

**DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
REGION 9  
ALLEGHENY NATIONAL FOREST**

**Grand Regen Removals Timber Sale**

<b>FR 133</b>	<b>Ludlow JoJo</b>	<b>1.4 Miles</b>	<b>Reconstruction – Maintenance – Level I (Old C)</b>
<b>FR 195</b>	<b>Martin Run</b>	<b>2.5 Miles</b>	<b>Reconstruction – Maintenance – Level I (Old C)</b>
<b>FR 196</b>	<b>Martin Ridge</b>	<b>0.4 Miles</b>	<b>Reconstruction – Maintenance – Level J (Old D)</b>
<b>FR 198</b>	<b>Crane-Martin</b>	<b>1.2 Miles</b>	<b>Reconstruction – Maintenance – Level J (Old D)</b>

Marienville Ranger District  
McKean and Elk 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 Eastside 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. Mortimer*

**Approved By:**

*[Signature]*  
**District Ranger**

*3/11/2014*  
**Date**

*[Signature]*  
**Forest Engineer**

*3-12-2014*  
**Date**

*[Signature]*  
**Forest Supervisor**

*3/14/14*  
**Date**



## Road Summary

### SPECIFIED ROADS

a. Description of Work:

**Reconstruction: FR 133, 195, 196 and 198**

Mobilization, Road Reconditioning, Seeding & Mulching, Commercial Road Surfacing and Turnout Construction/Reconstruction.

b. Construction Costs:

<u>Road No.</u>	<u>Miles</u>	<u>Estimated Road Cost</u>	<u>Engineer's Estimate</u>	<u>Reconstruction Deposits</u>
133	1.4 ®	\$10,012.00	\$11,578.00	\$1,900.00
195	2.5 ®	\$33,389.00	\$37,543.50	\$6,100.00
196	0.4 ®	\$6,581.00	\$7,331.50	\$1,200.00
198	1.2 ®	\$7,225.00	\$8,147.50	\$1,400.00
<u>Total</u>		<u>\$57,207.00</u>	<u>\$64,600.50</u>	<u>\$10,600.00</u>

Completion dates: 9/30/2014

## Schedule of Items

### FR 133 from Station 467+75 to EOR

Pay Item	Description	Pay Unit	Estimated Quantity	Unit Price	Extended Total	Engineer's Estimate Unit Price	Engineer's Extended Total
15101	Mobilization (Lump Sum)	All	1	1500.00	\$ 1,500.00	1800.00	\$ 1,800.00
20464	Turnout Construction/Reconstruction	Lump Sum	1	1400.00	\$ 1,400.00	1750.00	\$ 1,750.00
30109	Aggregate <b>surface course</b> , grading <b>PA 2A</b> , compaction method <b>B</b>	Ton	184	23.00	\$ 4,232.00	24.50	\$ 4,508.00
30326	Road reconditioning	Mile	1.4	1200.00	\$ 1,680.00	1400.00	\$ 1,960.00
62501	Seeding, hydraulic or dry method (Lump Sum)	All	1	1200.00	\$ 1,200.00	1560.00	\$ 1,560.00
<b>TOTAL</b>					<b>\$ 10,012.00</b>		<b>\$ 11,578.00</b>

### FR 195

Pay Item	Description	Pay Unit	Estimated Quantity	Unit Price	Extended Total	Engineer's Estimate Unit Price	Engineer's Extended Total
15101	Mobilization (Lump Sum)	All	1	1500.00	\$ 1,500.00	1800.00	\$ 1,800.00
20464	Turnout Construction/Reconstruction	Lump Sum	1	4400.00	\$ 4,400.00	5500.00	\$ 5,500.00
30109	Aggregate <b>surface course</b> , grading <b>PA 2A</b> , compaction method <b>B</b>	Ton	943	23.00	\$ 21,689.00	24.50	\$ 23,103.50
30326	Road reconditioning	Mile	2.5	1200.00	\$ 3,000.00	1400.00	\$ 3,500.00
62501	Seeding, hydraulic or dry method (Lump Sum)	All	1	2800.00	\$ 2,800.00	3640.00	\$ 3,640.00
<b>TOTAL</b>					<b>\$ 33,389.00</b>		<b>\$ 37,543.50</b>

## FR 196

Pay Item	Description	Pay Unit	Estimated Quantity	Unit Price	Extended Total	Engineer's Estimate Unit Price	Engineer's Extended Total
15101	Mobilization (Lump Sum)	All	1	1500.00	\$ 1,500.00	1800.00	\$ 1,800.00
30109	Aggregate <b>surface course</b> , grading <b>PA 2A</b> , compaction method <b>B</b>	Ton	187	23.00	\$ 4,301.00	24.50	\$ 4,581.50
30326	Road reconditioning	Mile	0.4	1200.00	\$ 480.00	1400.00	\$ 560.00
62501	Seeding, hydraulic or dry method (Lump Sum)	All	1	300.00	\$ 300.00	390.00	\$ 390.00
<b>TOTAL</b>					<b>\$ 6,581.00</b>		<b>\$ 7,331.50</b>

## FR 198

Pay Item	Description	Pay Unit	Estimated Quantity	Unit Price	Extended Total	Engineer's Estimate Unit Price	Engineer's Extended Total
15101	Mobilization (Lump Sum)	All	1	1000.00	\$ 1,000.00	1300.00	\$ 1,300.00
30109	Aggregate <b>surface course</b> , grading <b>PA 2A</b> , compaction method <b>B</b>	Ton	195	23.00	\$ 4,485.00	24.50	\$ 4,777.50
30326	Road reconditioning	Mile	1.2	1200.00	\$ 1,440.00	1400.00	\$ 1,680.00
62501	Seeding, hydraulic or dry method (Lump Sum)	All	1	300.00	\$ 300.00	390.00	\$ 390.00
<b>TOTAL</b>					<b>\$ 7,225.00</b>		<b>\$ 8,147.50</b>

## 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.**

– All road work will be completed prior to timber haul, unless otherwise approved.

– 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 furnish, erect and maintain the minimum barricades and warning signs identified in the Special Project Specifications until final inspection and acceptance, unless otherwise directed by the Engineer. Signs shall conform to the Manual on Uniform Traffic Control Devices (MUTCD). **Contractor shall install “ROAD CONSTRUCTION AHEAD” signs on all roads in this project area and at ATV trail crossings. Contractor’s sign plan must be approved by Forest Service prior to work. Signs will be covered on weekends, holidays and any days when contractor is not working.**

– 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.

– Forest Service gate plans are available at the Allegheny National Forest Supervisor’s Office, Warren, PA. 16365. The following are gate manufacturers:

Gary Asel	ADM Welding
Marienville, PA.	2818 Penna. Ave. West
(814) 927-8380	Warren, PA. 16365
	(814) 723-7227

– Pit run aggregate quantities are estimated as compacted in place on the road.

– 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. Contractor is responsible for obtaining any Department Of Environmental Protection GP-11 or GP-7 stream crossing permits and preparing a Soil Erosion and Sediment Control Plan. This work will be considered incidental to Section 151 Mobilization.

