

PRECONSTRUCTION ENGINEERING: All engineering work and expense of preparing for reconstruction engineering services, including the following:

	Cost (\$)
1. Transportation Planning. (All work necessary to complete the NEPA document and decision.)	<u>XXXXXXX</u>
2. Engineering investigations, studies and reports, and reconnaissance, location, etc.	<u>\$ 4,320.00</u>
3. Preliminary location surveys.	<u>\$ 3,840.00</u>
** 4. Soils, foundations, and materials investigations, surveys, tests, structural design and review.	<u>\$ -</u>
5. Preliminary and final designs.	<u>\$10,200.00</u>
6. Preliminary and final plans, drawings, spec's, and estimates of quantities.	<u>\$ 7,200.00</u>
7. Preparation of Government cost estimate.	<u>XXXXXXX</u>
8. Final location surveys staked on the ground.	<u>\$ 960.00</u>
9. Rights-of-way surveys, plans, and descriptions.	<u>\$ -</u>
** 10. FE review and approval.	<u>\$ 800.00</u>
11. Other (describe) _____	<u>\$ -</u>

CONSTRUCTION ENGINEERING: All work and expense of setting out, controlling, inspecting and measuring the reconstruction of a forest development transportation facility including:

1. Construction surveys to establish line and grade for the work, to control the work, and to measure quantities.	<u>\$ 640.00</u>
2. Redesigning, adjusting, and changing the plans, specifications, etc., to meet encountered conditions.	<u>\$ 1,280.00</u>
3. Inspecting and controlling operations for compliance with plans and specifications.	<u>XXXXXXX</u>
4. Inspecting and testing materials to be installed.	<u>XXXXXXX</u>
5. Inspecting and measuring completed work.	<u>XXXXXXX</u>
6. Processing payments and accepting materials and work.	<u>XXXXXXX</u>
** 7. FE inspection and construction mgt. (include structures).	<u>\$ 400.00</u>
I. Project Subtotal (Total of 1-10 and 1-7 above)	<u>\$ 29,640</u>
II. S.O. Overhead Account (V+IV)*.18	<u>\$ 5,335</u>
III. Project Total = (I + II)	<u>\$ 34,975</u>
IV. ** FE Account (4+10+7)	<u>\$ 1,200</u>
V. District Account = (I - IV)	<u>\$ 28,440</u>

Total (I + II)

To CT5.213# → \$ 34,975 FSRE18

Zone Engineer

JH RA

Date

3/5/12

NOTE: Do not include entries where XXXXXXXX appears.

MAJOR THIN TIMBER SALE

PROJECT COST

ROAD NUMBER	SPECIFIED ROAD COST	PUBLIC WORKS COSTS
1900	\$182,321.00	\$246,133.00
1940	\$55,500.00	\$74,925.00
TOTAL SPECIFIED ROAD COSTS	\$237,821.00	\$321,058.00
ENGINEERING DEPOSIT	\$34,975.00	

Major Thin Timber Sale prospectus should show 120 days for award of contract if bidder elects to have the Forest Service construct the roads. If the sale is not sold by 07/31/2012 please advise us so we can modify the Road Completion Date.

REVIEWED BY ZONE ENGINEER:

She Zm

DATE

3/5/12

SCHEDULE OF ITEMS

Timber Sale: Major Thin

Name: Aufderheide Drive

Project: 1900 Reconstruction

Length: 22.60 miles

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	SPECIFIED ROAD COSTS
60276B	24-inch corrugated aluminized steel pipe, 0.079-inch thickness, method B	Foot	142	\$50.50	\$7,171.00
60276C	36-inch corrugated aluminized steel pipe, 0.079-inch thickness, method B	Foot	54	\$70.50	\$3,807.00
60276D	36-inch corrugated aluminized steel pipe, 0.109-inch thickness, method B	Foot	108	\$65.00	\$7,020.00
60277	28-inch span x 20-inch rise corrugated aluminized steel pipe arch, 0.079 - inch thickness, method B	Foot	50	\$55.50	\$2,775.00
60710	Reconditioning drainage structures, jack out outlet	Each	1	\$194.00	\$194.00
60790	Clean culvert in place	Each	1	\$326.00	\$326.00
63501	Temporary Traffic Control	Lump Sum	All	\$22,182.00	\$22,182.00
				Total	\$182,321.00

* Denotes contract quantities.

SCHEDULE OF ITEMS

Timber Sale: Major Thin

Name: Aufderheide Drive

Project: 1900 Reconstruction

Length: 22.60 miles

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	SPECIFIED ROAD COSTS
15101	Mobilization	Lump Sum	All	\$24,430.00	\$24,430.00
15755A	Erosion control & pollution prevention	Each	100	\$48.00	\$4,800.00
15755B	Erosion control & pollution prevention	Each	3	\$630.00	\$1,890.00
15756	Mulch	Lump Sum	All	\$2,419.00	\$2,419.00
20253	Removal of individual trees, miscellaneous: disposal of tops & limbs f & logs f	Each	25	\$92.00	\$2,300.00
20301	Removal of log	Each	1	\$150.00	\$150.00
20303	Removal of asphalt	Square Yard *	364	\$14.00	\$5,096.00
20358	Removal of corrugated pipe, disposal method (a)	Each	5	\$439.00	\$2,195.00
20419A	Drainage excavation, type outlet ditch	Foot	225	\$2.60	\$585.00
20419B	Drainage excavation, type inlet ditch	Foot	10	\$5.00	\$50.00
20453	Excavation, compaction method E	Each	1	\$11,205.00	\$11,205.00
25101	Placed riprap, class 4	Cubic Yard *	52	\$29.00	\$1,508.00
30304	Road reconditioning, ditch	Mile	22.60	\$1,350.00	\$30,510.00
32203	Aggregate base, grading D , compaction method E.	Cubic Yard *	124	\$34.00	\$4,216.00
32222	Pit run maximum size 6", compaction method E	Cubic Yard *	53	\$10.00	\$530.00
40451	ODOT 1/2-inch dense graded HMAC, level II, asphalt cement PG 64-22	Ton	81.8	\$240.00	\$19,632.00
41551	Paving reinforcement grid, category 1	Square Yard *	72	\$16.00	\$1,152.00
43007	Skin patch, hot asphalt concrete mix	Ton	104.8	\$225.00	\$23,580.00
60276A	18-inch corrugated aluminized steel pipe, 0.064-inch thickness, method B	Foot	60	\$43.30	\$2,598.00

SCHEDULE OF ITEMS

Timber Sale: Major Thin

Name:

Project: 1940 Reconstruction

Length: 3.66 miles

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	SPECIFIED ROAD COSTS
15755	Erosion control & pollution prevention	Each	2	\$630.00	\$1,260.00
15756	Mulch	Lump Sum	All	\$550.00	\$550.00
20253	Removal of individual trees, miscellaneous: disposal of tops & limbs f & logs f	Each	10	\$88.00	\$880.00
20358	Removal of corrugated metal pipe, disposal method (a)	Each	5	\$292.00	\$1,460.00
20407	Select borrow, compaction method E, finishing method B	Cubic Yard *	233	\$22.00	\$5,126.00
20419	Drainage excavation, type outlet ditch	Foot	20	\$10.00	\$200.00
20457	Roadway excavation, compaction method E	Cubic Yard *	5	\$327.00	\$1,635.00
23051	Roadside brushing, disposal method 1	Mile	3.66	\$1,125.00	\$4,117.50
25101	Placed riprap, class 4	Cubic Yard *	4	\$34.00	\$136.00
30359	Roadway reconditioning, compaction method E	Mile	3.66	\$2,675.00	\$9,790.50
32203	Aggregate base, grading D, compaction method E	Cubic Yard *	489	\$38.00	\$18,582.00
60276A	18-inch corrugated aluminized steel pipe, 0.064 -inch thickness, method B	Foot	176	\$38.50	\$6,776.00
60276B	24-inch corrugated aluminized steel pipe, 0.079 -inch thickness, method B	Foot	86	\$42.50	\$3,655.00
60604	Anchor, for outlet pipes	Each	4	\$95.00	\$380.00
60605A	Pipe elbow, 18" hinged	Each	1	\$145.00	\$145.00
60605B	Pipe elbow, 24" hinged	Each	1	\$145.00	\$145.00
60651A	18-inch full-circle outlet pipe	Foot	20	\$17.50	\$350.00
60651B	24-inch full-circle outlet pipe	Foot	16	\$19.50	\$312.00

* Denotes contract quantities.

Total \$55,500.00

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE --- REGION SIX

WILLAMETTE NATIONAL FOREST

MIDDLE FORK RANGER DISTRICT

Lane County, Oregon

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PLANS FOR PROPOSED

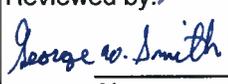
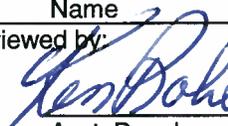
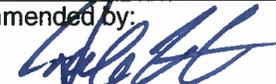
MAJOR THIN TIMBER SALE

ROADS

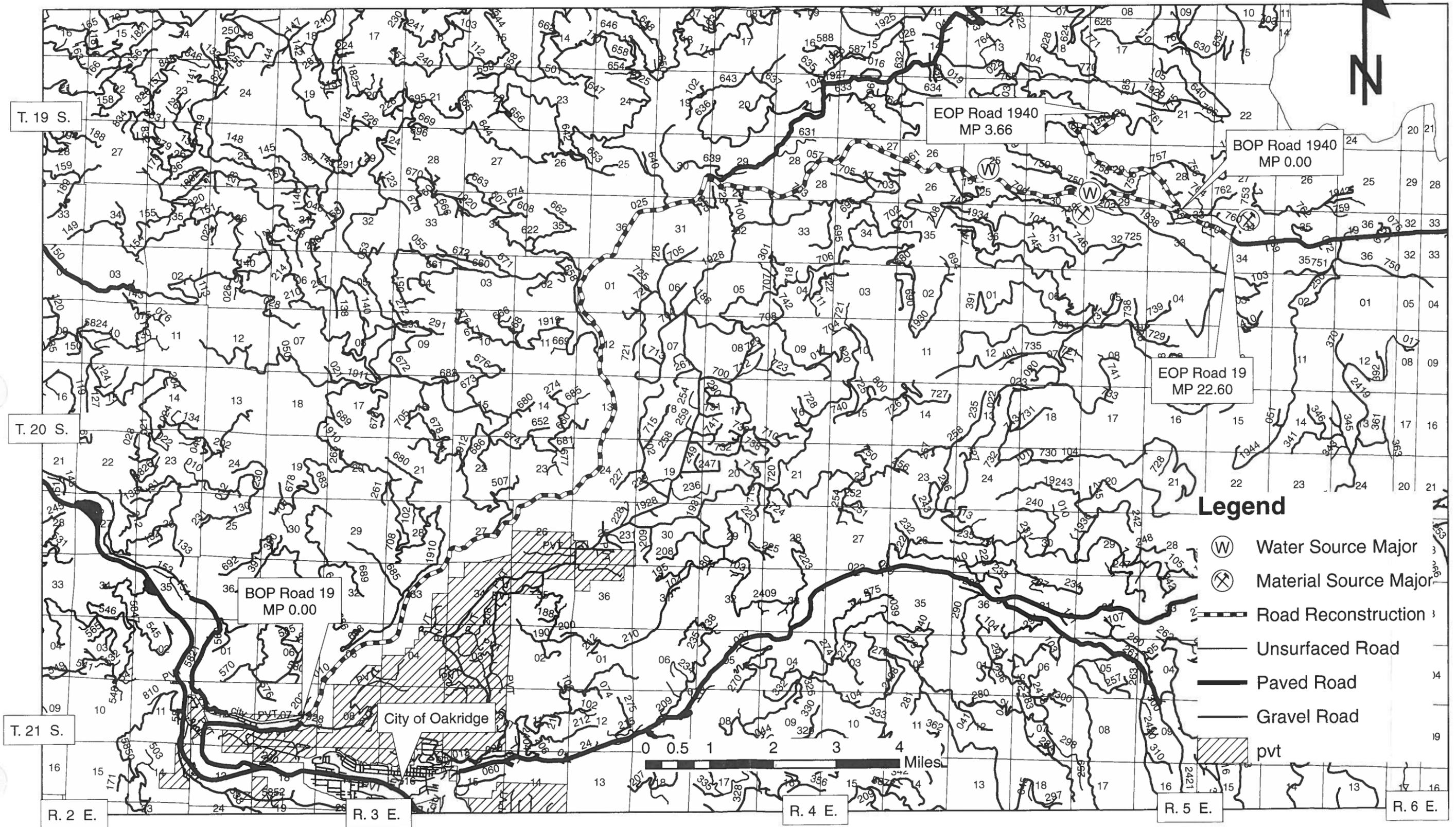
<u>ROAD NO.</u>	<u>LENGTH/MILES</u>	<u>CONST./RECONST.</u>
1900	22.60	Reconst.
1940	3.66	Reconst.

