UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE -- REGION SIX

MT. BAKER - SNOQUALMIE NATIONAL FOREST

MT.BAKER RANGER DISTRICT

SPECIFIED ROAD WORK DRAWINGS FOR PROPOSED

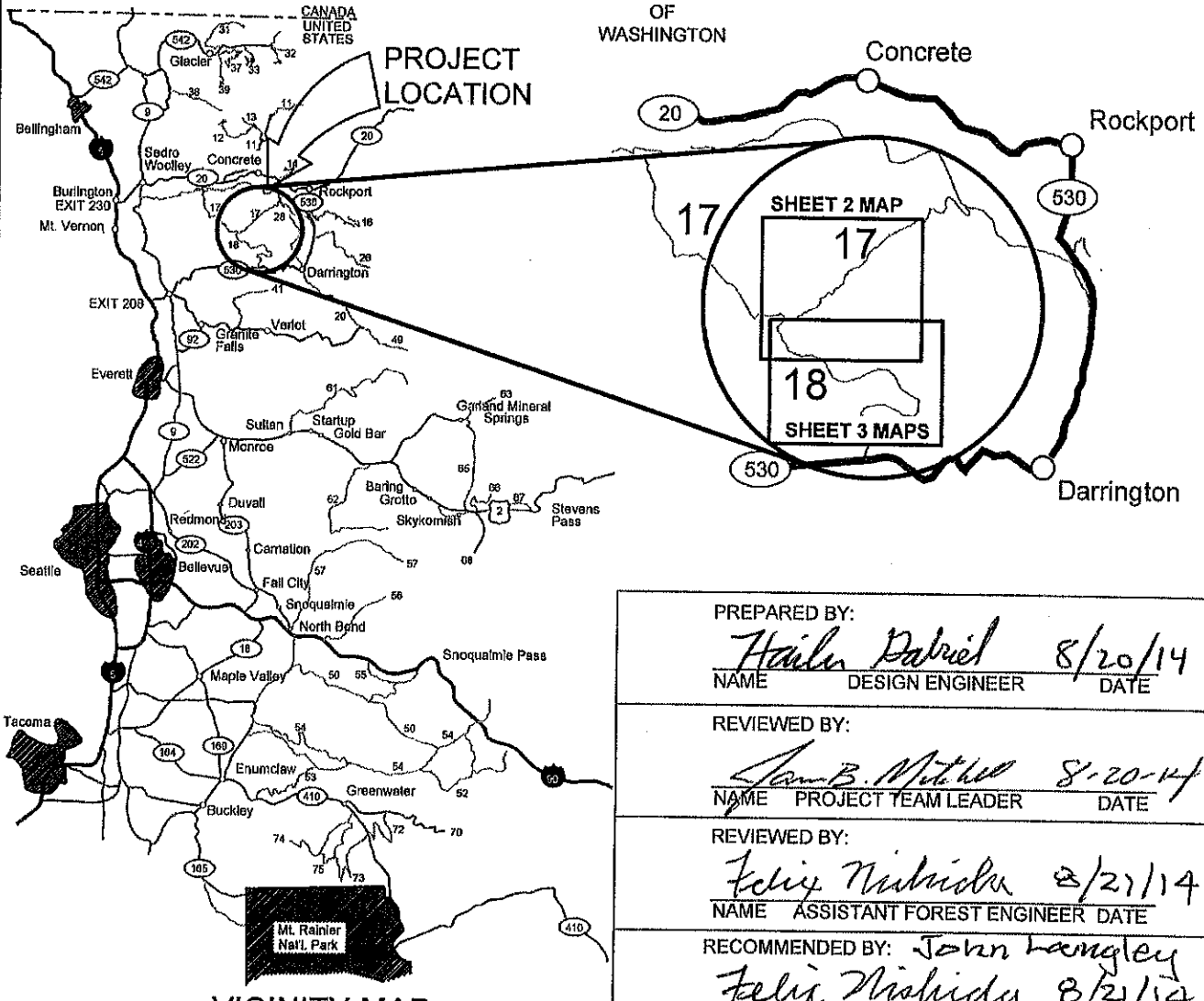
UPPER FINNEY THIN

ROAD NO.	MP to MP	MILES
1700	11.42 to 14.00	2.58
1735	0.00 to 2.00	2.00
1740	0.00 to 0.80	0.80
1740111	0.00 to 0.19	0.19
1800	0.00 to 21.1	21.10
	TOTAL	26.67

INDEX TO SHEETS

N

STATE OF WASHINGTON



PREPARED BY: Hailey Gabriel 8/20/14
NAME DESIGN ENGINEER DATE

REVIEWED BY: John B. Mitchell 8-20-14
NAME PROJECT TEAM LEADER DATE

REVIEWED BY: Felix Nishida 8/21/14
NAME ASSISTANT FOREST ENGINEER DATE

RECOMMENDED BY: John Langley
Felix Nishida 8/21/14
NAME for FOREST ENGINEER DATE

APPROVED BY: Acting for Erin Uloth
[signature] 08/22/14
NAME DISTRICT RANGER DATE

SHEET	OF
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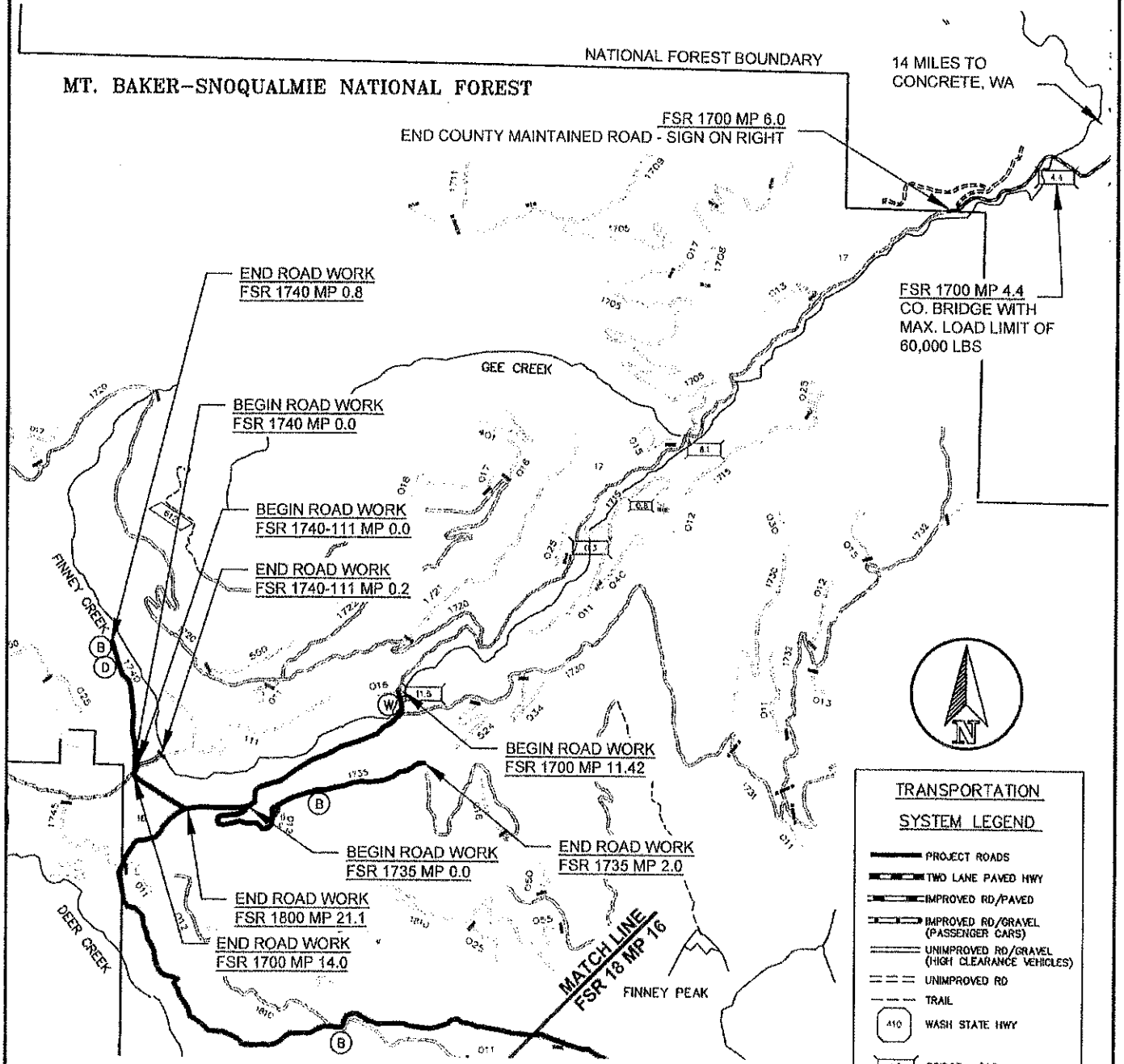
UPPER FINNEY THIN
LOCATION MAP
FSR 1700, 1735, 1740, 1740-111



NOTES:

1. FOR ROAD CLOSURES, RESTRICTIONS, SIGNAGE, AND OTHER REQUIREMENTS SEE GENERAL NOTES FOR SPECIFIC ROAD INFORMATION.
2. FOR BORROW, DISPOSAL, AND WATER SOURCE SPECIFIC LOCATIONS SEE GENERAL NOTES AND ROAD WORKLISTS.

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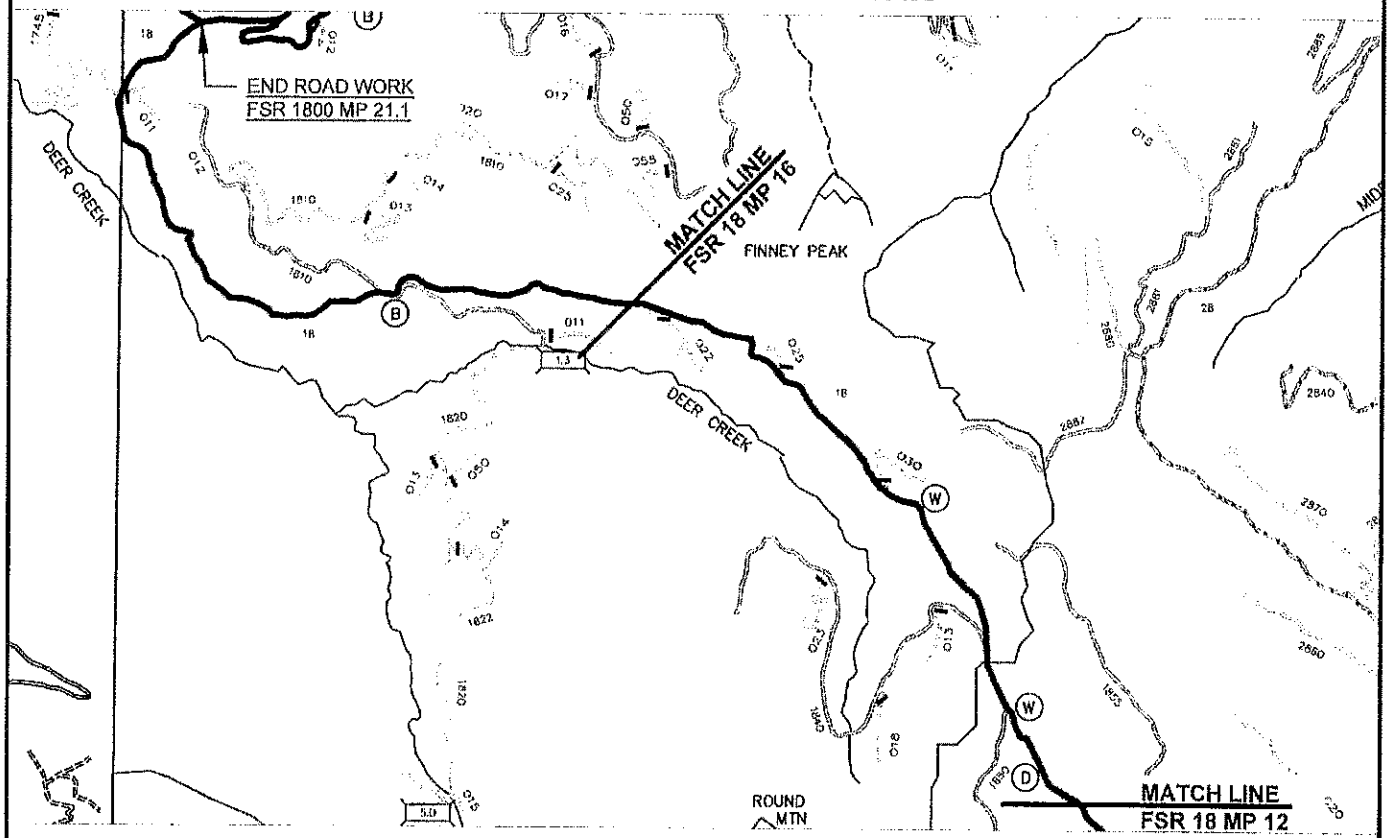
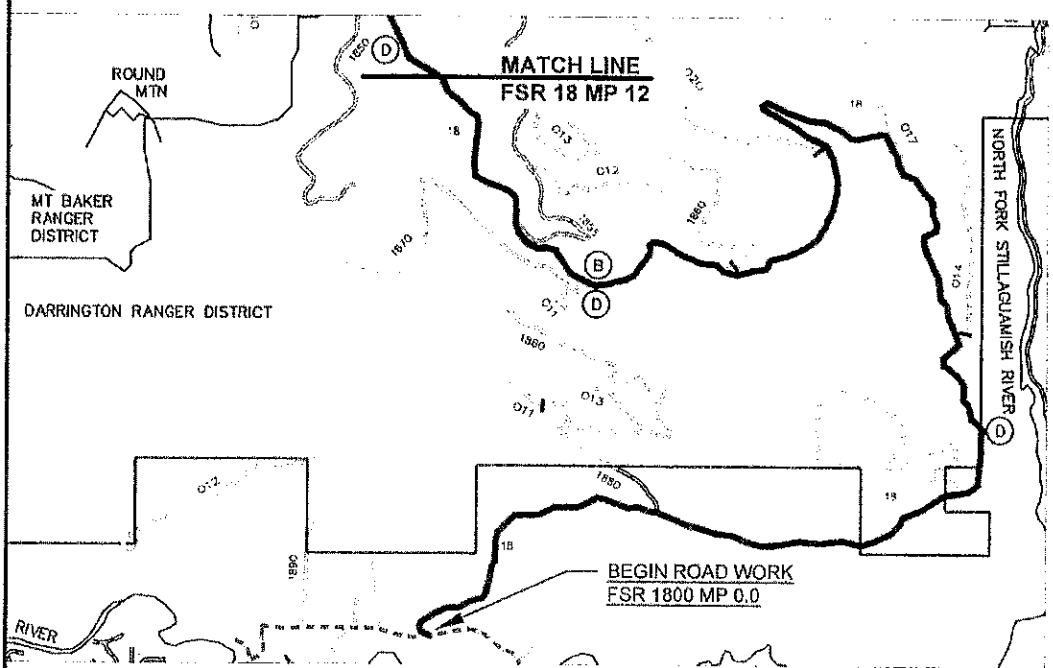
UPPER FINNEY THIN

LOCATION MAP FOR FSR 18





TRANSPORTATION SYSTEM LEGEND

- PROJECT ROADS
- TWO LANE PAVED HWY
- IMPROVED RD/PAVED
- IMPROVED RD/GRAVEL (PASSENGER CARS)
- UNIMPROVED RD/GRAVEL (HIGH CLEARANCE VEHICLES)
- UNIMPROVED RD
- TRAIL
- 410 WASH STATE HWY
- 1.5 BRIDGE w/M.P.
- LOCKED GATE
- BLOCKED ROAD
- (D) DESIGNATED DISPOSAL AREAS
- (W) DESIGNATED WATER WITHDRAWAL LOCATIONS
- (B) DESIGNATED BORROW SOURCES

NOTES:

1. FOR ROAD CLOSURES, RESTRICTIONS, SIGNAGE, AND OTHER REQUIREMENTS SEE GENERAL NOTES FOR SPECIFIC ROAD INFORMATION.
2. FOR BORROW, DISPOSAL, AND WATER SOURCE SPECIFIC LOCATIONS SEE GENERAL NOTES AND ROAD WORKLISTS.

0 1/2 1 2

MILES

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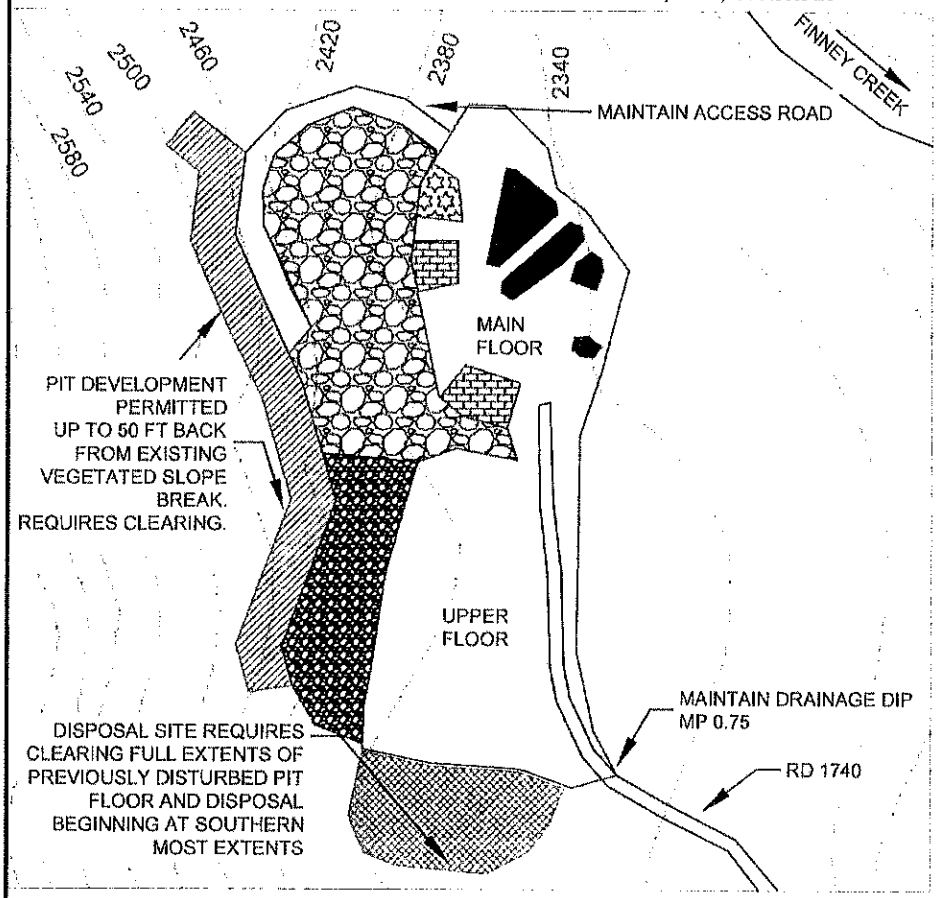
UPPER FINNEY THIN
RD 1740 FINNEY PIT PLAN

T34N, R7E, Section 25



LEGEND

- ROAD
- CONTOUR LINES
- CLEARING & EXCAVATION
- CLEARING & DISPOSAL
- ROCK BORROW
- SMALL ROCK BORROW
- PROPOSED ROCK STOCKPILES
- PROPOSED OVERSIZE STOCKPILE
- EXISTING STOCKPILE (DO NOT USE)

-80 -40 0 100 200

SCALE 1" = 100'

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NOTES:

1. AT THE COMPLETION OF OPERATIONS THE QUARRY FLOOR SHALL BE SHAPED TO DRAIN. CLEARING LIMITS SHALL BE 10 FEET BEYOND THE EXCAVATION LIMIT.
2. ROAD 1740 SHALL REMAIN OPEN TO TRAFFIC DURING AND AFTER THE MATERIAL SOURCE OPERATION. CONTRACTOR SHALL MAINTAIN THE ACCESS ROAD AND RESHAPE AT THE CONCLUSION OF OPERATIONS.
3. EXCAVATION SHALL BE CONFINED TO THE AREA SHOWN ON THE DRAWING. DO NOT UNDERCUT UPPER ACCESS ROAD.
4. CUT SLOPE SHALL BE LEFT NO STEEPER THAN ADJACENT EXISTING SLOPES UNALTERED BY TIMBER SALE CONTRACT WORK.
5. EQUIPMENT SHALL BE CLEANED IN ACCORDANCE WITH SECTION 171.03-171.07 OF THE TIMBER SALE CONTRACT.
6. OVERSIZED MATERIAL SHALL BE PLACED IN THE OVERSIZE STOCKPILE AREA SHOWN ON THE DRAWING.
7. CONTRACTOR SHALL NOT USE MATERIAL FROM EXISTING STOCKPILES.