– 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. This will be considered incidental to Pay Item 602.**

## Road Log - Work Descriptions

### FR 133 Ludlow JoJo Level I (Old Level C)

Station	Road Log/Work Description (October 2013)
0+00	Centerline of railroad tracks in Ludlow
50+75	FR 258 right
58+40	FR 133B right
69+50	FR 594 sign right
80+15	FR 650 left
110+15	North Country Trail Crossing
149+10	FR 468 left
219+90	FR 470 left
282+45	FR 133D left
293+05	FR 133E right
308+00	FR 133A left
406+40	FR 264 right, FR 126 left

**NOTE:** *This section of FR 133, from FR 195 to JoJo, will be used by Seneca to access a proposed Marcellus well off FR 198. Coordination of activities will need to be accomplished.*

**Items in bold are work items, other items are for information and reference only**

<b>467+75 - 543+00</b>	<b>Recondition roadbed, see TYPICAL RECONDITION SECTION, clean culverts and ditches</b>
467+75	<b>Coordinates: Latitude 41° 38' 10.49" N (41.6362) Longitude 78° 53' 11.57" W (-78.8865)</b>
467+75 - 533+00	14' roadway unless otherwise noted
467+75 - 533+00	<i>14' roadway, 4" compacted DSA limestone to be spread within 12' of centerline, to be completed by Oil and Gas Manufacturer (Seneca)</i>
467+75	FR 195 right
470+50	No Snowmobile sign right
<b>472+75 - 474+25</b>	<b>Reconstruct existing turnout left (473+22 to 474+24) to Typical Turnout Details, apply 23 tons PA-2A</b>
474+70	FR 462 left

477+30		Road right, culvert in right ditchline
<b>478+00</b>		18" x 30' CMP, <b>clean outlet ditch 50'</b>
478+30	- 479+85	Turnout right
<b>482+25</b>		18" x 26' CMP, <b>clean inlet, clean outlet ditch 25'</b>
485+00	- 491+50	Existing 5" DSA limestone surfacing applied in 2006
486+00	- 491+00	Existing 9" pit run material applied in 2006
487+70		Existing 24" x 30' CMP that is rusted thru. Needs replaced with 24" x 30' CMP - lower outlet 12", spring. <u>This work not included in this contract.</u>
<b>489+60</b>		18" x 28' CMP, installed in 1988, spring, <b>clean inlet, clean outlet ditch 100'</b>
<b>490+00</b>	- <b>491+50</b>	<b>Reconstruct existing turnout left (490+92 to 491+76) to Typical Turnout Details, apply 23 tons PA-2A</b>
491+00	- 522+00	Existing 6" pit run surfacing applied in 2006
<b>492+45</b>		18" x 30' CMP, installed in 1988, <b>clean outlet ditch 50'</b>
495+00		18" x 30' CMP, installed in 2006, outlet ditch 100'
497+30		18" x 30' CMP, installed in 2006, outlet ditch 75'
498+00		Leadoff ditch left 50'
<b>498+50</b>	- <b>500+00</b>	<b>Construct turnout left to Typical Turnout Details, apply 46 tons PA-2A</b>
496+85		Road left, private land
500+75		18" x 30' CMP, installed in 2006, outlet ditch 50'
<b>503+25</b>	- <b>504+75</b>	<b>Reconstruct existing turnout left (503+22 to 504+49) to Typical Turnout Details, apply 23 tons PA-2A</b>
505+00		OGM tank right
<b>510+50</b>	- <b>512+00</b>	<b>Reconstruct existing turnout left (510+61 to 511+82) to Typical Turnout Details, apply 23 tons PA-2A</b>
512+60		Old road right - not passable
513+10		Road left, private land
513+90		18" x 30' CMP, installed in 2006, outlet ditch 25'
516+25		OGM road right
518+00	estimated	Pipeline crossing
<b>518+50</b>	- <b>520+00</b>	<b>Reconstruct existing turnout left (518+62 to 519+72) to Typical Turnout Details, apply 23 tons PA-2A</b>
521+35		FR 130 right, gated
521+75		Road left, private land
522+00	- 527+50	Existing 12" pit run surfacing applied in 2006

524+00	estimated	Well right
526+75		2 track left
526+90		Road right
527+50	- 527+50	Existing 6" pit run surfacing applied in 2006
<b>527+75</b>	- <b>529+25</b>	<b>Reconstruct existing turnout right (527+95 to 529+19) to Typical Turnout Details, apply 23 tons PA 2A</b>
528+30		Existing 18" x 40' CMP that is rusted thru, needs replaced with 18" x 40' CMP. 25' outlet ditch. <u>This work not included in this contract.</u>
530+10		Road right
<b>531+50</b>		18" x 30' CMP, <b>clean outlet ditch 100'</b>
533+00	- 534+00	Transition from single lane to double lane
533+00	- 543+00	<i>Maintenance by SWEPI during their use, maintenance by Seneca during their use. During periods of joint use: need to be determined and agreed to.</i>
533+50		Leadoff ditch 50' right
534+00		SWEPI Marcellus well left
534+00	- 543+00	Double lane
541+00		"STOP AHEAD" sign right
542+50		"STOP" sign right
542+50		"WEIGHT LIMIT 10 TONS", "MARCH 1 THRU MAY 15" signs left
542+75		Scenic Area sign left
<b>543+00</b>		<b>End of road reconditioning</b> , end of road, Junction Township Road 301

**FR 195 Martin Run  
Level I (Old Level C)**

**NOTE: This road will be used by Seneca to access a proposed Marcellus well off FR 198. Coordination of activities will need to be accomplished.**

**Items in bold are work items, other items are for information and reference only**

Station	Road Log/Work Description (October 2013)
<b>0+00</b>	Intersection of FR 133 (sta. 467+75) and FR 195 <b>Coordinates: Latitude 41° 38' 41.6362" N (41.6362) Longitude 78° 53' 11.57" W (-78.8865)</b>
<b>0+00 - 133+50</b>	<b>Recondition roadbed, see TYPICAL RECONDITIONING DETAILS, clean culverts and ditches</b>
0+00 - 133+50	12' roadway unless otherwise noted
0+00 - 133+50	<i>12' roadway, apply 4" compacted DSA limestone, to be completed by Oil and Gas Manufacturer (SENECA)</i>
0+35	"STOP" sign left
<b>0+35</b>	Road number sign "195" right, <b>to be replaced by Forest Service</b>
0+45	Snowmobile Route Number sign "1" right
<b>3+00 - 4+50</b>	<b>Reconstruct existing turnout right (3+04 to 3+77) to Typical Turnout Details; apply 23 tons PA-2A</b>
5+05	18" x 26' CMP, outlet ditch 100'
5+35	FR 276 right
<b>5+50 - 7+00</b>	<b>Construct turnout right to Typical Turnout Details; apply 46 tons PA-2A</b>
7+75	Existing 18" x 26' CMP rusted thru, needs replaced with 18" x 30' CMP. <u>This work not included in this contract.</u>
10+75	13" x 17" x 24' CMPA
<b>11+50 - 13+00</b>	<b>Reconstruct existing turnout right (11+57 to 12+52) to Typical Turnout Details; apply 23 tons PA 2A</b>
16+40	Existing 18" x 24' CMP with 4' of outlet ripped off. Needs replaced with 18" x 26' CMP. <u>This work not included in this contract.</u>
<b>17+00 - 19+00</b>	<b>Reconstruct existing turnout left (17+89 to 18+85), 100' long with 50' tapers on each end; apply 46 tons PA-2A</b>
19+75	Existing 18" x 24' CMP installed in 1990. Crushed inlet, needs replaced with 18" x 28' CMP. <u>This work not included in this contract.</u>