INDEX TO SHEETS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	Title sheet
2	Vicinity map
3-5	Estimate of quantities
6	General notes
7	Drainage listing
8	Drainage construction details
9	Roadside brushing detail
10	Reconstruction typical
11	Miscellaneous typicals
12-15	1900 Reconstruction summary
16-18	1940 Reconstruction summary

Designed by:	
	1/31/12
Name	Date
Reviewed by:	
 George W. Smith 1-30-2012	 1/31/12
Name	Date
Reviewed by:	
 Ken Robertson	03/5/2012
Asst. Development Engineer	Date
Recommended by:	
	3-5-12
Zone Engineer	Date
Approved by:	
 Dave F. Bulger	3/6/12
District Ranger	Date
	3/5/12
Forest Engineer	Date

Vicinity Map Major Thin



ESTIMATE OF QUANTITIES ROAD 1900

22.60 Miles

Item Number	Description	Unit	Quantities	Remarks
15101	Mobilization	Lump Sum	All	Includes equipment washing, traffic control signs and fire protection measures.
15755A	Erosion control & pollution prevention	Each	100	Biobags
15755B	Erosion control & pollution prevention	Each	3	Dewatering
15756	Mulch	Lump Sum	All	Government furnished straw
20253	Removal of individual trees, miscellaneous: disposal of tops & limbs f & logs f	Each	25	
20301	Removal of log	Each	1	
20303	Removal of asphalt	Square Yard *	364	Disposal method a
20358	Removal of corrugated pipe, disposal method (a)	Each	5	
20419A	Drainage excavation, type outlet ditch	Foot	225	
20419B	Drainage excavation, type inlet ditch	Foot	10	
20453	Excavation, compaction method E	Each	1	Disposal method a, for CMP, construction tolerance D
25101	Placed riprap, class 4	Cubic Yard *	52	Class 4 riprap available from White Rock Pit on Road 1900703, or Bulleye Pit on Road 1942.
30304	Road reconditioning, ditch	Mile	22.60	
32203	Aggregate base, grading D , compaction method E.	Cubic Yard *	124	Government commerical source aggregate stockpiled at MP 0.25 on road 1942.
32222	Pit run maximum size 6", compaction method E	Cubic Yard *	53	Pit run material available from White Rock Pit
40451	ODOT 1/2-inch dense graded HMAC, level II, asphalt cement PG 64-22	Ton	81.8	Commerical source, Sand seal all joints
41551	Paving reinforcement grid, category 1	Square Yard *	72	
43007	Skin patch, hot asphalt concrete mix	Ton	104.80	ODOT 1/2-inch dense graded HMAC, level II, asphalt cement PG 64-22. Sand seal all joint
60276A	18-inch corrugated aluminized steel pipe, 0.064-inch thickness, method B	Foot	60	
60276B	24-inch corrugated aluminized steel pipe, 0.079-inch thickness, method B	Foot	142	
60276C	36-inch corrugated aluminized steel pipe, 0.079-inch thickness, method B	Foot	54	

ESTIMATE OF QUANTITIES ROAD 1900

22.60 Miles

Item Number	Description	Unit	Quantities	Remarks
60276D	36-inch corrugated aluminized steel pipe, 0.109-inch thickness, method B	Foot	108	Material only, installation is included in 20453.
60277	28-inch span x 20-inch rise corrugated aluminized steel pipe arch, 0.079 - inch thickness, method B	Foot	50	
60710	Reconditioning drainage structures, jack out outlet	Each	1	
60790	Clean culvert in place	Each	1	
63501	Temporary Traffic Control	Lump Sum	All	

* Denotes contract quantities.

ESTIMATE OF QUANTITIES ROAD 1940

3.66 Miles

Item Number	Description	Unit	Quantities	Remarks
15755	Erosion control & pollution prevention	Each	2	Dewatering
15756	Mulch	Lump Sum	All	Government furnished straw.
20253	Removal of individual trees, miscellaneous: disposal of tops & limbs f & logs f	Each	10	
20358	Removal of corrugated metal pipe, disposal method (a)	Each	5	
20407	Select borrow, compaction method E, finishing method B	Cubic Yard *	233	
20419	Drainage excavation, type outlet ditch	Foot	20	
20457	Roadway excavation, compaction method E	Cubic Yard *	5	Borrow available from Bull eye pit on Road 1942
23051	Roadside brushing, disposal method 1	Mile	3.66	
25101	Placed riprap, class 4	Cubic Yard *	4	
30359	Roadway reconditioning, compaction method E	Mile	3.66	
32203	Aggregate base, grading D, compaction method E	Cubic Yard *	489	Government commerical source aggregate stockpiled at MP 0.25 on Road 1942.
60276A	18-inch corrugated aluminized steel pipe, 0.064 -inch thickness, method B	Foot	176	
60276B	24-inch corrugated aluminized steel pipe, 0.079 -inch thickness, method B	Foot	86	
60604	Anchor, for outlet pipes	Each	4	
60605A	Pipe elbow, 18" hinged	Each	1	
60605B	Pipe elbow, 24" hinged	Each	1	
60651A	18-inch full-circle outlet pipe	Foot	20	Aluminized Steel
60651B	24-inch full-circle outlet pipe	Foot	16	Aluminized Steel

GENERAL NOTES

- 1) Designated disposal areas are identified on the Reconstruction Summary sheets and will be flagged by the CO prior to material placement. Smooth and slope material to drain.
- 2) Replace culverts when dry or during the instream work period. Instream work period is from July 1 to Aug 31.
- 3) Salvage existing aggregate during culvert replacement; use as backfill material.
- 4) Spread Government furnished straw over disturbed soil at all culvert installations and disposal areas. Cover area completely. Straw is stored at the Flat Creek Work Center located on FS road 24, 2 miles east of the town Oakridge. Contact the CO to arrange for pick up.
- 5) Do not undercut backslopes when cleaning and/or reconstructing ditchlines.
- 6) Recondition turnouts and curve widening full length and width of travelway.
- 7) Remove all berms, existing or created, to allow drainage of water from the traveled way, unless otherwise designated to remain.
- 8) Additional material for pipe installations can be obtained from Bulleye Pit. Hauling and placing of additional borrow material, is indirect to 60276 and 60277.
- 9) All fill slopes shall be constructed with a minimum of 1:1.5 and a 1' shoulder on both sides.
- 10) Use construction tolerance D on all construction work.

Road 1900 only

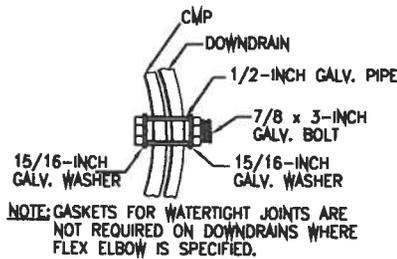
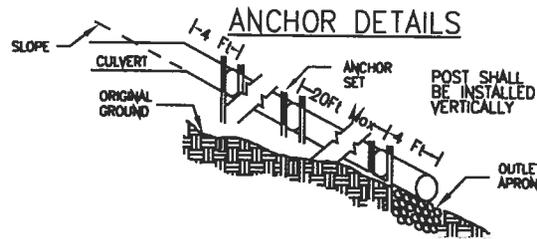
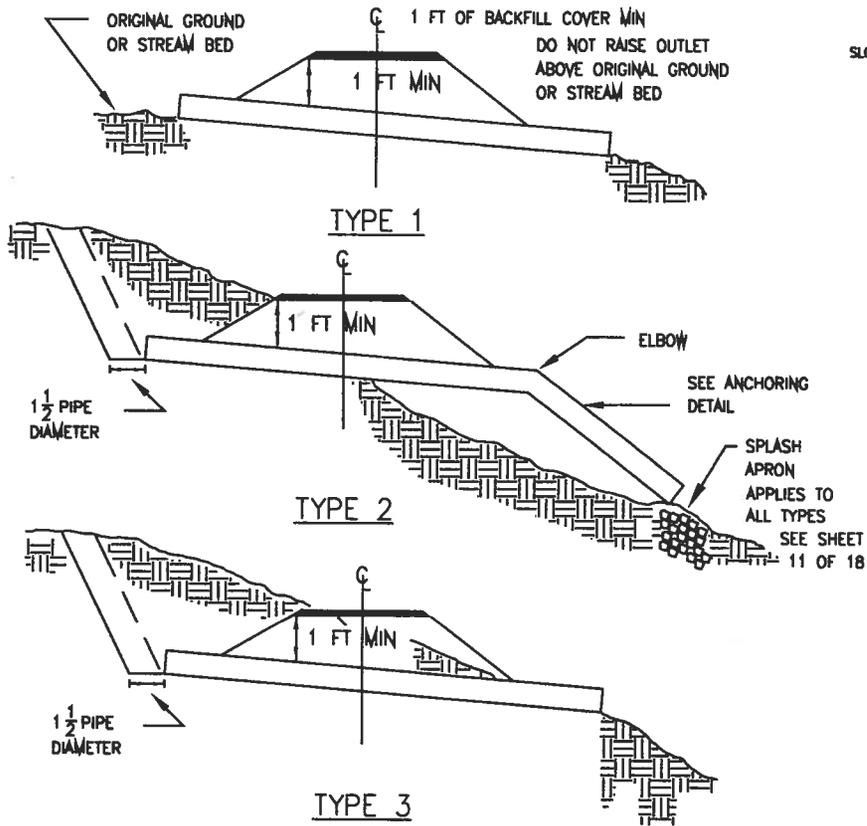
- 1) The submitted Traffic Control Plan shall include methods for accomodating public traffic and safety within the project until the project is accepted, use flaggers at both ends of the work zone to control traffic.
- 2) Place and maintain traffic cones at each corner of asphalt removal sites until asphalt surfacing has been placed.
- 3) Place warning signs to inform public of road construction work termini and rough road conditions at each access point into project area.
- 4) Initially place 12" of aggregate at culvert replacement and fill repair sites to accommodate traffic. Maintain leveling course until asphalt is placed. Remove 4" of aggregate in preparation for asphalt placement for a final depth of 8". Use excavated aggregate as shoulder rock. Haul excess aggregate to area desingated by the CO for stockpiling.
- 5) Match the road surface elevation of all fill and/or culvert repair sites before leaving project for the day. Maintain road surface elevation at repair sites until placement of asphalt is completed.
- 6) Pipe located at MP 14.38 on road 1900 replace after Labor Day in 2012 unless dewatering is needed than replace during in stream work period following season
- 7) No work will be allowed on Road 1900 on October 5, 2012, weekends or holidays, unless approved by the CO.

DRAINAGE LISTING													
M.P.	CMP	Outlet Pipe	As Built		Dimensions		Installation Details			Misc			Remarks
			M.P.	Feet	Inch	FE Inch	Type	Grade	Skew	Outlet/Inlet Ditch	Splash Apron	Select Backfill	
	Feet	Feet						%	Deg	Feet	Cubic Yards	Cubic Yards	
1900													
13.18	60				18	0.064	#	#	#		4	13 **	Lower entire installation 1.5'
13.22	54				36	0.079	#	*	#	10/10		24 **	Lower inlet end 1' and outlet 1.5'. Install gaskets indirect to 602
14.38	108				36	0.109	#	6	#	50	3	93 **	Raise outlet 2.5'. Install gaskets indirect to 602
18.14											3		
18.97											17		
21.02	76				24	0.079	#	#	#			20 **	Install gaskets indirect to 602
21.77	50				28x20"	0.079	#	*	#	150		17 **	Raise installation 6". Install gaskets indirect to 602
22.10											3		
22.18	66				24	0.079	#	#	#	15		20 **	
22.26											1		
22.51											7		
Road 1940													
1.09	36	16			24	0.079	1	3	90				Install grade as staked. Install gaskets indirect to 602
1.37	36				18	0.064	#	*	#				Lower entire installation 1' to natural ground
2.66	50				24	0.079	#	#	#	20			
2.86	32	20			18	0.064	3	10	110				
2.92	48				18	0.064	#	*	#		2		Lower entire installation to natural ground
3.42	60				18	0.064	#	*	#		2		Lower outlet 3' from original elevation.
NOTE: Standard pipe corrugation will be 2 2/3 inch X 1/2 inch unless otherwise noted.													
# Skew, grade and type shall match removed installation unless otherwise noted													
Some installations at culverts may require additional excavation below grade line.													
* The grade of this installation will change after lowering outlet of CMP.													
** See sheet 8 of plans; road 1900 culvert installation detail, select backfill indirect to 602													

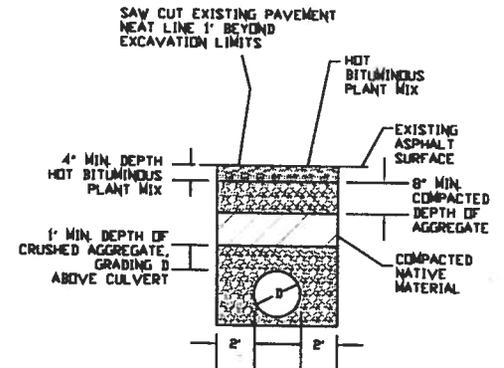
DRAINAGE CONSTRUCTION DETAILS

PROJECT	SHEET
MAJOR THIN TIMBER SALE	8 of 18

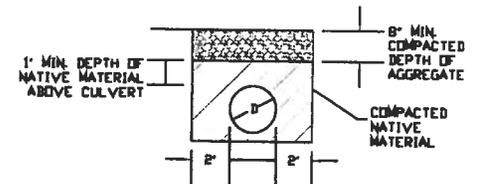
CULVERT INSTALLATION DETAIL



NOTE:
HALF BURY 36-INCH DIAMETER AND LARGER DOWNPIPE. ANCHOR SETS CONSIST OF TWO 6 FT. STEEL FENCE POSTS (AASHTO M 281) AND NO. 9 GALVANIZED WIRE. WRAP WIRE TO ENCOMPASS THE ENTIRE CIRCUMFERENCE OF THE PIPE 3 TIMES.