H.GABRIEL 08/20/2014

UPPER FINNEY THIN

SUMMARY OF QUANTITIES

(FOR EACH SPECIFIED ROAD)

	PAY ITEM	DESCRIPTION OF WORK	UNIT	ROAD NUMBER					TOTAL
				1700	1735	1740	1740111	1800	
* Denotes Contract Quantity									
	15101	MOBILIZATION (INCLUDES CLEANING OF EQUIPMENT, SIGNING, TRAFFIC CONTROL, SANITATION)	LS	1	1	1	1	1	**5**
	20301	REMOVAL OF EXISTING CULVERT	EACH	0	1	0	0	0	**1**
*	20401A	ROADWAY EXCAVATION, COMPACTION METHOD A	CY	69	742	0	0	75	**886**
	20401B	ROADWAY EXCAVATION, RD 1735 MP0.66 RECONSTRUCT ROAD GRADE AND PROFILE	LS	0	1	0	0	0	**1**
	20401C	ROADWAY EXCAVATION, RD 1735 MP 2.0 CONSTRUCT 40-FT RADIUS TURNAROUND	LS	0	1	0	0	0	**1**
	20401D	ROADWAY EXCAVATION, RD 18 MP 18.55 WIDEN ROAD	LS	0	0	0	0	1	**1**
*	20419	DRAINAGE EXCAVATION, DITCH RECONSTRUCTION	LF	0	50	3960	0	500	**4510**
	20420	DRAINAGE EXCAVATION, DRIVEABLE DIP	EACH	0	0	0	1	0	**1**
*	20950	CULVERT BEDDING MATERIAL (COMMERCIAL SOURCE)	TON	0	22	0	0	0	**22**
	23050	ROADSIDE BRUSHING	MILE	2.58	2.00	0.75	0.19	21.10	**26.62**
*	25101A	PLACED RIPRAP, CLASS 5 (GOVERNMENT SOURCE)	CY	63	369	0	0	0	**432**
*	25101B	PLACED RIPRAP, CLASS 7 (GOVERNMENT SOURCE)	CY	54	0	0	0	100	**154**
*	25302	GABIONS, 9-GAUGE WELDED-WIRE , GALVANIZED (INCLUDES GEOTECH FABRIC TYPE IV NONWOVEN, FILL, AND WASTE DISPOSAL)	CY	20	0	0	0	0	**20**
*	26201A	GEOGRID CATEGORY 1 BIAXIAL	SY	0	370	0	0	260	**630**
*	26201B	GEOGRID CATEGORY 2 BIAXIAL	SY	0	520	0	0	0	**520**
	30322	ROAD RECONDITIONING, COMPACTION METHOD A	MILE	2.58	2.00	0.75	0.19	21.10	**26.62**
*	32201	AGGREGATE BASE, CLASS 1 (<8"), COMPACTION METHOD A (COMMERCIAL SOURCE)	TON	50	366	0	0	25	**441.0**
*	32209A	AGGREGATE SURFACING, GRADING EQUAL TO WSDOT MIX 1-1/4" MINUS, COMPACTION METHOD C (COMMERCIAL SOURCE)	TON	79	311	0	0	115	**505**

UPPER FINNEY THIN

SUMMARY OF QUANTITIES

(FOR EACH SPECIFIED ROAD)

	PAY ITEM	DESCRIPTION OF WORK	UNIT	ROAD NUMBER					
				1700	1735	1740	1740111	1800	TOTAL
* Denotes Contract Quantity									
*	32209B	AGGREGATE SURFACING, GRADING EQUAL TO WSDOT MIX 2-1/2" MINUS, COMPACTION METHOD C (COMMERCIAL SOURCE)	TON	0	0	0	30	120	150
*	40401	MINOR HOT MIX ASPHALT CONCRETE	TON	264	0	0	0	0	264
	60273	ANCHOR ASSEMBLIES FOR POLYETHYLENE PIPE	EACH	0	1	0	0	0	1
	60275A	18-INCH HIGH DENSITY POLYETHYLNE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD A	FT	0	32	0	0	0	32
	60275B	24-INCH HIGH DENSITY POLYETHYLNE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD A	FT	0	68	0	0	0	68
	60275C	36-INCH HIGH DENSITY POLYETHYLENE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD A	FT	0	40	0	0	0	40
*	60505	GEOCOMPOSITE SHEET DRAIN SYSTEM	SY	0	0	0	0	150	150
	60790	RECONDITION DRAINAGE STRUCTURE	EACH	0	0	4	1	0	5
	62528	SEEDING, DRY METHOD WITH MULCH (SEED MIX C)	LS	1	1	1	1	1	5
*	63307	DELINEATORS, PLASTIC POST TYPE 2 RETROREFLECTOR (INCLUDES ANCHOR)	EACH	8	8	0	0	8	24
*	63390	INSTALL "1-LANE BRIDGE" SIGN (INCLUDES POST)	EACH	2	0	0	0	0	2
	63401	PAVEMENT MARKINGS TYPE B WHITE	FT	200	220	0	0	0	420
	65102	PIT AND QUARRY DEVELOPMENT	LS	0	0	1	0	0	1

GENERAL NOTES

1. Item 15101, Mobilization – In addition to what is identified in Section 151 of the Specifications, mobilization includes construction signing, traffic control, and cleaning of equipment as indirect costs to this item. Equipment shall be washed (to remove all material that could potentially contain weed seeds) and inspected by the Forest Service Engineering Representative (ER) prior to entering National Forest lands.

2. Item 20301, Removal of Culvert – Includes the removal and disposal of all culverts designated in this project for removal. All culverts shall become the property of the Purchaser and be removed off National Forest Lands. Follow all Federal, State, and Local laws for disposal of culverts.

   Item 20401A,B,C,D, Roadway Excavation – Item includes roadway excavation, embankment, compaction, hauling of waste material, and maintaining disposal sites. All excess material shall be hauled to one of the designated disposal areas identified on the Location Map and staked in the field by the ER. All work associated with loading, hauling, placing, processing, and compaction are indirect costs.

3. Item 20419, Drainage Excavation, Type Ditch Reconstruction. See the Work Description List for location and the Ditch Reconstruction Typical for details. All excess material shall be hauled to one of the designated disposal areas identified on the Location Map and staked in the field by the ER.

4. Item 20420, Driveable Dip. Construct as shown on typical drawing utilizing material from government source. The objective of this pay item is to provide continuous flow of Rd 1740 ditchwater across Rd 1740-111 during project use .

5. Item 20950, Pipe Bedding – Bedding material for culvert installations shall meet the requirements of Item 32201 (Aggregate Base) and shall be obtained from a certified weed free Commercial Source. Submit material certification, test reports, and gradation reports to the ER, prior to purchase, for approval. Load and weight tickets shall be submitted daily to the ER if commercial source. No bedding material shall be placed until the pipe bed has been constructed with positive camber.

6. Item 23050 A,B,C Roadside Brushing – This work consists of cutting and disposal of the existing roadway vegetation on all roads. Clearing limits and requirements are shown on the Road Brushing Typical. Loose debris such as logs, rocks and other large debris shall be removed prior to brushing operations incidental to Item 30322 Road Reconditioning.
   Normal roadside brushing – brushing can generally be accomplished with a standard rubber-tired mechanical mowing machine. Most all of the vegetation is less than 3" in diameter. Minor amounts of windfall may be present and require chainsaw and an excavator to remove.

7. Items 25101 A,B Placed Riprap, Class 5 and 7 – Riprap shall be obtained from Finney Pit at the end of Road 1740 per Pit Plan Drawing. Riprap stockpile shall be developed under Item 65102.

8. Items 25302, Gabions – This work includes but is not limited to excavation and disposal of waste material, gabion purchase and installation, geotechnical fabric, and cell fill including backfilling. Replacing object markers disturbed during construction is incidental. Submittals and materials certifications required.

9. Items 26201A,B, Geogrid– This work consists of purchase and placement of geogrid material for slope stabilization. Excavation volume is covered under Item 20401. Submittals and materials certifications required.

10. Item 30322 Road Reconditioning –This work consists of grading, shaping, and compacting the roadway; grading, cleaning and reshaping all ditches; and cleaning all culvert inlets and outlets. See the Road Reconditioning Typical

GENERAL NOTES

for details. Compaction with the use of a roller compactor is required. Loose debris such as logs, rocks and other large debris shall be removed from clearing limits.

11. **Item 32201,32209A,B**, Aggregate Base and Surfacing – aggregate shall be commercial source. Material certification, test reports, and gradation report shall be submitted to the ER for approval prior to delivery to the project. Quantities are measured by the ton. Load and weight tickets shall be submitted daily to the ER for verification of quantities. All work associated with loading, hauling, placing, processing, and compaction are indirect costs.

12. **Item 40401**, Minor Hot Mix Asphalt - This work consists of sawcutting existing asphalt, prepping surface and placing asphalt. Removal and disposal of existing asphalt off National Forest Lands in accordance with all state and local laws is also incidental to this pay item. Submittals and materials certifications required.

13. **Item 60273**, Anchor Assemblies- This work consists of repairing and reattaching to secure downpipes.

14. **Items 60275 A,B,C**, 18", 24", & 36" corrugated polyethylene pipe with Bell and Spigot connections – This work consists of furnishing and installing culverts. See the Drainage Construction Typicals for installation details. Compaction Method B is required as described in Section 209 of the Specifications. All culvert installations at locations with live streams or presence of water shall comply with the MOU with WDFW and be dewatered by pumping, temporary bypass culvert, or ditching. Dewatering is an indirect cost to the culvert installation. Construct culvert bed with positive camber prior to placing bedding material. Bedding Material is a separate pay item 20950. Submittals and materials certifications required.

15. **Item 60505**, Geocomposite Sheet Drain System – Place sheet drain system according to manufactures instruction. Submittals and materials certifications required.

16. **Item 60790**, Recondition drainage structure - This work consists of re-establishing the original culvert and culvert catch basin dimensions and cleaning debris out of the culvert inlets and outlets. See the Drainage Construction Typical for catch basin details.

17. **Item 62528**, Seeding (C-1), dry method (with straw mulch) – This work consists of seeding and mulching all constructed fill slopes, cut slopes, and all disturbed soil areas beyond the traveled way, all disturbed soil areas for culvert installations, and disposal areas. See the Supplemental Project Specifications for seed and mulch (weed free straw) requirements, application, and timing. Submittals and materials certifications required.

18. **Item 63307**, Delineators - This work consists of prepping surface, mounting anchor, and installing delineator. Submittals and materials certifications required.

19. **Item 63390**, Sign Installation - This work consists of installing signs and post. Install wood sign on 12-foot long 4x4 treated timber post with anti-theft bolted fasteners. Submittals and materials certifications required.

20. **Item 63401**, Pavement Markings - This work consists of preparing surface and marking. Submittals and materials certifications required.

21. **Item 65102**, Pit and Quarry Development Including Disposal Area - This work consists of clearing and grubbing, excavation, material sorting, and screening to produce designated material from Finney Pit at MP0.8 of Road 1740. Pit shall be developed by shifting into the hillside up to 50 feet horizontally without undercutting the upper access road. Refer to Pit Plan Drawing. This item also includes shaping pit to safe slopes after material is generated. Cubic Yards to be measured in place at respective designated project site. Material to be stockpiled is per worklist.

GENERAL NOTES

22. Designated Borrow Source – Borrow sources shall be used for unclassified borrow as described in the Work List. There are 4 designated borrow sources for this project.
    1. **Road 1740 at MP 0.8 Finney Pit.** Borrow is by widening and extension of the road as shown on Pit Plan Drawing. Utilize this material as designated.
    2. **Road 1735 at MP 1.09** is from existing piles in wide area on right. Utilize this material as road base rock or riprap on Road 1735. Any other excess and suitable material generated as the result of other construction activities may be used for unclassified borrow if approved in advance by the ER.
    3. **Road 18 at MP 9.65** is an unimproved rock source on right.
    4. **Road 18 at MP 17.6** is a crushed aggregate pile on left and small riprap on right.

23. Designated Disposal Areas – Disposal areas are for slash, debris, soil, and other waste material generated as a result of construction activities that are not designated for other specific locations. Place material within locations and as flagged by the ER. All waste shall be shaped to drain, seeded and mulched, and are indirect costs to those pay items.
    1. **Road 1740 at MP 0.8 Finney Pit.** Waste disposal site is the south end of the Finney Pit per Pit Plan Drawing.
    2. **Road 18 at MP 4.40 Right**
    3. **Road 18 at MP 9.65 Left**
    4. **Road 18 at MP 12.2 Left**

24. Load Limits – All vehicles and equipment shall not exceed State legal highway loads and widths or posted limits without valid State and Forest Service overload, over width permits. Forest Service overload permit applications for this project may be obtained from the ER. **Allow 21 days for permit processing.**

25. Timing of Noise Restrictions – Restrict heavy equipment and other noise-generating activities above ambient levels **between April 1st** and **September 15th** to between two hours after sunrise to two hours before sunset.

26. Timing of Drainage Work in live streams – All work in live streams shall be done under the provisions of the **2012 WDFW-USFS MOU** (Washington State Department of Fish & Wildlife – US Forest Service Memorandum of Understanding). The in-water work window is **July 16th** to **Feb 28th** for any project-related work.

27. Dewatering – The following requirements apply where worksite isolation from flowing waters and/or dewatering occur.
    a. A written dewatering plan shall be prepared prior to the start of the instream work that describes the method of bypass, location and construction of any coffer dams or diversion dams, the number and size of pumps to be used, and backup plans in place in case of mechanical failure or unanticipated storm events.
    b. The dewatering system will be designed and installed to minimize erosion and sediment delivery to watercourses and to withstand all streamflows anticipated during the construction period. Water shall be reintroduced back into the channel in a manner that minimizes the mobilization of fines and sediment into downstream waters.
    c. Water bypassed around the site will be returned to the stream channel downstream of the work site. The bypass discharge point shall be designed to minimize erosion and scour of the stream channel, banks, and vegetation.
    d. Wastewater from project activities within the dewatered area shall be routed to an area outside the bankfull channel to allow removal of fine sediment and other contaminants prior to infiltrating back into waterbodies.
    e. Any materials used to construct the dewatering system will be removed prior to the completion of the project

28. Water Withdrawal Sources –Water Withdrawal shall only occur at the following locations and in compliance with all special criteria below. Submit a water withdrawal plan to the Contracting Officer for review and approval 7 days prior to starting work.
    - Road 1700 MP 11.50 from mainstem Finney Creek (T34N, R8E, S29) – Water drafting and tank storage shall be located within the dispersed camping area on the left bank/downstream side of the bridge (North of the bridge).

GENERAL NOTES

- Road 1800 MP 12.5 Right (T33N, R8E, S24)
- Road 1800 MP 13.9 Right (T33N, R8E, S14)
- Resident Fish/ Non fish-bearing Stream (all streams assumed to be fish-bearing unless written documentation from FS fish biologist documenting otherwise) -The withdrawal hose or pipe must be fitted with a screen with a minimum effective surface area of at least one square inch of functional screen area for every gallon per minute (gpm) of water drawn through it, a round or square screen mesh that is no larger than 2.38 mm (3/32 or 0.094 inches) in the narrow dimension, or any other shape that is no larger than 1.75 mm (1/16 or 0.069 inches) in the narrow dimension.
- No more that 10% of the instantaneous stream flow may be removed. Streams may be pea-gravel bagged or have a weir placed across the stream to pond water. No soil shall be used to seal the water retention area and no logs or woody material from within the bankfull channel may be used. All bags or weirs shall be completely removed at the end of work season and prior to onset of rainy season.

29. Road Closures and Notification Requirements – **All work costs as shown below are incidental to 15101 Mobilization.**

1. Notify the Contracting Officer 7 Calendar days prior to construction and harvest activities regarding this project.

2. Install 3 Road Information Signs on FSR 1700 at MP 0.0 and at Junction with FSR 1740 (MP14.0) and on FSR 18 MP0.0 meeting all the requirements of the MUTCD 2012 with the following information. Coordinate with Skagit County regarding placement of information sign on FSR 1700 at MP 0.0. Signs shall be present and maintained during all ongoing project road work.

ROAD CONSTRUCTION	
DELAYS	**Sign shall be 60"x60", reflective, white with black letters**
DATE X TO X	**Installation on (2) 4"x4"x12' pressure treated posts with vandal proof nuts**
TIME X TO X	**and bolts**
ROAD # 1X X X X X X	

3. For construction activity work where the road will be CLOSED, install at the beginning and end of each project road, a closure sign meeting all the requirements of the MUTCD 2012 with the following information. Sign shall be present and maintained during all project construction work. See Traffic Control Drawing.

ROAD CLOSED	
FOR CONSTRUCTION	**Sign shall be 48" x 48", reflective, white with black letters**
DATE X TO X	**Sign may be installed on 4"x4"x12' post or placed on a mobile stand**

4. Road Work Ahead signs, At a minimum, (2) 36"x36" signs, Orange with Black Letters, shall be installed on each side of each work activity while work is ongoing. Placement of signs shall be located near the project work sites. See Traffic Control Drawing.

5. Road Closures – C6.315

Notify the Forest Service 14 days prior to any road closures so that land owners and existing mining claimants may be notified, and allow either alternate access, or permitted access through any temporary closure.

6. Specific Road Requirements – FSR 1700, 1735, and 1800 – C5.12

These roads are groomed and maintained for Washington State Finney Sno-Park use during the winter snow season which is typically November 30 to May 1. Haul and road reconstruction activities shall not inhibit Sno-Park use.

UPPER FINNEY THIN

WORK DESCRIPTION LIST

SHEET 11 OF 35

Rd. #1700 - MP11.42 to 14.00

Mile Post	Item	Description	Units	Estimated Quantity
0.00		**Junction with Concrete - Sauk Valley County Rd**		
		County Maintained Road MP 0.00 to 6.00 - No work required		
4.43		**County Bridge - Finney Creek - MAX LOAD LIMIT 60K POUNDS**		
		COUNTY WILL NOT ISSUE OVERLOAD PERMITS		
6.00		**"End of County Road" Sign - End County Maintained Road**		
8.04		**Road 1705 Right**		
8.15 to 8.17		**Gee Creek Bridge**		
8.97		**Road 1715 Left**		
10.57		**Road 1720 Right**		
11.36		**Road 1700016 Right**		
11.42		**Begin Specified Road Work for Road 1700**		
	63390	Install "One Lane Bridge" W5-3 Sign and Post, Right	EA	1
	23050	Begin Roadside Brushing	MILE	2.58
	30322	Begin Road Reconditioning	MILE	2.58
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source Locations to be determined in field at various sites between MP 11.42 to MP 14.0 at existing aggregate locations.	TON	14
	40401	Asphalt Placement - Place HMA - 1/2' Agg - AR4000 Oil Mix - Locations to be determined in field at various sites between MP 11.42 to MP 14.0 at existing asphalt locations.	TON	7
11.50		**Finney Creek Bridge - Overload Permits Required with Forest Service**		
		Water Source Location		
	25101B	Place Class 7 Riprap - 2 Abutments	CY	30
	25302	Install 2 Gabion Structures - See Typical	CY	20
	40401	Asphalt Placement - - HMA - 1/2" Agg - AR4000 Oil Mix - 2 Bridge Approaches - Each, 15'W x 30'L x 6" D	TON	36
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	30
11.50-11.60	40401	Asphalt Placement - - HMA - 1/2" Agg - AR4000 Oil Mix - From Bridge to Junction 1730, 15'W x 530'L x 3" D	TON	158
???? SEE N(	63390	Install "One Lane Bridge" W5-3 Sign and Post, Left	EA	1
11.99		**Existing 36" Culvert**		
	20401A	Excavate 3'Deep, Place Base Subgrade Material, Then Recompact	CY	69
		Haul excess excavation material to Road 1740 Pit		
	32201	Place Class 1 Aggregate Base 8" Depth - Commercial Source	TON	30
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	15
	40401	Asphalt Placement - HMA - 1/2" Agg - AR4000 Oil Mix - 14'W x 50'L x 3" D	TON	15

UPPER FINNEY THIN

WORK DESCRIPTION LIST

SHEET 12 OF 35

Rd. #1700 - MP 6.00 to 14.00 - Continued

Mile Post	Item	Description	Units	Estimated Quantity
12.00		**Mile Marker 12**		
12.06		Existing 24" Culvert		
	25101B	Place Class 7 Riprap at Outlet - Government Source	CY	24
	32201	Place Class 1 Subgrade Base 6" Depth - Commercial Source	TON	20
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	10
12.85	40401	Asphalt Placement - HMA - 1/2" Agg - AR4000 Oil Mix - 14'W x 120'L x 3" D - Leveling Course	TON	35
13.00		**Mile Marker 13**		
13.01		Existing Concrete Vented Ford over Open Box Culvert		
	63307	Install Flexible Delineators w/ Surface Mount to Concrete - 4 Left - 4 Right	EA	8
	63401	Install Fog Lines - Left and Right	LF	200
13.03	40401	Asphalt Placement - HMA - 1/2" Agg - AR4000 Oil Mix - 16'W x 20'L x 3" D	TON	7
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	10
13.10		**Road 1735 Left**		
13.20	40401	Asphalt Placement - HMA - 1/2" Agg - AR4000 Oil Mix - 6'W x 10'L x 3" D	TON	2
13.28 - 13.30	25101A	Place Class 5 Riprap for Grade Control Weirs as designated in Ditchline Left	CY	43
		Location Amounts are (#1 - 5 CY) - (#2 - 5 CY) - (#3 - 8 CY) - (#4 - 10 CY)		
		(# 5 - 15 CY) - Government Source		
13.21	40401	Asphalt Placement - HMA - 1/2" Agg - AR4000 Oil Mix - 5'W x 5'L x 3" D	TON	1
13.30		Existing 72" Culvert		
	25101A	Place Class 5 Riprap in Ditch Bottom - See Typical Details	CY	20
13.32	40401	Asphalt Placement - HMA - 1/2" Agg - AR4000 Oil Mix - 5'W x 5'L x 3" D	TON	1
13.36	40401	Asphalt Placement - HMA - 1/2" Agg - AR4000 Oil Mix - 5'W x 5'L x 3" D	TON	1
13.42	40401	Asphalt Placement - HMA - 1/2" Agg - AR4000 Oil Mix - 5'W x 5'L x 3" D	TON	1
13.55		**Road 18 Left**		
13.99		**Road 1740 Right**		
		End Specified Road W ork for Road 1700		
	30322	End Road Reconditioning		
	23050	End Roadside Brushing		
	32209A	End Place Crushed Aggregate Surface Course		
	40401	End Asphalt Placement		
14.00		**Mile Marker 14**		

