



UNITED STATES DEPARTMENT OF AGRICULTURE
 FOREST SERVICE - REGION SIX
 WILLAMETTE NATIONAL FOREST
 DETROIT RANGER DISTRICT
 MARION COUNTY



PLANS FOR PROPOSED

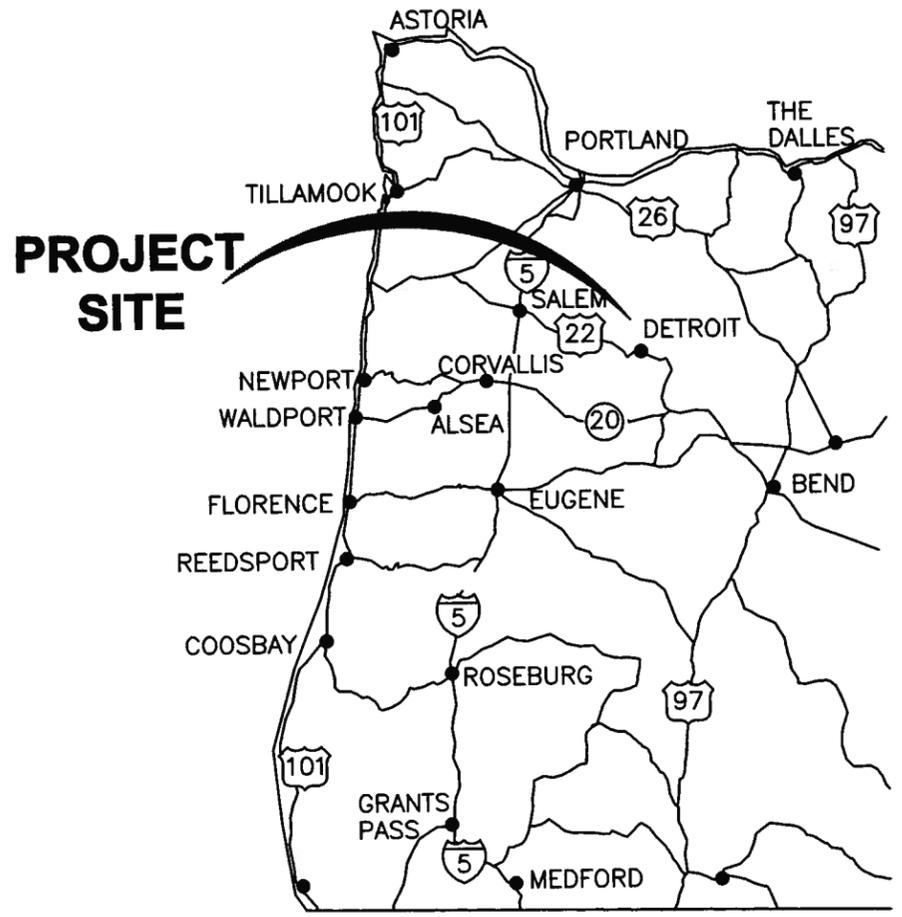
DUN THIN TIMBER SALE

ROAD RECONSTRUCTION DRAWINGS FOR:

ROAD NO.	LENGTH	TYPE OF WORK*
2223-501	3.50 Mi.	C, E, R

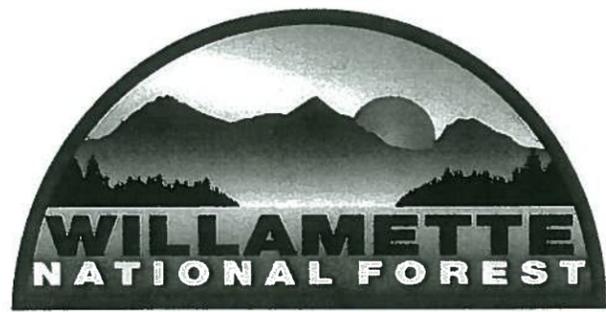
*
 C - CULVERTS
 E - EXCAVATION
 R - ROAD REALIGNMENT

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13	DISPOSAL SITE TYPICAL
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**WESTERN OREGON
 INDEX MAP**

—●— STATE HIGHWAY
 —■— FEDERAL HIGHWAY
 —□— INTERSTATE HIGHWAY



DESIGNED BY: <i>Mike Lammam</i>	DATE 5/31/12
REVIEWED BY: <i>Carlos Velaz</i>	DATE 5/31/12
REVIEWED BY: (ASST. DEVELOPMENT ENGINEER) <i>Tom Robertson</i>	DATE 6/7/12
RECOMMENDED BY: (ZONE ENGINEER) <i>Walter P. Hrylak</i>	DATE 6/11/12
APPROVED BY: (DISTRICT RANGER) <i>Tracy A. McInahan</i>	DATE 5/31/12
APPROVED BY: (FOREST ENGINEER) <i>Chad [Signature]</i>	DATE 6/14/12

SPECIFIED ROADS TOTAL RECONSTRUCTION COST

Dun Thin Timber Sale
Detroit Ranger District
Willamette National Forest
Marion County

Timber Sale Reconstruction Costs		
DESCRIPTION	NFSR #	ESTIMATED COST
Reconstruction	2223-501	\$58,880.80
	SUB-TOTAL	\$58,880.80
C5.213# Reconstruction Engineering Deposits	All	\$16,284.00
	TOTAL	\$75,164.80

X

Chalinda Jones 6/11/12

Zone Engineer's Approval

Dun Thin Timber Sale

SCHEDULE OF ITEMS					
ROAD NUMBER			2223-501		
CONSTRUCTION					
RECONSTRUCTION			X		
PROJECT LENGTH (MILES)			3.50		
ITEM NO.	DESCRIPTION	PAY UNIT	QTY	UNIT COST	TOTAL
15101	Mobilization	Lump Sum	All	\$4,861.72	\$4,861.72
15201	Construction survey and staking, method I, tolerance B	Lump Sum	All	\$1,500.00	\$1,500.00
15757	Erosion control and pollution prevention	Each	3	\$146.07	\$438.21
20103	Clearing and grubbing, disposal of tops and limbs F, logs F, and stumps F	Mile	3.50	\$2,600.37	\$9,101.30
20105	Clearing and grubbing, disposal of tops and limbs F, logs I, stumps F	Lump Sum	All	\$750.24	\$750.24
20253	Removal of individual trees, miscellaneous: disposal of tops & limbs F, & logs F	Each	8	\$86.27	\$690.16
20358A	Removal of corrugated metal pipe, disposal method A	Each	11	\$127.84	\$1,406.24
20358B	Removal of corrugated metal pipe by cutting, disposal method A	Each	3	\$49.50	\$148.50
20401	Roadway excavation, compaction method B, finishing method B	Cubic Yard*	201	\$25.64	\$5,153.64
20404	Unclassified borrow, compaction method B, finishing method B	Cubic Yard*	5	\$25.23	\$126.15
20416	Waste, disposal method A	Cubic Yard*	341	\$7.56	\$2,577.96
20419A	Drainage excavation, type culvert outlet ditch	Foot	85	\$2.80	\$238.00
20419B	Drainage excavation, type culvert inlet ditch	Foot	20	\$3.92	\$78.40
25104	Keyed riprap, class 4	Cubic Yard*	8	\$33.33	\$266.64
30304	Roadway reconditioning, ditch	Mile	3.35	\$2,229.59	\$7,469.13
30318	Road reconditioning, roadbed, compaction method B	Mile	0.15	\$3,254.33	\$488.15

* Designated Contract Quantities
 Payment will be made on actual work performed as described in FP-03 109.01 unless otherwise noted.

Dun Thin Timber Sale

SCHEDULE OF ITEMS					
ROAD NUMBER			2223-501		
CONSTRUCTION					
RECONSTRUCTION			X		
PROJECT LENGTH (MILES)			3.50		
ITEM NO.	DESCRIPTION	PAY UNIT	QTY	UNIT COST	TOTAL
32232	Haul and place stockpiled aggregate, compaction method B	Cubic Yard*	319	\$23.52	\$7,502.88
60256	18-inch corrugated steel pipe, 0.064-inch thickness, method B	Foot	12	\$36.99	\$443.88
60278A	18-inch corrugated polyethylene pipe, type S, method B	Foot	262	\$24.15	\$6,327.30
60278B	24-inch corrugated polyethylene pipe, type S, method B	Foot	172	\$32.80	\$5,641.60
60708	Cleaning culverts in place	Each	5	\$150.00	\$750.00
60710	Reconditioning drainage structures, culvert catchbasin	Each	1	\$150.00	\$150.00
62509	Mulching, dry method	Lump Sum	All	\$1,270.70	\$1,270.70
63501	Temporary traffic control	Lump Sum	All	\$1,500.00	\$1,500.00
				Total	\$58,880.80

* Designated Contract Quantities
 Payment will be made on actual work performed as described in FP-03 109.01 unless otherwise noted.