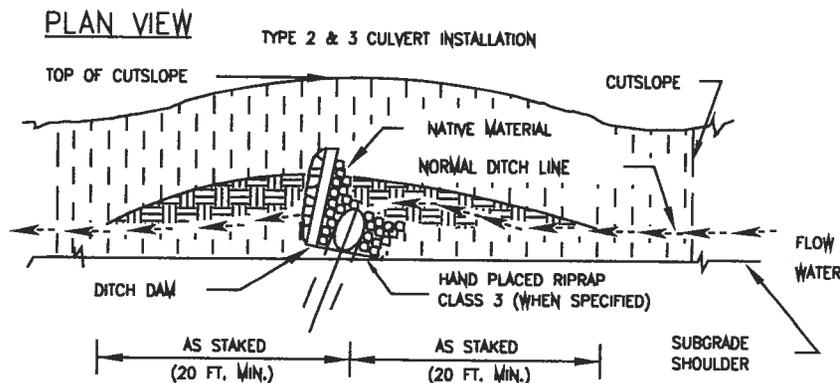
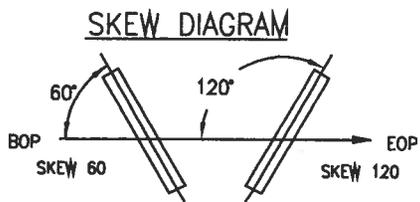
ROAD 1900 CULVERT INSTALLATION DETAIL



ROAD 1940 CULVERT INSTALLATION DETAIL

BOLT ASSEMBLY DETAIL

CATCH BASIN DETAIL



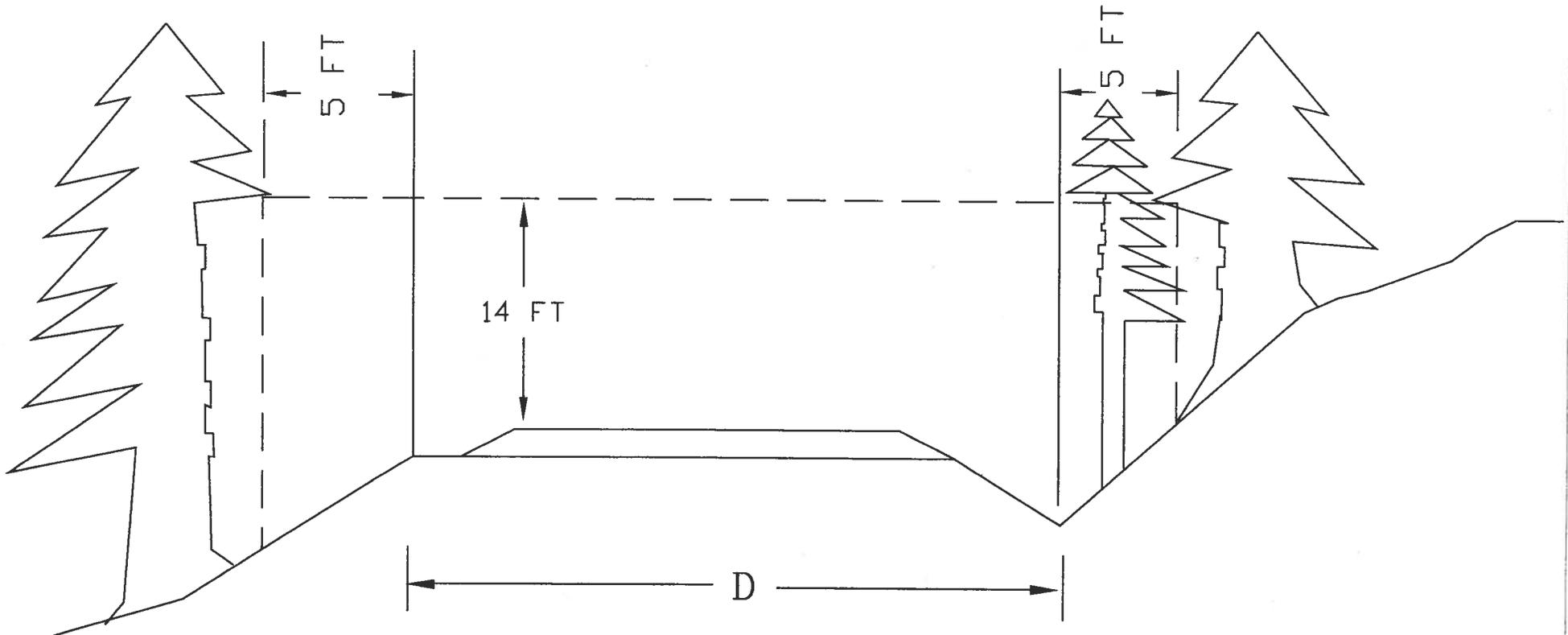
ROADSIDE BRUSHING DETAIL

PROJECT
MAJOR THIN TIMBER SALE

SH
9

TOTAL
SHEETS
18

TYPICAL SECTION



Leave trees over 8 inches in diameter as measured at $4\frac{1}{2}'$ above the ground that are within the brushing limits but beyond the bottom of ditch and beyond hinge point on the fill slope side. Limb to 14 feet above the traveled way surface.

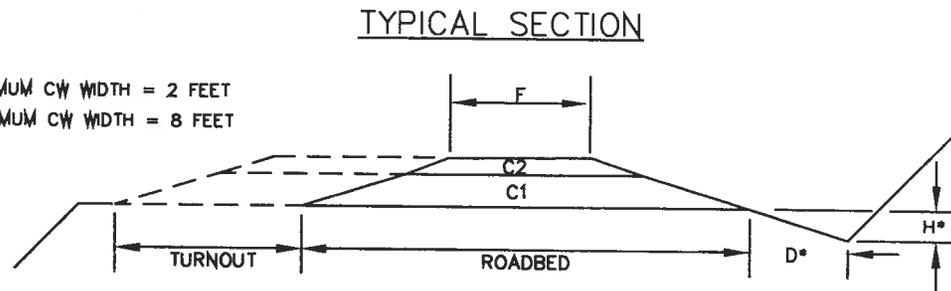
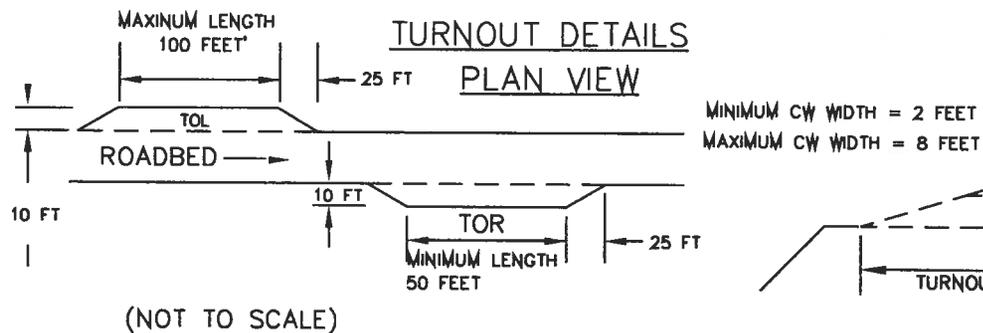
Grub stumps within "D" above and haul to designated **disposal areas** or as noted on the work descriptions.

Cut all vegetation to a maximum height of 6 inches above the ground surface.

Roads mechanically brushed may require manual scattering of cut material beyond the brushing limits.

RECONSTRUCTION TYPICAL

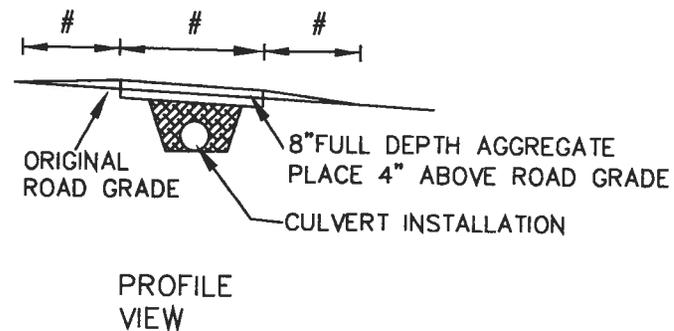
PROJECT	SHEET
MAJOR THIN TIMBER SALE	10 of 18



ROAD NUMBER	MILE POST	TO MILE POST	CONSTRUCTION TOLERANCE	GRADING			PAVEMENT STRUCTURE						
				OUTSLOPE (O) INSLOPE (I) CROWN (C) *	ROADBED WIDTH ft	DITCH DIMENSIONS ft		TRAVELED WAY WIDTH ft	GRADATION		COMPACTED DEPTH inch		ROCK SLOPE V:H
						D	H		F	C1	C2	C1	
1900	0.00	22.60	D	2(C)	28*	2*	1*	26 *	D	AC	8	4	1:2
1940	0.00	3.66	D	2(C)	16*	2*	1*	14 *	D	-	8	-	1:2

CULVERT SURFACE ROCK TYPICAL ROAD 1940

TOP LENGTH, WIDTH AND TAPER DIMENSIONS ARE DESIGNATED IN THE WORK DESCRIPTION.

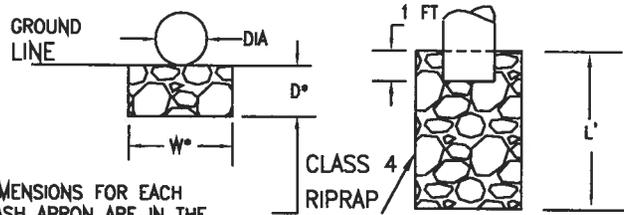


* DIMENSIONS MARKED WITH AN ASTERISK MAY BE ADJUSTED DURING CONSTRUCTION BY THE CO TO FIT SITE GEOMETRY.

MISCELLANEOUS TYPICALS

PROJECT	SHEET
MAJOR THIN TIMBER SALE	11 of 18

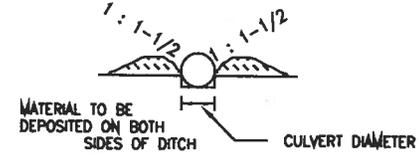
SPLASH APRON DETAIL



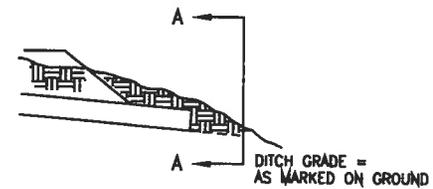
• DIMENSIONS FOR EACH SPLASH APRON ARE IN THE RECONSTRUCTION SUMMARIES. PLACE RIPRAP TO THE BOTTOM OF THE CHANNEL.

LEAVE APRON SURFACE WITH PROTRUDING RIPRAP FOR VELOCITY BREAK.

INLET DITCH

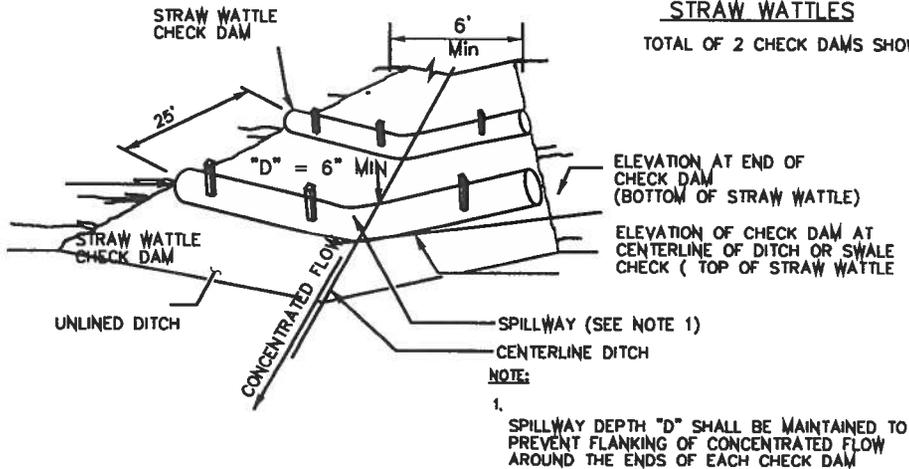


OUTLET DITCH

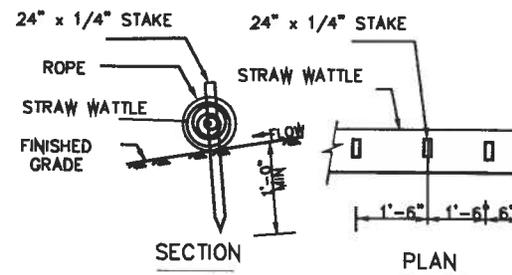


TYPICAL STRAW WATTLES

TOTAL OF 2 CHECK DAMS SHOWN



STAKING DETAIL



ROAD 1900 RECONSTRUCTION SUMMARY

Mile Post	Pay Item	Quantity	Unit	Reference Point or Work Description
0.00	30304	22.60	Mile	Junction of Co road 6128, Westfir covered bridge. Begin ditch reconstruction/reconditioning. Construct ditch 1V:2H for full length of project. Grubbing and disposal of all vegetation and root masses in the ditch is required unless otherwise noted in the work description. Haul material from ditch reconstruction, slough & slide removal to designated disposal area. Scatter all logs and woody debris lying between the top of cutbank and the opposite road shoulder, as approved by the CO. Remove dirt and vegetation from edge of asphalt according to subsection 30304.
	15755A	100	Each	After ditch reconstruction/reconditioning place biobags at all areas where water is running into culverts and at all areas where ditch water can run into live stream crossings or as specified by the CO.
2.94				Junction Road 1910, left.
4.65				Junction Road 1912, left.
8.72				Junction Road 1919, left.
9.42				Junction Road 1920, left.
10.00				Disposal area, right.
10.20	60790	1	Each	Remove log from culvert. Clean woody material from culvert. Cut and remove logs and woody material from inlet. Dispose of all material from both inlet and outlet so material will not interfere with culvert during high water events. Clearing of fill slope indirect to 303.
11.20				Disposal area, right. Development of this disposal area will be indirect to 303. Clear disposal area to flagged limits marked by the CO. Place rocks back at the entrance to the disposal area when finished with area. This area is to be used first.
12.08				Junction Road 1925, left.
12.89				Junction Road 1926, left.
13.18	20303	28	Square Yard	Cut and remove existing asphalt.
	20358	1	Each	Remove existing CMP.
	60276A	60	Foot	Install 18" CMP, lower entire installation 1.5'.
	32203	9	Cubic Yard	Place crushed aggregate over pipe installation as surfacing.
	40451	6.2	Ton	Place 4" of hot asphalt concrete.
	25101	4	Cubic Yard	Install splash apron, class 4, 7'L X 5'W X 3'D

