Hawbacker – Pittsfield Pit 814-563-7911

AI Construction Corporation – Gardland Plant 814-563-7680

**Pennsylvania 2A Gradation:**

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%	
2 inch	100%		
¾ inch	52%	100%	
#4	24%	50%	LA Abrasion < 40%
#16	10%	30%	Sulfate Test – Not Applicable
#200	0%	10%	PH between 6 and 9

**AASHTO 57 Gradation:**

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%
1-1/2 inch	100%	
1 inch	95%	100%
1/2 inch	25%	60%
#4	0%	10%
#8	0%	5%

## 704 – Soil

### **704.01 Foundation Fill.**

Replace section (a) with the following:

(a) Maximum particle size 3 inches

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### **704.04 Structural Backfill.**

Replace with the following:

Structural backfill shall be as specified in Section 704.03(a) unless otherwise specified by the arch/box culvert manufacturer.

## 705 - Rock

### 705.02 Riprap Rock.

Replace with the following:

Furnish rock sound, free from structural defects and foreign substances such as soil, shale, and organic materials. Use rock conforming to the following requirements:

No shale seams

Hard and angular shaped rock with neither width nor thickness less than one-third its length.

Minimum specific gravity of 2.5 as determined according to AASHTO T 85, bulk saturated, but surface-dry basis.

Each load of rock well-graded, from smallest to the largest size

**Table 705-1  
Gradation Requirements for Riprap**

Class, Size No. Rock Size (inches)	Percent Passing (Square Openings)				
	R-7	R-6	R-5	R-4	R-3
30	100				
24		100			
18	15-50		100		
12	0-15	15-50		100	
9			15-50		
6		0-15		15-50	100
4			0-15		
3				0-15	15-50
2					0-15
Nominal Thickness	36	30	24	18	12

Add the following:

**705.07 Streambed Simulation Material.** Furnish hard durable rock that is resistant to weathering and water action, free of organic or other unsuitable material, and conforms to the test values in

**Table 705-4  
Gradation Requirements for Streambed Simulation Material (inches)**

<b>Bed Class</b>	<b>100% passing</b>	<b>84% passing</b>	<b>50% passing</b>	<b>30% passing</b>	<b>16% passing</b>	<b>10% passing</b>
<b>10</b>	24 in	10 in	5 in	1.5 in	1 in	0.1(Sand)

**705.08 Streambed Channel Rock.** Furnish hard durable rock that is resistant to weathering and water action, free of organic or other unsuitable material, similar in color to those in the area, and at least as angular as that found in the natural stream channel. Do not use shale, rock with shale seams, or other fissile or fissured rock that may break into smaller pieces in the process of handling and placing. Conform to test values in 705.02.

Conform to the following:

**Table 705-5  
Gradation Requirement for Channel Rock (CR)**

<b>Class</b>	<b>Mass (Pounds)</b>	<b>Approximate Cubic Dimension (inches)</b>
<b>CR - 0</b>	6 - 50	6 - 12
<b>CR - 1</b>	50 - 200	12 - 18
<b>CR - 2</b>	<b>200 - 700</b>	<b>15 - 28</b>
<b>CR - 3</b>	700 - 2000	28 - 36
<b>CR - 4</b>	2000 - 4000	36 - 48
<b>CR - 5</b>	4000 - 6000	48 - 54
<b>CR - 6</b>	6000 - 8000	54 - 60

## 709 – Reinforced Steel and Wire Rope

### 709.01 Reinforcing Steel.

**(b) Reinforcing bars.** Delete the text and substitute the following:

Furnish deformed, grade 60 bars conforming to AASHTO M31.

**(d) Tie bars.** Delete the text and substitute the following:

Furnish deformed, grade 60 bars conforming to AASHTO M31.

**(e) Hook bolts.** Delete the text and substitute the following:

Furnish deformed, grade 60 bars conforming to AASHTO M31 with M14 rolled threads or M16 cut threads. Furnish a threaded sleeve nut capable of sustaining a minimum axial load of 15,000 pounds.

## 714 – Geotextile and Geocomposite Drain Material

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### 714.01 General.

#### Tables 714-1 and 714-4.

Add the following note to both tables:

(4) Woven slit film will not be allowed.

### 714.03 Geotextile Sediment Bags

The Geotextile Sediment Bag shall be a nonwoven bag which is sewn with a double needle matching using a high strength thread.

The Geotextile Sediment Bag seams shall have average wide width strength per ASTM D-4884 as follows. Test Method Test Result: ASTM D-4884 - 100 lb/in.

Each standard Geotextile Sediment Bag has a fill spout large enough to accommodate a 4” discharge hose. Attached are straps to secure the hose and prevent pumped water from escaping without being filtered.

The geotextile fabric shall be nonwoven fabric with the following properties:

Properties Test Method Units Nonwoven:

Weight ASTM D-3776 – 10 Oz/yd  
Grab Tensile ASTM D-4632 – 250 Lbs.  
Puncture ASTM D-4833 – 165 Lbs.  
Flow Rate ASTM D-4491 – 70 Gal/Min/Ft<sup>2</sup>  
Permittivity ASTM D-4491 Sec.-1 - 1.3 Sec<sup>-1</sup>  
Mullen Burst ASTM D-3786 – 550 lbs-in<sup>2</sup>  
UV Resistant ASTM D-4355 - 70 %  
AOS % Retained ASTM D-4751 - 100 %

*All properties are minimum average roll value except the weight of the fabric which is given for information only.*

## 717 – Structural Metal

### 717.01 Structural Steel

#### **(d) Bolts and nuts.**

Delete the paragraph and replace with the following:

Conform to ASTM A 307, ASTM A449 Type 1, ASTM A 563 Grade C, or F568 Class 8.8 and AASHTO M291 Class 12, as specified. Conform to AASHTO M293 (ASTM F 436) for hardened steel washers.

Add the following subsections:

#### **(g) Steel Anchor Bolts and Nuts.**

Furnish steel anchor bolts of the dimensions shown on the plans. Furnish steel anchor bolts that conform to ASTM F568 Class 4.6 and AASHTO M291 Class 5 unless otherwise shown on the plans. Ensure that the exposed portion of the bolt is zinc coated by hot dip or mechanical deposition.

### 717.07 Galvanized Coatings

Add the following:

Furnish hot-dipped galvanized hardware and fasteners conforming to AASHTO M 232 and mechanically galvanized hardware and fasteners conforming to AASHTO M 298. Repair damaged galvanized surfaces by power or hand tool cleaning, followed by 2 brush applications of zinc rich 2 component paint meeting FS TT-P-641, FS TT-P-1046A or MIL-P-21035. Single component brush or spray-on zinc or galvanizing compounds are not permitted. A source for TT-P-641 paint is Far West Paint Company, Tukwila, WA 206-244-8844.

### 717.14 Aluminum Bolt Heads and Nuts.

Add the following:

Aluminum structural plate fasteners shall conform to ASTM A467 and ASTM F468.