Dunn Thin Timber Sale

ENGINEER'S ESTIMATE					
ROAD NUMBER			2223-501		
CONSTRUCTION					
RECONSTRUCTION			X		
PROJECT LENGTH (MILES)			3.50		
ITEM NO.	DESCRIPTION	PAY UNIT	QTY	UNIT COST	TOTAL
15101	Mobilization	Lump Sum	All	\$7,190.93	\$7,190.93
15201	Construction survey and staking, method I, tolerance B	Lump Sum	All	\$1,500.00	\$1,500.00
15757	Erosion control and pollution prevention	Each	3	\$199.01	\$597.03
20103	Clearing and grubbing, disposal of tops and limbs F, logs F, and stumps F	Mile	3.50	\$3,279.15	\$11,477.03
20105	Clearing and grubbing, disposal of tops and limbs F, logs I, stumps F	Lump Sum	All	\$1,033.38	\$1,033.38
20253	Removal of individual trees, miscellaneous: disposal of tops & limbs F, & logs F	Each	8	\$115.03	\$920.24
20358A	Removal of corrugated metal pipe, disposal method A	Each	11	\$161.01	\$1,771.11
20358B	Removal of corrugated metal pipe by cutting, disposal method A	Each	3	\$66.35	\$199.05
20401	Roadway excavation, compaction method B, finishing method B	Cubic Yard*	201	\$31.27	\$6,285.27
20404	Unclassified borrow, compaction method B, finishing method B	Cubic Yard*	5	\$31.54	\$157.70
20416	Waste, disposal method A	Cubic Yard*	341	\$9.30	\$3,171.30
20419A	Drainage excavation, type culvert outlet ditch	Foot	85	\$3.67	\$311.95
20419B	Drainage excavation, type culvert inlet ditch	Foot	20	\$5.07	\$101.40
25104	Keyed riprap, class 4	Cubic Yard*	8	\$41.67	\$333.36
30304	Roadway reconditioning, ditch	Mile	3.35	\$2,786.99	\$9,336.42
30318	Road reconditioning, roadbed, compaction method B	Mile	0.15	\$4,067.93	\$610.19

* Designated Contract Quantities
 Payment will be made on actual work performed as described in FP-03 109.01 unless otherwise noted.

Dunn Thin Timber Sale

ENGINEER'S ESTIMATE					
ROAD NUMBER			2223-501		
CONSTRUCTION					
RECONSTRUCTION			X		
PROJECT LENGTH (MILES)			3.50		
ITEM NO.	DESCRIPTION	PAY UNIT	QTY	UNIT COST	TOTAL
32232	Haul and place stockpiled aggregate, compaction method B	Cubic Yard*	319	\$29.88	\$9,531.72
60256	18-inch corrugated steel pipe, 0.064-inch thickness, method B	Foot	12	\$42.37	\$508.44
60278A	18-inch corrugated polyethylene pipe, type S, method B	Foot	262	\$27.75	\$7,270.50
60278B	24-inch corrugated polyethylene pipe, type S, method B	Foot	172	\$36.44	\$6,267.68
60708	Cleaning culverts in place	Each	5	\$150.00	\$750.00
60710	Reconditioning drainage structures, culvert catchbasin	Each	1	\$150.00	\$150.00
62509	Mulching, dry method	Lump Sum	All	\$1,588.37	\$1,588.37
63501	Temporary traffic control	Lump Sum	All	\$1,500.00	\$1,500.00
				Total	\$72,563.06

* Designated Contract Quantities
 Payment will be made on actual work performed as described in FP-03 109.01 unless otherwise noted.

**Standard specification and supplemental list for
Dun Thin Timber Sale**

All specifications that are not included in the specification listing, but included by reference, are applicable "X" denotes applicable standard and/or supplemental specification. The supplementals shown on the specification list are physically attaches.			
Standard Specifications			
Standard Specifications	Date	Title	Road 2223-501
101-109	2003		X
151	2003	Mobilization	X
157	2003	Soil Erosion Control	X
201	2003	Clearing and Grubbing	X
203	2003	Removal of Structures and Obstructions	X
204	2003	Excavation and Embankment	X
251	2003	Riprap	X
303	2003	Road Reconditioning	X
602	2003	Culverts and Drains	X
607	2003	Cleaning, Reconditioning, and Repairing Drainage Structures	X
625	2003	Turf Establishment	X
635	2003	Temporary Traffic Control	X
Supplemental Specifications			
Supplemental Specifications	Date	Title	
Preface	03/15/04	Preface	X
101.01	01/22/09	Meaning of Terms	X
101.03	06/16/06	Abbreviations	X
101.04	03/29/07	Definitions	X
101.04	11/06/07	Definitions	X
102.00	02/16/05	Bid, Award, and Execution of Contract	X
103.00	02/16/05	Deletions	X
104.00	06/16/06	Deletions	X
104.03	01/22/09	Specifications and Drawings	X
104.06	02/17/05	Use of Roads by Contractor	X
104.07	02/17/05	Other Contracts	X
105.02(a)	01/18/07	Material Sources	X
105.02	02/17/05	Material Sources	X
105.02©	06/18/08	Designated Sources	X
105.05	05/12/04	Use of Material Found in the Work	X
106.01	07/31/07	Conformity with Contract Requirements	X
106.07	05/11/04	Delete	X
107.05	05/11/04	Responsibility for Damage Claims	X
107.06	06/16/06	Contractor's Responsibility for Work.	X
107.08	03/29/05	Sanitation, Health, and Safety	X
107.09	06/16/06	Legal Relationship of the Parties	X
108.00	02/16/05	Delete	X
109.00	02/17/05	Deletions	X
109.02	06/16/06	Measurement Terms and Definitions	X
152.01	08/05/05	Complete Specification	X
155.00	05/11/04	Delete	X
156.00	04/28/08	Complete Specification	X
157.03	01/29/09	General	X
170.00	03/26/07	Develop Water Supply and Watering	X
201.04	02/22/05	Clearing	X
201.04	02/18/05	Clearing	X
201.06	02/18/05	Disposal	X

**Standard specification and supplemental list for
Dun Thin Timber Sale**

All specifications that are not included in the specification listing, but included by reference, are applicable "X" denotes applicable standard and/or supplemental specification. The supplementals shown on the specification list are physically attaches.

Supplemental Specifications (continued)			
Supplemental Specifications	Date	Title	Road 2223-501
203.01	02/25/05	Description	X
203.04	02/18/05	Removing Material	X
203.05	02/18/05	Disposing of Material	X
203.05	03/26/07	Disposing of Material	X
203.08	02/24/05	Payment	X
204.00	02/11/08	Complete Specification	X
209.07	07/12/07	Dewatering	X
209.10	05/01/07	Backfill	X
251.03	08/05/09	Construction Requirements	X
303.01	03/02/05	Work	X
303.10	03/26/05	Measurement	X
303.10	03/29/05	Measurement	X
322.00	10/14/11	Minor Aggregate Courses	X
602.03	09/06/05	General	X
602.03	03/17/10	General	X
602.06	08/05/09	Laying Plastic Pipe	X
607.04	03/02/05	Cleaning Culvert in Place	X
625.08	01/29/09	Mulching	X
635.03	05/13/04	General	X
704.02	03/02/05	Bedding Material	X

Dun Thin Timber Sale

Willamette National Forest
 Timber Sale: **Dun Thin Timber Sale**

Prepared By: Mike Larman
 Date: **5/30/2012**
 Edited by

Road No.	Road Name	Traffic Service Level	Maint. Level	Design Class	Approx. Mi./km	C/R *	Specified Road Cost	Required Completion Date
2223-501	Margie Dunham	J	2		3.50/5.63	R	\$58,880.80	10/31/2013

* C=Construction
 R=Reconstruction

Summary of Road Construction/Reconstruction Costs

Specified Roads	\$58,880.80
Share Cost Roads	\$0.00
Road Engineering Reconst. Deposit Cost	\$16,284.00
Total Road Costs	<u>\$75,164.80</u>
Contributed Funds	\$0.00
Total Timber Sale Road Costs	<u>\$75,164.80</u>