UPPER FINNEY THIN **WORK DESCRIPTION LIST**			SHEET 13	OF 35
Rd. #1735 - MP 0.00 to 2.00				
Mile Post	*Item*	*Description*	*Units*	*Estimated Quantity*
0.00		**Begin Specified Road Work for Road 1735**		
	23050	Begin Roadside Brushing	MILE	2.00
	30322	Begin Road Reconditioning	MILE	2.00
0.27		**Switchback Left**		
0.35		New Stream Channel		
	60275B	Install new 24" HDPE Culvert (90deg skew, 19% gradient)	LF	30
	20950	Place Culvert bedding material - 1-1/4" minus - Commercial Source	TON	5
	25101A	Place Class 5 Riprap for inlet headwall and outlet apron - Government Source	CY	5
	25101A	Construct Class 5 Riprap Wall 20'W x 11'V x 3' D on Fillslope - See Detail	CY	25
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	3
0.35-0.48		Existing Shoulder Cracking		
	32201	Place Class 1 Aggregate Base 6" Depth - Commercial Source	TON	366
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	100
0.66		Existing 48" HDPE Culvert		
	20401B	Reconstruct and lower Roadway Grade by Excavating - Haul excess excavation material to FSR 1740 Pit - See Typical	LS	1
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	35
0.69		Existing Concrete Vented Ford		
	63307	Install Flexible Delineators w/ Surface Mount to Concrete - 4 Left - 4 Right	EA	8
	63401	Stripe Fog Lines	LF	220
1.00 to 1.02		Existing Shoulder Cracking		
	20401A	Reconstruct Roadway 9' in from Outside Edge 3' Depth	CY	35
	25101A	Place Class 5 Riprap for Geogrid Facing - Government Source	CY	15
	26201A	Install GeoGrid Category 1 - 1 Layer	SY	50
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	10
1.09		Borrow Source - Right		
1.10-1.16		Existing Shoulder Cracking		
	20401A	Reconstruct Roadway 9' in from Outside Edge 3' Depth	CY	224
	25101A	Place Class 5 Riprap for Geogrid Facing - Government Source	CY	96
	26201A	Install GeoGrid Category 1 - 1 Layer	SY	320
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	48
1.16		Existing Damaged 18" Aluminum Culvert with Flume		
	20301	Remove existing CMP and Flume	EA	1
	60275A	Install new 18" HDPE Culvert (match existing alignment and grade)	LF	32
	20950	Place Culvert bedding material - 1-1/4" minus - Commercial Source	TON	5
	25101A	Place Class 5 Riprap for inlet headwall and outlet apron - Government Source	CY	5
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	10
1.63		Existing 2 Streams		
1.64	60275B	Install new 24" HDPE Culvert (70deg skew, 17% gradient)	LF	38
	20950	Place Culvert bedding material - 1-1/4" minus - Commercial Source	TON	5
	25101A	Place Class 5 Riprap for inlet headwall and outlet apron - Government Source	CY	5
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	10

UPPER FINNEY THIN

WORK DESCRIPTION LIST

Rd. #1735 - MP 0.00 to 2.00

Mile Post	*Item*	*Description*	*Units*	*Estimated Quantity*
1.70		Existing 48" HDPE Culvert with Detached Flume		
	60273	Reattach Flume	EA	1
1.71		Existing Live Stream At Alluvial Fan Runs in Ditch 40' to Existing Culvert		
	60275C	Install new **36"** HDPE Culvert (90deg skew, 23% gradient)	LF	40
	20950	Place Culvert bedding material - 1-1/4" minus - Commercial Source	TON	7
	25101A	Place Class 5 Riprap for inlet headwall and outlet apron - Government Source	CY	10
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	10
1.78-1.88		Existing Shoulder Cracking		
	20401A	Reconstruct Roadway 9' in from Outside Edge 4' Depth	CY	483
	25101A	Place Class 5 Riprap for Geogrid Facing - Government Source	CY	208
	26201B	Install GeoGrid Category 2 - 1 layer	SY	520
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	70
1.88		Existing Ditch Obstructed		
	20419	Ditch Reconstruction 10CY, Haul excavated material to FSR 1740 Pit	LF	50
2.00		**Existing Landing, Road Continues after Sharp Turn to Right**		
		End Specified Road Work for Road 1735		
	20401C	Construct 40' radius turnaround	LS	1
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	15
	23050	End Roadside Brushing		
	30322	End Road Reconditioning		

UPPER FINNEY THIN

WORK DESCRIPTION LIST

SHEET 15 OF 35

Rd. #1740 - MP 0.00 to 0.80

Mile Post	*Item*	*Description*	*Units*	*Estimated Quantity*
0.00		**Begin Specified Road Work for Road 1740**		
	23050	Begin Roadside Brushing	Mile	0.75
	20419	Begin Ditch Reconstruction - Left -	LF	3960
	30322	Begin Road Reconditioning	Mile	0.75
0.45		Existing 18" Culvert		
	60790	Recondition Culvert Cleaning Inlet - Inside - Outlet	EA	1
0.49		Existing 18" Culvert		
	60790	Recondition Culvert Cleaning Inlet - Inside - Outlet	EA	1
0.52		Existing 18" Culvert		
	60790	Recondition Culvert Cleaning Inlet - Inside - Outlet	EA	1
0.57		Existing 18" Culvert		
	60790	Recondition Culvert Cleaning Inlet - Inside - Outlet	EA	1
0.75		**End Specified Road Work at Entrance to Existing Finney Rock Pit**		
		End Specified Road Work for Road 1740		
		End of Landing		
	23050	End Roadside Brushing		
	30322	End Road Reconditioning - Maintain Existing Dip		
	20419	End Ditch Reconstruction - Left		
0.80		Finney Rock Pit		
	65102	Pit Development per Pit Plan - See Typical	LS	1

UPPER FINNEY THIN

WORK DESCRIPTION LIST

SHEET 16 OF 35

Rd. #1740111 - MP 0.00 to 0.19

Mile Post	*Item*	*Description*	*Units*	*Estimated Quantity*
0.00		**Begin Specified Road Work for Road 1740-111**		
	23050	Begin Roadside Brushing	Mile	0.19
	30322	Begin Road Reconditioning	Mile	0.19
0.01	20420	Install low water crossing at entrance - Class 2 - Government Furnished	EA	1
0.12		Existing 18" Culvert in Dry Swale		
	60790	Recondition Culvert Cleaning Inlet and Outlet	EA	1
0.17 to 0.19	32209B	Place Crushed Aggregate Surface Course - 2-1/2" minus Commercial Source	CY	30
0.19		**End Specified Road Work for Road 1740-111**		
		End of Landing		
	23050	End Roadside Brushing		
	30322	End Road Reconditioning		

UPPER FINNEY THIN

WORK DESCRIPTION LIST

SHEET 17 OF 35

Rd. #18 - MP 0.00 to 21.05

Mile Post	*Item*	*Description*	*Units*	*Estimated Quantity*
0.00		**Junction with County Rd**		
	23050	Begin Roadside Brushing	Mile	21.10
	30322	Begin Road Reconditioning	Mile	21.10
2.05		DNR Spur Rd Left		
2.25		DNR Spur Rd Right		
3.00		Mile Marker 3 - Left		
3.1 - 3.3		Begin Rough Road Segment		
	20419	Ditch Reconstruction - Haul excavated material to MP 4.4 Disposal Site	LF	500
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	40
3.90		DNR Spur Rd - Right		
4.00		Interstection with FSR 1880 - Left		
4.40		FS Sno Park - Right - Waste Disposal Site at Designated locations		
5.95		Mile Marker 6 - Left		
7.30		Switchback Left		
9.30		Existing 36" HDPE Culvert		
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	20
9.65		Existing Borrow Site - Right - Waste Area Left		
10.00		Mile Marker 10 - Right		
10.48	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	20
10.70		Intersection with FSR 1855 - Right		
12.25		Waste Area - Left		
12.50		Water Source Location		
12.52		Intersection with FSR 1850 - Left		
12.97		Intersection with FSR 1840 - Left		
13.85		Repair Scour at 36' HDPE Culvert - Left		
	25101B	Place Class 7 Riprap at Outlet - See Typical	CY	100
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	10
13.90		Water Source Location		
15.15		Intersection with FS Spur Road - Right		
15.2 - 15.3		Widen Road Right by 2 feet		
	20401A	Widen Roadway 2' on Right - Haul excess waste to Spur Disposal Site	CY	75

UPPER FINNEY THIN **WORK DESCRIPTION LIST**			SHEET 18	OF 35
Rd. #18 - MP 0.00 to 21.05				
Mile Post	***Item***	***Description***	***Units***	***Estimated Quantity***
16.21		Reconstruct Roadway by Raising Grade through Dip		
	32209B	Place Crushed Aggregate Surface Course - 2-1/2" minus Commercial Source	TON	20
16.25		Existing Concrete Ford		
	63307	Install Flexible Delineators w/ Surface Mount to Concrete - 4 Left - 4 Right	EA	8
16.40		AC Dip		
16.45		Raise Grade at Dip for uniform grade		
	32209B	Place Crushed Aggregate Surface Course - 2-1/2" minus Commercial Source	TON	25
16.50		Raise Grade at Dip for uniform grade		
	32209B	Place Crushed Aggregate Surface Course - 2-1/2" minus Commercial Source	TON	25
16.66		AC Dip		
17.20		Raise Grade at Dip for uniform grade		
	32209B	Place Crushed Aggregate Surface Course - 2-1/2" minus Commercial Source	TON	25
17.48		AC Dip		
17.52		AC Dip		
17.60		Borrow Site - Crushed Aggregate Left - Riprap on Bank Right		
17.63		Intersection with FSR 1820 - Left		
17.72		Intersection with 1810 - Right		
17.93		Raise Grade at Dip for uniform grade		
	32209B	Place Crushed Aggregate Surface Course - 2-1/2" minus Commercial Source	TON	25
18.55		Repair Left Side Shoulder Failure		
	20401D	Reconstruct Roadway Embankment - See Typical	LS	1
	60505	Geocomposite Type 1 Sheet Drain System	SY	150
	26201A	Install GeoGrid Category 1 - 3 layers	SY	260
	32201	Place Class 1 Aggregate Base 6" Depth - Commercial Source	TON	25
	32209A	Place Crushed Aggregate Surface Course - 1-1/4" minus Commercial Source	TON	25
20.00		Mile Marker 20 - Right		
20.30		Intersection with Spur Road - Right - Enter Timber Sale Unit Boundary # 4		
21.10		Intersection with FSR 17 -		
	23050	End Roadside Brushing		
	30322	End Road Reconditioning		

UPPER FINNEY TIMBER SALE

DRAINAGE LISTING

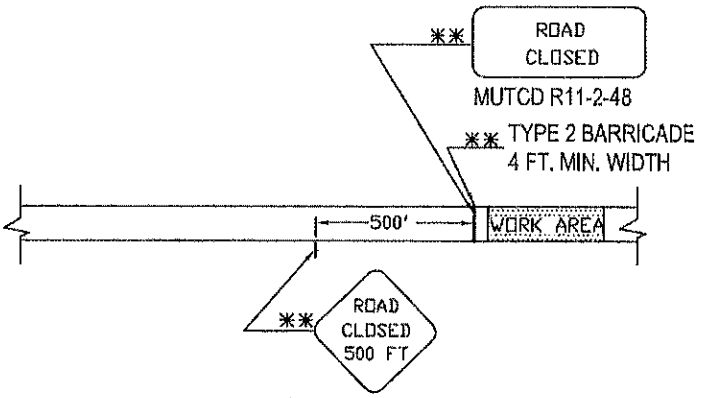
SHEET	OF
19	35

(See the work summary sheets for work description at each location.)

Design		As Built		Allowable Alternatives		Installation Details								Remarks
Mile Post	L.F.	Mile Post	L.F.	All Pipes Shall Be Plastic Unless Otherwise Specified: Dia. in Inches	All Pipes Shall Be Plastic Unless Otherwise Specified: Corrugations If Metal Pipe is Specified	Type	Grade %	Skew Deg.	Headwall Ditchdam (CY)	Outlet Apron (CY)	Bedding (TON)	Elbow	Anchor Sets	*Place Class 7 Riprap **Place Class 8 Riprap All Others Class 5 Riprap
ROAD 1700 DRAINAGE LISTING														
11.40		Existing Bridge over Finney Creek												
12.06		Existing 24" Plastic Pipe with large scour hole								20				Reconstruct outlet apron - Class 7
13.00		Existing concrete ford												
13.28		Existing Scoured Ditch LT												Construct grade control weirs
13.30		Existing 72" CMP												
ROAD 1735 DRAINAGE LISTING														
0.35	30			24		3	19	90	1	4	3			New Culvert at Stream
0.69		Existing Concrete Vented Ford												
1.16	32			18		Match Existing			1	2	2			Remove/Replace Existing 18"x32' CMP
1.63		Existing Culvert												
1.64	38			24		3	17	70	1	3	3			New Culvert at Stream
1.70		Existing 48" HDPE Culvert												
1.71	40			36		3	23	90	3	6	4			New Culvert at Stream
ROAD 1800 DRAINAGE LISTING														
13.85		Existing 36" HDPE Culvert												Place Riprap at Outlet Scour Hole

TRAFFIC CONTROL PLAN

TRAFFIC CONTROL PLAN FOR ROAD CLOSURE



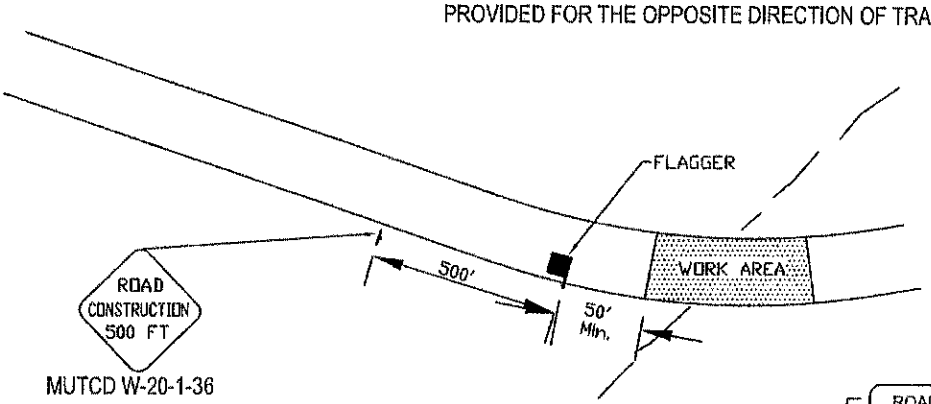
1.) ROAD USE AUTHORIZATION PER C 5.12, "USE OF ROADS BY PURCHASER" IN CONTRACT.

2.) TOTAL ROAD CLOSURE PER SUPPLEMENTAL SPECIFICATIONS SECTION 156 PUBLIC TRAFFIC IN THE CONTRACT. OPERATIONS AT ALL OTHER TIMES WILL ACCOMODATE TRAFFIC.

3.) TRAFFIC CONTROL DEVICES SHALL BE MAINTAINED FOR DURATION OF CLOSURE.

4.) ALL SIGNS SHALL CONFORM WITH MUTCD SECTIONS 2A-11, THROUGH 2A-16, 6B-1 AND 6B-2 OF THE 2012 EDTION.

5.) ** SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL ONLY. THE SAME NUMBER AND TYPES OF SIGNS SHALL BE PROVIDED FOR THE OPPOSITE DIRECTION OF TRAVEL.



TRAFFIC CONTROL PLAN FOR TRAFFIC ALLOWED THROUGH WORK AREA

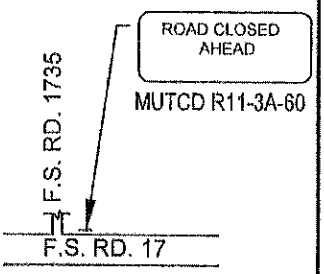
1.) WORK AREA SHALL BE IN A CONDITION SUCH THAT IT MAY BE SAFELY TRAVERSED AT NIGHT, INCLUDING CHANNELIZING DEVICES IF NEEDED.

2.) WARNING LIGHTS SHALL BE USED TO MARK CHANNELIZING DEVICES AT NIGHT AS NEEDED.

3.) TRAFFIC CONTROL DEVICES SHALL BE MAINTAINED FOR DURATION OF WORK IN BOTH DIRECTIONS OPEN TO TRAFFIC.

4.) SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL ONLY. THE SAME NUMBER AND TYPES OF SIGNS SHALL BE PROVIDED FOR THE OPPOSITE DIRECTION OF TRAVEL.

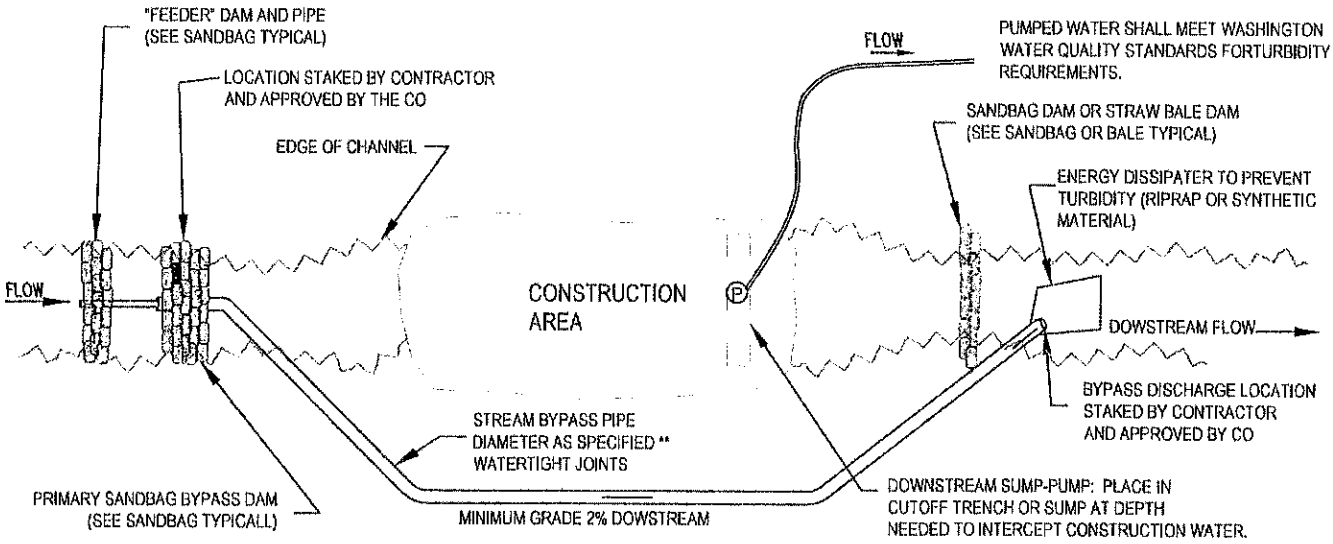
5.) ALL SIGNS SHALL CONFORM WITH MUTCD SECTIONS 2A-11, THROUGH 2A-16, 6B-1 AND 6B-2 OF THE 2012 EDITION.