ROAD 1900 RECONSTRUCTION SUMMARY

Mile Post	Pay Item	Quantity	Unit	Reference Point or Work Description
13.22	20303	51	Square Yard	Cut and remove existing asphalt.
	15755B	1	Each	Dewater site.
	20358	1	Each	Remove existing CMP.
	60276C	54	Foot	Install 36" CMP, lower inlet end of the culvert 1' and the outlet end 1.5'.
	32203	17	Cubic Yard	Place crushed aggregate over pipe installation as surfacing.
	40451	11.5	Ton	Place 4" of hot asphalt concrete.
	20419A	10	Foot	Construct outlet ditch
	20419B	10	Foot	Construct inlet ditch.
14.00				Junction Road 1928, right.
14.35				Junction Road 1900703, right leads to White rock pit.
14.38	20303	150	Square Yard	Cut and remove existing asphalt
	15755B	1	Each	Dewater site.
	20453	1	Each	Remove and replace fill. Removal and disposal of existing culvert and required clearing are indirect to 20453. Logs meeting utilization standards (see subsection 201.04) or suitable for firewood will be limbed, separated and decked adjacent to the work area as designated by CO. Dispose of slash according to subsection 203.05, disposal methods (l), (i), or (f).
	60276D	108	Foot	Install 36" CMP. Raise outlet 2.5'. Use 1" material from White Rock Pit as backfill material
	32222	53	Cubic Yard	Place 12" of pit run over culvert installation before placing aggregate.
	32203	51	Cubic Yard	Place crushed aggregate over pipe installation as surfacing.
	40451	33.8	Tons	Place 4" of hot asphalt concrete.
	20419A	50	Cubic Yard	Construct outlet ditch beginning at 2.5' below the bottom of the new outlet.
	25101	3	Cubic Yard	Install splash apron, class 4, 6'L X 5'W X 2.5'D.
17.80	43007	4.5	Ton	Place skin patch 45' X 8' X 2" left side.
17.90				Junction Road 1934, right.
18.14	25101	3	Cubic Yard	Install splash apron, class 4, 6'L X 5'W X 2.5'D
18.97	25101	17	Cubic Yard	Install splash apron, class 4 15'L X 10'W X 3'D, begin placing riprap where outlet exits fill to support shotgunned outlet, for engery dissipator and to stabillize slope. Removal of trees and slash indirect to 251.

ROAD 1900 RECONSTRUCTION SUMMARY

Mile Post	Pay Item	Quantity	Unit	Reference Point or Work Description
19.19	43007	9.1	Ton	Place skin patch 56' X 13' X 2" left side.
19.90				Junction Road 1900749, right, Sink rock quarry, disposal area.
20.26	25101	7	Cubic Yard	Armor outlet end of fill slope, 7.5'L X 9'W X 2.5'H, class 4.
20.29				Junction Road 1938, right.
20.31	43007	3.2	Ton	Place skin patch 20' X 12' X 2" left side.
20.32	43007	26.0	Ton	Begin placing skin patch leveling course 160' X 13' X 2" on left lane
	41551	72	Square Yard	Place glass grid for 160' x 4' centered over top of crack, along edge of leveling course as specified by the CO.
	43007	62.0	Ton	Place skin patch for 190' X 26' X 2'
20.50				Jack out outlet
20.63	20253	6	Each	Cut danger trees, left.
20.67	20253	9	Each	Cut danger trees, left
20.80				Junction Road 1939, left.
21.02	20303	72	Square Yard	Cut and remove existing asphalt.
	15755B	1	Each	Dewater site.
	20358	1	Each	Remove existing CMP. Removal of trees on fill slope indirect to 203.
	60276B	76	Foot	Install 24" CMP
	32203	24	Cubic Yard	Place crushed aggregate over pipe installation as surfacing.
	40451	16.0	Ton	Place 4" of hot asphalt concrete.
21.15	20253	1	Each	Cut danger trees, right.
21.23	20253	1	Each	Cut danger tree, right.
21.36				Cut and remove log blocking inlet of CMP, remove designated tree from outlet of CMP, work is indirect to 30304
21.49				Junction of Road 1940, left.
21.77	20303	25	Square Yard	Cut and remove existing asphalt.
	20358	1	Each	Remove existing CMP.

ROAD 1900 RECONSTRUCTION SUMMARY

Mile Post	Pay Item	Quantity	Unit	Reference Point or Work Description
	60277	50	Foot	Install 28" X 20" CMP, raise installation 6" to allow for drainage. Reconstruct catch basin to bottom of new pipe, cost indirect to 602.
	25101	7	Cubic Yard	Construct headwall on inlet of installation, 9' L X 5'W X 4'D, class 4 riprap.
	32203	9	Cubic Yard	Place crushed aggregate over pipe installation as surfacing.
	40451	5.8	Ton	Place 4" of hot asphalt concrete.
	20419A	150	Foot	Construct outlet ditch
21.80				Junction of Road 1900762, left.
21.90	20253	3	Each	Cut danger trees, left.
22.01	20253	4	Each	Cut danger trees, left.
22.02	20253	1	Each	Cut danger tree, left.
22.10	25101	3	Cubic Yard	Install splash apron 8'L X 3'W X 2.5'D, class 4
22.18	20303	38	Square Yard	Cut and remove existing asphalt.
	20358	1	Each	Remove existing CMP.
	60276B	66	Foot	Install 24" CMP.
	32203	14	Cubic Yard	Place crushed aggregate over pipe installation as surfacing.
	40451	8.5	Ton	Place 4" of hot asphalt concrete.
	20419A	15	Foot	Construct outlet ditch
22.26	20301	1	Each	Remove log from inlet of CMP.
	25101	1	Cubic Yard	Install splash apron, class 4, 4'L X 3'W X 2.5'D.
22.51	60710	1	Each	Jackout outlet of CMP
	25101	7	Cubic Yard	Install splash apron, class 4 10'L X 6'W X 3'D.
22.60				End of reconstruction.

ROAD 1940 RECONSTRUCTION SUMMARY

Mile Post	Pay Item	Quantity	Unit	Reference Point or Work Description
0.00	30359	3.66	Mile	Beginning of project. Junction of road 1900 Begin roadway reconditioning. Grubbing and disposal of all vegetation and root masses within the road bed and in the ditch is required unless otherwise noted in the work description. Haul material from ditch reconstruction, slough & slide removal to disposal area. Scatter all logs and woody debris lying between the top of cutbank and the opposite road shoulder, as approved by the CO. Scarify minimum 1" below the depth of all potholes, washboards or surface irregularities.
	23051	3.66	Mile	Begin roadside brushing.
0.30				Junction Road 1940102.
0.50				Junction Road 1940103.
0.53				Junction Road 1940104.
0.82				Disposal area, right.
0.85	32203	185	Cubic Yard	Beginning placing 4" depth of crushed aggregate
0.86				Junction Road 1940756.
0.87				Junction Road 1940757.
1.02				End placing crushed aggregate.
1.09	60276B	36	Foot	Install 24" CMP as staked by the CO.
	15755	1	Each	Dewater site.
	60605B	1	Each	Install 24" hinged pipe elbow.
	60651B	16	Foot	Install 24" outlet pipe.
	60604	2	Each	Install anchors
	32203	18	Cubic Yard	Place 8" depth of crushed aggregate for 30 feet centered over culvert installation with a 16 foot top width and 15 foot tapers on each end. Blend to adjacent surfaces to provide for smooth transition.
1.37	20358	1	Each	Remove existing CMP
	60276A	36	Foot	Install 18" CMP. Lower entire installation 1' to natural ground.
	32203	18	Cubic Yard	Place 8" depth of crushed aggregate for 30 feet centered over culvert installation with a 16 foot top width and 15 foot tapers on each end. Blend to adjacent surfaces to provide for smooth transition.

ROAD 1940 RECONSTRUCTION SUMMARY

Mile Post	Pay Item	Quantity	Unit	Reference Point or Work Description
1.65				Disposal area, left.
2.01	20253	2	Each	Cut danger trees, left
	20407	233	Cubic Yard	Excavate slump in road 150'L x 14'W x 3'D haul material to disposal area. Haul pit run material from Bull Eye pit and place in excavation.
	32203	29	Cubic Yard	Place 4" of crushed aggregate for 175' with a 12' top width and 15 foot tapers on each end. Blend to adjacent surfaces to provide for smooth transition.
2.06	20253	1	Each	Cut danger trees, right.
2.11	20253	2	Each	Cut danger trees, right.
2.26	20253	2	Each	Cut danger trees, left.
2.38				Junction road 1940760
2.51	20253	1	Each	Cut danger tree, right.
2.66	20358	1	Each	Remove existing CMP.
	60276B	50	Foot	Install 24" CMP.
	32203	16	Cubic Yard	Place 8" depth of crushed aggregate for 30 feet centered over culvert installation with a 14 foot top width and 15 foot tapers on each end. Blend to adjacent surfaces to provide for smooth transition.
	20419	20	Foot	Construct outlet ditch.
2.85	20457	5	Cubic Yard	Excavate 15'L X 6'W X 1.5'D slump in roadway and rebuild fill with borrow material.
2.86	20358	1	Each	Remove existing CMP.
	60276A	32	Foot	Install 18" CMP.
	60605A	1	Each	Install 18" hinged pipe elbow.
	60651A	20	Foot	Install 18" outlet pipe.
	60604	2	Each	Install anchors
	32203	16	Cubic Yard	Place 8" depth of crushed aggregate for 30 feet centered over culvert installation with a 14 foot top width and 15 foot tapers on each end. Blend to adjacent surfaces to provide for smooth transition.
2.92	20358	1	Each	Remove existing CMP.
	60276A	48	Foot	Install 18" CMP. Lower entire installation to natural ground.