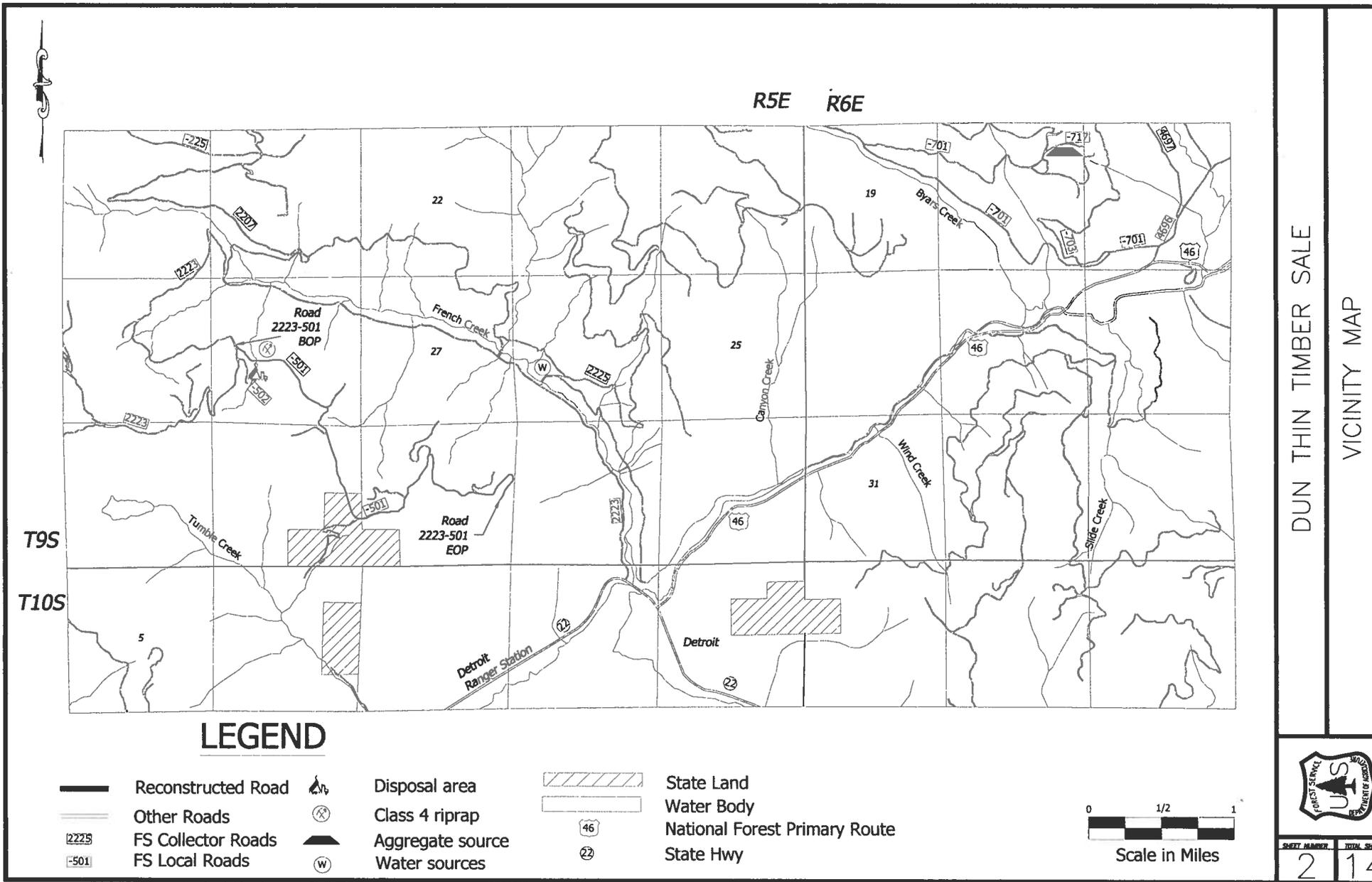
Total Estimated Road Construction Cost

Public Works Cost (opted sales) \$88,847.06

Attachments

Schedule of Items	2 pages
Plans	14 sheets
Specification Lists	2 pages for Specified Roads, 1 page for TS haul route maintenance
FS Supplemental Specs	54 pages
Road Maintenance T-Specs	22 pages

* Applicable to Specified Roads only.



R5E R6E

T9S
T10S

LEGEND

- | | | | | | |
|--|--------------------|--|------------------|--|-------------------------------|
| | Reconstructed Road | | Disposal area | | State Land |
| | Other Roads | | Class 4 riprap | | Water Body |
| | FS Collector Roads | | Aggregate source | | National Forest Primary Route |
| | FS Local Roads | | Water sources | | State Hwy |



DUN THIN TIMBER SALE
VICINITY MAP



SHEET NUMBER	TOTAL SHEETS
2	14

General Notes:

1. Salvage existing aggregate during culvert installation and use as bedding and initial backfill material.
2. Designated disposal site(s) are identified on the vicinity map. The Contracting Officer will flag the disposal areas prior to placement of material. Layer place, smooth uniformly, and shape to drain excess or unsuitable excavation materials. Cost of disposal area shaping is indirect to the applicable pay items (20416, 30304, 30318, and 20401).
3. All culvert installations/replacements with flowing water are considered stream channels. Replace culverts when stream channels are dry or during instream work period. Dewatering will be deleted if there is no water in the stream when work is done. The instream work period is June 1 to August 31.
4. Minor excavation is required to bevel cut existing culverts and to place riprap for armoring culverts inlets and outlets (indirect cost to items 25101, and 20358B).
5. Removal of individual trees shall be completed at designated locations on the ground prior to culvert removal and installation.
6. Do not undercut existing backslopes when cleaning and/or reconstructing roadway ditch.
7. Maintain all construction staking on the project, until final inspection and acceptance.
8. Spread weed free hay or straw over all disturbed ground at culvert installations, waste areas, and other sites as directed by the Contracting Officer, excluding ditches. Cover areas a minimum of 2" uniformly over all disturbed ground.
9. Construction tolerance class D. Road realignment shall be construction tolerance C.
10. Submit a written Erosion Control/Dewatering Plan for approval 21 days prior to beginning culvert replacements. Refer to FSSS 157.02 for additional requirements. Dewatering is included under Pay item 15757.

Abbreviation List:

BOP - Beginning of Project
EOP - End of Project
HDPE - High Density Polyethylene
CMP - Corrugated metal pipe
V: H - Vertical to horizontal slope ratio

DUN THIN TIMBER SALE

GENERAL NOTES



SHEET NUMBER	TOTAL SHEET
3	14

ITEM NUMBER	DESCRIPTION	UNIT	QUANTITIES	REMARKS
15101	Mobilization	Lump Sum	All	Includes fire protection and equipment cleaning.
15201	Construction survey and staking, method I, tolerance B	Lump Sum	All	Staking necessary for road realignment.
15757	Erosion control and pollution prevention	Each	3	Dewatering for culvert installations.
20103	Clearing and grubbing, disposal of tops and limbs F, logs F, and stumps F	Mile	3.50	Includes removal of roots and large boulders within clearing limits.
20105	Clearing and grubbing, disposal of tops and limbs F, logs I, stumps F	Lump Sum	All	Includes tree removal needed for all culvert work. Clearing limits will be flagged by the Contracting Officer when work begins. Also includes removal of trees from MP 3.42 to MP 3.50 as flagged by the Contracting Officer.
20253	Removal of individual trees, miscellaneous: disposal of tops & limbs F, & logs F	Each	8	Fell and leave. Trees will be designated by the Contracting Officer when work begins.
20358A	Removal of corrugated metal pipe, disposal method A	Each	11	Does not include excavation.
20358B	Removal of corrugated metal pipe by cutting, disposal method A	Each	3	
20401	Roadway excavation, compaction method B, finishing method B	Cubic Yard*	201	
20404	Unclassified borrow, compaction method B, finishing method B	Cubic Yard*	5	Government furnished material; located on Road 2223-501 from road realignment section.
20416	Waste, disposal method A	Cubic Yard*	341	Disposal of material at designated disposal site, Road 2223-502, MP 0.15, left side.
20419A	Drainage excavation, type culvert outlet ditch	Foot	85	
20419B	Drainage excavation, type culvert inlet ditch	Foot	20	
25104	Keyed riprap, class 4	Cubic Yard*	8	Government furnished material; located on Road 2223-501 from road realignment section.

* Denotes contract quantity

DUN THIN TIMBER SALE
ESTIMATE OF QUANTITIES



SHEET NUMBER TOTAL SHEETS

4 14

ITEM NUMBER	DESCRIPTION	UNIT	QUANTITIES	REMARKS
30304	Roadway reconditioning, ditch	Mile	3.35	Disposal of material at designated disposal site, Road 2223-502, MP 0.15, left side.
30318	Road reconditioning, roadbed, compaction method B	Mile	0.15	Disposal of material at designated disposal site, Road 2223-502, MP 0.15, left side.
32232	Haul and place stockpiled aggregate, compaction method B	Cubic Yard*	319	Government furnished material; located on Road 4696-717, MP 0.28. Must pay royalty charge before placing aggregate.
60256	18-inch corrugated steel pipe, 0.064-inch thickness, method B	Foot	12	Includes band and hardware.
60278A	18-inch corrugated polyethylene pipe, type S, method B	Foot	262	Provide soil-tight bell and spigot joints.
60278B	24-inch corrugated polyethylene pipe, type S, method B	Foot	172	Provide soil-tight bell and spigot joints.
60708	Cleaning culverts in place	Each	5	
60710	Reconditioning drainage structures, culvert catchbasin	Each	1	
62509	Mulching, dry method	Lump Sum	All	Includes work on all disturbed areas.
63501	Temporary traffic control	Lump Sum	All	
* Denotes contract quantity				

DUN THIN TIMBER SALE

ESTIMATE OF QUANTITIES



SHEET NUMBER TOTAL SHEETS

5 14

MILE POST	ITEM NUMBER	QUANTITY	UNIT	DESCRIPTION OF WORK
0.00				Junction with Road 2223 at MP 8.40.
	20103	3.50	Mile	Begin clearing and grubbing.
	30304	0.69	Mile	Begin reconditioning roadway ditch.
				Beginning of project.
0.16	20358A	1	Each	Remove existing 18-inch CMP.
	60278A	38	Foot	Install 18-inch HDPE at same skew and grade.
	20419A	20	Foot	Construct culvert outlet ditch.
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
0.43				Existing 18-inch CMP.
	60708	1	Each	Clean existing culvert.
0.57				Existing 18-inch CMP.
	60708	1	Each	Clean existing culvert.
	25104	1	Cubic Yard*	Construct splash apron (5' L x 3' W x 2' D).
0.62				Existing 18-inch CMP.
	20358B	1	Each	Remove 4 ft of CMP from inlet end.
	60256	4	Foot	Install 18-inch CMP to inlet end.
0.69				End reconditioning roadway ditch.
	20401	201	Cubic Yard*	Begin roadway realignment. MP 0.69 = Station 0+00. See sheet 8 and 9 for details.
	30318	0.04	Mile	Begin reconditioning roadbed with a 2% inslope.
	32232	90	Cubic Yard*	Begin placement of 6-inch depth of crushed aggregate for re-alignment section of roadway. See road re-alignment for details.
0.70	20358A	1	Each	Remove existing 24-inch CMP.
	60278B	38	Foot	Install 24-inch HDPE at same skew and grade.
				Move inlet into hillside. See sheet 8 and 9 for details.
				Reconstruction of culvert catchbasin is incidental to road realignment.
0.75				End of reconditioning roadbed with a 2% inslope.
				End roadway realignment.
				End placement of 6-inch depth of crushed aggregate for re-alignment section of roadway.
	20418	151	Cubic Yard*	Haul excess material from road realignment to designated disposal area.
	30304	0.65	Mile	Begin reconditioning roadway ditch.
0.78	20416	60	Cubic Yard*	Remove ravel material from cutbank as directed by the CO.
				Place spot rock to level dip in road as directed by the CO. Blend to adjacent surfaces and widths to provide for smooth transition.
0.79	32232	5	Cubic Yard*	