SAMPLE ONLY
ACTUAL ROAD NUMBER MAY NOT MATCH DETAIL TYPICAL.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: AUGUST 8, 2014
		SHEET: 20 OF: 35
APPROVED:	DWG NO: 15101–1	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: TRAFFIC CONTROL

TEMPORARY EROSION CONTROL PLAN

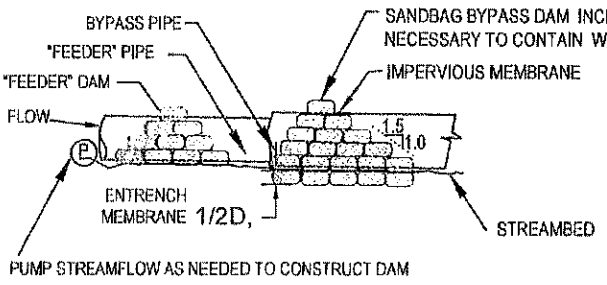


PLAN VIEW
TYPICAL DEWATERING & SEDIMENT CONTROL PLAN
NOT TO SCALE

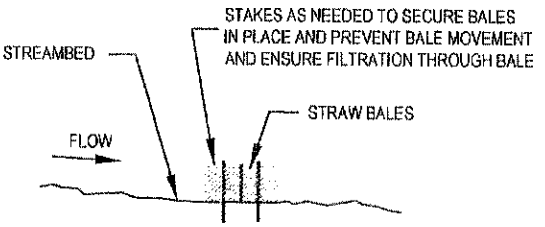
NOTE:

1. WORK SHALL BE DONE UNDER DRY CONDITIONS. A CONTINGENCY PLAN WILL BE SUBMITTED PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES, ALONG WITH AN EROSION CONTROL PLAN.
2. CONTRACTOR SHALL PROTECT EXISTING VEGETATION AND WILL CONFINE EXCAVATION TO WITHIN THE CLEARING LIMITS.
3. WHEN IN FISH BEARING STREAM, PUMPS SHALL BE EQUIPPED WITH A FISH GUARD THAT HAS A 3/32-INCH OR SMALLER MESH TO PREVENT PASSAGE OF FISH INTO PUMP.
4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE M.O.U./H.P.A. A COPY OF THE M.O.U./H.P.A. WILL BE ON SITE DURING ALL CONSTRUCTION ACTIVITIES.

**THE VOLUME OF WATER EXPECTED AT THE DAM IS UNKNOWN. SIZE PIPE OR USE A COMBINATION OF SIPHONING AND PUMPING TO DIVERT WATER AROUND EXCAVATION TO A SUITABLE TREATMENT AREA OR DIRECTLY BACK INTO STREAM IF APPROVED BY THE COR.

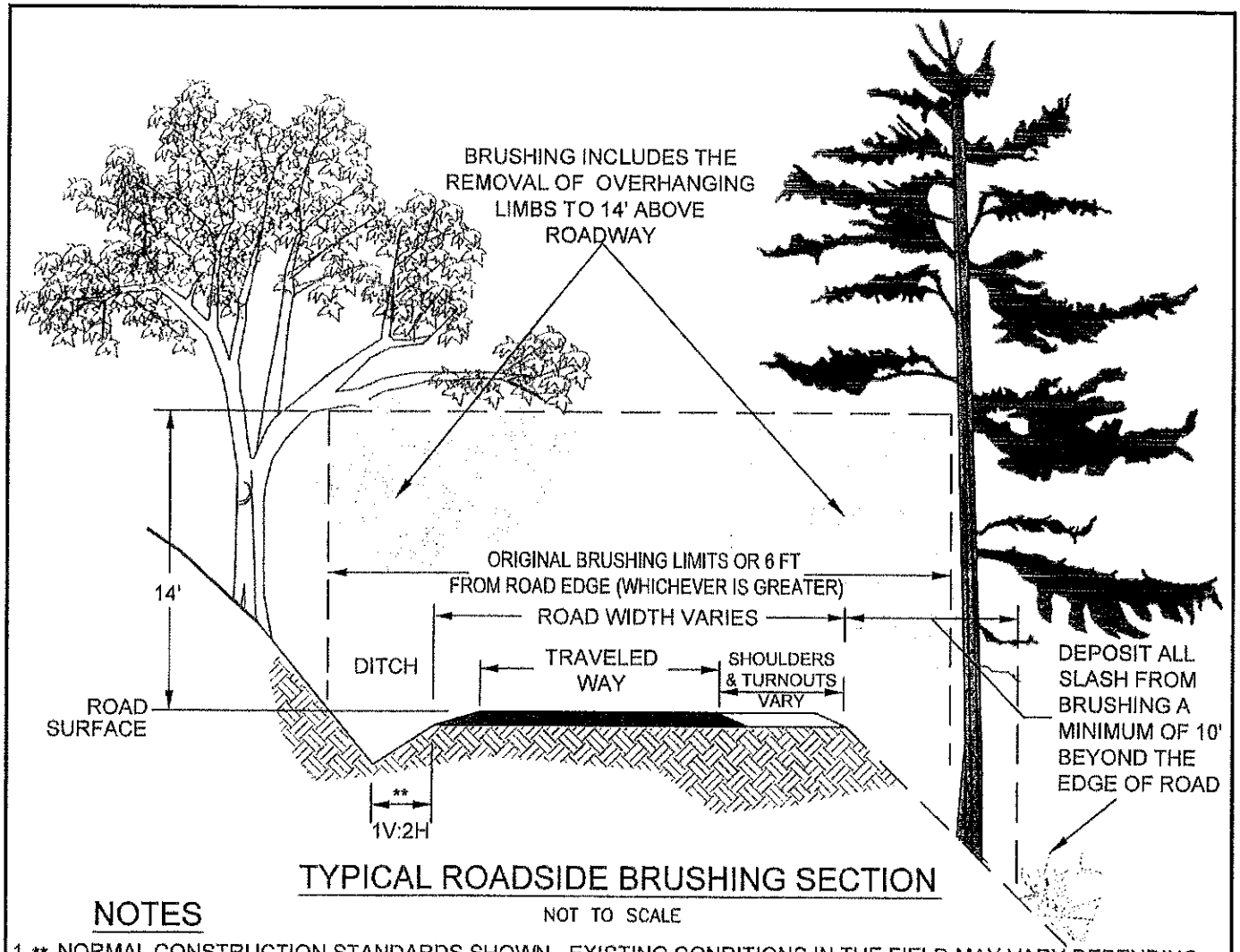


SECTION VIEW AT STREAMBED INVERT
SANDBAG BYPASS DAM TYPICAL
NOT TO SCALE



SECTION VIEW
STRAW BALE DAM TYPICAL
NOT TO SCALE

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION-6		DATE: July 21, 2014
		SHEET: 21 OF: 35
APPROVED:	DWG NO: 15101-2	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: EROSION CONTROL



TYPICAL ROADSIDE BRUSHING SECTION

NOT TO SCALE

NOTES

1. ** NORMAL CONSTRUCTION STANDARDS SHOWN. EXISTING CONDITIONS IN THE FIELD MAY VARY DEPENDING ON THE ACTUAL SHOULDER AND DITCH CONSTRUCTED AND MAINTAINED.

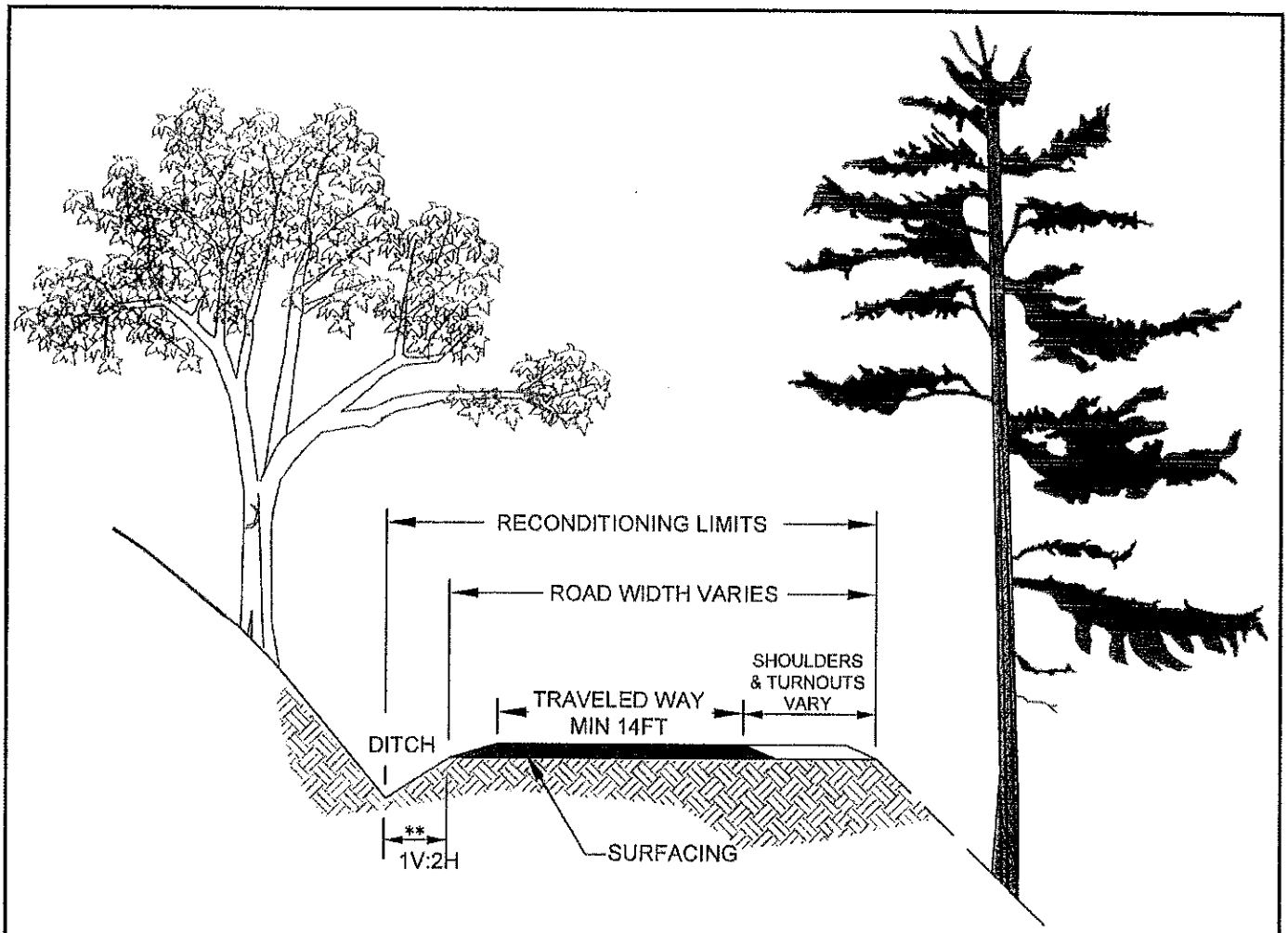
2. SCATTER MATERIAL A MINIMUM OF 10 FEET BEYOND THE EDGE OF ROAD ALONG THE FILL SLOPE AND A MINIMUM OF5 FEET AWAY FROM DRAINAGE AREAS. DO NOT DEPOSIT SLASH AND DEBRIS INSIDE THE TIMBER SALE UNIT BOUNDARIES. MATERIAL WITHIN THE TIMBER SALE UNIT BOUNDARIES SHALL BE HAULED TO A DESIGNATED DISPOSAL AREA OR SCATTERED IN THE LOCATIONS OUTSIDE THE UNIT BOUNDARIES. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION.

3. ALL VEGETATION SHALL BE CUT WITHIN 6" OF THE GROUND LINE OR PROTRUDING SOLID OBJECT BEYOND THE BOTTOM OF THE DITCH AND THE ROADWAY RECONDITIONING LIMITS.

4. ALL CULVERT CATCH BASINS SHALL BE BRUSHED A MINIMUM OF 10 FOOT RADIUS FROM THE CULVERT INLET.

5. UPON COMPLETING MECHANICAL OR HAND BRUSHING OPERATIONS, ALL STICKS AND LIMBS LARGER THAN 1" IN DIAMETER AND 18" LONG SHALL BE REMOVED FROM THE DITCHLINE AND ROADSIDE AND SCATTERED 10' BEYOND THE ROADWAY.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: August 1, 2014
		SHEET: 22 OF: 35
APPROVED:	DWG NO: 23050	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: ROADSIDE BRUSHING



TYPICAL ROADWAY SECTION

NOT TO SCALE

NOTES

**1. Normal construction standards shown. Existing conditions in the field may vary depending on the actual shoulder and ditch constructed and maintained.

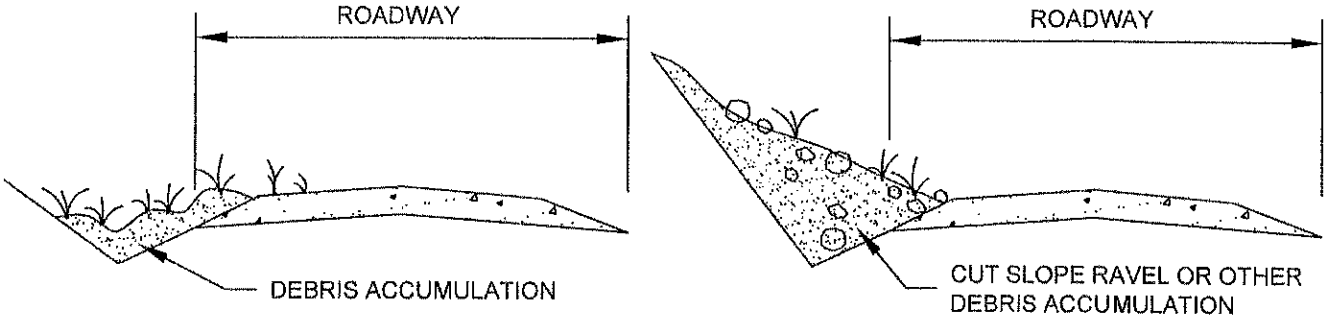
2. All culvert inlets, catch basins, and outlets shall be cleaned to allow maximum water flow.

3. All culvert outlet ditches and roadway lead-off ditches shall be cleaned and shaped to allow maximum water flow.

4. All unsuitable, excess, and oversize material generated from reconditioning the ditch or roadway shall be removed and distributed uniformly on the fill slope.

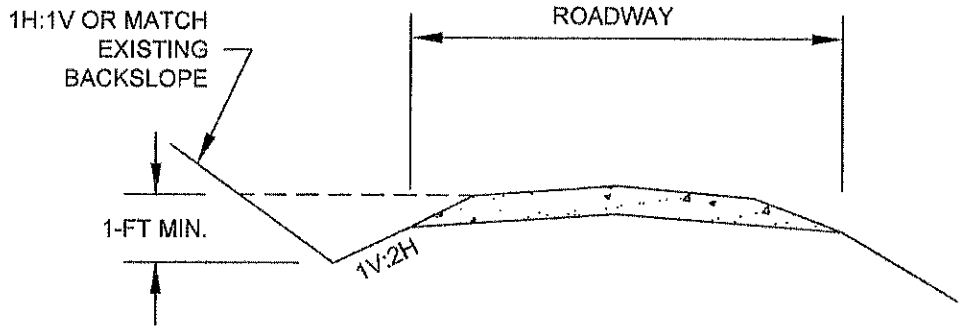
5. Roadway shoulder berms shall not be allowed.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: AUG 20, 2014
		SHEET: 23 OF: 35
APPROVED:	DWG NO: 30322	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: ROAD RECONDITIONING



TYPICAL DITCH DEBRIS/OBSTRUCTIONS

NOT TO SCALE



TYPICAL COMPLETED DITCH

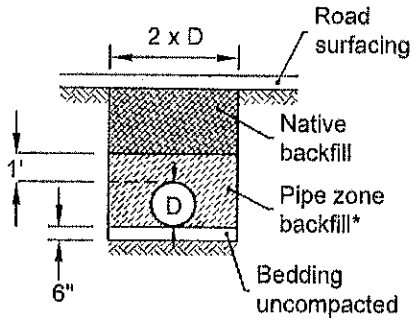
NOT TO SCALE

NOTES:

1. RESTORE DITCHES (VARIOUS TYPES) IDENTIFIED AND STAKED IN THE FIELD TO THE MINIMUM DIMENSIONS SHOWN OR MATCH EXISTING DITCH LINES.
2. LARGE ROCK, SOIL, WOOD AND OTHER MATERIALS SHALL BE REMOVED.
3. SUITABLE MATERIAL (ROCKS UP TO 2" IN GREATEST DIMENSION), MAY BE BLENDED INTO THE ROADBED OF NATIVE SURFACES AND SHOULDERS, OR PLACED IN DESIGNATED LOCATION(S) WHERE EXCESS MATERIAL IS DEPOSITED.
4. EXCESS MATERIALS TEMPORARILY STORED ON THE DITCH-SLOPE OR SHOULDER SHALL BE REMOVED DAILY.
5. LEAD-OFF DITCHES SHALL BE SHAPED AND SLOPED TO DRAIN AWAY FROM THE TRAVELED-WAY.
6. LOAD AND HAUL WASTE MATERIAL TO THE DESIGNATED DISPOSAL AREAS AS FLAGGED. CONSOLIDATE BY LUMPING WASTE MATERIAL INTO 1 LARGE PILE AND COMPACT PILE WITH TRACK WHEELED EQUIPMENT PRIOR TO SEED AND MULCHING.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: August 2, 2013
		SHEET: 24 OF: 35
APPROVED:	DWG NO: 20419	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: DITCH RECONSTRUCTION

CULVERT TYPES

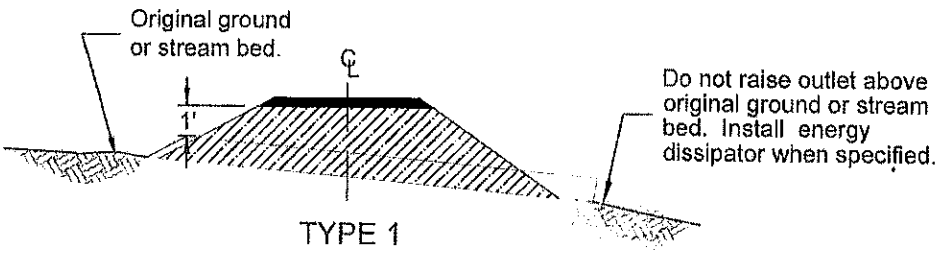


* Maximum particle size is 3", except 1-1/2" for plastic pipe

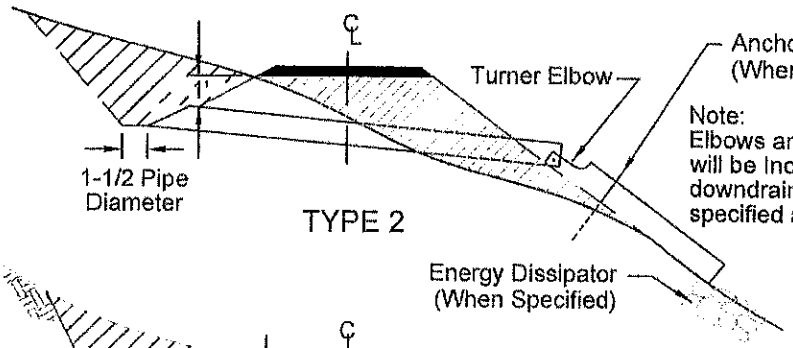
CULVERT INSTALLATION

NOTE: Pipe beds shall be constructed with a positive camber (1% of pipe length, 2% max.) before placing the pipe.

NOTE: Downhill-most section of pipe shall be full length.

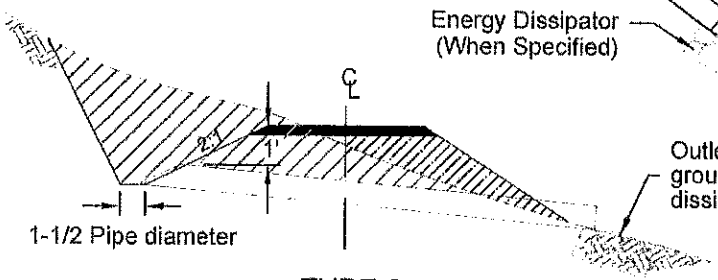


TYPE 1

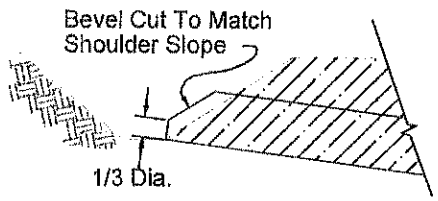


Note: Elbows and Anchors will be Incidental to the downdrain, unless specified as a Pay Item.

TYPE 2

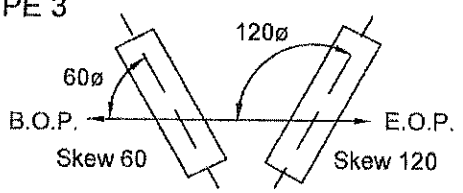


TYPE 3

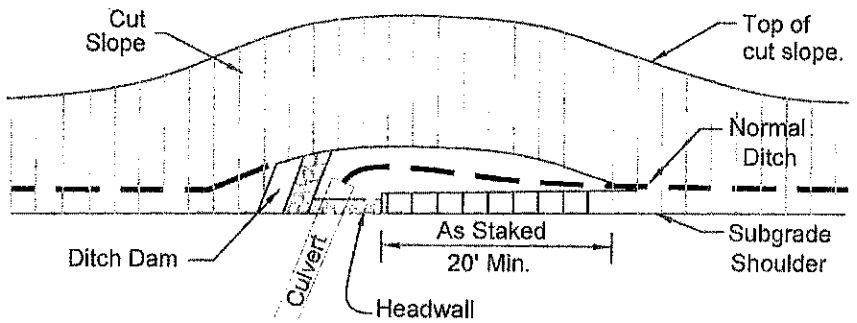


NOTE: All culverts shall be beveled at the inlet.