<b>24+50 - 27+00</b>	<b>Reconstruct existing turnout right (25+19 to 26+16), 150' long with 50' tapers on each end; apply 69 tons PA-2A</b>
25+95	Road left
28+35	Dispersed camping area left
28+60	18" x 38' CMP, 25' outlet ditch
<b>28+60 - 30+10</b>	<b>Construct turnout right to Typical Turnout Details; apply 46 tons PA-2A</b>
<b>28+95</b>	<b>FR 324 right, integrate intersection into turnout</b>
29+50 - 34+00	Existing 6" pit run surfacing applied in 1990
32+45	18" x 26' CMP, installed in 1990
<b>34+00 - 35+50</b>	<b>Reconstruct existing turnout right (34+02 to 35+31) to Typical Turnout Details; apply 23 tons PA-2A</b>
36+05	18" x 26' CMP, installed in 1990, 25' outlet ditch
38+60	18" x 26' CMP, installed in 1990, <b>clean outlet, 25' outlet ditch</b>
<b>38+75 - 40+25</b>	<b>Construct turnout left to Typical Turnout Details; apply 46 tons PA-2A</b>
39+40	Old road left, blocked, grassed in
43+45	18" x 26' CMP, installed in 1990, 25' outlet ditch
45+00 - 49+00	Existing 6" pit run surfacing applied in 1990
47+05 - 48+05	Existing turnout left
<b>48+75 - 50+25</b>	<b>Reconstruct existing turnout right (49+22 to 50+20) to Typical Turnout Details; apply 23 tons PA-2A</b>
<b>56+15</b>	18" x 24' CMP, installed in 1990, <b>clean outlet ditch 25'</b>
<b>57+00 - 59+50</b>	<b>Construct turnout right, 150' long with 50' tapers on each end; apply 46 tons PA-2A</b>
60+05	Road left
62+05	18" x 32' CMP, installed in 1990, 1' shotgun, lower outlet 1' when replaced, spring
63+55	Snowmobile trail route marker right
63+75	Snowmobile trail leaves road left
63+75	Snowmobile trail route marker left
66+80	Existing 18" x 30' CMP, inlet rusted thru, needs replaced with 18" x 30' CMP. <u>This work not included in this contract.</u>
<b>69+30 - 70+75</b>	<b>Reconstruct existing turnout left, 45' long with 50' tapers on each end; apply 23 tons PA 2A</b>
71+45	OGM tank left

<b>72+00 - 73+50</b>	<b>Construct turnout left to Typical Turnout Details; apply 46 tons PA-2A. Integrate with well road left.</b>
<b>73+50</b>	Existing 18" x 34' CMP, rusted thru, needs replaced with 18" x 34' CMP. <u>This work not included in this contract.</u>
<b>77+25 - 82+00</b>	<b>Reconstruct existing turnout left (77+33 to 79+62), 50' long with 375' tapers on each end; apply 138 tons PA-2A</b>
79+00 - 82+10	Existing 6" pit run surfacing applied in 1990
<b>81+65</b>	FR 195B left, <b>integrate intersection into turnout</b>
<b>84+50 - 86+00</b>	<b>Construct turnout right to Typical Turnout Details; apply 46 tons PA-2A</b>
86+25	18" x 26' CMP, installed in 1990, spring, length by 4' when replaced
87+95	30" x 38' CMP, installed in 1990, stream
<b>90+15 - 91+65</b>	<b>Reconstruct existing turnout left (90+59 to 91+64) to Typical Turnout Details; apply 23 tons PA-2A</b>
92+60	18" x 30' CMP, installed in 1990
<b>94+00 - 95+50</b>	<b>Construct turnout left to 50' full widening with 50' tapers on each end; apply 46 tons PA-2A</b>
96+70	FR 196 left
<b>97+00 - 98+50</b>	<b>Reconstruct existing turnout left (97+17 to 98+31) to Typical Turnout Details; apply 23 tons PA 2A</b>
99+00 - 119+30	Existing 8" pit run surfacing applied in 1990
<b>100+00 - 102+00</b>	<b>Reconstruct existing turnout right (100+70 to 101+54), 100' long with 50' tapers on each end; apply 46 tons PA-2A</b>
102+35	18" x 24' CMP, installed in 1990, lengthen 4' when replaced, outlet ditch 50'
105+30	Well road right
110+60	18" x 30' CMP, installed in 1990, lengthen 4' when replaced, spring
112+00	18" x 26' CMP, installed in 1990, lengthen 4' when replaced, spring
<b>112+00 - 113+50</b>	<b>Construct turnout right to Typical Turnout Details; apply 46 tons PA-2A</b>
114+25	18" x 28' CMP, installed in 1990, lengthen 4' when replaced
116+60 - 118+30	Existing turnout left
<b>118+85</b>	18" x 28' CMP, <b>clean outlet, outlet ditch 50'</b>
<b>119+50 - 121+00</b>	<b>Construct turnout left to Typical Turnout Details; apply 46 tons PA-2A</b>
121+10	FR 197 left
125+25	Well road right

**125+50 - 127+00**     **Reconstruct existing turnout left (125+36 to 126+35) to Typical Turnout Details; apply 23 tons PA 2A**

126+65                 Road right

128+95                 18" x 24' CMP, installed in 1990

**131+00 - 132+50**     **Construct turnout right to Typical Turnout Details; apply 46 tons PA-2A.**  
*NOTE: existing turnout on left from station 131+31 to 132+17.*

132+70                 Existing 18" x 28' CMP, installed in 1990, rusted thru, spring, needs replaced with 42" x 32' CMP, bury inlet and outlet 6". This work not included in this contract.

133+35                 FR 198 right

**133+50**                 **End of road reconditioning, FR 195 continues**

**FR 196 Martin Ridge  
Level J (Old Level D)**

<b>Items in bold are work items, other items are for information and reference only</b>
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<b>Station</b>	<b>Road Log/Work Description (October 2013)</b>
<b>0+00</b>	Intersection with FR 195 (Station 96+70) <b>Coordinates: Latitude 41° 38' 10.14" N (41.6174) Longitude 78° 53' 11.46" W (-78.8959)</b>
<b>0+00 - 20+50</b>	<b>Recondition roadbed, see TYPICAL RECONDITIONING DETAILS, clean culverts and ditches</b>
0+00 - 20+50	12' roadway unless otherwise noted
<b>0+00 - 4+00</b>	<b>Apply 4" compacted PA-2A road surfacing (107 tons)</b>
0+10	FR 196 road number sign right
<b>0+25</b>	<b>"STOP" sign left to be replaced by Forest Service</b>
0+35	Forest Service gate
1+75 - 3+25	Construct turnout right to Typical Turnout Details. Apply 46 tons PA-2A. <u>This work not included in this contract.</u>
<b>3+35</b>	17" x 13" x 22' CMPA, <b>clean outlet</b>
7+60	17" x 13" x 22' CMPA
8+00 - 9+50	Reconstruct existing turnout left (8+50 to 9+55) to Typical Turnout Details. Apply 23 tons PA-2A. <u>This work not included in this contract.</u>
<b>11+70</b>	12" x 22' CMP, <b>clean outlet</b>
13+00 - 14+50	Construct turnout right to Typical Turnout Details. Apply 46 tons PA-2A. <u>This work not included in this contract.</u>
<b>14+85</b>	12" x 22' CMP, <b>clean 100' outlet ditch</b>
<b>17+50 - 20+50</b>	<b>Apply 4" compacted PA-2A road surfacing (80 tons)</b>
17+65 - 19+15	Reconstruct existing turnout left, 100' long with 50' tapers on each end. Apply 46 tons PA-2A. <u>This work not included in this contract.</u>
18+30	Intersection right
<b>19+40</b>	12" x 30' CMP, <b>clean outlet ditch 25'</b>
20+25	Intersection right - grassed in road to cutting unit.
<b>20+50</b>	<b>End of reconditioning , FR 196 continues</b>

**FR 198 Crane-Martin  
Level J (Old Level D)**

***NOTE: This road will be used by Seneca to access a proposed Marcellus well off FR 198. Coordination of activities will need to be accomplished.***