MILE POST	ITEM NUMBER	QUANTITY	UNIT	DESCRIPTION OF WORK
0.81	20358A	1	Each	Remove existing 24-inch CMP.
	15757	1	Each	Install dewatering system.
	60278B	50	Foot	Install 24-inch HDPE at same skew and grade.
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
0.91				Existing 18-inch CMP.
	20358B	1	Each	Remove 4 ft of CMP from inlet end.
	60256	4	Foot	Install 18-inch CMP to inlet end.
0.95	20416	50	Cubic Yard*	Remove ravel material from cutbank as directed by the CO.
				Place spot rock to level slump in road as directed by the CO. Blend to adjacent surfaces and widths to provide for smooth transition.
0.96	32232	10	Cubic Yard*	
1.03	20416	50	Cubic Yard*	Remove ravel material from cutbank as directed by the CO.
1.16	20358A	1	Each	Remove existing 24-inch CMP.
	15757	1	Each	Install dewatering system.
	60278B	40	Foot	Install 24-inch HDPE at same skew and grade.
	20419A	15	Foot	Construct culvert outlet ditch.
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
1.24	20358A	1	Each	Remove existing 18-inch CMP.
	60278A	28	Foot	Install 18-inch HDPE at same skew and grade.
	20419A	15	Foot	Construct culvert outlet ditch.
	20419B	20	Foot	Construct culvert inlet ditch as staked.
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
1.27	20358A	1	Each	Remove existing 18-inch CMP.
	15757	1	Each	Install dewatering system.
	60278B	44	Foot	Install 24-inch HDPE at same skew and grade.
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
1.32	20358A	1	Each	Remove existing 18-inch CMP.
	60278A	32	Foot	Install 18-inch HDPE at same skew and grade.
	25104	1	Cubic Yard*	Construct splash apron (5' L x 3' W x 2' D).
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.

DUN THIN TIMBER SALE

RECONSTRUCTION SUMMARY



SHEET NUMBER TOTAL SHEETS

6 14

MILE POST	ITEM NUMBER	QUANTITY	UNIT	DESCRIPTION OF WORK
1.38				End reconditioning roadway ditch.
	30318	0.03	Mile	Begin reconditioning roadbed with a 2% inslope.
1.40	20416	30	Cubic Yard*	Remove rock material from cutslope as directed by the CO in order to get 12 ft travel width.
1.41	30304	2.01	Mile	Begin reconditioning roadway ditch. End reconditioning roadbed with a 2% inslope.
1.43	60278A	40	Foot	Install 18-inch HDPE at 70 skew and 10% grade as staked.
	25104	1	Cubic Yard*	Construct splash apron (5' L x 3' W x 2' D).
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
1.50				Existing 24-inch CMP.
	20404	5	Cubic Yard*	Place unclassified borrow on left shoulder to add road width.
1.59	32232	5	Cubic Yard*	Place spot rock to level dip in road as directed by the CO. Blend to adjacent surfaces and widths to provide for smooth transition.
1.61				Existing 18-inch CMP.
	60708	1	Each	Clean existing culvert.
	20419A	15	Foot	Construct culvert outlet ditch.
1.75				Junction with unnamed spur road right.
1.86	20358A	1	Each	Remove existing 18-inch CMP.
	60278A	26	Foot	Install 18-inch HDPE at same skew and grade.
	25104	1	Cubic Yard*	Construct splash apron (5' L x 3' W x 2' D).
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
1.97	20358A	1	Each	Remove existing 18-inch CMP.
	60278A	34	Foot	Install 18-inch HDPE at same skew and grade.
	25104	1	Cubic Yard*	Construct splash apron (5' L x 3' W x 2' D).
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
2.19				Junction with unnamed spur road right.
2.38				Existing 18-inch CMP.
	60708	1	Each	Clean existing culvert.
	20419A	10	Foot	Construct culvert outlet ditch.
2.49				Existing 18-inch CMP.
	60708	1	Each	Clean existing culvert.

MILE POST	ITEM NUMBER	QUANTITY	UNIT	DESCRIPTION OF WORK
2.60				Existing 18-inch CMP.
	20358B	1	Each	Remove 4 ft of CMP at inlet end.
	60256	4	Foot	Install 18-inch CMP at inlet end.
	25104	1	Cubic Yard*	Construct splash apron (5' L x 3' W x 2' D).
2.66	32232	5	Cubic Yard*	Place spot rock to level dip in road as directed by the CO. Blend to adjacent surfaces and widths to provide for smooth transition.
2.69	20358A	1	Each	Remove existing 18-inch CMP.
	60278A	32	Foot	Install 18-inch HDPE at same skew and grade.
	20419A	10	Foot	Construct culvert outlet ditch.
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
2.86				Existing 18-inch CMP.
	25104	1	Cubic Yard*	Construct splash apron (5' L x 3' W x 2' D).
2.96	20358A	1	Each	Remove existing 18-inch CMP.
	60278A	32	Foot	Install 18-inch HDPE at same skew and grade.
	25104	1	Cubic Yard*	Construct splash apron (5' L x 3' W x 2' D).
	32232	10	Cubic Yard*	Place 6-inch depth of crushed aggregate over culvert installation. Blend to adjacent surfaces and widths to provide for smooth transition. See sheet 14 of 14.
3.33				Existing 18-inch CMP.
	60710	1	Each	Reconstruct culvert catchbasin.
3.42				End reconditioning roadway ditch.
	30318	0.08	Mile	Begin reconditioning roadbed with a 2% crown.
	32232	94	Cubic Yard*	Begin placement of 6-inch depth of crushed aggregate. Blend to adjacent surfaces and widths to provide for smooth transition.
3.50				End clearing and grubbing.
				End reconditioning roadbed with a 2% crown.
				End placement of 6-inch depth of crushed aggregate. Blend to adjacent surfaces and widths to provide for smooth transition.
				End of project.
Danger Tree Removal List:				
All pay item 20253				
0.91	Remove 1 danger tree, left side.			
1.23	Remove 1 danger tree, left side.			
1.24	Remove 2 danger trees, left side.			
1.25	Remove 1 danger tree, left side.			
1.44	Remove 1 danger tree, left side.			
1.61	Remove 1 danger tree, right side.			
2.37	Remove 1 danger tree, right side.			