BEVELED INLET DETAIL



SKEW DIAGRAM



INLET CATCH BASIN DETAIL-PLAN VIEW

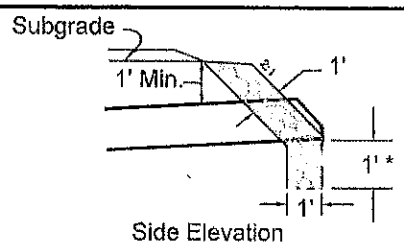
TYPE 2 & 3 CULVERT INSTALLATION

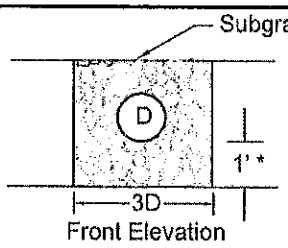
ANCHOR DESCRIPTION

Anchors (Each) shall consist of two 6' steel fence posts 1.5 lb./foot and No. 9 galvanized wire.
Posts shall be driven a minimum of 3' into the ground.
3 strands of wire shall be twisted together and encompass the entire circumference of the downpipe.
The number of Anchors sets per installation will be specified on the drawings.
1 set of Anchors will be required per 20' length of Plastic Downpipe.

NOT TO SCALE

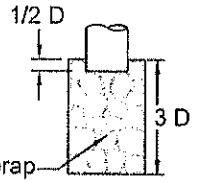
U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6	DATE: AUGUST 8, 2014	
	SHEET: 25 OF: 35	
APPROVED:	DWG NO: 60275A/B/C–1	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: DRAINAGE CONSTRUCTION DETAILS



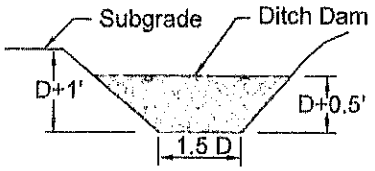


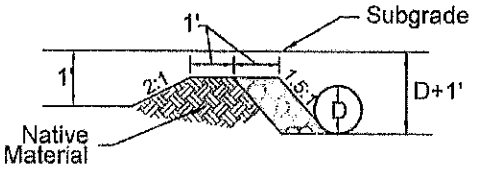
* For culvert over 24" in diameter otherwise 0'.

HAND-PLACED RIPRAP HEADWALL

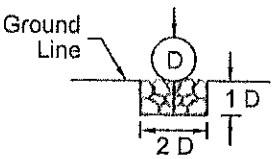


ENERGY DISSIPATOR PLAN VIEW



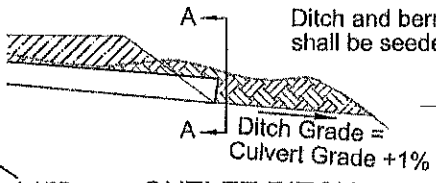


PLACED RIPRAP DITCH DAM

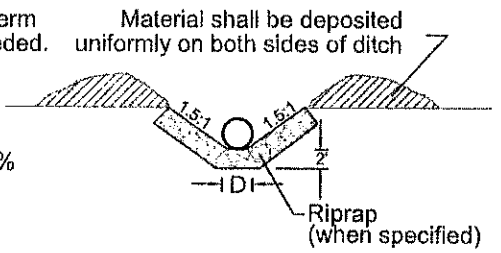


NOTE: Energy dissipator shall be installed prior to setting the culvert. Apron surface shall be left with protruding riprap for velocity break.

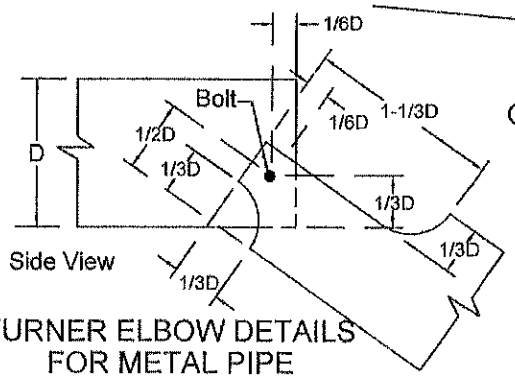
ENERGY DISSIPATOR ELEV. VIEW



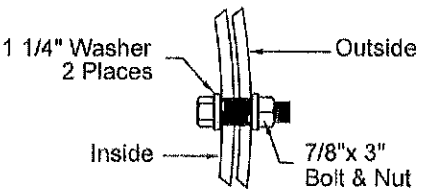
OUTLET DITCH



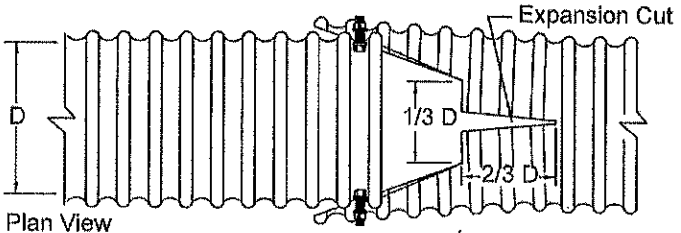
SECTION A-A OUTLET/LEAD-OFF DITCH

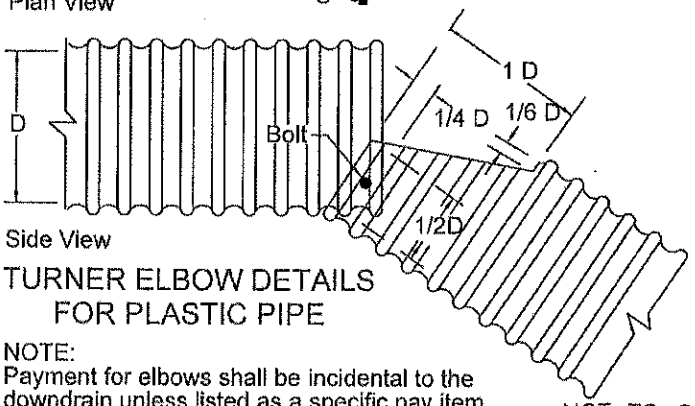


TURNER ELBOW DETAILS FOR METAL PIPE

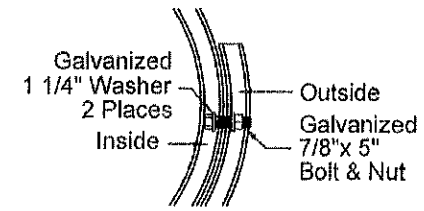


BOLT DETAIL FOR METAL PIPE





TURNER ELBOW DETAILS FOR PLASTIC PIPE

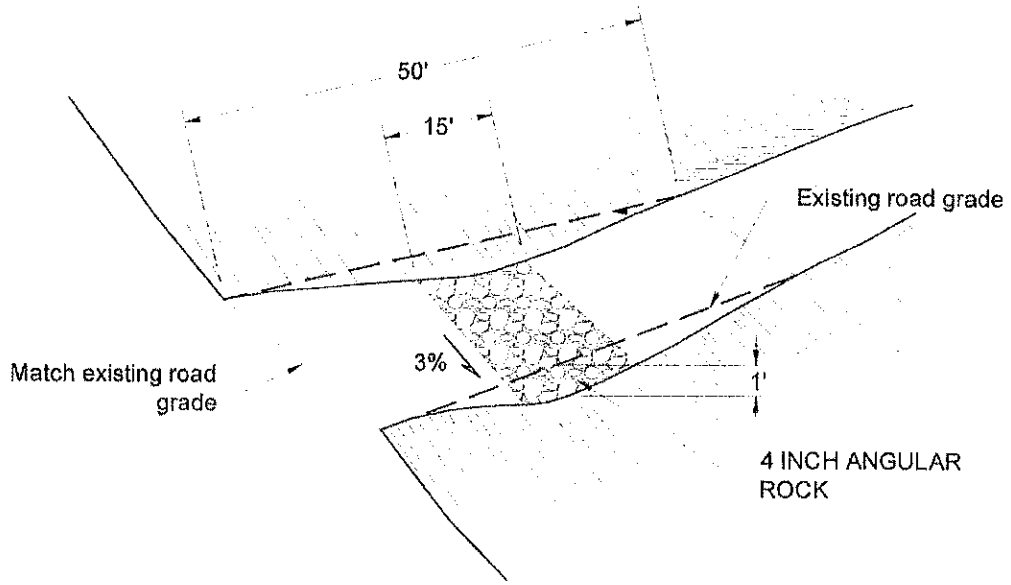


BOLT DETAIL FOR PLASTIC PIPE

NOTE:
Payment for elbows shall be incidental to the downdrain unless listed as a specific pay item.

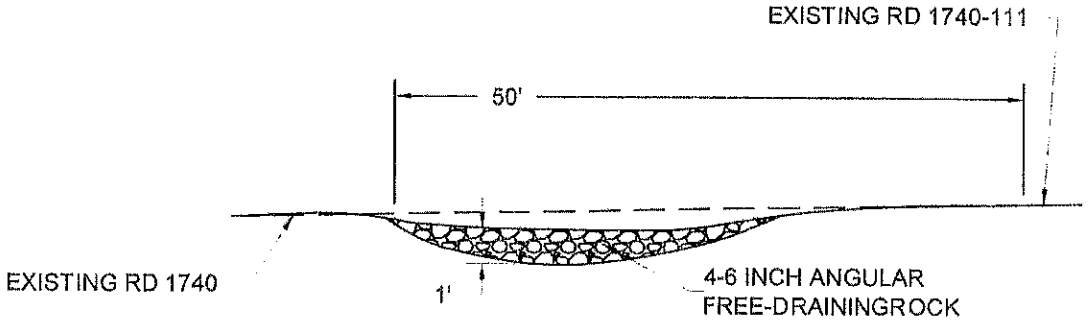
NOT TO SCALE

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: August 2, 2013	
		SHEET: 26	OF: 35
APPROVED:	DWG NO: 60275A/B/C–2	DRAWN BY: U. S. FOREST SERVICE	
Title: UPPER FINNEY THIN		FILE NAME: DRAINAGE CONSTRUCTION DETAILS	



DRIVABLE DIP 3D TYPICAL

NOT TO SCALE



DRIVABLE DIP ELEVATION VIEW

NOT TO SCALE

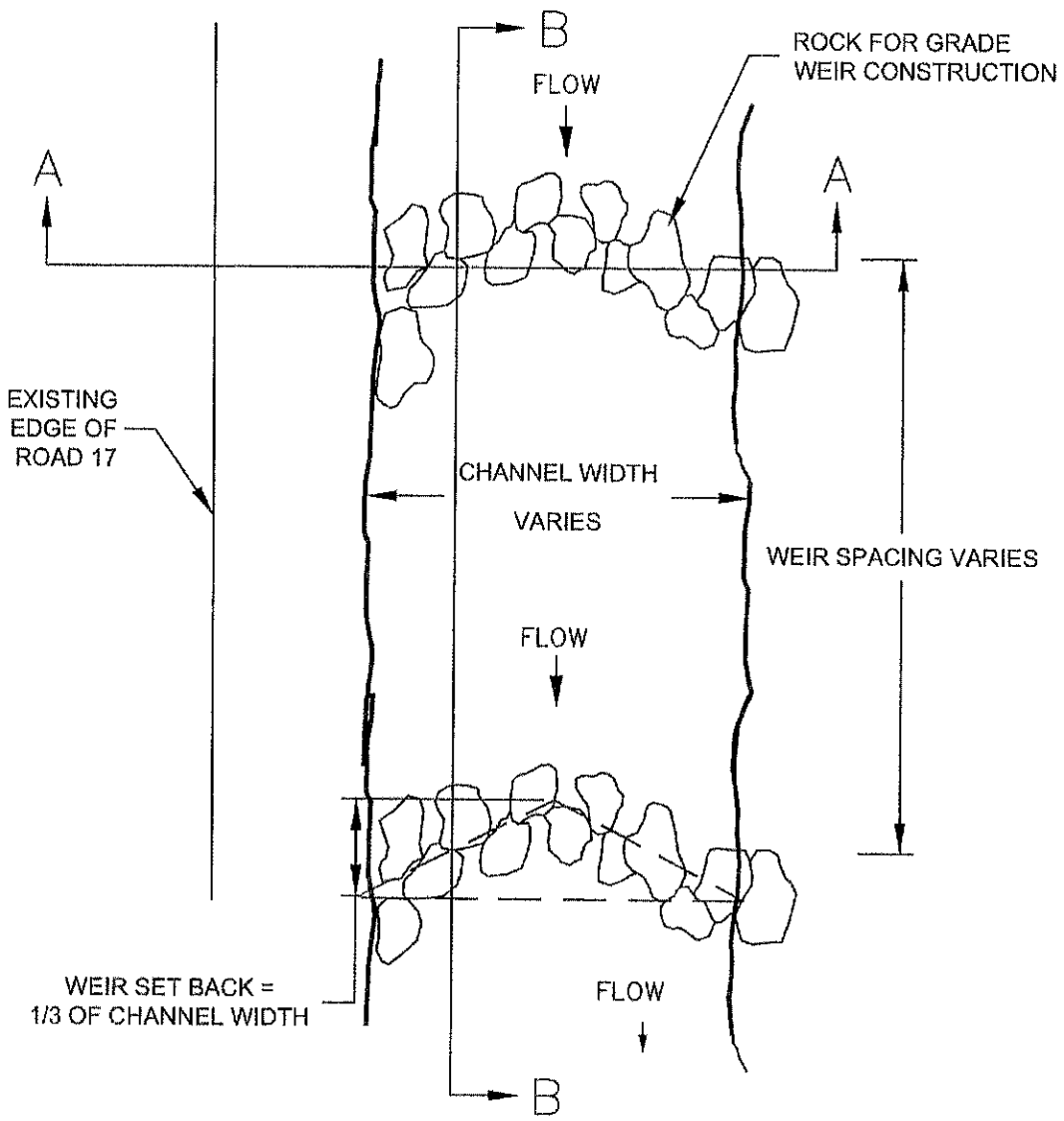
NOTES:

1. Finish dip elevation shall be constructed 1' below existing road grade.
2. Use 4-6" angular free draining rock 1' thick to line the bottom of the dip for the full width of the roadway.
3. Dip shall match alignment of exisitng dips/swales adjacent to the roadway.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: AUGUST 20, 2014
		SHEET: 27 OF: 35
APPROVED:	DWG NO: 20420	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: DRIVABLE DIP RD 1740–111

GRADE CONTROL WEIRS (1/2)

RD 17 MP 13.28



NOT TO SCALE

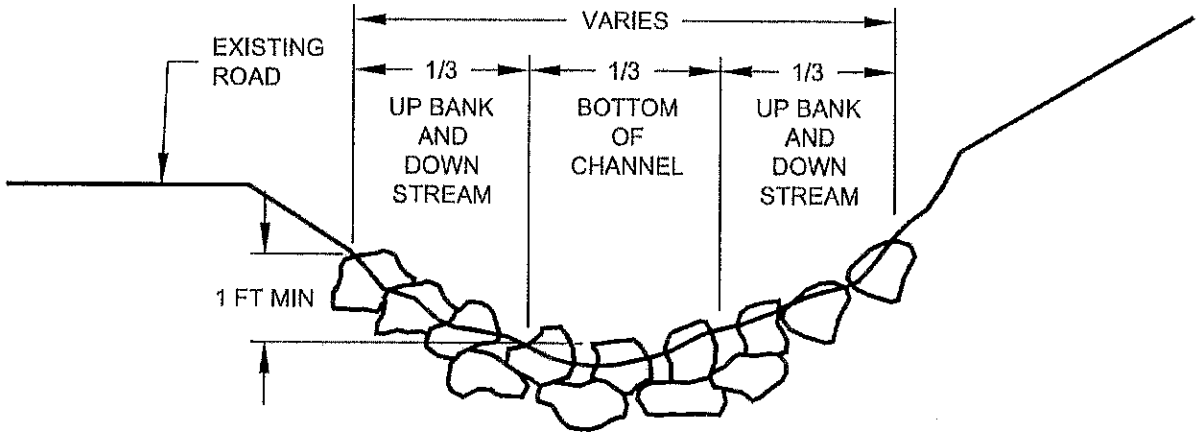
NOTES:

1. ROCK USED TO CONSTRUCT WEIRS SHALL BE 1–2 FT DIAMETER ANGULAR ROCK FROM FINNEY PIT. REQUIRES SORTING.
2. WEIRS CAN BE CONSTRUCTED BY TRENCH AND FILL METHODS BUT ALL ROCK SHALL BE KEYED IN WITH IMPACT PRESSURE PER SPEC 251.05.
3. EACH WEIR LOCATION WILL BE STAKED IN THE FIELD BY FOREST SERVICE PRIOR TO CONSTRUCTION OF WEIRS.
4. BEST MANAGEMENT PRACTICES FOR DEWATERING AND EROSION CONTROL ARE APPLICABLE.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6	DATE: JULY 29, 2014	
	SHEET: 28 OF: 35	
APPROVED:	DWG NO: 25101B–1	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: GRADE CONTROL WEIR 1 OF 2

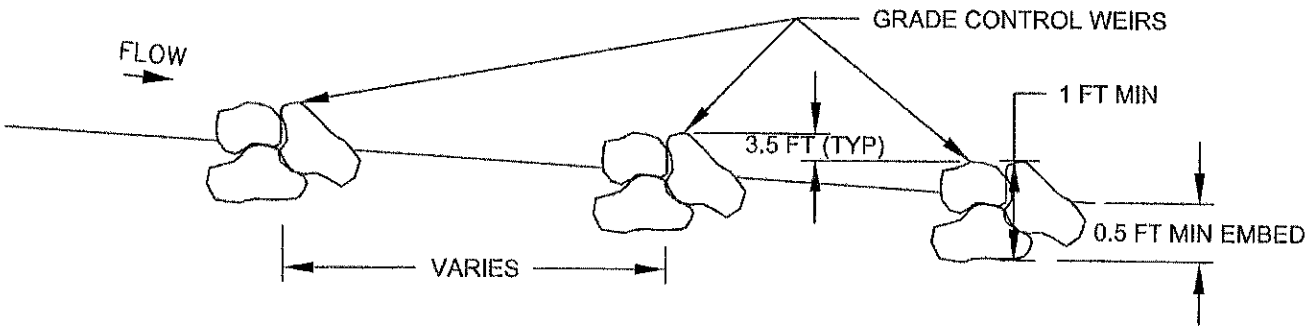
GRADE CONTROL WEIRS (2/2)

RD 17 MP 13.28



CROSS SECTION VIEW A–A

NOT TO SCALE



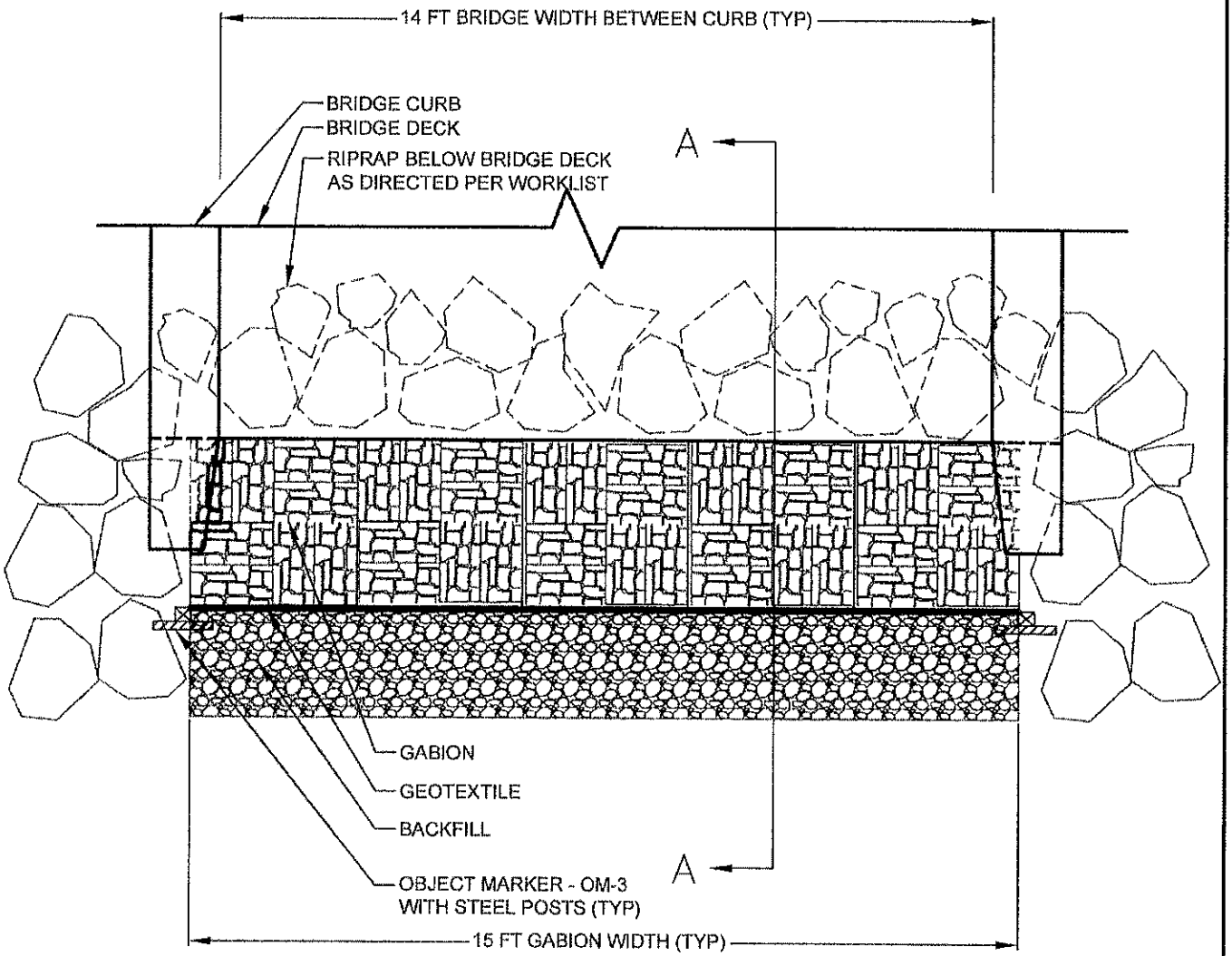
PROFILE VIEW B–B

NOT TO SCALE

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: AUG 21, 2014	
		SHEET: 29	OF: 35
APPROVED:	DWG NO: 25101B–1	DRAWN BY: U. S. FOREST SERVICE	
Title: UPPER FINNEY THIN		FILE NAME: GRADE CONTROL WEIR 2 OF 2	