<b>Items in bold are work items, other items are for information</b>
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<b>Station</b>	<b>Road Log/Work Description (October 2013)</b>
0+00	Intersection with FR 195 (Station 133+35) <b>Coordinates: Latitude 41° 36' 43.49" N (41.6129) Longitude 78° 54' 40.14" W (-78.9068)</b>
<b>0+00 - 62+00</b>	<b>Recondition roadbed, see TYPICAL RECONDITIONING DETAILS, clean culverts and ditches</b>
0+00 - 62+00	12' roadway unless otherwise noted
0+00 - 62+00	<i>4" compacted DSA limestone to be completed by Oil and Gas Manufacturer (SENECA). <u>This work is not included in this contract.</u></i>
0+00 - 13+50	Existing 6" pit run surfacing applied in 1990
0+00 - 24+00	Existing 8" pit run surfacing applied in 1978
<b>0+35</b>	<b>Replace "STOP" sign left, to be replaced by Forest Service</b>
0+35	FR 198 road number sign right
0+40	"Rough Road" sign right
0+45	Forest Service gate
0+50 - 2+00	Construct turnout right to Typical Turnout Details; apply 46 tons PA-2A. <u>This work not included in this contract.</u>
<b>3+10</b>	18" x 24' CMP, installed in 1978, leadoff ditch 25', culvert 1/4 filled with sediment, <b>clean culvert and outlet ditch to drain</b>
<b>5+35</b>	18" x 24' CMP, installed in 1978, leadoff ditch 25', culvert 1/2 filled with sediment, <b>clean culvert and outlet ditch to drain</b>
6+50 - 8+00	Construct turnout left to Typical Turnout Details; apply 46 tons PA-2A. <u>This work not included in this contract.</u>
8+55	18" x 24' CMP installed in 1978.
12+90	FR 396 right
14+00 - 15+50	Reconstruct existing turnout right (14+20 to 15+58) to Typical Turnout Details; apply 23 tons PA-2A. <u>This work not included in this contract.</u>
18+40	Existing 18" x 24' CMP installed in 1978, inlet rusted thru, 25' outlet ditch. Needs replaced with 18" x 24' CMP. <u>This work not included in this contract.</u>

19+00 - 20+50 Construct turnout right to Typical Turnout Details; apply 46 tons PA-2A. This work not included in this contract.

23+35 Roads left and right

23+45 18" x 24' CMP installed in 1978

24+00 - 26+00 Reconstruct existing turnout left (24+64 to 25+76), 100' long with 50' tapers on each end; apply 46 tons PA-2A. This work not included in this contract.

**27+00 - 30+00 Apply 4" compacted PA-2A road surfacing (80 tons)**

28+60 18" x 26' CMP

30+00 - 31+50 Construct turnout right to Typical Turnout Details; apply 46 tons PA-2A. This work not included in this contract.

33+05 Existing 18" x 24' CMP installed in 1978 needs replaced with 18" x 24' CMP, inlet rusted thru. This work not included in this contract.

33+50 - 35+00 Reconstruct existing turnout right (33+65 to 34+72) to Typical Turnout Details; apply 23 tons PA-2A. This work not included in this contract.

35+50 - 46+50 Existing 8" pit run surfacing applied in 1978

**36+50 - 39+00 Apply 4" compacted PA-2A road surfacing (69 tons)**

36+70 Road right to well

37+95 Existing 18" x 24' CMP installed in 1978 needs replaced with 18" x 28' CMP, rusted thru. This work not included in this contract.

39+50 - 41+00 Construct turnout left to Typical Turnout Details; apply 46 tons PA-2A. This work not included in this contract.

41+45 Existing 18" x 24' CMP installed in 1978 needs replaced with 18" x 28' CMP, rusted thru, outlet ditch 25'. This work not included in this contract.

**45+00 Existing 18" x 24' CMP installed in 1978 needs replaced with 18" x 28' CMP, rusted thru. Culvert replacement not included in this contract. Clean outlet ditch 25'**

46+50 - 48+00 Reconstruct existing turnout left (47+02 to 48+05) to Typical Turnout Details; apply 23 tons PA-2A. This work not included in this contract.

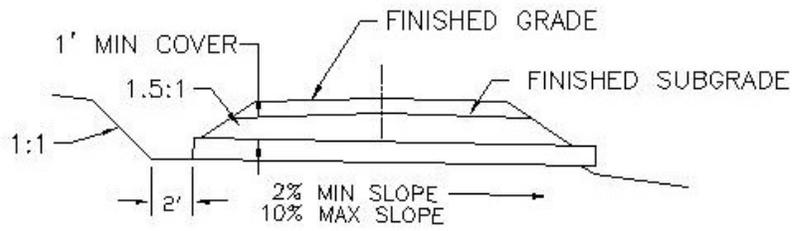
46+50 - 69+50 Pit run surfacing

49+00 Existing 18" x 24' CMP installed in 1978 needs replaced with 18" x 28' CMP. Plugged with sediment, crushed inlet, rusted thru, outlet ditch 25'. This work not included in this contract.

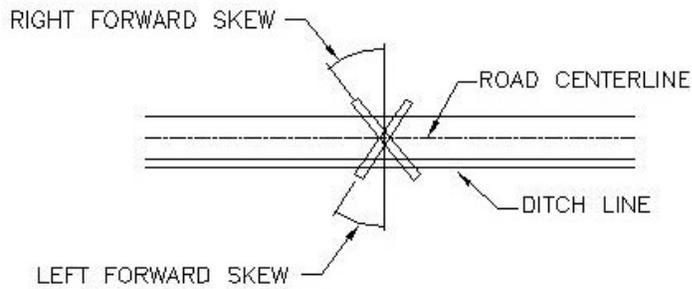
52+50 Existing 18" x 24' CMP installed in 1978 needs replaced with 18" x 28' CMP. Rusted thru, outlet ditch 25'. This work not included in this contract.

- 54+50 - 57+00**      **Reconstruct existing turnout right (54+44 to 55+56), 150' long with 50' tapers on each end, construct integrated turnaround right, apply 46 tons PA-2A**
- 57+95**                18" x 24' CMP, installed in 1978, outlet ditch 25', plugged with sediment, **clean culvert and outlet ditch**
- 61+95**                18" x 24' CMP, installed in 1978, plugged with sediment, **clean culvert**
- 62+00**                **End of road reconditioning**, FR 198 continues



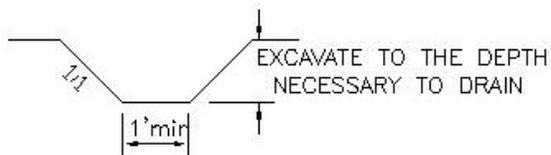


CULVERT SECTION

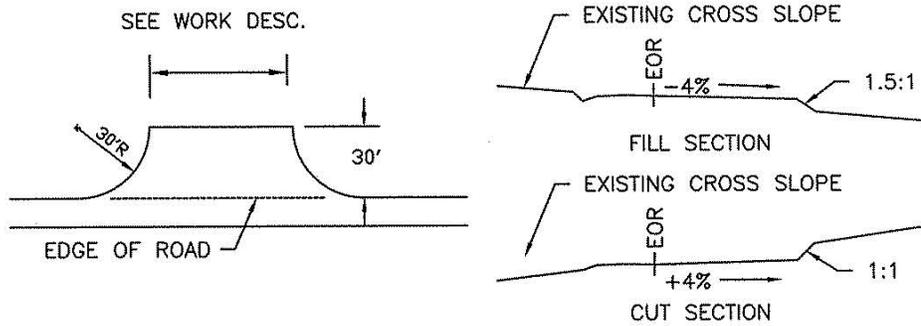


SKEW DETAIL

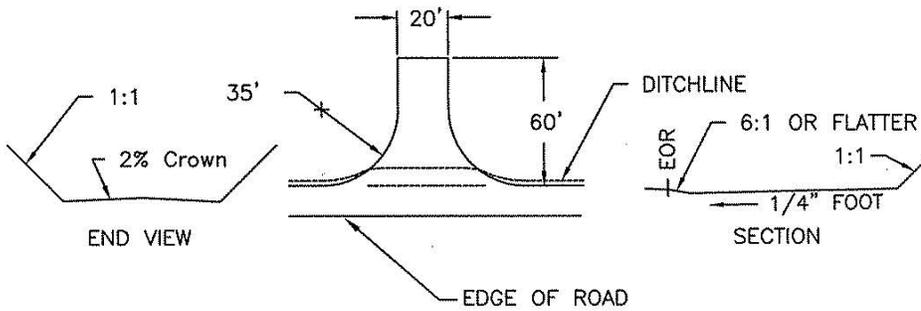
NOTE: Field locate ditch to minimize new clearing