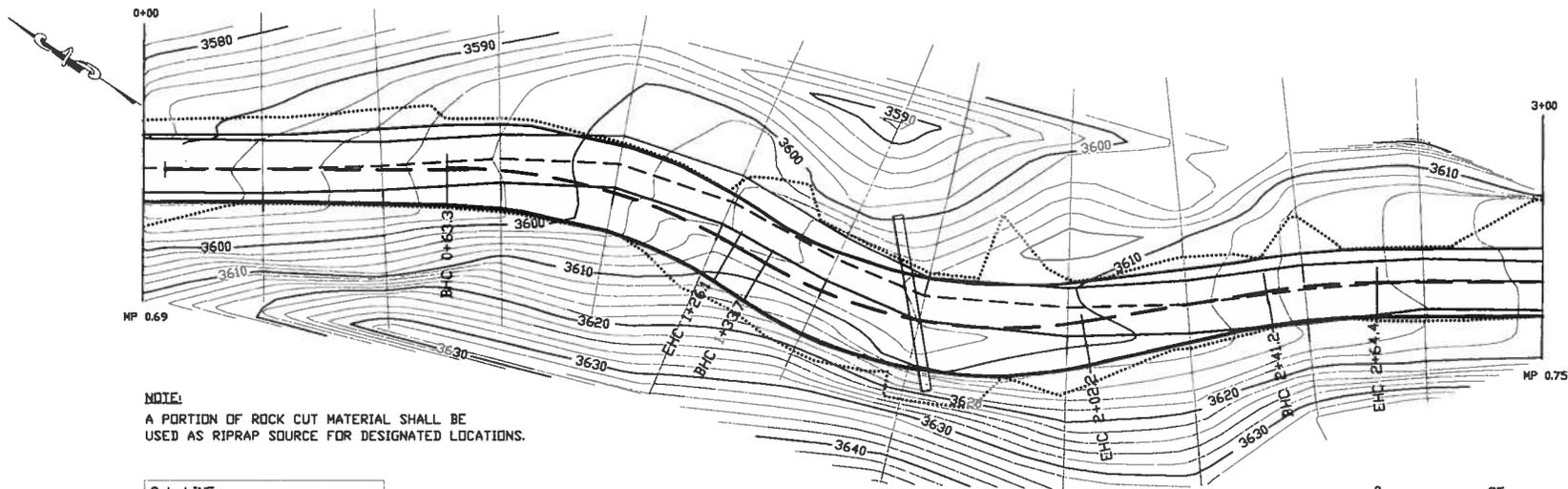
DUN THIN TIMBER SALE

RECONSTRUCTION SUMMARY



SHEET NUMBER TOTAL SHEET

7 14

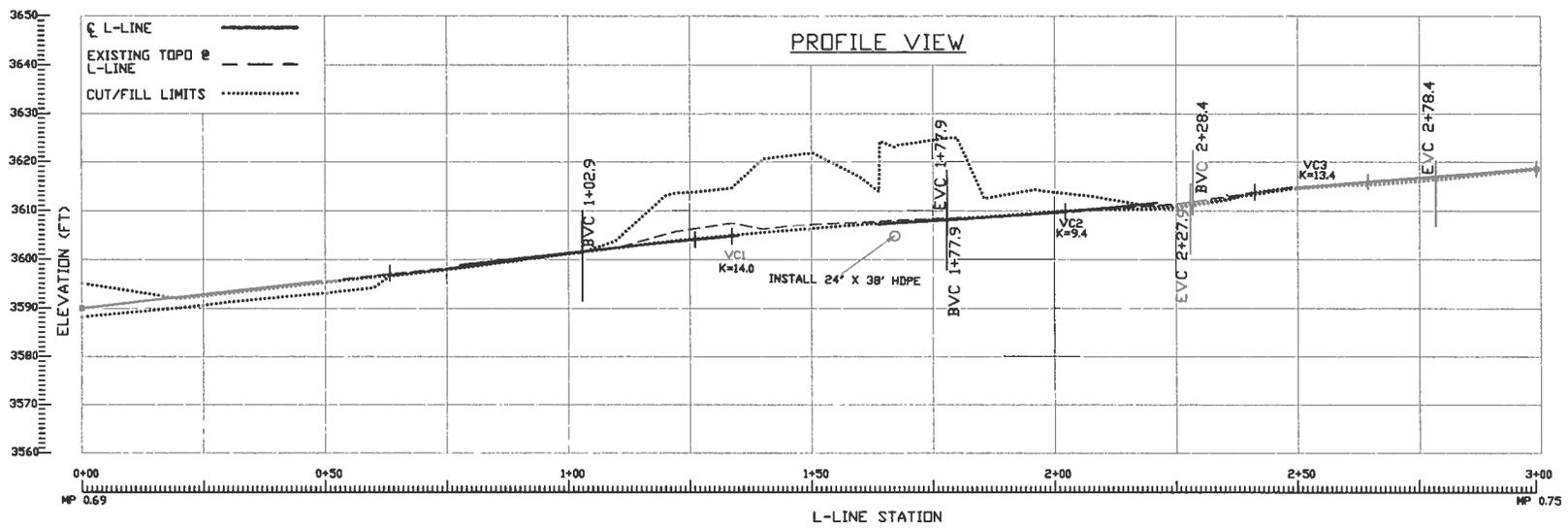


NOTE:
 A PORTION OF ROCK CUT MATERIAL SHALL BE
 USED AS RIPRAP SOURCE FOR DESIGNATED LOCATIONS.

L-LINE ———
 P-LINE - - - -
 CUT/FILL LIMITS ······

2' CONTOUR INTERVAL

PLAN VIEW



L-LINE ———
 EXISTING TOPD @
 L-LINE - - - -
 CUT/FILL LIMITS ······

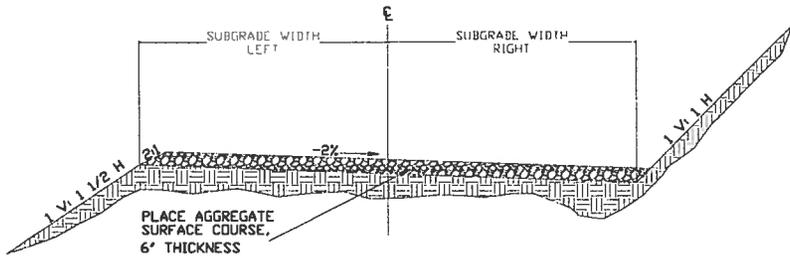
PROFILE VIEW

L-LINE STATION

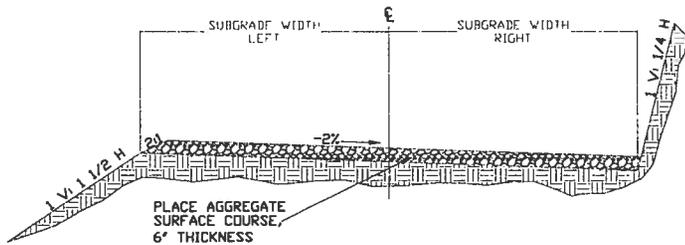
DUN THIN TIMBER SALE
 MP 0.69 PLAN/PROFILE



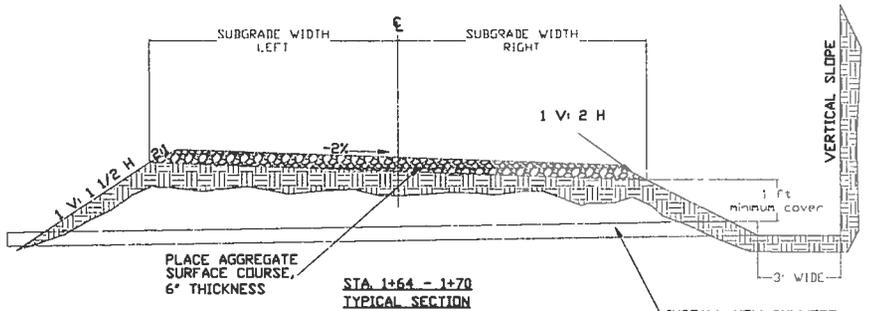
SHEET NUMBER TOTAL SHEET
 8 14



STA 0+00 - 1+10, 1+96 - 2+99
TYPICAL SECTION



STA 1+40 - 1+64
TYPICAL SECTION



STA 1+64 - 1+70
TYPICAL SECTION

INSTALL NEW CULVERT.
SEE RECONSTRUCTION SUMMARY
FOR DETAILS

ROAD RECONSTRUCTION TABLE						
P-LINE STATION	I-LINE STATION	CL OFFSET P TO L	CL SUBGRADE ELEVATION	SUBGRADE WIDTH LEFT (FT)	SUBGRADE WIDTH RIGHT (FT)	REMARKS
0+00.0	0+00.0	0.0	3590.0	7.0	7.0	BEGIN AGGREGATE SURFACE COURSE
0+25.0	0+24.8	0.2 LT	3592.8	7.0	7.0	
0+50.0	0+49.7	0.4 RT	3595.6	8.1	7.4	
0+63.7	0+63.3	1.2 RT	3597.1	9.0	7.7	BEGIN HORIZONTAL CURVE (R=120.0')
0+75.0	0+74.5	2.4 RT	3598.4	9.6	7.9	
1+00.0	0+98.7	6.1 RT	3601.1	10.0	8.0	
1+04.4	1+02.9	6.0 RT	3601.6	10.0	8.0	BEGIN VERTICAL CURVE (K=14.0')
1+25.0	1+22.1	7.7 RT	3603.6	9.2	8.4	
1+29.1	1+26.1	7.7 RT	3604.0	9.0	8.6	END HORIZONTAL CURVE (R=120.0')
1+36.8	1+33.7	7.9 RT	3604.7	8.5	9.0	BEGIN HORIZONTAL CURVE (R=100.0')
1+50.0	1+46.7	7.4 RT	3605.9	8.8	9.8	
1+70.0	1+68.0	5.2 RT	3607.4	9.0	10.0	
1+79.5	1+77.9	5.6 RT	3608.0	9.0	10.0	END VERTICAL CURVE (K=14.0'); BEGIN VERTICAL CURVE (K=9.4')
2+00.0	1+99.1	3.4 RT	3609.5	8.4	9.2	
2+03.1	2+02.2	3.0 RT	3609.8	8.3	9.0	END HORIZONTAL CURVE (R=100.0')
2+25.0	2+24.4	0.0	3612.0	7.4	7.7	
2+28.5	2+27.9	0.1 LT	3612.3	7.3	7.5	END VERTICAL CURVE (K=9.4')
2+29.0	2+28.4	0.1 LT	3612.4	7.2	7.5	BEGIN VERTICAL CURVE (K=13.4')
2+41.9	2+41.2	0.5 LT	3613.8	7.0	7.0	BEGIN HORIZONTAL CURVE (R=150.0')
2+50.0	2+49.2	0.6 LT	3614.6	7.0	7.0	
2+65.2	2+64.4	0.3 LT	3616.0	7.0	7.0	END HORIZONTAL CURVE (R=150.0')
2+75.0	2+74.2	0.4 RT	3616.7	7.0	7.0	
2+79.2	2+78.4	0.3 RT	3617.1	7.0	7.0	END VERTICAL CURVE (K=13.4')
3+00.0	2+99.1	0.0	3618.6	7.0	7.0	END AGGREGATE SURFACE COURSE

ROAD 2223-501 STA 0+00 - 2+99
RECONSTRUCTION TABLE

NOTE:
TAPER CUT SLOPE RATIOS BETWEEN STATIONS AS DIRECTED BY THE CONTRACTING OFFICER.
APPLY SLOPE ROUNDING ON ALL TOP OF CUTS AS DIRECTED BY THE CONTRACTING OFFICER.