ROAD 1940 RECONSTRUCTION SUMMARY

Mile Post	Pay Item	Quantity	Unit	Reference Point or Work Description
	32203	16	Cubic Yard	Place 8" depth of crushed aggregate for 30 feet centered over culvert installation with a 14 foot top width and 15 foot tapers on each end. Blend to adjacent surfaces to provide for smooth transition.
	25101	2	Cubic Yard	Install splash apron 6'L X 4'W X 2'D, class 4
3.03	20253	1	Each	Cut danger tree, right.
3.42	20358	1	Each	Remove existing CMP.
	15755	1	Each	Dewater site
	60276A	60	Foot	Install 18" CMP, lower outlet 3' from original elevation.
	32203	16	Cubic Yard	Place 8" depth of crushed aggregate for 30 feet centered over culvert installation with a 14 foot top width and 15 foot tapers on each end. Blend to adjacent surfaces to provide for smooth transition.
	25101	2	Cubic Yard	Install splash apron 6'L X 4'W X 2'D, class 4
3.54	20253	1	Each	Cut danger tree, right.
3.66	32203	175	Cubic Yards	Junction road 1940761 Place spot rock as specified by CO. End reconstruction

Standard
Specification and Supplemental Specification List
for **MajorThin**
Timber Sale

Road Name			Aufderheidede	Battle Creek		
Road Number			1900		1940	
Termini (Miles)			22.60		3.66	
Construction						
Reconstruction			X		X	
Supplemental No.	Latest Revision Date	Title	All specifications not included in the specification list but included by reference are applicable. X denotes applicable standard/or supplemental specifications. The supplementals shown on specification list are physically attached.			
Standard Specification	2003					
Preface	03/15/04		X		X	
101-109	2003		X		X	
101.01	01/22/09	Meaning of Terms	X		X	
101.03	06/16/06	Abbreviations	X		X	
101.04	03/29/07	Definitions	X		X	
101.04	11/06/07	Definitions	X		X	
102.00	02/16/05	Bid, Award, and Execution of Contract	X		X	
103.00	02/16/05	Deletions	X		X	
104.00	06/16/06	Deletions	X		X	
104.03	01/22/09	Specifications and Drawings	X		X	
104.06	02/17/05	Use of Roads by Contractor	X		X	
104.07	02/17/05	Other Contracts	X		X	
105.02	01/18/07	Material Sources	X		X	
105.02	03/08/07	Material Sources	X		X	
105.02	02/17/05	Government Provided Sources	X		X	
105.02	06/18/08	Material Sources	X		X	
105.05	05/12/04	Use of Material Found in the Work	X		X	
106.01	07/31/07	Conformity with Contract Requirements	X		X	
106.07	05/11/04	Delete	X		X	
107.02	02/17/05	Protection and Restoration of Property and Landscape	X		X	
107.05	05/11/04	Responsibility for Damage Claims	X		X	
107.06	06/16/06	Contractor's Responsibility for Work	X		X	
107.08	03/29/05	Sanitation, Health and Safety	X		X	
107.09	06/16/06	Legal Relationship of the Parties	X		X	
108.00	02/16/05	Delete	X		X	
109.00	02/17/05	Deletions	X		X	
109.02	06/16/06	Measurement Terms and Definitions	X		X	
151	2003	Mobilization	X		X	
156.00	4/17/07	Complete Specification				

Standard
Specification and Supplemental Specification List
for **MajorThin**
Timber Sale

Road Name			Aufderheidede	Battle Creek		
Road Number			1900		1940	
Termini (Miles)			22.60		3.66	
Construction						
Reconstruction			X		X	
Supplemental No.	Latest Revision Date	Title	All specifications not included in the specification list but included by reference are applicable. X denotes applicable standard/or supplemental specifications The supplementals shown on specification list are physically attached.			
Standard Specification	2003					
157	2003	Soil Erosion Control	X		X	
157.01	02/03/09	Soil Erosion Control	X		X	
170.00	03/26/07	Develop Water Supply and Watering	X		X	
201.00	08/05/09	Materials	X		X	
201.01	02/18/05	Description	X		X	
201.04	02/22/05	Clearing	X		X	
201.04	03/03/05	Clearing	X		X	
201.06	11/09/05	Disposal	X		X	
201.06	02/18/05	Disposal	X		X	
201.06	03/26/07	Disposal	X		X	
202	2003	Additional Clearing and Grubbing	X		X	
203	2003	Removal of Structures and Obstructions	X		X	
203.01	02/25/05	Description	X		X	
203.05	02/18/05	Disposing of Material	X		X	
203.05	03/26/07	Disposing of Material	X		X	
204	2003	Excavation and Embankment	X		X	
204.00	02/11/08	Complete Specification	X		X	
209.07	07/12/07	Dewatering	X		X	
209.10	10/23/07	Backfill	X		X	
209.11	02/24/05	Compacting	X		X	
230.00	03/31/10	Roadside Brushing			X	
251	2003	Riprap	X		X	
303	2003	Road Reconditioning	X		X	
303.01	03/23/07	Work	X		X	
303.05	03/26/07	Roadbed Reconditioning	X		X	
303.06	04/04/07	Aggregate Surface Reconditioning	X		X	
303.07	03/23/07	Roadway Reconditioning	X		X	
303.10	03/26/07	Measurement	X		X	
322.00	10/14/11	Minor Aggregate Courses	X		X	
404	2003		X			
404.02	06/09/06	Composition of Mix	X			
404.03	06/09/07	Surface Preparation	X			
404.04	03/02/05	Weather Limitations	X			
404.06	03/02/05	Placing	X			
404.07	03/02/05	Compacting (a)	X			
404.09	03/02/05	Acceptance	X			
415	2003	Paving Geotextiles	X			

Standard
Specification and Supplemental Specification List
for **MajorThin**
Timber Sale

Road Name			Aufderheidede	Battle Creek		
Road Number			1900		1940	
Termini (Miles)			22.60		3.66	
Construction						
Reconstruction			X		X	
Supplemental No.	Latest Revision Date	Title	All specifications not included in the specification list but included by reference are applicable. X denotes applicable standard/or supplemental specifications. The supplementals shown on specification list are physically attached.			
Standard Specification	2003					
415.01	03/26/07	Paving Geotextiles	X			
430	2003	Asphalt Pavement Patching	X			
430.00	03/26/07	Asphalt Pavement Patching	X			
602	2003	Culverts and Drains	X		X	
602.03	10/02/08	General	X		X	
602.03	09/06/05	General	X		X	
602.03	03/17/10	General	X		X	
607	2003	Cleaning, Reconditioning, and Repairing Existing Drainage Structures	X		X	
607.06	03/26/07	Reconditioning Drainage Structures	X		X	
635	2003	Temporary Traffic Control	X			
635.03	05/13/04	General	X			
703.05	08/14/09	Subbase, Base, Surface Course, and Screened Aggregate	X		X	
704.02	04/24/08	Bedding Material	X		X	
704.03	03/26/07	Backfill Material			X	
704.03	03/26/07	Backfill Material	X			

Preface

Preface_wo_03_15_2004_m

Delete all but the first paragraph and add the following:

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

101 - Terms, Format, and Definitions

101.01_nat_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

101.01_nat_us_01_22_2009

101.01 Meaning of Terms

Delete all references to the FAR (Federal Acquisition Regulations) in the specifications.

101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	<u>National Institute of Standards and Technology</u>
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:

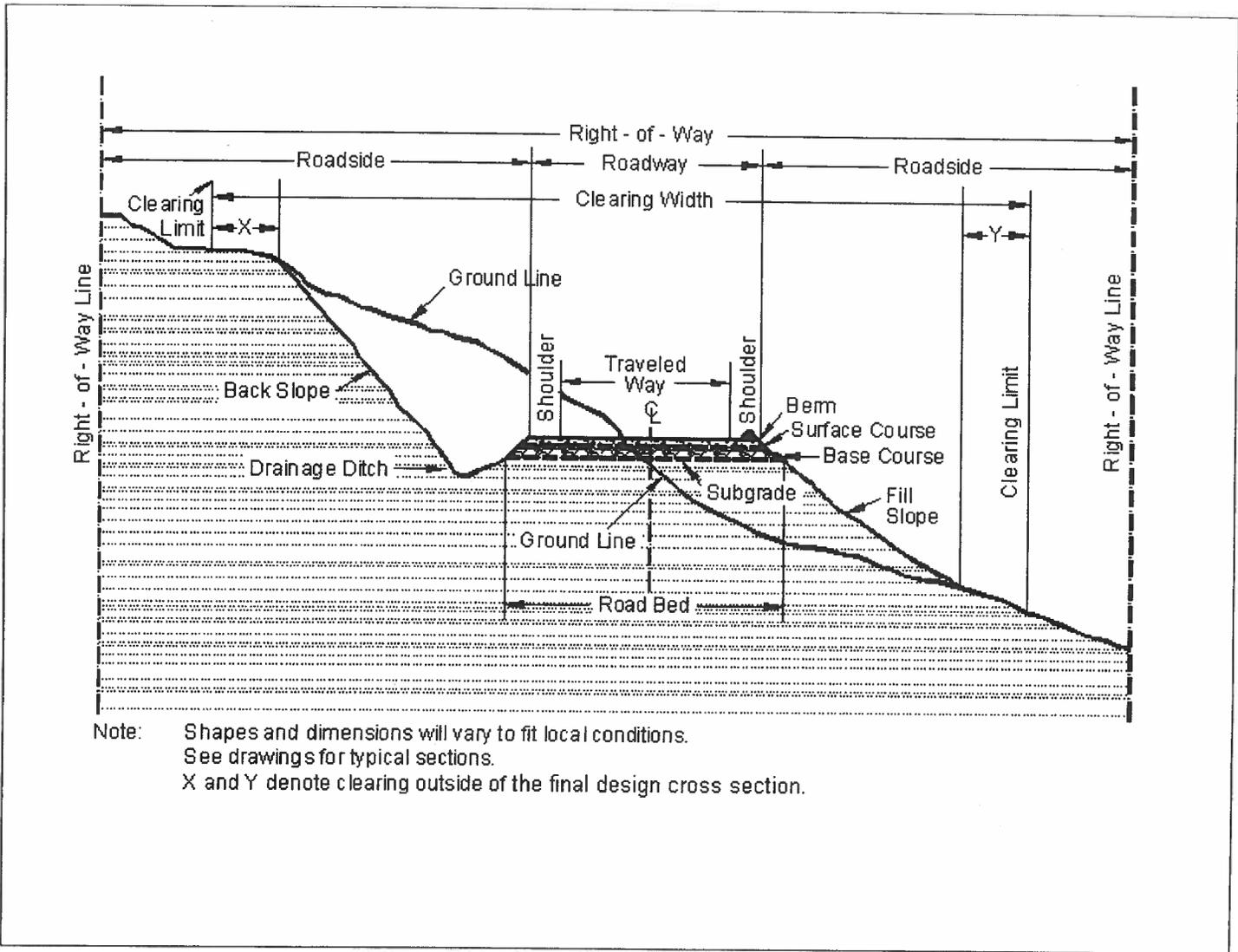


Figure 101-1—Illustration of road structure terms.

101.04 Definitions.

Delete the following definitions:

Contract Modification

Day

Notice to Proceed

Solicitation

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.

104.03_nat_us_01_22_20

104.03 Specifications and Drawings.

Delete 104.03.

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.

104.07_nat_us_02_17_2005

Add Subsection.

104.07 Other Contracts.

Several timber sales are currently being logged the entire length of the project and 2 more timber sales are in the design phase so coordination with other purchasers and contractors will be necessary. Road 1900 is a high recreational use area during summer months, construction activities will be planned around scheduled events

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.

105.02_nat_us_03_08_2007

105.02 Material Sources.

105.02(a) Contractor-provided sources.

All material (e.g., soil, gravel, sand, borrow, aggregate, etc.) transported onto National Forest System land or incorporated into the work will be weed-free. The Contracting Officer may request written documentation of methods used to determine the weed-free status of any and all materials furnished by the contractor.

Contractor-provided expertise and methods to establish weed-free status must be appropriate for the weeds of concern in the local area. The following applies to this contract:

Weeds specific to this project:

The Invasive Plant Species on the Willamette National Forest.: 2011

Potential Invaders		New Invaders		Established Infestations	
Leafy spurge	<i>Euphorbia esula</i>	Spotted knapweed	<i>Centaurea maculosa</i>	Canada thistle	<i>Cirsium arvense</i>
Yellow starthistle	<i>Centaurea solstitialis</i>	Diffuse knapweed	<i>Centaurea diffusa</i>	Bull thistle	<i>Cirsium vulgare</i>
Distaff thistle	<i>Carthamus lanatus</i>	Yellow toadflax	<i>Linaria genistifolia</i>	Scotch broom	<i>Cytisus scoparius</i>
Squarrose knapweed	<i>Centaurea. virgata</i>	Dalmatian toadflax	<i>Linaria vulgaris</i>	Tansy ragwort	<i>Senecio jacobaea</i>
Gorse	<i>Ulex europaeus</i>	Japanese knotweed	<i>Polygonum cuspidatum</i>	St. Johns-wort	<i>Hypericum perforatum</i>
Milk thistle	<i>Silybum marianum</i>	Meadow knapweed	<i>Centaurea pratensis</i>	Foxglove	<i>Digitalis purpurea</i>
French broom	<i>Cytisus monspessulanus</i>	Climbing nightshade	<i>Solanum dulcamara</i>	Oxeye daisy	<i>Leucanthemum vulgare</i>
Garlic mustard	<i>Alliaria petiolata</i>	Field bindweed	<i>Convolvulus arvensis</i>		
Himalayan knotweed	<i>Polygonum polystachyum</i>	Evergreen blackberry*	<i>Rubus laciniatus</i>		
		Himalayan blackberry*	<i>Rubus armeniacus (discolor)</i>		
		False brome	<i>Brachypodium sylvaticum</i>		
		Reed canarygrass*	<i>Phalaris arundinacea</i>		
		Sweetclover	<i>Melilotus alba</i>		
		Houndstongue	<i>Cynoglossum officianale</i>		
		English ivy	<i>Hedera helix</i>		
		Butterfly bush	<i>Buddleja davidii</i>		
		Yellow hawkweed	<i>Hieracium caespitosum</i>		
		Purple loosestrife	<i>Lythrum salicaria</i>		
		Yellow archangel	<i>Laniastrum galeobdolon</i>		

Species with a star may be considered either new or established weed infestations, depending on their densities. For example, blackberry at low elevations along river corridors are established, but single clumps at high elevations are newly invading. Reed canarygrass around reservoir fringes is established but clumps around alpine lakes are newly invading.