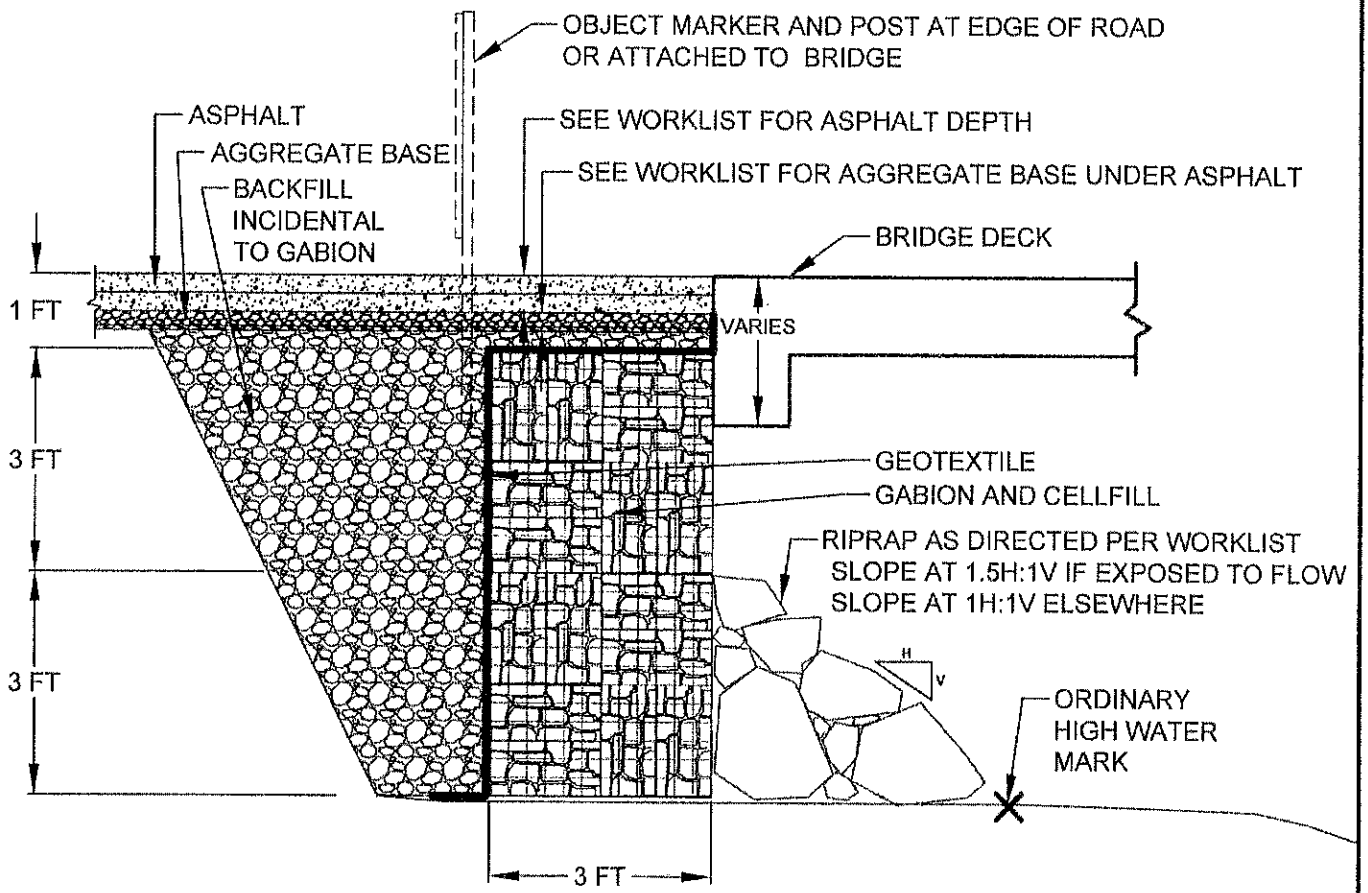
GABION PLAN DURING GABION CELLFILLING

RD 17 MP 11.5



U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: AUG 20, 2014
		SHEET: 30 OF: 35
APPROVED:	DWG NO: 25302–1	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: GABION SHEET 1 OF 2

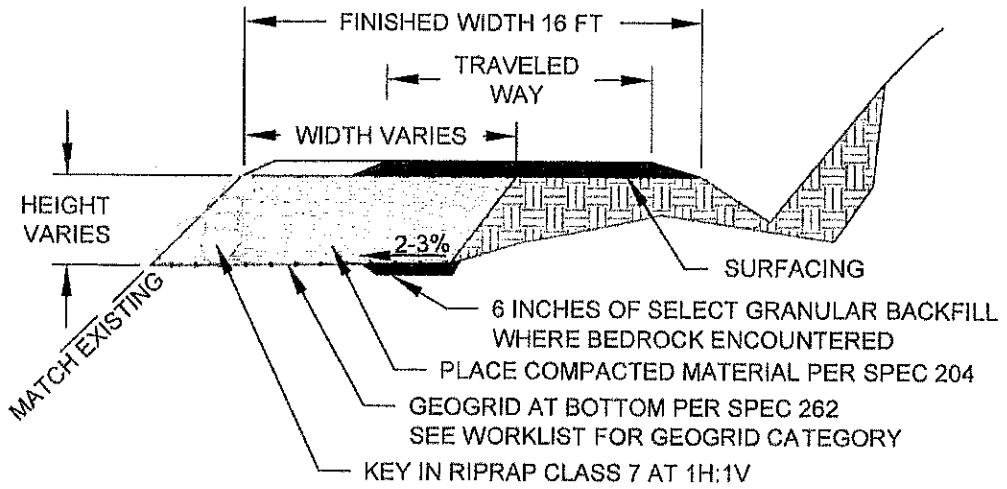
GABION SECTION A-A



NOTES:

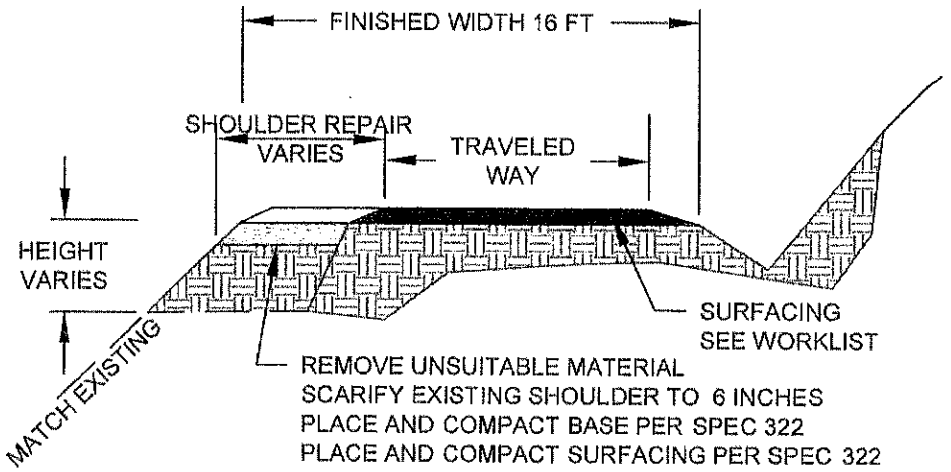
1. COMPACTION - BACKFILL AND CRUSHED AGGREGATE BASE COURSE TO BE COMPACTED TO 95% OF OPTIMAL COMPACTION ACCORDING TO AASHTO T180.
2. GABIONS SHALL BE 9-GAUGE GALVANIZED WELDED-WIRE CONSTRUCTION.
3. GEOTEXTILE 9 OZ. NON-WOVEN FABRIC SHALL BE USED TO SEPARATE BACKFILL AND BASE COURSE FROM GABIONS.
4. RIPRAP SHALL NOT EXTEND BEYOND THE EXISTING TOE OF FILL/RIPRAP. DO NOT PLACE RIPRAP BELOW THE DESIGNATED ORDINARY HIGHWATER MARK.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: AUG 20, 2014
		SHEET: 31 OF: 35
APPROVED:	DWG NO: 25302–2	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: GABION SHEET 2 OF 2



SINGLE-LAYER GEOGRID/RIPRAP EMBANKMENT REPAIRS

RD 1735 MP 1.00, 1.10 1.8
NOT TO SCALE



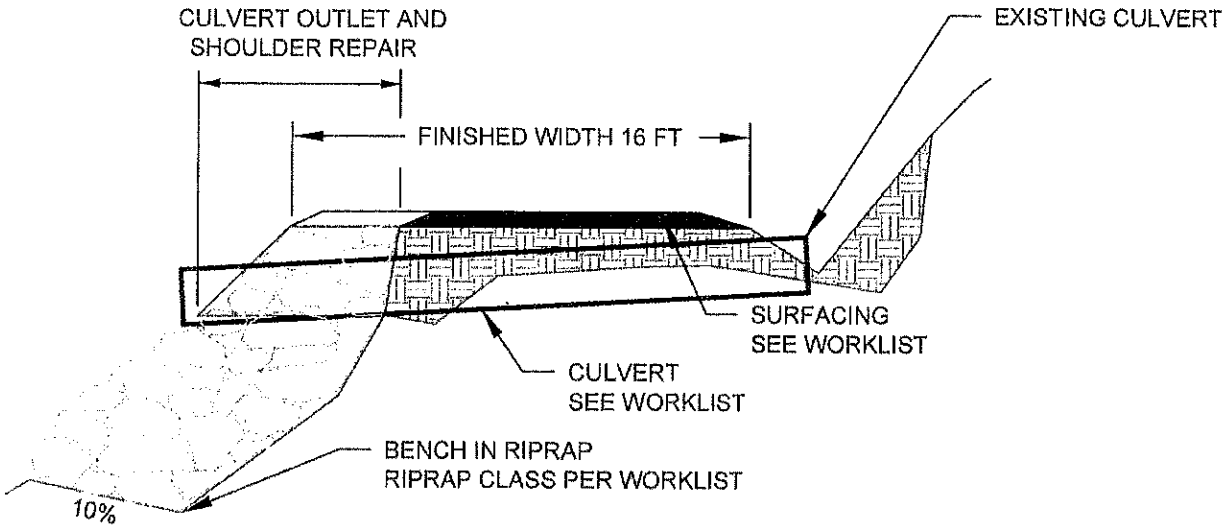
MINOR SHOULDER EMBANKMENT REPAIRS

RD 1735 MP 0.35
NOT TO SCALE

NOTES

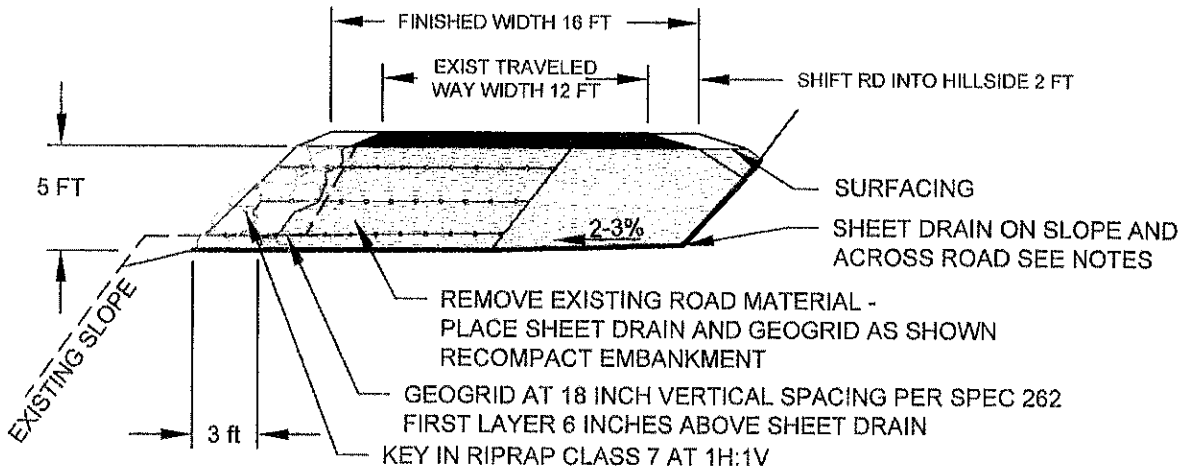
1. CONSERVE AND USE SUITABLE EXCAVATED MATERIAL AT REPAIRS.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: AUGUST 8, 2014
		SHEET: 32 OF: 35
APPROVED:	DWG NO: 25101/26201–1	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: RD 1735 EMBANKMENT REPAIRS



CULVERT SCOUR REPAIR AND/OR RIPRAP WALL

RD 1735 MP 0.35, RD 18 MP 13.85
NOT TO SCALE



3-LAYER GEOGRID/RIPRAP/SHEET DRAIN EMBANKMENT REPAIR

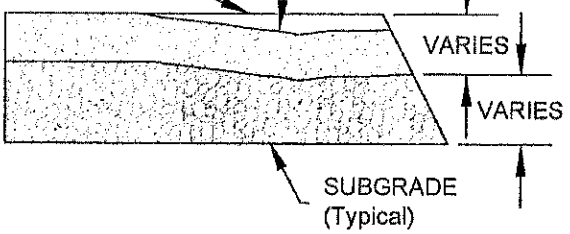
RD 18 MP 18.55
NOT TO SCALE

NOTES

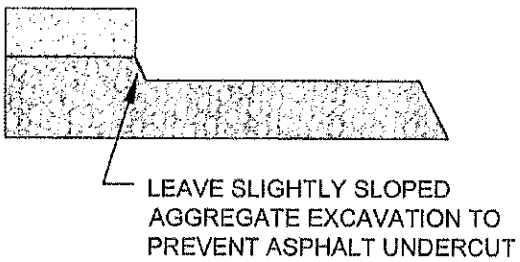
1. CONSERVE AND USE SUITABLE EXCAVATED MATERIAL AT REPAIRS.
2. PLACE UNSUITABLE EXCAVATED MATERIAL AT ROAD 1740 FINNEY PIT.
3. SHEET DRAIN TO BE AMERICAN WICK DRAIN SITEDRAIN P-180 OR APPROVED EQUIVALENT. SHEET DRAIN SHALL BE PLACED DRAIN SIDE DOWN ON SLOPE AND UP ON ROAD.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: AUGUST 20, 2014
		SHEET: 33 OF: 35
APPROVED:	DWG NO: 25101/26201–2	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: RD 18 EMBANKMENT REPAIRS

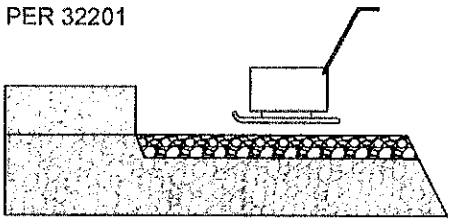
1. ORIGINAL ASPHALT (Typical) EXISTING ASPHALT (Typical)



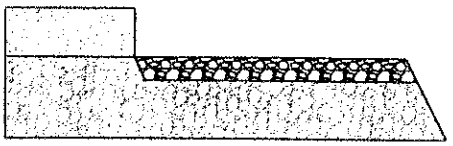
2. SAW CUT ASPHALT EDGES TO A CLEAN LINE OUTSIDE OF FAILURE. EXCAVATE AGGREGATE TO AREA OF FIRM SUPPORT. DISPOSAL PER GENERAL NOTES.



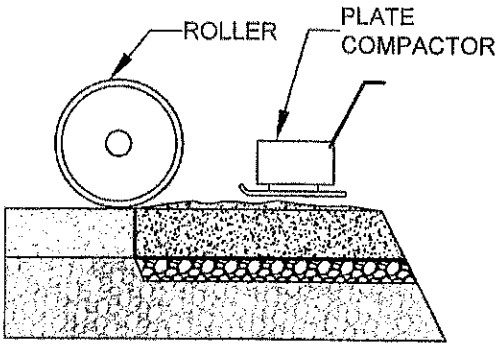
3. PLACE AND COMPACT AGGREGATE BASE PER 32201



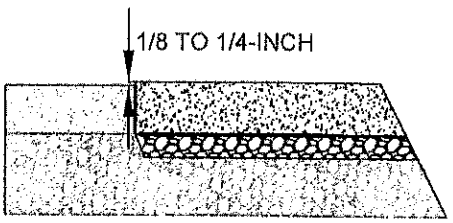
4. APPLY TACK/PRIME COAT TO ASPHALT AND AGGREGATE.



5. PLACE FULL DEPTH ASPHALT MIXTURE & COMPACT.



6. FINISHED COMPACTED ELEVATION SHALL BE 1/8 TO 1/4-INCH ABOVE THE EDGES OF THE EXISTING ASPHALT.

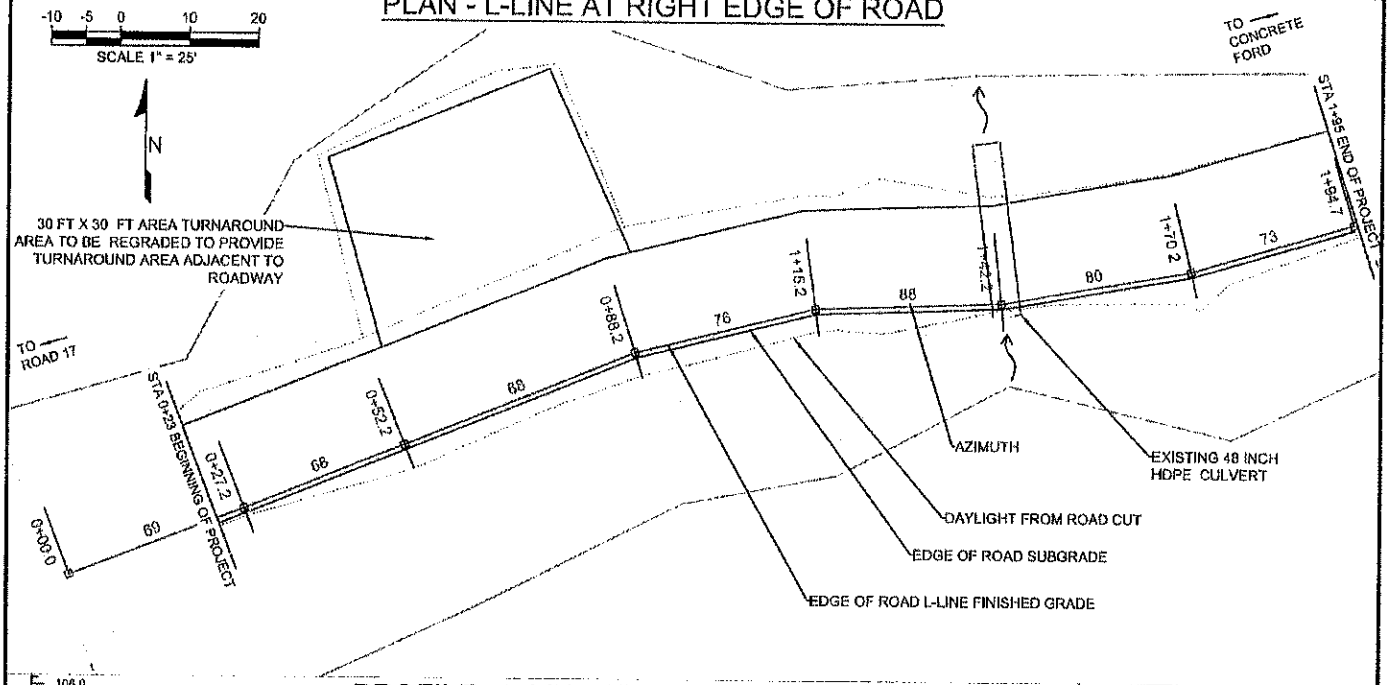


TYPICAL HOT-MIX ASPHALT PATCHING AND PAVING

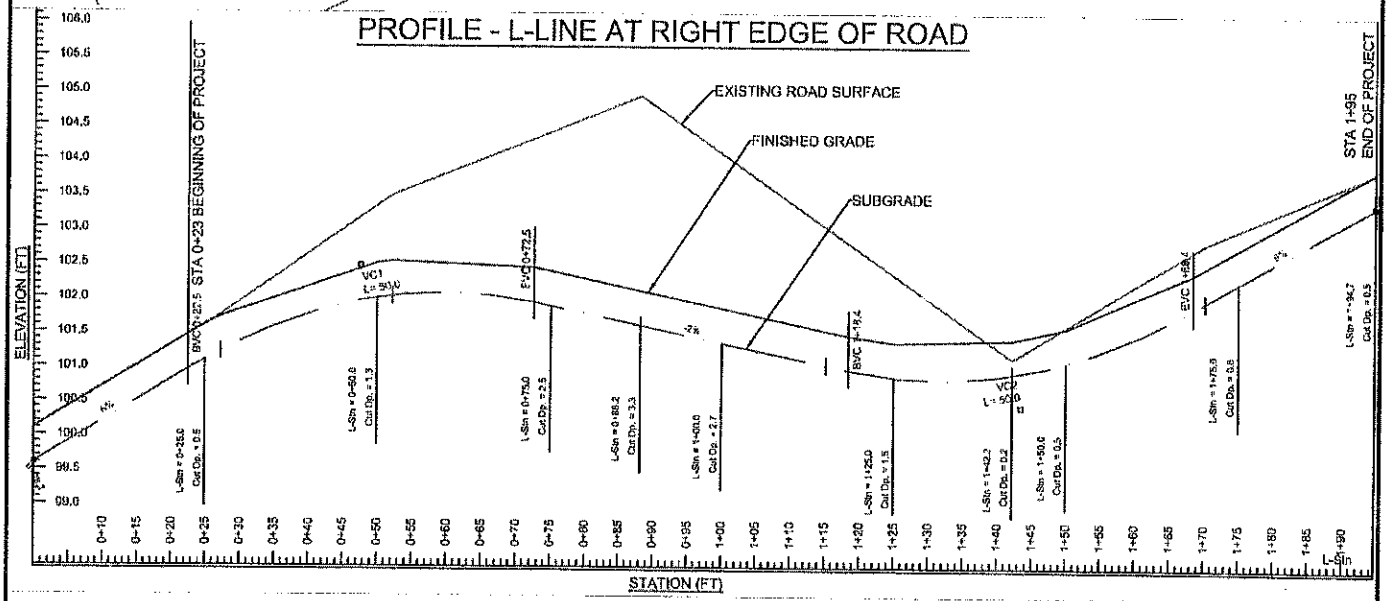
LOCATIONS AS SHOWN ON WORKSHEETS
NOT TO SCALE

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: August 20, 2014
		SHEET: 34 OF: 35
APPROVED:	DWG NO: 40401	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: ASPHALT PAVEMENT REPAIRS