DUN THIN TIMBER SALE

MP 0.69 ROAD TEMPLATE DETAILS



SHEET NUMBER TOTAL SHEET

9 14

ROAD NUMBER	STATION OR MILE POST	DESIGNED									AS-BUILT		INSTALLATION DETAILS			RIPRAP		DEWATER	OUTLET DITCH (FT)	REMARKS		
		HDPE		HDPE OUTLET PIPE		CMP			CMP OUTLET PIPE		PIPE		OUTLET PIPE	TYPE	SKEW (%)	GRADE (°)	MACHINE PLACED					
		DIAMETER (INCH)	LENGTH (FT)	FULL CIRCLE	HALF ROUND	DIAMETER (INCH)	LENGTH (FT)	THICKNESS (INCHES)	FULL CIRCLE	HALF ROUND	DIAMETER	LENGTH	INLET (CY)				OUTLET (CY)					
2223-501	0.16	18	38											#	#	#				20		
	0.43																					Clean existing culvert.
	0.57																	1				Clean existing culvert.
	0.62					18	4	0.064														Remove 4 ft of CMP from inlet end. Attach new CMP to inlet end of culvert.
	0.70	24	38											#	#	#						Move inlet into hill side. Reconstruct culvert catchbasin. See sheet 8 and 9 for details.
	0.81	24	50											#	#	#			X			
	0.91					18	4	0.064														Remove 4 ft of CMP from inlet end. Attach new CMP to inlet end of culvert.
	1.16	24	40											#	#	#			X	15		
	1.24	18	28											#	#	#					15	Construct 20 ft inlet ditch as staked.
	1.27	24	44											#	#	#			X			
	1.32	18	32											#	#	#				1		
	1.43	18	40											3	70	10				1		Install new culvert as staked.
	1.61																				15	Clean existing culvert.
	1.86	18	26											#	#	#				1		
	1.97	18	34											#	#	#				1		
	2.38																				10	Clean existing culvert.
	2.49																					Clean existing culvert.
	2.60					18	4	0.064													1	Remove 4 ft of CMP from inlet end. Attach new CMP to inlet end of culvert.
	2.69	18	32											#	#	#					10	
	2.86																				1	
	2.96	18	32											#	#	#					1	
	3.33																					Reconstruct culvert catchbasin.

Skew, grade and type shall match removed installation unless otherwise noted.
Some installations of culverts may require additional excavation below grade line.

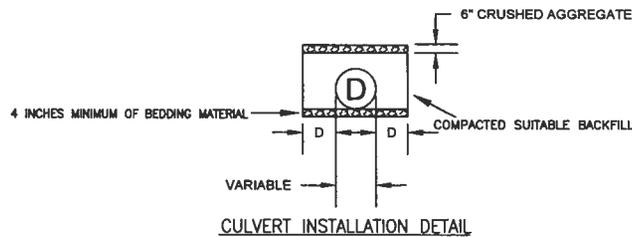
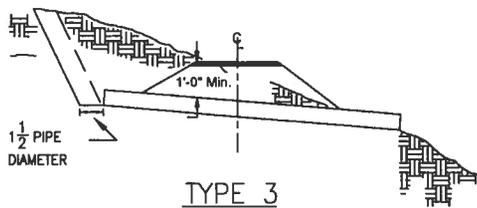
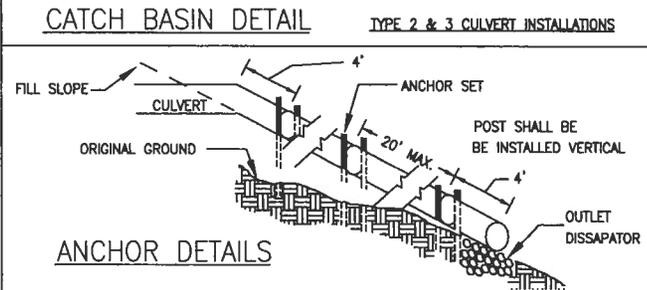
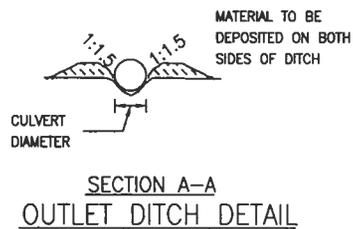
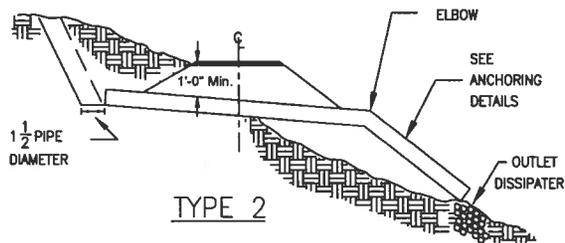
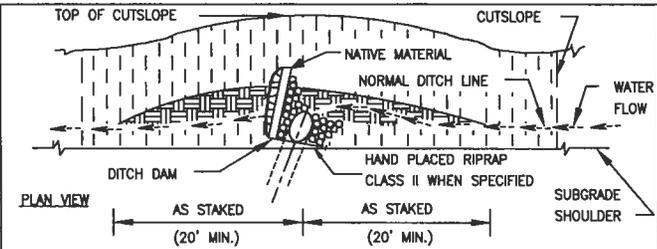
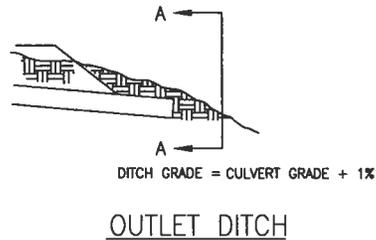
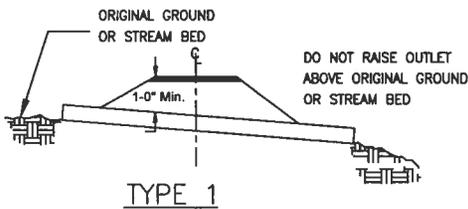
DUN THIN TIMBER SALE

DRAINAGE LISTING

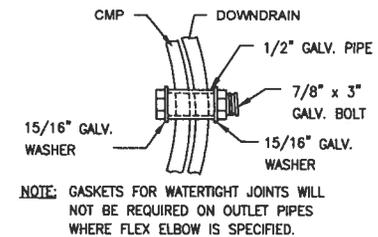
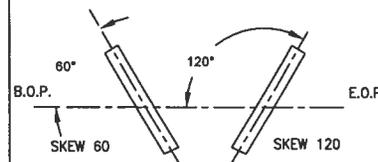
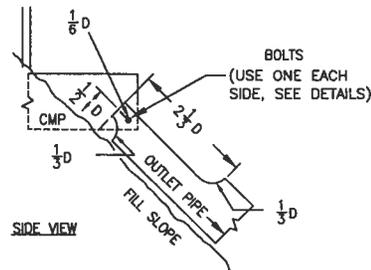
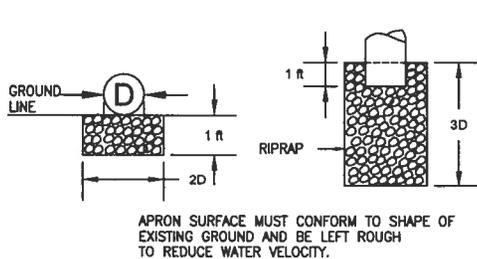


SHEET NUMBER TOTAL SHEET

10 14



NOTE:
ANCHOR SETS SHALL CONSIST OF TWO 6" STEEL FENCE POSTS (AASHTO M 281) AND 3/8" GALVANIZED WIRE ROPE. PROVIDE 2 TIGHT WRAPS AROUND THE PIPE AND BOTH ANCHOR POSTS. USE 2 CABLE CLAMPS AT EACH POST TO SECURE THE ENDS.