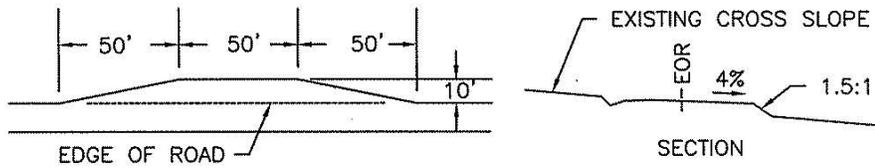
OUTLET/LEAD OFF DITCH SECTION



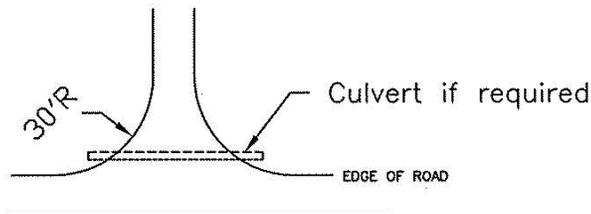
PARKING LOT DETAIL



TURNAROUND DETAIL



TURNOUT DETAIL



INTERSECTION DETAIL

**GENERAL NOTES**

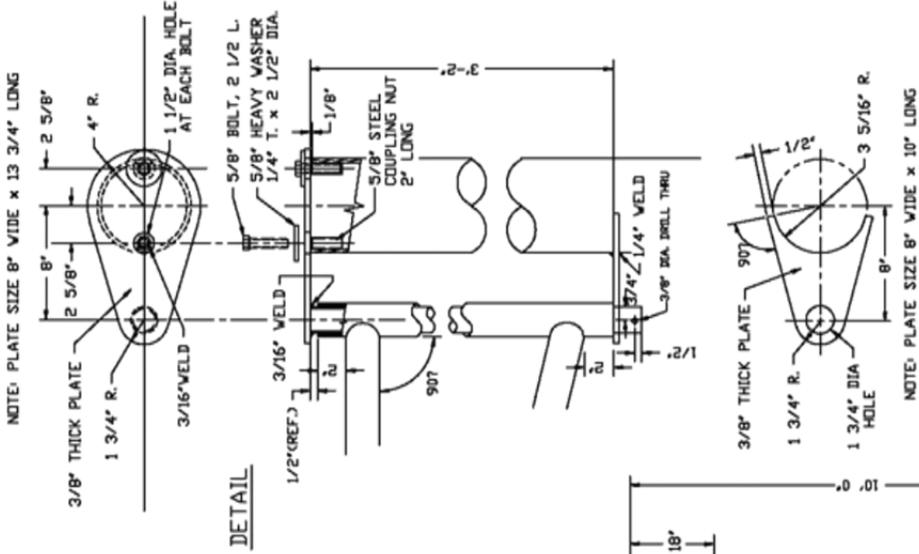
- ALL STEEL SHALL BE PAINTED WITH (2) COATS OF IRON OXIDE RED PRIMER AND (3) COAT OF WALNUT BROWN PAINT; FED. STANDARD 595 A PAINT NO. 20140 (EXCEPT PIVOT TUBE)
- ALL STEEL SHALL BE NEW MATERIAL.
- WELD ALL CROSS ARM ASSEMBLY JOINTS WITH 3/16" FILLETS ALL AROUND ALL WELDS ON GATE ASSEMBLY SHALL BE STRUCTURALLY SOUND
- DRILL 1/4" DIAMETER HOLES 4" ON CENTER IN BOTTOM OF CROSS ARM TO FACILITATE DRAINAGE.
- APPLY GREASE TO OUTSIDE OF PIVOT TUBE, ENTIRE LENGTH, PRIOR TO INSTALLATION OF CROSS ARM ASSEMBLY. TYPE OF GREASE SHALL BE TO EXTREME PRESSURE MULTIPURPOSE WHEEL BEARING GREASE OR EQUAL
- POSTS SHALL BE ENCASED WITH CONCRETE TO WITHIN 1 FT. OF GROUND LEVEL AND BACKFILL COMPACTED (3 POSTS)
- PRIOR TO GATE INSTALLATION, NOTIFY FOREST SERVICE FOR LOCATION ON ROAD
- PARTS MAY BE FLAME CUT AND ALL BURRS REMOVED
- INSTALL SIGNS AFTER INSTALLATION OF GATE
- TECHNICAL CONTACT IS: JIM BUCKETT, FOREST SERVICE, WARREN, PA. (614) 728-6257

**SIGN CODE**

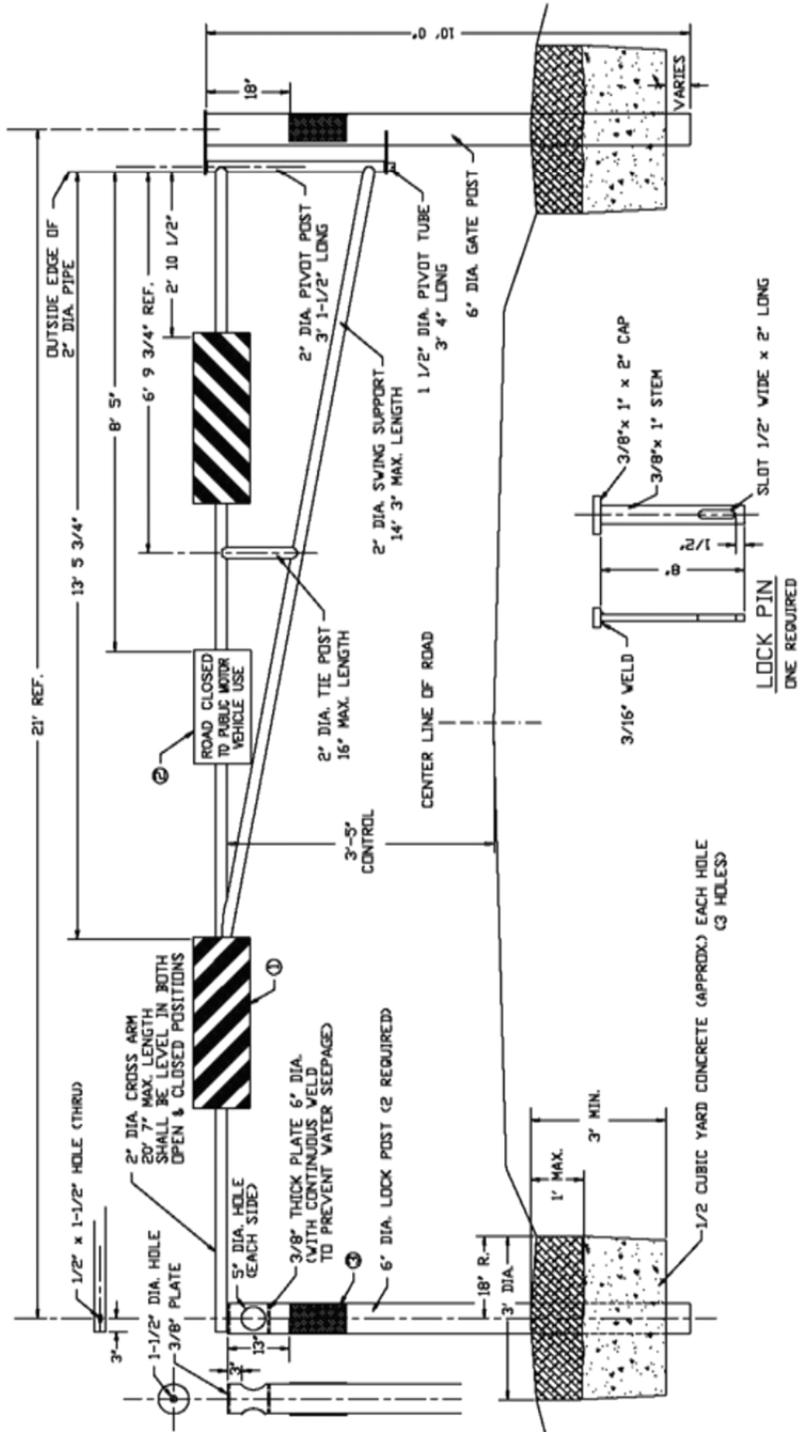
- (1) (2) L-R AND (2) R-R TYPE 1 BARRICADE MARKERS
  - (3) ROAD CLOSED TO PUBLIC MOTOR VEHICLE USE
  - (4) TYPE 2 OBJECT MARKERS (DM-2-R)
  - (5) YELLOW REFLECTORIZED 6" x 12" (3) ON GATE POST AND (2) ON CLOSED POSITION LOCK POST
  - (6) ON OPEN POSITION LOCK POST FACED TO ONCOMING TRAFFIC
- NOTE: ALL SIGNS SHALL BE FURNISHED BY THE FOREST SERVICE AND INSTALLED BY THE CONTRACTOR.