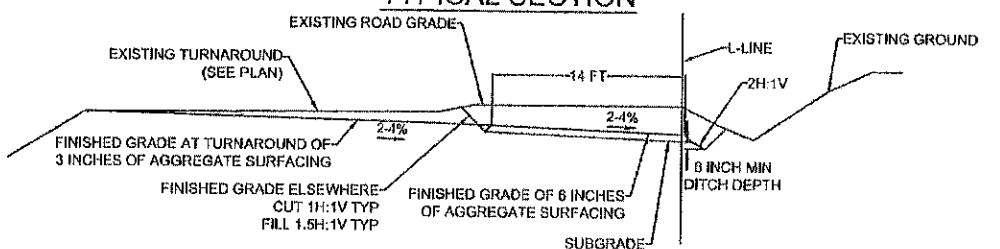
PLAN - L-LINE AT RIGHT EDGE OF ROAD



PROFILE - L-LINE AT RIGHT EDGE OF ROAD



TYPICAL SECTION



U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6	DATE: JULY 30, 2014	
	SHEET: 35 OF: 35	
APPROVED:	DWG NO: 20401B	DRAWN BY: U. S. FOREST SERVICE
Title: UPPER FINNEY THIN		FILE NAME: 1735 MP 0.66 RECONSTRUCTION

UPPER FINNEY THIN

SPECIFICATION AND SUPPLEMENTAL SPECIFICATION LIST

Road Name		Finney-Cumberland	Finney Peak	Finney Pit	Finney GS	Segelsen
Road Number		**1700**	**1735**	**1740**	**1740-111**	**1800**
Termini (Miles)		11.42 to 14.00	0.00 to 2.00	0.00 to 0.80	0.00 to 0.19	0.00 to 21.10
Construction (Miles)						
Reconstruction (Miles)		2.58	2.00	0.80	0.19	21.10
Standard Spec. or Supplemental No.	Latest Revision Date	Specifications that are referenced by other specifications are not listed below. "X" denotes applicable standard specs. or Forest Service Supplemental specifications.				
Standard Specification	2003					
Preface	3/15/04	X	X	X	X	X
101-109	2003	X	X	X	X	X
101.01	1/22/09	X	X	X	X	X
101.03	6/16/06	X	X	X	X	X
101.04	3/29/07	X	X	X	X	X
102.00	2/16/05	X	X	X	X	X
103.00	2/16/05	X	X	X	X	X
104.00	6/16/06	X	X	X	X	X
104.06	2/17/05	X	X	X	X	X
105.02	1/18/07	X	X	X	X	X
105.05	5/12/04	X	X	X	X	X
106.07	5/11/04	X	X	X	X	X
107.05	5/11/04	X	X	X	X	X
107.06	6/16/06	X	X	X	X	X
107.09	6/16/06	X	X	X	X	X
107.10	6/16/07	X	X	X	X	X
108.00	2/16/05	X	X	X	X	X
109.00	2/17/05	X	X	X	X	X
109.02	6/16/06	X	X	X	X	X
151.00	2003	X	X	X	X	X
155.00	5/11/04	X	X	X	X	X
201.00	2003	X	X	X	X	X
201.01	2/18/05	X	X	X	X	X
201.04	2/18/05	X	X	X	X	X
201.04	2/22/05	X	X	X	X	X
203.00	2003		X			
203.01	2/25/05		X			
203.04	2/18/05		X			
203.05	2/18/05		X			
204.00	3/26/09	X	X	X	X	X
209.00	2003	X	X			
209.10	10/23/07	X	X			
209.11	2/24/05	X	X			
Table 209-1	2/24/05	X	X			
230.00	10/11/06	X	X	X	X	X
251.00	8/5/09	X	X			X
251.03	8/5/09	X	X			X
253.00	2003	X				
262.00	2003		X			X
303.00	5/11/07	X	X	X	X	X
322.00	10/14/11	X	X		X	X

Road Name		Finney-Cumberland	Finney Peak	Finney Pit	Finney GS	Segelsen
Road Number		**1700**	**1735**	**1740**	**1740-111**	**1800**
Termini (Miles)		11.42 to 14.00	0.00 to 2.00	0.00 to 0.80	0.00 to 0.19	0.00 to 21.10
Construction (Miles)						
Reconstruction (Miles)		2.58	2.00	0.80	0.19	21.10
Standard Spec. or Supplemental No.	Latest Revision Date	Specifications that are referenced by other specifications are not listed below. "X" denotes applicable standard specs. or Forest Service Supplemental specifications.				
Standard Specification	2003					
404.00	2003	X				
602.00	2003		X			
602.03	9/26/05		X			
602.06	8/5/09		X			
605.00	2003					X
607.00	2003			X	X	
625.00	2003	X	X	X	X	X
625.03	7/22/07	X	X	X	X	X
625.04	7/22/07	X	X	X	X	X
625.04	2/25/06	X	X	X	X	X
625.05	7/22/07	X	X	X	X	X
625.05	3/30/05	X	X	X	X	X
625.06	7/22/07	X	X	X	X	X
625.07	7/22/07	X	X	X	X	X
625.08	7/22/07	X	X	X	X	X
625.09	7/22/07	X	X	X	X	X
625.11	7/22/07	X	X	X	X	X
633.00	2003	X	X			X
633.03	3/3/05	X	X			X
633.05	3/3/05	X	X			X
634.00	2003	X	X			
651.00	2003			X		

FOREST SERVICE SUPPLEMENTAL SPECIFICATIONS

Table of Contents

Preface

Preface_wo_03_15_2004_m

Delete all but the first paragraph and add the following:

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

101 - Terms, Format, and Definitions

101.00_nat_us_07_25_2005

101.01_nat_us_01_22_2009

101.01 Meaning of Terms

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

101.03_nat_us_06_16_2006

101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	National Institute of Standards and Technology
NESC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau

Add the following to (b) SI symbols:

mp	Milepost
ppm	Part Per Million

101.04_nat_us_03_29_2007

101.04 Definitions.

Delete the following definitions and substitute the following:

Bid Schedule--The Schedule of Items.

Bridge--No definition.

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

Culvert--No definition.

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

Add the following:

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

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

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

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

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

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

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

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

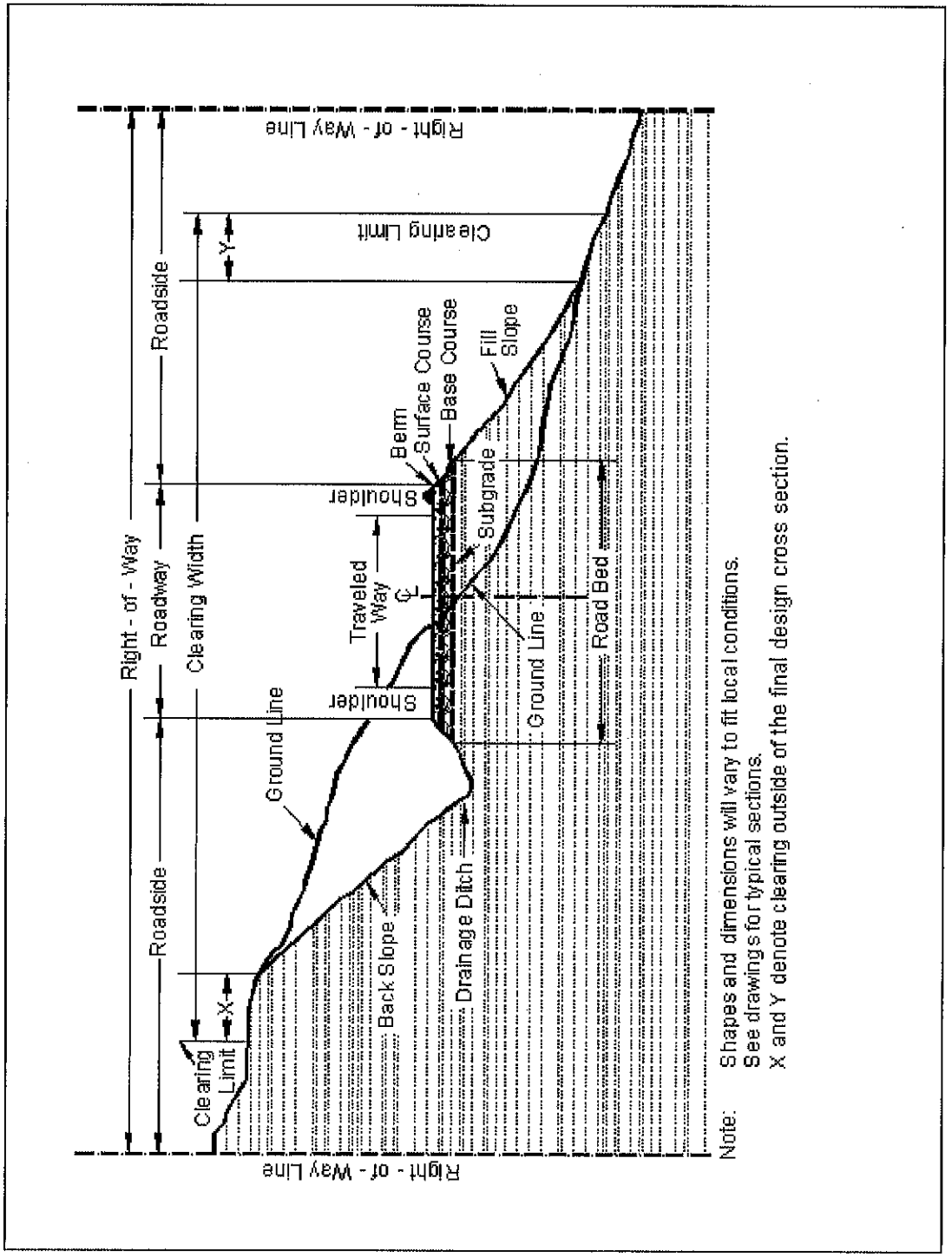
Road Order--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

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

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

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

Figure 101-1—Illustration of road structure terms.



102 - Bid, Award, and Execution of Contract

102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.

103 - Scope of Work

Deletions

Delete all but subsection 103.01 Intent of Contract.

104 - Control of Work

104.00_nat_us_06_16_2006

Deletions

Delete Sections 104.01, 104.02, and 104.04.

104.06_nat_us_02_17_2005

Add the following subsection:

104.06 Use of Roads by Contractor

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

105 - Control of Material

105.02_nat_us_01_18_2007

105.02 Material Sources.

105.02(a) Government-provided sources.

Add the following:

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

105.05_nat_us_05_12_2004

105.05 Use of Material Found in the Work.

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

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

106 - Acceptance of Work

106.07 Delete

Delete subsection 106.07.

107 - Legal Relations and Responsibility to the Public

107.05_nat_us_05_11_2004

107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06_nat_us_06_16_2006

107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.

"except as provided in Subsection 106.07".

107.09_nat_us_06_16_2006

107.09 Legal Relationship of the Parties.

Delete the entire subsection.

107.10_nat_us_06_16_2006

107.10 Environmental Protection.

Add the following:

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

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

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

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

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

108 - Prosecution and Progress

108 Delete.

Delete Section 108 in its entirety.

109 - Measurement and Payment

109.00_nat_us_02_17_2005

109 Deletions

Delete the following entire subsections:

109.06 Pricing of Adjustments.

109.07 Eliminated Work.

109.08 Progress Payments.

109.09 Final Payment.

109.02_nat_us_06_16_2006

109.02 Measurement Terms and Definitions.

(b) Contract quantity.

Add the following:

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

Change the following:

"(b) Cubic yard" to "(c) Cubic yard".

Add the following definition:

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

151 - Mobilization

151.01_0105_us_05_04_2007

151.01 Description

Add the following at the end of the last sentence:

"Work also includes cleaning of all equipment used at the project site. Clean all construction equipment prior to entry on the project site. Remove all dirt, plant parts and material that may carry noxious weed seeds into the area. Only construction equipment inspected by the Forest Service will be allowed to operate within the project area. Treat subsequent move-ins of equipment the same as the initial move-in. Clean truck beds and dump boxes hauling to the project site prior to entering the work area."

155 - Schedules for Construction Contracts

155 Delete.

Delete Section 155 in its entirety.

201 - Clearing and Grubbing

201.00_nat_us_08_05_2009

201.02 Material:

Delete Tree wound dressing material reference.

201.03 General.

Delete the last sentence.

201.04 Clearing.

Delete the last sentence of (d).

201.01_nat_us_02_18_2005

201.01 Description

Replace with the following

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

201.04_nat_us_02_22_2005

201.04 Clearing. (c)

Delete paragraph (c) and replace with the following:

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

201.04 Clearing.

Delete subsection (d) and replace with the following:

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

Add the following:

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

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

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_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 Payment

Add the following:

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

204 - Excavation and Embankment

Replace Section 204 in its entirety with the following:

Description

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

204.02 Definitions.

(a) Excavation. Excavation consists of the following:

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

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

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

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

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

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

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

Material

204.03 Conform to the following Subsections:

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

Construction Requirements

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

204.05 Reserved.

204.06 Roadway Excavation. Excavate as follows:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(1) Reduce rock to less than 48 inches in the largest dimension.

(2) Distribute rock within the embankment to prevent nesting.

(3) Place layers of embankment material around each rock to a depth not greater than that permitted by (b) above. Fill all the voids between rocks.

(4) Compact each layer according to Subsection 204.11 before placing the next layer.

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

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

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

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

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

(a) Four roller passes of a vibratory roller having a minimum dynamic force of 40,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.
(b) Eight roller passes of a 20-ton compression-type roller.
(c) Eight roller passes of a vibratory roller having a minimum dynamic force of 30,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(b) Stepped slopes. Where required by the contract, construct steps on slopes of 1⅓V:1H to 1V:2H. Construct the steps approximately 18 inches high. Blend the steps into natural ground at the end of the cut. If the slope contains nonrippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

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

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

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

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

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

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

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

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

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

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

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

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

Measurement

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

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

(1) Include the following volumes in roadway excavation:

(a) Roadway prism excavation;
(b) Rock material excavated and removed from below subgrade in cut sections;
(c) Unsuitable material below subgrade and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
(d) Ditches, except furrow ditches measured under a separate bid item;
*(e*Topsoil;
(f) Borrow material used in the work when a pay item for borrow is not shown in the bid schedule;
(g) Loose scattered rocks removed and placed as required within the roadway;
(h) Conserved material taken from stockpiles and used in Section 204 work; and
(i) Slide and slipout material not attributable to the Contractor's method of operation.

(2) Do not include the following in roadway excavation:
(a) Overburden and other spoil material from borrow sources;
(b) Overbreakage from the backslope in rock excavation;
(c) Water or other liquid material;
(d) Material used for purposes other than required;
(e) Roadbed material scarified in place and not removed;
(f) Material excavated when stepping cut slopes;
(g) Material excavated when rounding cut slopes;
(h) Preparing foundations for embankment construction;
(i) Material excavated when benching for embankments;
(j) Slide or slipout material attributable to the Contractor's method of operation;
(k) Conserved material taken from stockpiles constructed at the option of the Contractor; and
(l) Material excavated outside the established slope limits.

(3) When both roadway excavation and embankment construction pay items are shown in the bid schedule, measure the following as roadway excavation only:
(a) Unsuitable material below subgrade in cuts and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
(b) Slide and slipout material not attributable to the Contractor's method of operations; and
(c) Drainage ditches, channel changes, and diversion ditches.

(b) Unclassified borrow, select borrow, and select topping. When measuring by the cubic yard measure in its original position. If borrow excavation is measured by the cubic yard in place, take initial cross-sections of the ground surface after stripping overburden. Upon completion of excavation and after the borrow source waste material is returned to the source, retake cross-sections before replacing the overburden.
Do not measure borrow excavation used in place of excess roadway excavation.

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

(1) Include the following volumes in embankment construction:
(a) Roadway embankments;
(b) Material used to backfill subexcavated areas, holes, pits, and other depressions;
(c) Material used to restore obliterated roadbeds to original contours; and
(d) Material used for dikes, ramps, mounds, and berms.

(2) Do not include the following in embankment construction:
(a) Preparing foundations for embankment construction;
(b) Adjustments for subsidence or settlement of the embankment or of the foundation on which the embankment is placed; and
(c) Material used to round fill slopes.

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

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

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

Payment

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

Table 204-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Topping (704.05) & unclassified borrow (704.06)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type	Processed material before incorporating in work	Yes, when requested	Before using in work
		Moisture-density	—	AASHTO T 180, method D[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 the grade change is greater than or equal to 10 percent. The centerline grade is not to exceed 20 percent in 100 feet of length.

209 - Structure Excavation and Backfill

Section 209A. — STRUCTURE EXCAVATION AND BACKFILL FOR SELECTED MINOR STRUCTURES

Description

209A.01 This work consists of excavating, preparing foundations, backfilling, and subsequent removal of safety features for the construction of selected structures with or without a geogrid reinforcing mesh and welded wire facing.

Material

209A.02 Conform to the following Subsections:

Crushed Aggregate	703.06
Backfill Material	704.03
Structural backfill	704.04
Geotextile type I-D	714.01
Geogrids, Category 1, 2, 3, 4, 5 or 6	714.03
Welded wire form	720.01(b)

Construction Requirements

209A.03 Preparation for Structure Excavation. Clear the area of vegetation and obstructions according to Sections 201 and 203.

209A.04 General. Excavate trenches or foundation pits to a width and length that allows room for work. When excavation is complete obtain written approval of the foundation. Ensure the foundation is firm with uniform density throughout its length and width. Foundation grade is the elevation at the bottom of any bedding for installing the structure.

Where necessary to blast rock, blast according to Section 205.

Follow OSHA safety regulations (29 CFR, Part 1926, Subpart P, Excavation) for sloping the sides of excavations, using shoring and bracing, and for using other safety features. When sides of excavations are sloped for safety considerations, provide one copy of the design that demonstrates conformity with OSHA regulations. Where support systems, shield systems, or other protective systems are to be used, design the shoring according to Section 562 and submit working drawings and construction details according to Subsection 104.03.

Remove safety features when no longer necessary. Remove shoring and bracing to at least 2 feet below the surface of the finished ground.

Saw cut or mill existing pavements or concrete structures adjacent to the area to be excavated that are designated to remain.

Do not deposit excavated material in or near a waterway. Do not stockpile excavated material or allow equipment closer than 2 feet from the edge of the excavation.

Dispose of unsuitable or excess material at designated sites or legally off the project. If approved, suitable excavated material may be used as backfill material or structural backfill.

Remove all water as necessary to perform work.

Survey minor structures according to Subsection 152.03 (e) and (i), and verify the limits of the structure. Survey and establish controls within $\pm$ 0.16 feet. Grade the foundation for a width equal to the length of the bottom geogrid layer.

209A.05 Foundation Preparation. Excavate any unsuitable material below foundation grade, and replace it with backfill material. Place backfill material in horizontal layers that, when compacted, do not exceed 6 inches in depth. Compact each layer according to Subsection 210.07.