**Potential
Invaders**

New Invaders

**Established
Infestations**

Vinca	<i>Vinca major</i>
Evening primrose	<i>Oenothera biennis</i>
Bladder campion	<i>Silene vulgaris</i>
Creeping buttercup	<i>Ranunculus repens</i>
Creeping charlie	<i>Glechoma hederacea</i>
Yellowflag iris	<i>Iris pseudacorus</i>
Shinyleaf geranium	<i>Geranium lucidum</i>
Sulphur cinquefoil	<i>Potentilla recta</i>
Herb robert	<i>Geranium robertianum</i>
Depford pink	<i>Dianthus armeria</i>
Burdock	<i>Arcticum minus</i>
Feverfew	<i>Tanacetum parthenium</i>
Anise	<i>Pimpinella anisum</i>
Fennel	<i>Foeniculum vulgare</i>
Daphnia	<i>Daphne laureola</i>
Orange	<i>Hieracium</i>
Hawkweed	<i>aurantiacum</i>

105.02_nat_us_02_17_2005

105.02(a) Government Provided Sources.

(a) Government-provided sources. Add the following:

Government-provided sources for this project are identified as follows:

(1) Government-provided mandatory sources.

Obtain material for use as NA and in the production of aggregates under Sections (301/401/411/etc.) from NA.

(2) Government-provided optional sources.

Material for use as (riprap.) and in the production of aggregates under Sections (251,322.) may be obtained from (White Rock pit or Bull eye Pit) Aggregate Base may be obtained from stockpile site at Bull eye Pit on road 1942.

105.02_0618_us_06_18_2008

Add the following:

105.02(c) Designated Sources.

There is no material source development or needed production under Section(s) **(251.)** on Road or Source **1942** The cost for **crushed aggregate (322)** was calculated from stockpile(s) located at **Bulleye Pit on road 1942.**

If Purchaser/Contractor elects to use the provided material, a "Timber Purchaser's Request For Work" (Form FS-2400-16) or a "Specified Road Construction Agreement and/or Notice" (Form FS-7700-42), will be executed and advanced payment will be made to the Forest Service prior to removing material from the stockpile site. The advanced deposit will be the sum of the contract quantity at the rate of **(\$12.40)** per cubic yard, and an administrative charge of **(\$75.00).**

Changes that increase or decrease the designated quantity shall require an additional advanced deposit or refund, calculated in the same manner at the original advanced deposit.

105.05_nat_us_05_12_2004

105.05 Use of Material Found in the Work.

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

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

106 - Acceptance of Work

106.01_nat_us_07_31_2007

106.01 Conformity with Contract Requirements.

Delete Subsection 106.01 and substitute the following:

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

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

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

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

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

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

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

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

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

- (1) Sampling method;
- (2) Number of samples;
- (3) Sample transport;
- (4) Test procedures;
- (5) Testing laboratories;
- (6) Reporting;
- (7) Estimated time and costs; and
- (8) Validation process.

If the evaluation requires additional sampling or testing be performed, mutually agree with the Government on witnessing procedures and on sampling and testing by a third party laboratory. Use a

third party laboratory accredited by the AASHTO accreditation program. Provide proof of the laboratory's accreditation for the test procedures to be used. Do not use the same laboratory that produced the disputed Government test results or that produced the test results used as a basis for the dispute.

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

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

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

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

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

106.07_nat_us_05_11_2004

106.07 Delete

Delete subsection 106.07.

107 - Legal Relations and Responsibility To the Public

107.02_nat_us_02_17_2005

107.02 Protection and Restoration of Property and Landscape.

Add the following:

See the "C" provisions under C6.24# for seasonal restrictions.

107.05_nat_us_05_11_2004

107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06_nat_us_06_16_2006

107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.

“except as provided in Subsection 106.07”.

107.08_nat_us_03_29_2005

107.08 Sanitation, Health, and Safety

Delete the entire subsection.

107.09_nat_us_06_16_2006

107.09 Legal Relationship of the Parties.

Delete the entire subsection.

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.

156 - Public Traffic

156.00_nat_us_04_17_2007

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

Description

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

Material

156.02 Conform to the MUTCD and the following Sections and Subsections:

Construction sign panels	633
Retro-reflective sheeting	718.01
Temporary concrete barrier	618
Temporary plastic fence	710.11
Temporary traffic control devices	718.22

156.03 General. Unless otherwise provided for in Table 156-1, keep existing roads open to all traffic during road improvement work, and maintain them in a condition that will adequately accommodate traffic. Delays may not exceed 30 minutes at any one time followed by an open period of no less than 5 minutes.

Perform no work that interferes or conflicts with traffic or existing access to the roadway surface until a traffic control plan has been approved. Post construction signs and traffic control devices in conformance with MUTCD. All required signs will be in place and approved prior to beginning work on project.

If the Contractor agrees in writing to allow public traffic to use a new road being constructed prior to completion, it will be considered an existing road for traffic control purposes.

156.04 Temporary Traffic Control. Install and maintain temporary traffic control devices adjacent to and within the project as required by the approved traffic control plan and the MUTCD. Install and maintain traffic control devices as follows:

- (a) Furnish and install traffic control devices before the start of construction operations.
- (b) All detours outside of clearing limits will be approved in writing by the Contracting Officer as part of the traffic control plan.
- (c) Install only those traffic control devices needed for each stage or phase.
- (d) Relocate temporary traffic control devices as necessary.
- (e) Remove devices that no longer apply to the existing conditions.
- (f) Immediately replace any device that is lost, stolen, destroyed, or inoperative.
- (g) Keep temporary traffic control devices clean.
- (h) Remove all temporary traffic control devices upon contract completion or when approved.
- (i) When required, use flaggers certified by the American Traffic Safety Services Association, the National Safety Council, the International Municipal Signal Association, a state agency, or other

acceptable organization. Perform the work described under MUTCD Part 6. Use type III, VII, VIII, or IX retroreflective sheeting on flagger paddles. Do not use flags. Flaggers must wear high visibility safety apparel as required by MUTCD 6E.02.

156.05 Temporary Closures. Road segments may be closed as shown in Table 156-1. The maximum consecutive days of closure shall be followed by a minimum number of consecutive days open to traffic as shown. Maintain traffic control devices during closure period(s). Appropriate barricades and signs will be erected and maintained as shown in the traffic control plan or as otherwise designated.

Prior to closing roads during construction, give written notice to the Contracting Officer at least 10 days in advance.

**Table 156-1
Temporary Road Closures**

Road Number	From Terminus	To Terminus	Maximum Consecutive Days of Closure	Minimum Consecutive Days Open
1940	0.00	2.50	5	
1900	14.00	14.50	6 *	

* When road is closed will need to sign detour route. Will need 30 days advance notice before closure can take effect.

156.06 Acceptance. Public traffic work will be evaluated under Subsection 106.02.

Measurement and Payment

156.07 Do not measure Public Traffic for payment. Compensation is made as an indirect payment.

157 - Soil Erosion Control

158

157.01_0618_us_02_03_2009

Description

157.01 Add the following:

This includes protection of all phases of work during the life of the contract including storm events.

Materials

157.02 Add the following:

Coarse Aggregate for Concrete.....	703.02
Watertight Gaskets.....	712.03

Construction Requirements

157.03 **General.** Add the following:

21 days prior to the start of construction, submit a written plan that provides specific sediment control measures to minimize delivery of soil and turbidity into the stream during the construction period including a channel diversion and dewatering plan if dewatering is required. Include the sequence of operations and information on equipment, materials and suppliers. Measures given in the Plans and Supplemental Specifications are minimum requirements, and may be revised only with written approval by the CO.

The turbidity of the water 100-200 feet downstream shall not be visually greater than the turbidity of the water upstream of the project site.

When this turbidity requirement or other erosion control measures are not met, immediately take corrective action. Cease operations that are causing turbidity and pump or otherwise improve the diversion of the stream around the construction site according to this specification and the Plans until the turbidity requirement can be met. When the interpretation of this requirement is in question, measure turbidity using a turbidity meter as approved by the CO, and provide documentation that operations are in compliance with FAR 52.236-7 Permits and Responsibilities, subsection 107.01 Laws to be Observed and subsection 107.10 Environmental Protection, and subsection 107.11, including but not limited to, the requirements of the National Marine Fisheries Service.

Do not begin work until the necessary controls for that particular phase of work have been implemented. Incorporate all erosion control features into the project at the earliest practicable time, as agreed by the CO. Operate in a manner that will avoid harm to aquatic organisms whenever possible.

Notify the CO of the intention to dewater the stream, at least 10 days in advance. Do not re-route the stream until approved by the CO. The CO will not approve dewatering until a fisheries biologist and other Government personnel are present and prepared to rescue aquatic organisms. Dewater the stream slowly and incrementally in order to facilitate the fish rescue. The rescue operation will generally take several hours.

Do not release water through the newly constructed simulated streambed until approved by the CO. After approval, release water slowly and incrementally over a period of at least one hour, or as approved by the CO. During this time, treat any water that does not meet the requirements of the turbidity standard stated in this specification.

157.04 Controls and Limitations on Work. Add the following:

Prior to construction, Contracting Officer will delineate critical riparian vegetation areas, wetlands, and other sensitive sites to prevent ground disturbance. Minimize disturbance to existing vegetation along stream.

Where necessary, danger tree removal may be required. Fell danger trees within riparian areas. Where possible, fell trees towards the stream. Dispose of trees as directed by the Contracting Officer.

Confine work within the construction limits marked by the Contracting Officer. Use existing roadways or travel paths whenever reasonable. Minimize the number of new access paths.

Dispose of waste material at approved sites.

When erosion control materials are to be left on site after the project has been completed, construct erosion controls of organic and bio-degradable materials whenever possible.

157.04(b) Add the following:

For the work immediately adjacent to the stream, use sediment control barriers between the work and the stream. Place sediment barriers prior to construction around sites where significant levels of erosion may enter the stream directly or through road ditches.

Provide straw bales and silt fence for sediment control measures for each channel crossing being constructed concurrently. Use only as needed for sediment control or when specified by the Contracting Officer.

Provide waterproof membrane products to cover all stockpiled material adjacent to a live stream that is subject to erosion or water saturation. Cover stockpiles at the end of each work day and all day during the threat of precipitation or when specified by the Contracting Officer.

157.04(d) Delete the subsection and replace with the following:

Apply temporary turf establishment, mulch and stabilization measures on disturbed areas within three days of the last disturbance. Short-term stabilization measures may include the use of non-native sterile seed mix when native seeds are not available; weed-free certified straw, jute matting, and other similar techniques. Maintain short-term stabilization measures until permanent erosion control measures are effective.

157.04(f) Add the following:

When required by the Contracting Officer, loosen compacted areas, such as access roads, stream crossings, staging, and stockpile areas.

157.09 Diversions. Add the Following:

Construct stream diversion, related appurtenances and measures as follows:

(a) In Stream Work.

- (1) Isolate construction area and coordinate with Contracting Officer for aquatic species removal by the Government. Coordinate aquatic species removal a minimum of 10 working days prior to beginning isolation of construction areas.
- (2) Cease project operations under high flow conditions that inundate the project area, except for efforts to avoid or minimize resource damage.
- (3) When approved, minimize time in which heavy equipment is in stream channels, riparian areas, and wetlands. Operate heavy equipment in streams only when Contracting Officer determines that such actions are the only reasonable alternative for implementation, or would result in less sediment in the stream channel or damage (short- or long-term) to the overall aquatic and riparian ecosystem relative to other alternatives.
- (4) Clean and repair all equipment used in the in-stream work prior to entering the project area. Remove external oil and grease, along with dirt and mud, prior to construction. Inspect equipment daily for leaks or accumulations of grease, and repair any identified problems prior to entering streams or areas that drain directly to streams or wetlands.
- (5) Fuel and service equipment used for in stream or riparian work in an approved staging area outside of riparian zone. When not in use, store vehicles in the staging area.

(b) Stream Bypass Dam and Pipe. Construct a dam of material handling bags, and bypass pipe as shown on the Plans or as approved by the CO. The mining of material from the streambed or floodplain to construct diversions is not permitted. If diversion allows for downstream aquatic species passage, (i.e., is not screened), place diversion outlet in a location to promote safe reentry of aquatic species into the stream channel, preferably into pool habitat with cover.

- (1) Primary Bypass Dam. Construct the material handling bag dam in a dry condition by first pumping the stream around the dam. Place temporary cofferdams as needed. Remove rock and other irregularities from the streambed to form smooth bedding for the bypass dam. Place the dam so that water does not seep from the downstream side of the dam; if seepage occurs, improve the dam by adding bags, improving or adding seals, or other means to minimize seepage from the dam. When it is impossible to eliminate seepage, construct a sump and pump clear water to the upstream side of the dam.
- (2) Bypass Dam Impermeable Membrane. Place an impermeable membrane within or on the upstream side of the dam and entrenched in the streambed as shown on the Plans or approved by the CO. When approved by the CO, a small amount of granular bentonite may be used along the edges of the membrane to minimize seepage between the membrane and the streambed. Cut a

hole in the membrane to fit the bypass pipe and seal the membrane to the bypass pipe or the bypass pipe collar using gaskets, adhesive strips or other approved methods.