**ESTIMATED QUANTITIES**

MATERIAL	QUANTITY (LF)	REMARKS
1-1/2" DIA PIPE (NDM)	3' 4"	PIVOT TUBE
2" DIA PIPE (NDM)	39' 4"	CROSS ARM ASSEMBLY
6" DIA PIPE (NDM)	30' 0"	GATE POSTS (3)
3/8" x 1" STRAP	0' 10"	LOCK PIN
3/8" x 8" PLATE	4' 1"	MISC.
BOLTS, NUTS, WASHERS		TWO (2) OF EACH



LEVEL 2D FOREST SERVICE GATE
ALLEGHENY NATIONAL FOREST
WARREN, PA
DES. RICHARD J. JOHNSON, R44LD-147/09
TRK. J. JOHNSON & RIGALLO - 12/09
NOT TO SCALE



## 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 – 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

101.00\_nat\_us\_07\_25\_2005

101.01\_nat\_us\_01\_22\_2009

### 101.01 Meaning of Terms

Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.03\_nat\_us\_06\_16\_2006

### 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>
NESC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau

.

Add the following to (b) SI symbols:

mp	Milepost
ppm	Part Per Million

101.04\_nat\_us\_03\_29\_2007

### 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”.

**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.

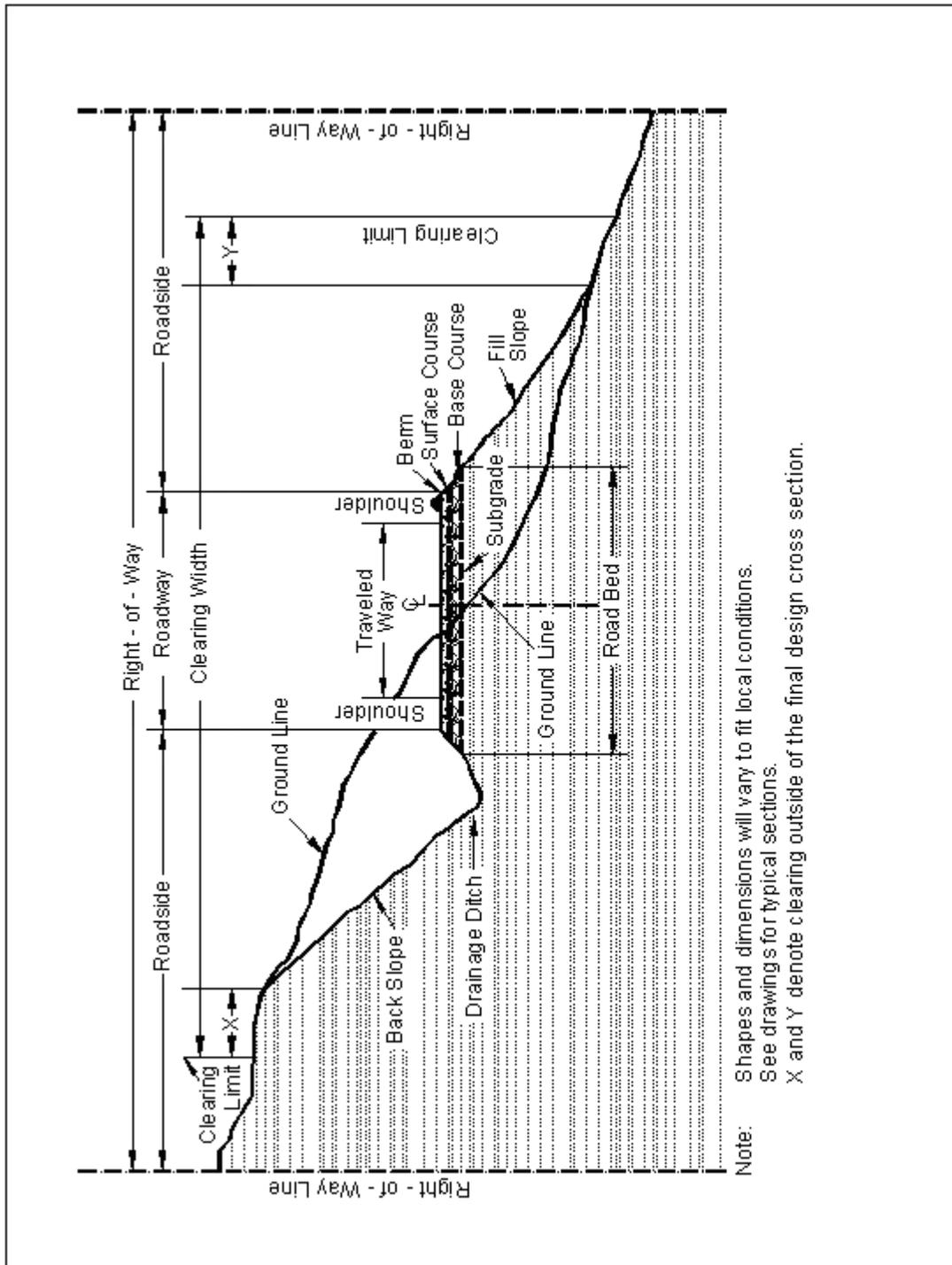
**Road Order**--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

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



## 102 - Bid, Award, and Execution of Contract

102.00\_nat\_us\_02\_16\_2005

### 102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.

## 103 - Scope of Work

103.00\_nat\_us\_02\_16\_2005

### Deletions

Delete all but subsection 103.01 Intent of Contract.

## 104 - Control of Work

104.00\_nat\_us\_06\_16\_2006

### Deletions

Delete Sections 104.01, 104.02, and 104.04.

104.06\_nat\_us\_02\_17\_2005

Add the following subsection:

### **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.

## 105 - Control of Material

105.02\_nat\_us\_01\_18\_2007

### 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.

105.05\_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

106.07\_nat\_us\_05\_11\_2004

### 106.07 Delete

Delete subsection 106.07.

## 107 - Legal Relations and Responsibility to the Public

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”.

107.09\_nat\_us\_06\_16\_2006

### 107.09 Legal Relationship of the Parties.

Delete the entire subsection.

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 the 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

### 108 Delete.

Delete Section 108 in its entirety.

## 109 - Measurement and Payment

109.00\_nat\_us\_02\_17\_2005

### 109 Deletions

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”.

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.