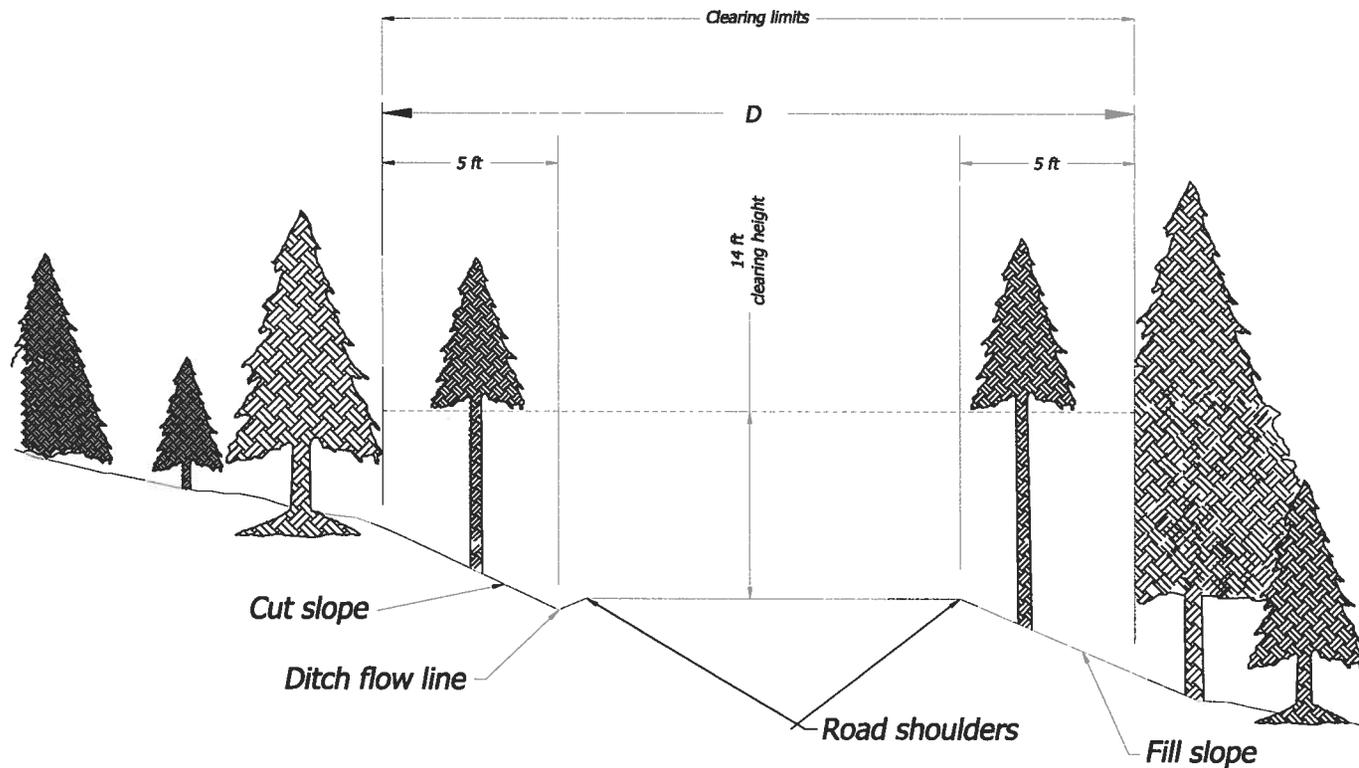
DUN THIN TIMBER SALE

DRAINAGE INSTALLATION DETAILS



SHEET NUMBER TOTAL SHEET

1114



NOTES:

1. All trees with a diameter of 8 inches or greater (measured from the ground up to a height of 4.5 feet on the downhill side) are to remain standing. Dispose of all other vegetation within the clearing limits.
- 2.
3. Cut all vegetation between the road shoulders or the bottom of the ditch to a maximum height of 6 inches above the ground surfaces.
4. Grub stumps within "D" above and scatter outside the clearing limits.
5. Drawings not to scale.

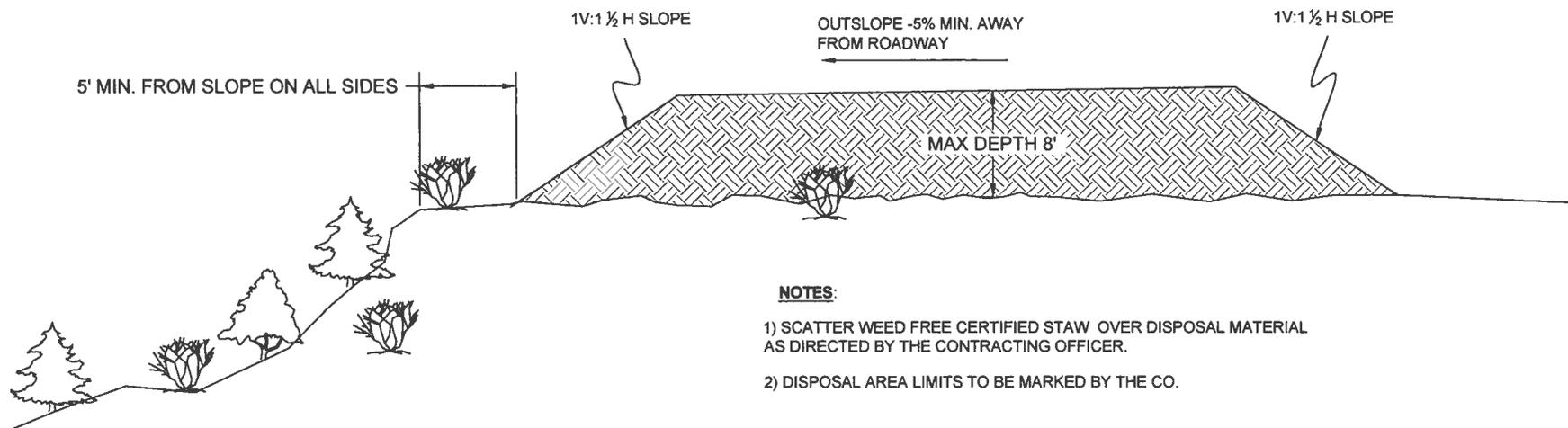
DUN THIN TIMBER SALE

CLEARING AND GRUBBING TYPICAL



SHEET NUMBER	TOTAL SHEET
12	14

DISPOSAL SITE TYPICAL



NOTES:

- 1) SCATTER WEED FREE CERTIFIED STAW OVER DISPOSAL MATERIAL AS DIRECTED BY THE CONTRACTING OFFICER.
- 2) DISPOSAL AREA LIMITS TO BE MARKED BY THE CO.

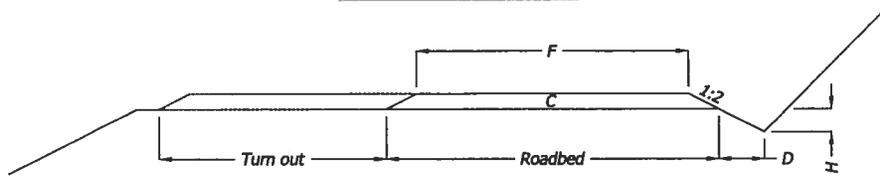
DUN THIN TIMBER SALE

DISPOSAL SITE TYPICAL

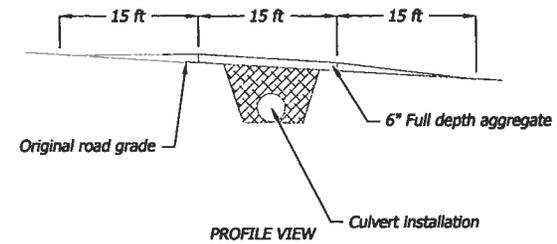


SHEET NUMBER	TOTAL SHEET
13	14

TYPICAL SECTION



CULVERT SURFACE ROCK REPLACEMENT FOR AGGREGATE ROADS ONLY



Note: Top width dimension is 12 ft unless noted otherwise

ROAD NUMBER	BEGINNING MILE POST	ENDING MILE POST	CONSTRUCTION TOLERANCE	OUTSLOPED INSLOPED CROWNED	ROADBED WIDTH (FT)	DITCH DIMENSIONS (FT)		PAVEMENT STRUCTURE		
						D	H	TRAVELED WAY WIDTH (FT)	COMPACTED DEPTH (IN)	SLOPE RATIO
										AGG
%	F	C								
2223-501	0.00	0.69	-	2 C	12*	2	1			
2223-501	0.69	0.73	-	2 I	12*	2	1			
2223-501	0.73	1.38	-	2 C	12*	2	1			
2223-501	1.38	1.41	-	2 I	12*	2	1			
2223-501	1.41	3.50	-	2 C	12*	2	1			

* Widths are minimum. Reconstruct roadbed to match existing widths.

Drawings not to scale.

DUN THIN TIMBER SALE

ROAD RECONSTRUCTION TYPICALS



SHEET NUMBER TOTAL SHEET
14 14

Willamette National Forest
Detroit Ranger District
Marion County

FP-03 - SUPPLEMENTAL SPECIFICATIONS

for

DUN THIN TIMBER SALE

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.

101.01_nat_us_01_22_2009

101.01 Meaning of Terms

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

101.03_nat_us_06_16_2006

101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	<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.