- (3) Bypass pipe. Place bypass pipe as shown on the Plans or approved by the CO. Place the upstream invert of the pipe at the lowest point in the stream channel as practical. Install joints and elbows as shown on the Plans and as needed to accommodate the site layout. Use watertight seals meeting the requirements of Subsection 712.03. Do not place backfill until the pipe joints have been approved by the CO. Allow water to pass through pipe only after a downstream splash apron has been prepared in a manner that will protect the stream from scour and turbidity, and protect fish from harm. Construct the bypass in a manner that avoids injury to aquatic organisms.
- (4) Material handling bags. Use only clean sand or coarse concrete aggregate in the bags. Loosely fill and tamp the bags in place to minimize seepage between, under, and around the bags.
- (5) Bypass Pipe Collar. Install and maintain a leak-proof pipe collar as shown on the Plans or approved by the CO.
- (6) Sediment Retention Pond. Provide a pond immediately downstream of the construction area capable of collecting and holding all seepage, drainage, and sediment not captured in stream diversion. Provide sufficient storing capacity to enable a sump pump to transfer the water, sediment and turbidity to a suitable treatment facility or area. Construct a downstream cofferdam to create a sediment retention pond when none is available immediately downstream of the project, when it is too small to use or to prevent water from entering the work area.

(c) Pumps. Install pumps as required to re-route stream around construction site and dewater foundations. When failure of a pump would result in movement of sediment or turbidity beyond the work area, provide a back-up pump that is readily available. When adjacent stream crossing projects are constructed concurrently, provide a minimum of one extra pump on site for the largest discharge site. Use the pumps for installing and removing the gravity bypass pipes and dams, at other times to facilitate construction operations, and during storms to supplement the gravity bypass. Pumps must have fish screens if used in streams where aquatic species are present and be operated in accordance with National Marine Fisheries Service (NMFS) aquatic species screen criteria. Equip the pump with approved screens, appropriate suction and discharge hoses, fittings and flow regulation equipment as needed. Insure that the pumps are clean, free of leaks and that the oil used as lubricant in the pump seal systems is food grade mineral oil. Install and operate pumps in a manner that will avoid impingement of small fish against the intake screens.

- (1) Pump intakes. Use one of the following methods of screening on all draft hoses:
 - i. Perforated Plate; screen openings shall not exceed 3/32 or 0.0938-inches
 - ii. Profile Bar Screen; the narrowest dimension in the screen openings shall not exceed 0.0689-inches in the narrowest direction.
 - iii. Woven Wire Screen; screen openings shall not exceed 3/32 or 0.0938-inches the narrow direction.

Check intakes frequently and clean as needed with wire brushing, flushing, or any other acceptable method.

- (2) Sump Pumps. Supply pumps capable of dewatering the structure foundation and sediment retention pond. Insure that pumps are clean and free of leaks. Remove sediment and turbidity in the Sump Pump discharge water prior to re-entering the stream.

(d) Sump Water Discharge. Discharge sump water as shown on the Plan or as approved by the CO. Apply one or more methods to remove sediment from sediment-laden water. Apply additional methods as needed to eliminate increase in downstream turbidity. Use the following methods as needed:

- (1) Natural Vegetation/Soil Dispersal and Filtration. Discharge sump water onto areas of ground most advantageous for dispersal and filtration of sediment, e.g. flat heavily vegetated soil. When single point discharge does not function adequately, discharge water into a perforated pipe or series of pipes laid approximately level so that the brown water disperses over a wide area.
- (2) Silt Bag Filtration. Discharge sump water into one or more silt bags. Silt bags are constructed of Mirafi 180N (or approved equal) with sewn seam strengths of 90% efficiency according to ASTM D4632. Construct bag to hold and filter sump water. Place silt bag(s) on level ground having layer of straw one foot thick minimum.
- (3) Settling Basin. Discharge sump water into one or more basins. The basins may be pre-manufactured tanks, folding tanks, geotextile or membranes placed over a sandbag or weed-free straw berm, or other similar basins designed to separate sediment from the water.
- (4) Suspended Sediment Coagulation Agent. When other methods do not function adequately, add an approved coagulation agent to water prior to discharging the water onto natural vegetation, silt bag, or settling basin. Use a flocculation agent such as Chitisan-based Storm-Klear Gel-Floc, or approved equal. Use suspended sediment coagulation agent according to manufacturer's recommendations.
- (e) Stream Re-Watering. Monitor downstream during rewatering to prevent stranding of aquatic organisms below the construction site. Ensure that concrete is sufficiently cured or dried before coming into contact with stream flow.

157.13 Maintenance & Cleanup. Add the following:

When removing sandbags, spread sand away from the waterway; if coarse concrete aggregate meeting the requirements of Subsection 703.02 is used in the sandbags, the gravel may be distributed evenly across the waterway.

Remove geotextile and other non-biodegradable materials used in dewatering and sediment control operations from Government property, unless otherwise approved by the CO.

170 - Develop Water Supply and Watering

170.00_0618_us_03_26_2007

Description

170.01 This work consists of developing an acceptable water supply, furnishing, hauling, and applying water.

Materials

70.02 Conform to the following subsection.

Water

725.01.

Construction Requirements

170.03 Development of Supply & Access. Develop water supplies and access to the water supplies as required. Use designated water sources or other approved water sources. Before using non-designated water sources, obtain all necessary permissions, water rights, and permits.

170.04 Equipment.

(a) Water tanks. Provide mobile watering equipment with watertight tanks of known capacity. Provide for positive control of water application from the driver's position.

(b) Juvenile fish protection. All draft hoses being used to withdraw water from any live flowing stream or pond will utilize one of the following methods of screening.

(1) Perforated plate: Screen opening shall not exceed 3/32 or 0.0938-inches.

(2) Profile bar screen: The narrowest dimension in the screen openings shall not exceed 0.0689-inches in the narrowest direction.

(3) Woven wire screen: Screen openings shall not exceed 3/32 or 0.0938-inches in the narrow direction.

All methods shall be cleaned frequently with either wire brushing, flushing or other acceptable method.

70.05 Application. Apply water uniformly without ponding or washing.

170.06 Acceptance. Developing water supplies and watering will be evaluated under Subsections 106.02 and 106.04.

Measurement and Payment

170.07 See Subsection 109.05.

Do not measure develop water supply and watering for payment.

201 - Clearing and Grubbing

201.00_nat_us_08_05_2009

201.02 Material:

Delete Tree wound dressing material reference.

201.03 General.

Delete the last sentence.

201.04 Clearing.

Delete the last sentence of (d).

201.01_nat_us_02_18_2005

201.01 Description

Replace with the following

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

201.04_nat_us_02_22_2005

201.04 Clearing. (c)

Delete paragraph (c) and replace with the following:

(c) In areas outside the excavation, embankment, and slope rounding limits, cut stumps to within 12 inches or one-third of the stump diameter of the ground, whichever is higher, measured on the side adjacent to the highest ground. For timber sales, stump heights will meet the requirements of the Timber Sale contract.

201.04 Clearing.

Delete subsection (d) and replace with the following:

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

Add the following:

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

(f) Remove brush from log decks. Deck logs so that logs are piled parallel to one another; can be removed by standard log loading equipment; will not damage standing trees; will not interfere with drainage, and will not roll. Keep logs in log decks free of brush and soil.

Construction Requirements

201.04 Clearing.

Add the following:

Utilization standards for merchantable timber are listed below. Fall and buck merchantable material into lengths not to exceed 40 feet. Pieces (logs) meet utilization standards when such pieces would have met Utilization Standards if bucking lengths were varied to include such material.

Minimum Utilization Standards

Length	Diameter (Inside Bark) at Small End	<u>40</u> % Net Scale in
<u>8</u> feet	<u>6</u> inches	% of Gross Scale

201.06_nat_us_11_09_2005

201.06 Disposal

Delete the first sentence of this paragraph and substitute the following:

Limb and deck logs that meet utilization standards at locations approved by the CO or otherwise designated.
Deck logs according to 201.04 (f).

201.06_nat_us_02_18_2005

201.06 Disposal.

Delete the first sentence of this subsection and substitute the following:

Dispose of merchantable timber designated for removal according to the provisions of the timber sale contract.

201.06_0618_us_03_26_2007

201.06 Disposal

Delete the first sentence of this subsection.

203 - Removal of Structures and Obstructions

203.01_nat_us_02_25_2005

203.01 Description.

Delete and replace with the following:

This work consists of disposing of construction slash and debris, salvaging, removing, and disposing of buildings, fences, structures, pavements, culverts, utilities, curbs, sidewalks, and other obstructions.

203.05_nat_us_02_18_2005

203.05 Disposing of Material.

Add the following:

- (e) Windrowing Construction Slash.** Place construction slash outside the roadway in neat, compacted windrows approximately parallel to and along the toeline of embankment slopes. Do not permit the top of the windrows to extend above subgrade. Use construction equipment to matt down all material in a windrow to form a compact and uniform pile. Construct breaks of at least 15 feet at least every 200 feet in a windrow. Do not place windrows against trees. Obtain approval for pioneer roads. A pioneer road may be constructed to provide an area for placement of windrows, provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.
- (f) Scattering.** Scatter construction slash outside the clearing limits without damaging trees. Limb all logs. Place logs and stumps away from trees, positioned so they will not roll, and are not on top of one another. Limb and scatter other construction slash to reduce slash concentrations.
- (g) Chipping or Grinding.** Use an approved chipping machine to grind slash and stumps greater than 3 inches in diameter and longer than 3 feet. Deposit chips or ground woody material on embankment slopes or outside the roadway to a loose depth less than 6 inches. Minor amounts of chips or ground woody material may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.
- (h) Debris Mat.** Use tree limbs, tops, cull logs, split stumps, wood chunks, and other debris to form a mat upon which construction equipment is operated. Place stumps upside down and blend stumps into the mat.
- (i) Decking Firewood Material.** Remove brush from decks. Limb and deck logs that do not meet Utilization Standards according to Subsection 201.04 as directed by the CO. Cut logs to lengths less than 30 feet. Ensure that log stacks are stable and free of brush and soil.
- (j) Removal to designated locations.** Remove construction slash to designated locations.
- (k) Piling.** Pile construction slash in designated areas. Place and construct piles so that if the piles are burned, the burning will not damage remaining trees. Keep piles free of dirt from stumps. Cut unmerchantable logs into lengths of less than 20 feet.
- (l) Placing Slash on Embankment Slopes.** Place construction slash on completed embankment slopes to reduce soil erosion. Place construction slash as flat as practicable on the completed slope. Do not place slash closer than 2 feet below subgrade. Priority for use of available slash is for: (1) through fills; (2) insides of curves; and (3) ditch relief outlets.
- (m) Hydrological Sensitive Placement.** Where required use this method in combination with other designated methods to dispose of material to reduce erosion and to aid in re-vegetation:
1. Place windrow segments on contours, wrap in type I geotextile.
 2. Place logs as log erosion barriers on contours. Place logs so that 80% of their length is on the ground surface.
 3. Scatter slash on bare or disturbed areas within or outside the clearing limits as directed.

4. Scatter chips or ground woody material on bare or disturbed areas within or outside the clearing limits as directed.

Place stumps in swales or on sites to form planting pockets. Place windrow segments on contours, wrap in type I geotextile.

203.05_0618_us_03_26_2007

203.05 Disposing of Material

- (a) Remove from project.

Delete the last two sentences

204 - Excavation and Embankment

204.00_0618_us_02_11_2008

Delete Section 204 in its entirety and replace with the following.

Description

204.01 This work consists of excavating material, constructing embankments and drainage excavation. This includes furnishing, hauling, stockpiling, placing, disposing, sloping, shaping, compacting, and finishing sand, 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

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.

(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 When blasting rock, use blasting methods according to Subsection 205.08.

(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.

(e) **Drainage Excavation.** Drainage excavation includes construction of all ditches, minor channel changes, drainage dips, catchbasins, surface water deflectors, and other minor drainage structures. Compact by Method (f) unless otherwise shown on the plans. Excavate on a uniform grade between control points.

204.07 Subexcavation. Excavate material to the limits as designated. 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.** Unless otherwise designated by the CO, remove topsoil. 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 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.

(d) **Compaction D.** Hauling and Spreading Equipment. Adjust the moisture content to a level suitable for compaction. Compact the material by operating equipment over the full width of the roadway.

(e) **Compaction E.** Roller Compaction. Adjust the moisture content to a level suitable for compaction. 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.
- (4) Sheepsfoot, tamping, or grid rollers capable of exerting a force of 250 lbs/inch of width of roller drum.

(f) **Compaction F.** Mechanical Tamper. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each 6 inch layer with a minimum of three complete passes with a mechanical tamper.

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

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

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

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

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

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

(c) **Shaping.** Shape the subgrade to a smooth surface and to the cross-section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground.

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

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

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

(1) Method A. Remove all material larger than 6 inches from the top 6 inches of the roadbed and replace with suitable material.

(2) Method B. Use a vibratory grid roller or approved equal with a minimum weight of 10 tons. Roll at least 5 full-width passes or until there is no visible evidence of further consolidation.

(3) Method C. For roads designated as Construction Tolerance Class K, L, or M, finish the roadbed by spreading the excavation. Eliminate rock berms.

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

When there is a pay item for waste, shape and compact the waste material in its final location according to Subsection 204.11 (c) Compaction C. Do not mix clearing or other material not subject to payment with the waste material. When there is not a pay item for waste, shape and compact the waste material in its final location according to Subsection 204.11 (c) Compaction C.