## 151 - Mobilization

151.03\_nat\_us\_08\_05\_2005

### 151.03 Payment

Delete the entire subsection and add the following:

### 151.03 Payment

Mobilization is considered an indirect cost of this contract and will not be compensated as a separate work item.

## 152 - Construction 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 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 80 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 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 stake outside the clearing limits for station identification purposes, and mark it with horizontal distance to location line

#### **(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 80 feet.

#### **(g) Culverts.**

Replace subsection with the following:

Set culvert reference stakes at all culvert 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) Diameter, actual field measured length, and type of culvert.
- (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 culvert intersects centerline.

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

**152.03 (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 (<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>
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>
<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.	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%
Clearing limits	1.0 ft	1.0 ft	1.0 ft	1.5 ft	2.5 ft

## 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.

153.04\_nat\_us\_10\_24\_2007

### **153.04 Records.**

Delete all but the first sentence

## 155 - Schedules for Construction Contracts

155.00\_nat\_us\_05\_11\_2004

### **155 Delete.**

Delete Section 155 in its entirety.

## 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 1½V: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.

### **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	“	“	“
		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	Yes, when requested	Before using in work
		Gradation	—	AASHTO T 27	“	“	“	“
		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	“	“	“
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**

<b>Material or Product</b>	<b>Type of Acceptance (Subsection)</b>	<b>Characteristic</b>	<b>Category</b>	<b>Test Methods Specifications</b>	<b>Sampling Frequency</b>	<b>Point of Sampling</b>	<b>Split Sample</b>	<b>Reporting Time</b>
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.

## 209 - Structure Excavation and Backfill

209.10\_nat\_us\_10\_23\_2007

### 209.10 Backfill.

#### (a) General.

##### Add the following:

Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Do not place or backfill pipe that meets any of the following conditions until the excavation and foundation have been approved in writing by the CO:

- Embankment height greater than 6 feet at subgrade centerline.
- Installation in a protected streamcourse.
- Round pipe with a diameter of 48 inches or greater.
- Pipe arches with a span of 50 inches or greater.
- Any box culvert of structure other than pipe culverts.

#### (b) Pipe culverts.

##### (1) Pipe culverts with compacted backfill.

##### Add the following:

Excavate an area on each side of the pipe as needed to effectively achieve compaction requirements. Backfill without damaging or displacing the pipe. Complete backfilling of the trench with suitable material.

209.11\_nat\_us\_02\_24\_2005

### 209.11 Compacting.

##### Delete the subsection and add the following:

Compact backfill using designated compaction method A, B, or C:

**Method A.** Ensure that backfill density exceeds the density of the surrounding embankment.

**Method B.** Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each layer using appropriate compaction equipment until visual displacement ceases. For compaction under sections 252, 254, 255, 257, 258 and 262 compact with a vibratory steel wheeled roller with a mass of at least 8 tons.

**Method C.** Determine optimum moisture content and maximum density according to AASHTO T 99 method C. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact material placed in all layers 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.

**Table 209-1 Sampling and Testing Requirements**

Add the following:

(2) Compaction methods (A) and (B) do not require AASHTO T-99 or T-310 test methods for foundation fill.

## 301 - Untreated Aggregate Courses

301.00\_nat\_us\_03\_03\_2005

### 301 Title Change.

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

301.01\_nat\_us\_03\_03\_2005

### 301.01 Work.

Add the following:

Work includes producing aggregate by pit-run, grid rolling, screening, or crushing methods, or placing Government-furnished aggregate. Work may include additive mineral filler, or binder.

301.02\_nat\_us\_05\_16\_2005

### 301.02 Material.

Add the following:

Bentonite	725.30
Calcium Chloride Flake	725.02
Lignon Sulfonate	725.20
Magnesium Chloride Brine or Calcium Chloride Liquid	725.02

301.03\_nat\_us\_09\_14\_2005

### 301.03 General.

Add the following:

Written approval of the roadbed is required 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. Clear and grub stockpile sites according to Section 201.

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 following crushing. Control additive proportions to 0.5 percent dry weight.

**(a) 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.

**(b) 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.

**(c) 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\_05\_17\_2005

### 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.** Operating 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.** Compact to a density of at least 96 percent of the maximum density, as determined by the Modified Marshall Hammer Compaction Method (available upon

request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

**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.** Compact to a density of at least 100 percent of the maximum density as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

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 for any ½ mile of 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 any ½ mile of road segment is within +4 inches of the specified width.

301.09\_nat\_us\_07\_07\_2005

### **301.09 Measurement.**

Replace the second paragraph with the following:

Measure aggregate by cubic yard 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

## 303 - Road Reconditioning

303.00\_01\_us\_10\_11\_2006

Delete Section 303 in its entirety and replace with the following.

### Description

**303.01** This work consists of reconditioning ditches, shoulders, roadbeds, parking areas, turnouts, approach road intersections, cattleguards, asphalt surfaces and aggregate surfaces. Construct outlopes, clean and maintain all roadbed drainage structures when shown on the plans.

### Material

**303.02** Conform to the following Subsection:

Water 725.01

### Construction Requirements

**303.03 Ditch Reconditioning.** Remove all slide material, sediment, vegetation, and other debris from the existing ditches and culvert inlets and outlets. Reshape ditches and culvert inlets and outlets to achieve positive drainage and a uniform ditch width, depth, and grade. Dispose of waste as shown on the plans.

**303.04 Shoulder Reconditioning.** Repair soft and unstable areas according to Subsection 204.07. Remove all slide material, vegetation, and other debris from existing shoulders including shoulders of parking areas, turnouts, and other widened areas. Dispose of waste as shown on the plans.

**303.05 Roadbed Reconditioning** Repair soft and unstable areas according to Subsection 204.07. Remove all organic, deleterious material larger than 6 inches from the top 6 inches of subgrade. Dispose of waste as shown on the plans. Scarify, rip and shape the traveled way and shoulders at locations and to the depth and width designated on the plans. Remove surface irregularities and shape to provide a uniform surface.

Dispose of rock larger than 4 inches brought to the surface during scarification in areas designated on the plans.

For portions of roads not requiring scarification, the roadbed may contain rocks larger than 4 inches provided they do not extend above the finished roadbed surface. Reduce in place or remove rock extending above the finished roadbed surface. Dispose of removed rock in areas designated on the plans.

Compact using the following method as specified:

- (a) Compaction A. Operate equipment over the full width.

(b) Compaction B. Operate rollers over the full width of each layer until visual displacement ceases, but not fewer than three complete passes. Use rollers that meet the following requirements:

(1) Steel wheeled rollers, other than vibratory, capable of exerting a force of not less than 250 pounds per inch of width of the compression roll or rolls.

(2) Vibratory steel wheeled rollers equipped with amplitude and frequency controls with a minimum weight of 6 tons, specifically designed to compact the material on which it is used.

(3) Pneumatic-tired rollers with smooth tread tires of equal size that will provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 psi.

**303.06 Aggregate Surface Reconditioning.** Repair soft and unstable areas to the full depth of the aggregate surface and according to Subsection 204.07. Scarify to the depth of the aggregate surface or to a depth of 8 inches, whichever is less, and remove surface irregularities. Reshape, finish, and compact the entire aggregate surface according to Section 308.

**303.07 Roadway Reconditioning.** Perform all the applicable work described in Subsections 303.03 through 303.06.

Maintain the existing cross slope or crown unless otherwise shown on the plans. Establish a blading pattern that will retain the surfacing on the roadbed and provide a through mixing of the materials within the completed surface width.

Blade and shape the subgrade for both surfaced and unsurfaced roads when moisture content is suitable for compaction.

**303.08 Pulverizing.** Scarify the surface to the designated depth and width. Pulverize all material to a size one and one half times the maximum sized aggregate or to 1½ inches, whichever is greater. Mix, spread, compact, and finish the material according to Section 301.