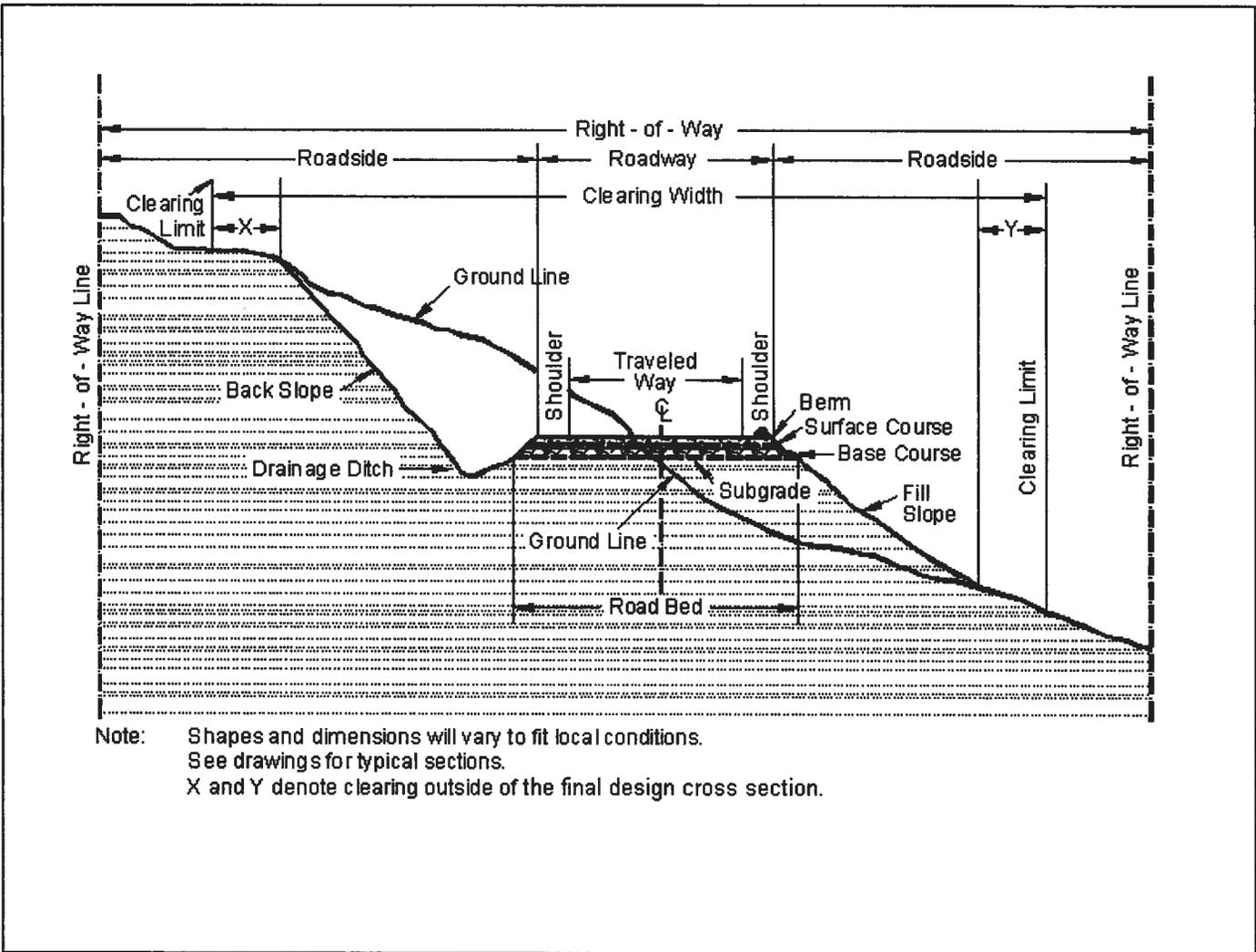
Road Order--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

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_2009

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.

The Forest Service is intending to award additional contracts for the reconstruction of Road 2223, French Creek Road. Schedule activities to assure no delays or interference to the operations of the Forest Service Contract administration.

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_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 riprap, borrow, and pit run and in the production of aggregates under Sections 322, 251, 204 from Road 2223-501 road realignment and Road 4696-717, Deadhorse Pit.

(2) Government-provided optional sources.

None

105.02_0618_us_06_18_2008

105.02(c) Designated Sources.

There is no material source development or needed production under Section(s) (322) on Road or Source 4696-717. The cost for crushed aggregate (322) was calculated from stockpile(s) located at Dead horse Pit on road 4696-717. 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 (\$10.00) per loose cubic yard, and an administrative charge of \$(N/A). 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 to the methods in effect on the date of solicitation for bids.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

106.07_nat_us_05_11_2004

106.07 Delete

Delete subsection 106.07.

107 - Legal Relations and Responsibility to the Public

107.05_nat_us_05_11_2004

107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06_nat_us_06_16_2006

107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.

“except as provided in Subsection 106.07”.

107.08_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.

152 - Construction Survey and Staking

152.00_nat_us_08_05_2005

Description

152.01(c) Material.

Add the following:

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

Do not use aerosol spray paints.

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

Construction Requirements

152.02 General.

Delete the first two sentences.

Add the following:

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

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

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

152.03 Survey and Staking Requirements.

(b) Roadway cross-sections.

Replace the first two sentences with the following:

Take roadway cross-sections normal to centerline. When the centerline curve radius is less than or equal to 200 feet, take cross-sections at a maximum centerline spacing of 25 feet. When the centerline curve radius is greater than 200 feet take cross-sections at a maximum centerline spacing of 80 feet.

c) Slope Stakes & References:Replace section with the following:

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

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

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

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

Use the designated method to establish the slope stake catchpoint.

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

(d) Clearing and grubbing limits.Add the following:

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

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

(e) Centerline reestablishment.Replace with the following:

Reestablish centerline from instrument control points. The maximum spacing between centerline points is 25 feet when the centerline curve radius is less than or equal to 200 feet. When the centerline curve radius is greater than 200 feet, the maximum distance between centerline points is 80 feet.

(g) Culverts.Replace subsection with the following:

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

- (1) Diameter, actual field measured length, and type of culvert.
- (2) The vertical and horizontal distance from the reference stake to the invert at the ends of the culvert.
- (3) Station of actual point where culvert intersects centerline.

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

152.03 (l) Miscellaneous Survey and Staking.Add the following:

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

Replace Table 152-1 with the following two tables:

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

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

a. Accuracy of offset measurement.

b. Determine vertical closures at intervals not to exceed 2000 ft as measured along centerline.

c. Use greater value.

Table 152-2 Cross section and slope stake tolerances.

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

155 - Schedules for Construction Contracts

155.00_nat_us_05_11_2004

155 Delete.

Delete Section 155 in its entirety.

156 - Public Traffic

156.00_0618_us_04_28_2008

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 **N/A** minutes at any one time followed by an open period of no less than **N/A** 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
2223501	0.00	3.50	NA	NA

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

Traffic control devices and services will be evaluated under Section 635.

Measurement and Payment

156.07 See Subsection 109.05.

157 - Soil Erosion Control

157.03_nat_us_01_29_2009

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. 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 of 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 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, Section 107.10 Laws to be Observed and Section 107.10 Environmental Protection, and 107.10, 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 72 hours in advance (not including weekends and holidays). 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.

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

170.02 Conform to the following subsection.

Water	725.01.
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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.

170.05 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

201.04_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.

201.04_nat_us_02_18_2005

201.04 Clearing.

Add the following:

When marked in advance, remove dead trees over 6 inches in diameter measured at 12 inches above the ground that lean toward the road and are tall enough to reach the roadbed.

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.

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.

203.04_nat_us_02_18_2005

203.04 Removing Material.

Replace the fourth and fifth paragraphs with the following:

Where part of an existing culvert is removed, remove the entire culvert upstream from the removal. The remaining downstream culvert may be left in place if no portion of the culvert is within 12 inches of the subgrade, embankment slope, or new culvert or structure; and the culvert ends are sealed with concrete.

Remove structures and obstructions in the roadbed to 12 inches below subgrade elevation. Remove structures and obstructions outside the roadbed to 12 inches below finished ground or to the natural stream bottom.

203.05_0618_us_03_26_2007

203.05 Disposing of Material.

(a) Remove from Project

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 logs 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.

203.08_nat_us_02_24_2005

203.08 Payment

Add the following:

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

204 - Excavation and Embankment

204.00_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 a uniform cross-section. Eliminate all ruts and low spots that could hold water.

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

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

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

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

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

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

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

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

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

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

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

(a) Compaction A. Use AASHTO T 27 to determine the amount of material retained on a Number 4 sieve. If there is more than 80 percent retained on the No. 4 sieve use procedure (1). If there is 50 to 80 percent retained on the No. 4 sieve use procedure (2). If there is less than 50 percent retained on the No. 4 sieve use procedure (3).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(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 overlying solid rock to the extent practical. Scale all rock slopes. Slope rounding is not required on tolerance class D through 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	“	“	“
		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	Yes, when requested	Before using in work
		Gradation	—	AASHTO T 27	“	“	“	“
		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	“	“	“
		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_0618_us_05_01_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:

On each side of the pipe, excavate an area at least as wide AS SHOWN ON THE PLANS. 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.

251 - Riprap

251.03_nat_us_08_05_2009

Construction Requirements

251.03 General.

Add the following:

Place riprap under or adjacent to structures before placing prefabricated superstructure units or constructing superstructure falsework unless otherwise approved by the CO.

251.08 Measurement.

Add the following:

Payment for excavation and embankment required for placement of riprap is indirectly included in the pay item for riprap.

303 - Road Reconditioning

303.01_nat_us_03_02_2005

303.01 Work.

Delete and add the following:

This work consists of reconditioning ditches, shoulders, roadbeds, cattleguards, asphalt surfaces, and aggregate surfaces.

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.

303.11_nat_us_03_29_2005

303.10 Measurement

Modify the second paragraph as follows:

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

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 per-cent of the maximum density, as determined by AASHTO T 180, method C or D.

Compaction G. Removed.

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

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		

**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

602 - Culverts and Drains

602.03_nat_us_09_06_2005

602.03 General.

Add the following:

Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 1.0 feet, whichever is less.

602.03_06_us_03_17_2010

602.03 General

Add the following:

Clean and paint damaged coating caused by welding, field cutting, or handling in accordance with AASHTO M 36M and ASTM A 849.

602.06_nat_us_08_05_2009

602.06 Laying Plastic Pipe.

Delete the second paragraph and substitute the following:

Provide soil-tight bell and spigot joints for plastic pipe culverts.

607 - Cleaning, Reconditioning, and Repairing Existing Drainage

607.04_nat_us_03_02_2005

607.04 Cleaning Culverts in Place.

Add the following:

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

625 - Turf Establishment

625.08_0618_us_01_29_2009

625.08 Mulching. (a) Dry method.

Delete the paragraph and replace with the following:

Apply certified weed free straw mulch as shown on the plans.

635 - Temporary Traffic Control

635.03_nat_us_05_13_2004

635.03 General.

Add the following:

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

704 - Soil

704.02_nat_us_03_02_2005

704.02 Bedding Material.

Delete Subsection 704.02 and substitute the following:

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

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