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 ⁽¹⁾ or T 99, method C ⁽¹⁾	1 per soil type but not less than 1 per 13,000 yd ³	"	"	"
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd ² but not less than 1 per layer	In-place	—	Before placing next layer
Select borrow (704.07 & Select topping (704.08)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type but not less than 1 for each day of production	Processed material before incorporating in work	Yes, when requested	Before using in work
		Gradation	—	AASHTO T 27 & T 11	"	"	"	"
		Liquid limit	—	AASHTO T 89	"	"	"	"
		Moisture-density	—	AASHTO T 180, method D ⁽¹⁾ or T 99, method C ⁽¹⁾	1 per soil type but not less than 1 per 13,000 yd ³	"	"	"
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd ² but not less than 1 per layer	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor

Table 204-1 (continued)
Sampling and Testing Requirements

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

(1) Minimum of 5 points per proctor.

**Table 204-2
Construction Tolerances**

	Tolerance Class ^(a)												
	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 ^(b))	±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

209 - Structure Excavation and Backfill

209.07_0618_us_07_12_2007

209.07 Dewatering.

Delete subsection 209.07 and substitute the following:

Dewatering. Where necessary to dewater, dewater according to Subsection 157.09.

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 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.

230 - Roadside Brushing

230.00_0618_us_03_31_2010

230.01 Description. This work consists of removing limbs, residual slash, roadside brush and small trees within the brushing limits designated in the plans, including turnouts.

Construction Requirements

230.02 General. Cut all brush and small trees, (___* inch diameter or less at the point of cut) within the brushing limits and outside the roadbed no higher than ___* inches above the ground surface or obstructions such as rocks or stumps. Trees beyond the bottom of ditch and beyond the hinge point on the fill slope side, with a diameter larger than ___* inches at a point ___* feet above the ground shall be limbed to a height of ___* feet above the road surface.

* **Refer to Sheet 9 of plans.**

Cut all brush and trees located in the roadbed. Grub and haul stumps to designated waste areas or as directed by the Contracting Officer. Smooth and shape the disturbed areas where stumps are removed to prevent water ponding.

230.03 Windfalls. Cut windfalls lying within or across the brushing limits to a horizontal distance of 8 feet from each shoulder or at the brushing limit, whichever is least. Dispose of windfall material as slash.

230.04 Slash Treatments. Remove limbs, chunks, and debris within the roadway in excess of 3 feet in length or 1 inches in diameter, or concentrations which may plug ditches or culverts, from the traveled way, shoulders, ditches and water courses.

Dispose of slash in accordance with one or more of the following methods, as shown in the bid schedule:

- (1) **Scattering.** Scatter slash outside the roadway limits without damaging trees. Do not scatter any material in streambeds, culvert inlets or outlets, drainage ways or cattleguards.
- (2) **Chipping.** Process slash through a chipping machine. Deposit chips on embankment slopes or outside the roadway to a loose depth less than 6 inches.
- (3) **Piling.** Pile slash in designated locations. Place and construct piles so that if the piles are burned, the burning will not damage surrounding trees. Keep piles free of dirt. Cut unmerchantable logs into lengths less than 20 feet.
- (4) **Decking.** Deck logs in excess of 8 feet long and 6 inches in diameter in designated locations. Logs shall be limbed and decks are to be stable and free of brush and soil. Treat other material according to designated slash treatment methods.
- (5) **Placing slash on embankment slopes.** Place slash on embankments slopes as designated in the plans to reduce soil erosion. Place slash as flat as practicable on slope. Do not place closer than 2 feet below shoulder. Priority for use of available slash in for: (1) through fills; (2) insides of curves.
- (6) **Burying.** Bury slash at designated locations. Mat slash down in layers and cover with rock and soil.
- (7) **Piling & burning.** Pile and burn slash in designated locations. Construct piles so that burning does not damage remaining trees.

Measurement

230.05 Measure the Section 230 items listed in the bid schedule according to Subsection 109.02. Quantities will be the number of miles and fractions thereof along the road centerline, regardless of the amount of work required.

Payment

230.06 The accepted quantities will be paid at the contract price per unit of measurement for the Section 230 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

303 - Road Reconditioning

303.01_0618_us_03_23_2007

303.01 Work.

Delete and add the following:

This work consists of reconditioning ditches, shoulders, roadbeds, aggregate surfaces and approach road intersections.

303.05_0618_us_03_26_2007

303.05 Roadbed Reconditioning.

Delete fourth sentence and replace with the following:

Scarify to the depth and width shown on the drawings, remove surface irregularities, and shape to provide a uniform surface.

303.06_0618_us_04_04_2007

303.06 Aggregate Surface Reconditioning.

Delete and replace with the following:

Repair soft and unstable areas to the full depth of the aggregate surface and according to Subsection 204.07. Scarify to the depth and width shown in the drawings, and remove surface irregularities. Reshape, finish, and compact the entire aggregate surface according to Section 301, Section 321, or Section 322 as applicable.

Delete Table 303-1 and replace with the following:

**Table 303-1
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
Existing Roadway	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 ⁽¹⁾	1 per each mixture or change in material	Processed material before incorporating in work	Yes, when requested	Before using in work
		Moisture-density Method E	—	R-1 Marshall	"	"	"	"
		Moisture-density Method F	—	AASHTO T 180 ⁽¹⁾	"	"	"	"
		Moisture-density Method G	—	R-1 Marshall	"	"	"	"
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	1 per 3000 yd ²	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

303.07 Roadway Reconditioning.

Delete and add the following:

Perform all the applicable work described in Subsection 303.03 through 303.06. Recondition the traveled way, shoulders and ditchline of intersecting roads to provide a smooth transition as shown on the plans.

303.10_0618_us_03_26_2007

303.10 Measurement

Remove and replace the first sentence in the third paragraph with the following:

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

322 - Minor Aggregate Courses

322.00_nat_us_10_14_2011

Description

322.01 This work consists of constructing one or more courses of aggregate on a prepared surface. Work includes producing aggregate by grid rolling, screening, or crushing methods, or placing pit-run or Government-furnished aggregate.

Surface aggregate grading is designated as shown in Table 703-3.

Subbase and base aggregate grading is designated as shown in Table 703-2.

Screened aggregate grading is designated as shown in Table 703-16.

Material

322.02 Conform to the following Subsections:

Aggregate	703.05
Water	725.01

Construction Requirements

322.03 General. Prepare the surface on which the aggregate course is placed according to Section 204 or 303 as applicable.

Request approval of the roadbed in writing before placing aggregate.

Develop, haul, and apply water in accordance to Section 170.

Submit target values within the gradation ranges shown in Table 703-2 or 703-3 for the required grading. After reviewing the proposed target values the CO will determine the final values for the gradation and notify the Contractor in writing.

No quality requirements or gradation other than maximum size will be required for pit run and 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.

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

322.04 Mixing and Spreading. Mix the aggregate and adjust the moisture content to obtain a uniform mixture with a moisture content suitable for the specified compaction method. Spread and shape the mixture on the prepared surface in a uniform layer with no segregation of size, and to a loose depth that will provide the required compacted thickness.

Do not place in layers exceeding 6 inches in compacted thickness for aggregate base and surface courses or twice the maximum particle size for screened aggregate. When more than one layer is necessary, compact each layer according to Subsection 322.05 before placing the next layer. Route hauling and leveling equipment uniformly over the full width.

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

322.05 Compacting. 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. Removed.

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

Compaction G. Removed.

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

322.06 Construction Tolerance. If grade finishing stakes are required, finish the surface to within ± 0.10 feet from staked line and grade elevation.

If grade finishing stakes are not required, shape the surface to the required template and check the surface with a 10-foot straightedge. Defective areas are surface deviations in excess of 1/2 inch in 10 feet between any two contacts of the straightedge with the surface.

Correct all defective areas by loosening the material, adding or removing material, reshaping, and compacting.

Ensure that the compacted thickness is not consistently above or below the specified thickness. The maximum variation from the compacted specified thickness is 1/2 inch.

Ensure that the compacted width is not consistently above the specified width. The maximum variation from the specified width will not exceed +12 inches at any point.

322.07 Maintenance. Maintain the aggregate course to the correct line, grade, and cross-section by blading, watering, rolling, or any combination thereof until placement of the next course. Correct all defects according to Subsection 322.06.

322.08 Acceptance. See Table 322-1 or Table 322-2 as applicable, for sampling and testing requirements.

Aggregate gradation and surface course plasticity index will be evaluated under Subsection 106.04. If the aggregate is obtained from a Government stockpile then the above characteristics will be evaluated under Subsection 106.02. Other aggregate quality properties will be evaluated under Subsections 106.02 and 106.04. Placement of aggregate courses will be evaluated under Subsections 106.02 and 106.04.

The allowable upper and lower aggregate gradation limits are the Target Value plus or minus the allowable deviations shown in Tables 703-2 and 703-3.

The allowable upper and lower Plasticity index limits for surface courses are stated in 703.05(b).

Preparation of the surface on which the aggregate course is placed will be evaluated under Section 204 or 303 as applicable.

Measurement

322.09 Measure the Section 322 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measure square yard width horizontally to include the top of aggregate width including designed widening. Measure the square yard length horizontally along the centerline of the roadway.

If the measurement for aggregate is by cubic yard using contract quantities then measure aggregate by the cubic yard in-place once compacted, otherwise measurement for aggregate by the cubic yard is measured by the cubic yard in the hauling vehicle.

Measure thickness perpendicular to the grade of the travelway.

Measure width perpendicular to the centerline.

Payment

322.10 The accepted quantities will be paid at the contract price per unit of measurement for the Section 322 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

**Table 322-1
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
Aggregate source quality 703.05	Measured and tested for conformance (106.04 & 105)	LA abrasion (coarse)	—	AASHTO T 96	1 per type & source of material	Source of material	Yes, when requested	Before using in work
		Sodium sulfate soundness loss (coarse & fine)	—	AASHTO T 104	"	"	"	"
		Durability index (coarse & fine)	—	AASHTO T 210	"	"	"	"
		Fractured faces	—	ASTM D 5821	"	"	"	"
Subbase, Base, and Surface courses	Measured and tested for conformance (106.04)	Sample	—	AASHTO T 2	2 per day	From windrow or roadbed after processing or from approved crusher sampling device	Yes	48 hours

**Table 322-1 (continued)
Sampling and Testing Requirements**

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Subbase, Base, and Surface	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 ⁽¹⁾	1 per type and source of material	Source of material	Yes, when requested	Before using in work
			—		"	"	"	"
		Moisture-density Method F	—	AASHTO T 180 ⁽¹⁾	"	"	"	"
			—		"	"	"	"
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	3 per day	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

**Table 322-2
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
Screened Aggregate	Measured and tested for conformance (106.04)	Sample	—	AASHTO T 2	2 per day	From windrow or roadbed after processing or from approved crusher sampling device	Yes	48 hours

404 - Minor Hot Asphalt Concrete

404.02_nat_us_06_09_2006

404.02 Composition of Mix (Job-Mix Formula).

Delete the second paragraph and replace with the following:

Submit a job-mix formula and supporting documentation, test results, and calculations for the material to be incorporated into the work. Include copies of laboratory test results and mix design data that demonstrate that the properties of the aggregate, additives, and mixture meet the current requirements and criteria of Federal or state agencies. Ensure that the job-mix formula was performed no more than one year prior to placing the hot asphalt concrete. After reviewing the Contractor's proposed job-mix formula, the CO will determine the final values for the job-mix formula to be used and notify the Contractor in writing.

404.03_0618_us_06_09_2007

404.03 Surface Preparation.

Change the following:

"Subsection 410.05" to "Subsection 401.06"

Add the following:

Apply an asphalt prime coat to contact surfaces of aggregate base according to Section 411.

404.04_nat_us_03_02_2005

404.04 Weather Limitations.

Change 35° F to 45° F:

404.06_nat_us_03_02_2005

404.06 Placing.

Add the following:

Do not place asphalt until the CO has approved in writing the area where it will be placed.

Delete the last sentence and replace with the following:

Offset the longitudinal joint of one layer at least 6 inches from the joint in the layer immediately below. Make the longitudinal joint in the top layer along the centerline of two-lane roadways or at the lane lines of roadways with more than two lanes. Offset transverse joints in succeeding layers and in adjacent lanes at least 10 feet, where possible.

404.07_nat_us_03_02_2005

404.07 Compacting (a).

Delete and replace with the following:

(a) Roadway paving. Thoroughly and uniformly compact the surface a minimum of three passes with rollers that meet one of the following requirements:

(1) Steel-wheeled rollers, other than vibratory type, capable of exerting a force of not less than 1.5 ton/feet of width of the compression roll or rolls.

(2) Vibratory steel-wheel rollers with a minimum mass of 5 ton, equipped with amplitude and frequency controls, and designed to compact asphalt concrete.

(3) Pneumatic-tire rollers with smooth tread tires of equal size that provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 lbf/in².

Perform initial compaction while the mixture is above 250 °F. Perform finish rolling with steel-wheel rollers and continue until no roller tracks remain.

404.09_nat_us_03_02_2005

404.09 Acceptance.

Add the following to the second paragraph:

See Table 404-1 for sampling and testing requirements.