**303.09 Acceptance.** See Table 303-1 for sampling and testing requirements. Road reconditioning work will be evaluated under Subsections 106.02 and 106.04.

### **Measurement**

**303.10** Measure the Section 303 items listed in the Schedule of Items according to Subsection 109.02 and the following as applicable.

Measure ditch reconditioning and shoulder reconditioning by the mile, by the station or foot horizontally along the centerline of the roadway for each side of the roadway.

Measure roadbed reconditioning, aggregate surface reconditioning, roadway reconditioning, and pulverizing by the mile, by the station, or by the square yard.

## **Payment**

**303.11** The accepted quantities will be paid at the contract price per unit of measurement for the Section 303 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

## 607 - Cleaning, Reconditioning, and Repairing Existing Drainage Structures

607.04\_nat\_us\_05\_01\_2013

### 607.04 Cleaning Culverts in Place.

#### Add the following:

If approved by the CO, all or part of the pipe designated to be cleaned in-place may be removed, cleaned, and re-laid in accordance with Section 602. In these cases, furnish all material required to replace damaged pipe and joints and relay the pipe.

## 625 - Turf Establishment

625.03\_nat\_us\_07\_02\_2007

### 625.03 General.

Delete this subsection and replace with the following:

Apply turf establishment to prepared ground or any disturbed area between April 15<sup>th</sup> and October 15<sup>th</sup>. Apply turf establishment to the areas shown on the plans or worklists within 7 days after completion of ground disturbing activities. Unless otherwise specified in writing by the CO apply turf establishment after each 1000 foot section of road has been constructed to template lines. Seeded areas damaged by construction activities shall be reseeded within 10 days of the damage. Do not seed during windy weather or when the ground is excessively wet, frozen, or snow covered.

Assure that all seed and mulch used in the work conforms to the weed free requirements of Section 713.

### 625.04 Preparing Seedbed.

Delete entire subsection and replace with the following:

Ensure that the surface soil is in a roughened condition favorable for germination and growth.

### 625.05 Watering

Delete entire subsection.

### 625.06 Fertilizing.

Delete entire subsection and replace with the following:

Apply fertilizer having a chemical analysis as listed below by the following methods.

**(a) Dry Method.** Apply the fertilizer with approved mechanical equipment. Hand operated methods are satisfactory on areas inaccessible to mechanical equipment.

**(b) Hydraulic method.** Use hydraulic-type equipment capable of providing a uniform application using water as the carrying agent. Add fertilizer to the slurry and mix before adding seed. Add the tracer material when designated by the CO.

**Fertilizer.** Apply fertilizer at the rate of 450 pounds per acre. Insure that the fertilizer meets the following chemical analysis:

<u>Nutrient</u>	<u>Percent</u>
Nitrogen, N . . . . .	<u>10</u>
Phosphorus, P <sub>2</sub> O <sub>5</sub> . . . . .	<u>20</u>
Potassium, K . . . . .	<u>20</u>

### 625.07 Seeding.

Delete the first sentence and add the following.

Apply seed mix by the following methods:

(a) **Dry method.** Delete the third sentence.

Add the following after subsection

(b).**Seed Mix.** Furnish and apply the following kinds and amounts of pure live seed from Ernst Conservation Seeds, 9006 Mercer Pike, Meadville, PA (800) 873-3221 or Fax (814) 336-5191 or [www.ernstseed.com](http://www.ernstseed.com) Native Right-of Way Woods Seed Mix with Annual Ryegrass-ERNMX-132-1:

<u>Type of Seed</u>	<u>Quantity of Pure Live Seed (Lbs/Acre)</u>
1. 30% Virginia Wild Rye	9
2. 20% Annual Rye Grass	6
3. 15% Shelter Switchgrass	4.5
4. 10% Creeping Red Fescue	3
5. 5% Autumn Bentgrass	3
6. 5% Fox Sedge	3
7. 5% Showy Tick Trefoil	3
8. 5% Nimble Will	3
9. 5% Tioga Deer Tongue	3

Total Seeding Rate 30lb per acre

Determine the pounds of seed to be furnished per acre by dividing the pounds of pure live seed required per acre by the product of the percent purity and percent germination.

#### **625.08 Mulching.**

Delete the entire subsection and replace with the following:

Apply Mulch within 24 hours after seeding by the following methods.

(a) **Dry Method.** Apply mulch with a hand spreader or a spreader utilizing forced air at a rate of 4000 pounds per acre. Anchor the mulch with an approved stabilizing emulsion tackifier at a rate of 0 gallons per acre. Do not mark or deface structure, pavements, utilities, or plant growth with tackifier.

(b) **Hydraulic Method.** Apply mulch in a separate application from the seed using hydraulic-type equipment according to Subsection 625.07(b).

Apply wood fiber or grass straw cellulose fiber mulch at a rate of 775 pounds per acre.

Apply bonded fiber matrix hydraulic mulch at a minimum rate of 775 pounds per acre. Apply so no hole in the matrix is greater than 0.04 inches. Apply so that no gaps exist between the matrix and the soil.

Inaccessible areas may be mulched by hand. Apply mulch uniformly over the entire disturbed area.

**625.09 Protecting and Caring for Seeded Areas**

Delete the first sentence and add the following:

Protect and care for seeded areas until final acceptance.

**625.11 Measurement.**

Delete the entire Subsection and replace with the following:

Measure the Section 625 items listed in the bid schedule according to Subsection 109.02.

## 633 - Permanent Traffic Control

633.02\_nat\_us\_03\_03\_2005

### 633.02 Material.

#### Add the following subsections

Protective Overlay Film	718.02
Edge Film	718.02

633.03\_nat\_us\_03\_03\_2005

### 633.03 General.

#### Delete the subsection and add the following:

Furnish traffic control devices and guide signs according to the MUTCD, approved USDA-FS and state supplements, the current edition of USDA-FS EM-7100-15 Sign and Poster Guidelines for the Forest Service, and Standard Highway Signs published by FHWA. Submit the sign list for approval before ordering.

633.05\_nat\_us\_03\_03\_2005

### 633.05 Panels.

#### Add the following:

Apply protective overlay film and top edge film as required and according to with manufacturer's recommendations.

Delete the sentence: "Use antitheft fasteners where possible" in the fifth paragraph and replace it with the following: "For each sign panel use at least one antitheft fastener."

## SPS 703 - Aggregate

Add the following: **703.20 Driving Surface Aggregate.** 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. For use in this program, both are restricted to that which has been mined or quarried from existing bedrock formations.

All components of the aggregate mix are to be derived from crushed parent rock material that meets program specifications for abrasion resistance, pH and freedom from contaminants. Ninety-eight percent (98%) of the fines passing the #200 sieve must be parent rock material. No clay or silt soil may be added. The amount of particles passing the #200 sieve shall be determined using the washing procedures specified in PTM No. 100.

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%	90%
#4	30%	65%
#16	15%	30%
#200	10%	20%

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 9 as measured by EPA 9045C.

Optimum Moisture: Material is to be delivered and placed at optimum moisture content as determined for the particular source. 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.

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

704.02\_nat\_us\_03\_02\_2005

### 704.02 Bedding Material.

Delete Subsection 704.02 and substitute the following:

Furnish a well graded, free draining material free of excess moisture, muck, frozen lumps, roots, sod, or other deleterious material conforming to the following:

- |  |  |
|--|--|
| (a) Maximum particle size                                | 3 inch or half the corrugation depth, whichever is smaller |
| (b) Material passing No. 200 sieve, AASHTO T 27 and T 11 | 10% max.   |

## 718 - Traffic Signing and Marking Material

718.05\_nat\_us\_08\_05\_2009

### 718.05 Aluminum Panels

Delete the third paragraph and replace with the following:

Clean, degrease and properly prepare the panels according to methods recommended by the sheeting manufacturer. Conversion coatings will conform to ASTM B-921 or ASTM B-449.