Compact the foundation prior to placing backfill in Subsection 210.06

209A.06 Backfill. Place leveling course with crushed aggregate on the foundation grade when required. Backfill with structural backfill material. Place backfill in horizontal layers that do not exceed 6 inches in compacted thickness. Compact each layer according to Subsection 210.07.

Bring structural backfill up evenly on all sides of the structure as appropriate. Extend each layer to the limits of the excavation or to natural ground.

Ensure when placing the geotextile or geogrid layers that there are no voids below the layer. When placing geotextiles overlap the geotextile a minimum of one foot. When placing geogrid no overlap is required but ensure no gap between adjoining sheets is larger than one-inch. Do not operate equipment directly on top of or damage the welded wire form facing, geotextile, or geogrid elements. Place the geotextile and geogrid smooth and free of wrinkles or folds. Correct all damaged, misaligned, or distorted structure elements. Repair all damage to galvanized coating before installation.

Do not deviate from the design batter of the welded wire form by more than 1 inch per 10 feet of structure height.

209A.07 Compacting. 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 inplace density and moisture content according to AASHTO T 310 or other approved test procedures.

Do not apply density requirements as measured by AASHTO T 310 to material that is incapable of being tested or compacted to maximum values determined by AASHTO T 99. For these materials, fill the voids around the rock in each layer with earth or other fine material. Compact each layer, full width, until there is no visible evidence of further consolidation, with a vibratory steel wheeled roller with a mass of at least 8 tons.

In places not accessible to the rollers compact with alternative equipment to obtain the required compaction requirements.

209A.08 Acceptance. See Table 210-1 for sampling and testing requirements.

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

Survey work will be evaluated under Subsection 106.02 and 106.04.

Material for the backfill material and structural backfill will be evaluated under Subsections 106.02 and 106.04.

Structure excavation and backfill work will be evaluated under Subsections 106.02 and 106.04.

Shoring and bracing will be evaluated under Subsections 106.02 and 106.04.

Welded wire forms, geotextiles, and geogrids will be evaluated under Subsection 106.02 and 106.03.

Placement of welded wire forms, geotextiles, and geogrids will be evaluated under Subsection 106.02 and 106.04.

Measurement

209A.09 Measure the Section 210 items listed in the bid schedule according to Subsection 109.02 and the following.

Measure structural excavation by the cubic yard in its original position according to Subsections 204.16 (a) (1) and (2). Do not include the following volumes in structure excavation:

(a) Any material included within the staked limits of the excavation, such as contiguous channel changes and ditches, for which measurement is covered under other sections; or

(b) Material rehandled, except when the contract specifically requires excavation after embankment placement.

Measure backfill material and structural backfill by the cubic yard in place for the volume placed according to Subsection 204.16 (c).

Measure geotextile by the horizontal and vertical dimensions.

Payment

209A.10 The accepted quantities measured as provided in Subsection 109.02 and above, will be paid at the contract price per unit of measurement for the Section 210 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Payment for structure excavation, shoring, and bracing will be full compensation for excavation to a depth of 6 feet below the lowest elevation shown on the plans for each minor structure. When the excavation exceeds 6 feet, either the Contractor or the CO may request an equitable price adjustment for the depth in excess of 6 feet.

209.10 Backfill.

(a) General.

Add the following:

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

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

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

(b) Pipe culverts.

(1) Pipe culverts with compacted backfill.

Add the following:

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

209.11 Compacting.

Delete the subsection and add the following:

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

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

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

Method C. Determine optimum moisture content and maximum density according to AASHTO T 99 method C. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact material placed in all layers to at least 95 percent of the maximum density. Determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

Table 209-1 Sampling and Testing Requirements
Add the following:

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

230 - Roadside Brushing

Description

230.01 Work. This work consists of removing all vegetative material including limbs, residual slash, live roadside brush, and small trees within the brushing limits designated on the plans.

Construction

230.02 Brushing. Cut all brush and small trees (6 inches diameter, or less, at the point of cut) inside the brushing limits and outside the roadbed no higher than 4 inches above ground level (6 inches for machine brushing). If rocks or other obstructions are encountered, cut no higher than 6 inches above the obstruction. Limb live trees with a diameter larger than 6 inches to provide a clear height of 14 feet above the road surface.

Cut all brush and trees located on the roadbed as nearly flush to the road surface as possible so stumps will not become a hazard to vehicle tires.

230.03 Windfalls. Limb windfalls lying within or across the brushing limits, cut off at the top of the existing cut slope or 5 feet from the shoulder on the fill slope. Dispose of windfall material as slash.

230.04 Road Junctions. Do not deposit brushing debris on the roadway of adjoining roads.

230.05 Slash Treatment. Scatter slash outside the brushing limits without damaging residual trees. Slash is defined as any material that has a length greater than 36 inches or a diameter greater than 2 inches at any point. Do not deposit material in streams, streambeds, culvert inlets or outlets, drainage ways, or cattle guards.

230.06 Acceptance. Roadside brushing will be evaluated under Subsection 106.02.

Measurement

230.07 Method. Measure the Section 230 items listed in the bid schedule according to Subsection 109.02 and the following.

Linear measurements will be horizontal along the road centerline.

Quantities will be the number of miles (or stations) and fractions thereof along the road centerline.

Payment

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

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.

262 - Reinforced Soil Embankment

Description

262.01 This work consists of constructing reinforced soil embankments.

Material

262.02 Conform to the following Subsections:

Geogrid, category 1,2,3,4,5,or 6	714.03
Structural backfill	704.04
Select granular backfill	704.10
Reinforcing mesh	720.01(h)

Construction Requirements

262.03 General. Before beginning work, submit a work plan for acceptance. Allow at least 3 days for acceptance. Include procedures for stretching and staking the geogrid.

Excavate according to Section 209. Grade the foundation for a width equal to the length of reinforcing elements plus 18 inches. Where the embankment is set on a rocky foundation, place 6 inches of select granular backfill under the geogrid or reinforcing mesh. Dispose of unsuitable or excess excavation material according to Subsection 204.14.

The final limits and configuration of the excavation may vary, depending on the foundation materials encountered during excavation.

262.04 Reinforcing Elements. Place soil reinforcing elements at the specified elevation and alignment. Orient the reinforcing elements so that the maximum tensile strength available is in the direction of specified primary reinforcement.

Do not splice reinforcement elements in the primary direction. Overlap geogrids three ribs in the direction transverse to the primary direction, and attach with hog rings or other approved methods. Overlap reinforcing mesh one rib in the direction transverse to the primary direction.

Prevent wrinkle development or slippage of reinforcement elements during fill placement and spreading.

262.05 Backfilling. Install the base of the reinforced embankment within + 4 inches of the plan elevation or as directed by the CO. Backfill the stabilized volume with specified structural backfill or select granular backfill according to Subsection 209.10. Ensure that no voids exist below the geogrids or reinforcing mesh. Compact each layer according to Subsection 209.11, method (b). Do not use sheepsfoot rollers for compaction.

Do not damage or disturb the reinforcing elements. Do not operate equipment on the embankment with less than 6 inches of fill on top of the geogrid or reinforcing mesh. Correct all damaged, misaligned, or distorted reinforcing elements.

Backfill and compact behind the stabilized volume with structural backfill according to Subsection 209.10 and 209.11, method (b). At the end of each day's operation, slope the last lift of backfill away from the embankment face to direct surface runoff away from the face. Do not allow surface runoff from adjacent areas to enter the embankment construction area.

262.06 Embankment Slope Treatment. Treat the face of the reinforced slope for erosion control in according to Section 157.

262.07 Acceptance. Reinforcing elements will be evaluated under Subsections 106.02 and 106.03.

Construction of reinforced soil embankments and services will be evaluated under Subsections 106.02 and 106.04.

Select granular backfill and structural backfill will be evaluated under Subsections 106.02 and 106.04. See Table 262-1 for sampling and testing requirements.

Measurement

262.08 Measure the items listed in the bid schedule according to Subsection 109.02 and the following.

Measure reinforcing elements by the square yard in place.

Measure select granular backfill within the stabilized volume by the cubic yard in place.

Payment

262.09 The accepted quantities, measured as provided in Subsection 109.02 and above, will be paid at the contract price per unit of measurement for the Section 262 pay item listed in the bid

schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 262-1 Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Backfill (704)	Measured and tested for conformance (106.04)	Classification	AASHTO M 145	One per soil type	Source of material	Yes	Before using in work
		Gradation	AASHTO T 27 & AASHTO T 11	"	"	"	"
		Moisture-Density	AASHTO T 180 Method D(1) or T99 Method C(1)	"	"	"	"
		Compaction	AASHTO T 310 or other approved procedures	Minimum two per Lift	In-place	–	Before placing next layer

(1) Minimum of 5 points per proctor.

303 - Road Reconditioning

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

Description

303.01 This work consists of reconditioning ditches, shoulders, roadbeds, parking areas, approach road intersections, cattleguards, asphalt surfaces and aggregate surfaces. Clean and maintain all drainage structures.

Material

303.02 Conform to the following Subsection:

Water 725.01

Construction Requirements

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

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

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

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

For portions of roads not requiring scarification, the roadbed may contain rocks larger than 4 inches provided they do not extend above the finished roadbed surface. Reduce in place or

remove rock extending above the finished roadbed surface. Dispose of removed rock in areas designated on the plans.

Compact using the following method as specified:

(a) Layer Placement Method (Hauling and Spreading Equipment). 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.

(b) Layer Placement (Roller Compaction) Method. 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 visible deformation of the layer ceases or, in when a sheepsfoot roller is used, the roller "walks out" of the layer. Make at least three complete passes. . Use rollers that meet the following requirements:

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

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

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

303.06 Aggregate Surface Reconditioning. Repair soft and unstable areas to the full depth of the aggregate surface and according to Subsection 204.07. Scarify to the depth and width shown on the plans, and remove surface irregularities. Reshape, finish, and compact the entire aggregate surface according to Section 301, Section 308, Section 321, or Section 322 as applicable.

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

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

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

303.08 Pulverizing. Scarify the surface to the designated depth and width. Pulverize all material to a size one and one half times the maximum sized aggregate or to 1½ inches, whichever is greater. Mix, spread, compact, and finish the material according to Section 322.

303.09 Acceptance. Road reconditioning work will be evaluated under Subsections 106.02 and 106.04.

Measurement

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

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

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

Payment

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

322 - Minor Aggregate Courses

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. Compact to a density of at least 96 percent of the maximum density, as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

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

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

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

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 ½ 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 E	—	R-1 Marshall	"	"	"	"
		Moisture-density Method F	—	AASHTO T 180[1]	"	"	"	"
		Moisture-density Method G	—	R-1 Marshall	"	"	"	"
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	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

404 - Minor Hot Asphalt Concrete

404.02_nat_us_06_09_2006

404.02 Composition of Mix (Job-Mix Formula).

Delete the second paragraph and replace with the following:

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

404.04_nat_us_03_02_2005

404.04 Weather Limitations.

Change 35° F to 45° F:

404.06_nat_us_03_02_2005

404.06 Placing.

Add the following:

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

Delete the last sentence and replace with the following:

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

404.07_nat_us_03_02_2005

404.07 Compacting (a).

Delete and replace with the following:

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

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

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

(3) Pneumatic-tire rollers with smooth tread tires of equal size that provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 lbf/in^2.

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

404.07_nat_us_03_02_2005

404.07 Compacting (b).

Delete and replace with the following:

(b) Non-roadway paving. Compact by rolling with a hand-operated roller with a mass of least 1 ton. Perform initial compaction while the mixture is above 250 °F and continue until no roller tracks remain.

404.09 Acceptance.

Add the following to the second paragraph:

See Table 404-1 for sampling and testing requirements.

Table 404-1. Delete and replace with the following:

Table 404-1. Sampling and Testing Requirements.

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Sampling Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Asphalt Mixture (404.09)	-	-	-	AASHTO T 168	Three minimum per project and at least one per 500 Cubic yards	Roadway prior to compaction	yes	As soon as sampled

430 - Asphalt Pavement Patching

Description

430.01 This work consists of performing full depth patching, patching with geotextiles, skin patching, spray-injection patching, and removal and replacement of asphalt berms.

Material

430.02 Conform to the following Subsections:

Minor Hot Asphalt Pavement	404.02
Asphalt Binder	702.01
Cutback Asphalt	702.02
Emulsified Asphalt	703.03
Application Temperatures	702.04
Cold Asphalt Mix	702.10
Aggregate	703.07 (a) and (b)
Choker Aggregate	703.12
Geotextile Type VI	714.01
Sand	703.15

Construction

430.03 Composition of Mix (Job-Mix Formula). Furnish either Minor Hot Asphalt Pavement or Minor Cold Asphalt Mix as approved by the CO.

430.04 Full Depth Patch.

Remove material to a minimum depth of 4 inches, or as necessary to reach firm support. If firm support for a patch is unavailable, notify the CO prior to placing any material.

Trim or mill the edges of the prepared hole to form a vertical face in un-fractured asphalt surfacing. Make the prepared hole rectangular, and clean it of all loose material. When the hole is dry, apply emulsified asphalt to the bottom and faces of the hole. Barricade prepared sites. Patch the sites immediately after the emulsified asphalt breaks. Place the asphalt concrete mixture in layers not exceeding 4 inches. Thoroughly compact each layer with hand or mechanical tampers or rollers. For hot asphalt concrete mixtures, compact the mix while it is above 230 °F.

Compact the finished surface with a steel-wheel roller or vibratory plate compactor. Ensure that the compacted patch is approximately 1/8 to 1/4 inches above the level of the adjacent pavement. Seal the edges of the completed patch with emulsified asphalt, and blot with fine sand.

430.05 Patching with Geotextile. Prepare the surface by digging out and patching according to Subsection 430.04 or by cleaning the surface, removing vegetation, and filling all cracks more than 1/4 inch wide with an approved crack-filling material. Remove excess crack-filling material. Spray the prepared surface with asphalt cement or emulsified asphalt according to the geotextile manufacturer's direction. Immediately place the geotextile over the repaired area. Allow emulsified asphalt to break before placing geotextile. Extend the fabric a minimum of 6 inches beyond the repaired or patched area onto sound adjoining pavement. Use a minimum of 2 inches overlap where adjacent fabric panels are needed to cover the repaired area.

Do not place the asphalt concrete mixture until authorized by the CO. Uniformly distribute asphalt concrete mixture in layers not to exceed 2 inches compacted depth. Feather the edges of skin patches. When placing more than one layers, offset all joints at least 6 inches between layers. Compact each layer with an 8 to 10 ton steel roller. For hot asphalt concrete mixtures, compact the mix while it is above 230°F. Ensure that the completed patch does not have abrupt transitions that could adversely affect the steering of a passenger car traveling across the area. Provide transition tapers for skin patches that are 12 inches long per 1/8 inch thickness of patch in the direction on travel.

430.06 Skin Patches. Prepare the surface on which the skin patch is placed by cleaning the surface, removing vegetation, and filling all cracks more than 1/4 inch wide with an approved crack-filling material. Remove excess crack-filling material. Spray the surface with emulsified asphalt at the rate approved by the CO.

Apply the asphalt concrete mixture according to Subsection 430.05.

430.07 Spray-Injection Patching. Use an approved continuous process that cleans and dries the area to be patched, sprays a tack coat of binder on the sides and bottom of the pothole, place aggregate coated with emulsified asphalt, and covers the area with a choker aggregate.

430.08 Asphalt Berm. Remove damaged segments of berm and bevel exposed ends at approximately 45 degrees from vertical. Clean and patch the berm foundation as necessary. Coat the foundation and joining surfaces with emulsified asphalt. Place and compact asphalt mix to conform to the shape of the undamaged segment.

430.09 Waste Material. Dispose of all materials removed from potholes, patches, and berms in accordance with Subsection 203.05(a).

430.10 Acceptance. Asphalt concrete mixtures will be evaluated under Subsections 106.02 and 106.03. Geotextiles will be evaluated under Subsection 106.03. Spray-injection patching will be evaluated under Subsections 106.02 and 106.03.

Measurement

430.11 Measure the Section 430 items listed in the bid schedule according to Subsection 109.02.

Payment

430.12 The accepted quantities will be paid at the contract unit price per unit of measurement for Section 430 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05

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 Structures

607.01_06_us_09_15_2009

607.01 Description.

Add the following to the first sentence:

.....and bridges.

Add the following paragraph:

Remove all dirt and deleterious debris from bridge decks, expansion joints, curbs, rails and deck drains.

607.02 General.

Add the following:

Clean bridge decks and appurtenances by an approved pressurized water method and/or other approved mechanical and manual methods. Contain and remove loose material from the bridge off the work site to an approved location. Do not allow material to enter the waterways.

Remove cleaned material from bridge to designated site as specified in the plans.

607.06_01_us_10_12_2006

607.06 Reconditioning Drainage Structures.

Add the following:

Repair all culverts designated to be cut by removal of the damaged sections and furnish all material required to replace damaged pipe and joints.

617 - Guardrail

617.02_nat_us_07_03_2007

Material

617.02

Add the following:

Galvanized coating repair	717.07

Construction Requirements

617.03 Posts.

Replace the first paragraph with the following:

Fabricate all timber components of guardrail as detailed in Subsection 557.04. Pressure treat all timber as detailed in Subsection 716.03, using creosote, pentachlorophenol (any solvent), ammoniacal copper zinc arsenate (ACZA), or chromated copper arsenate (CCA – Type A, B, or C) in conformance with AASHTO M 133. Provide grading certification and pressure treatment test results, and meet the Best Management Practices (BMP's) requirements of Subsection 716.03. Field treat cuts or abrasions made in fabricated timber after treatment in accordance with Subsection 557.04.

617.04 Rail Elements.

(a) Steel rail.

Replace the third paragraph with the following:

Repair all scrapes, cuts and other damaged coating areas on galvanized surfaces that are through to the base metal with galvanized coating repair.

617.05 Terminal Sections.

Add the following to the end of the second sentence:

"... unless otherwise shown on the plans."

625 - Turf Establishment

625.03_nat_us_02_25_2005

625.03 General.

Delete the first subsection and add the following:

Apply turf establishment to finished slopes and ditches between _____ and _____. Do not seed during windy weather or when the ground is excessively wet, frozen, snow covered, extremely dry, cloddy, hard pan, or is otherwise untillable.

625.04_nat_us_02_25_2005

625.04 Preparing Seedbed.

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

625.05_nat_us_03_30_2005

625.05 Watering.

Delete the entire subsection

625.07_nat_us_02_25_2005

625.07 Seeding. (a) Dry method.

Remove the last sentence "Lightly compact the seedbed within 24 hours after seeding."

625.07 Seeding. (b) Hydraulic method.

Add the following:

Apply fertilizer conforming to Subsection 713.03 at the rates shown in Table 625-1. Fertilize areas inaccessible to hydro-type equipment by hand.

Table 625-1. Fertilizer Application Rate.

Type	Quantity per Slurry Unit
: :	__lbs
: :	__lbs

Apply the seed mixture at the rate of _____ kilograms of live seed per _____ (hectare/slurry unit). Include a tracer material consisting of either wood fiber mulch or grass

cellulose fiber mulch to provide visible evidence of uniform application. Add the tracer to the slurry at a rate of _____ (400 pound per acre or 100 pound per slurry unit). Seed areas inaccessible to hydro-type equipment by hand.

625.08 (a) Dry Method

Delete this subsection and replace with the following:

Spread all mulch material, except wood and grass cellulose fibers and wood strand, by a mulch spreader utilizing forced air to blow the mulch material onto the seeded area. Apply straw mulch at a rate of 3200 pounds per acre. Anchor the mulch material, except wood strand and straw, with an approved stabilizing emulsion tackifier or approved mechanical method. Do not mark or deface structures, pavements, utilities, or plant growth with tackifier.

633 - Permanent Traffic Control

633.00_01_us_10_12_2006

633.01

Delete the first paragraph and add the following:

This work includes furnishing, installing, removing and reinstalling guide signs, route markers (with or without arrows), gate signs, object markers, gate barricades and sign posts.

633.02 Material.

Add the following subsections:

Protective Overlay Film	718.02
Edge Film	718.02

633.03 General.

Delete the subsection and replace with the following:

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

633.05 Panels.

Add the following:

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

Modify the following:

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

651 - Development of Pits & Quarries

Description

651.01 This work consists of clearing, grubbing, stripping topsoil, removing overburden, constructing access roads, conducting restoration activities, and performing other incidental work required for pit or quarry development.

Construction Requirements

651.02 General. Submit a plan of operations according to Section 105. Perform all work in accordance with Sections 105, 201, 203, 204, 625, and 635, landscape preservation requirements, and the approved pit and quarry development plan of operations. Perform the work in accordance with MSHA 30 CFR, part 56.

651.03 Acceptance. Developing pits and quarries will be evaluated under Subsections 106.02 and 106.04.

Measurement

651.04 Measure the Section 651 items listed in the bid schedule according to Subsection 109.02.

Payment

651.05 The accepted quantities will be paid at the contract price per unit of measurement for the Section 651 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

703 - Aggregate

Delete 703.05 and replace with the following:

703.05 Subbase, Base, Surface Course, and Screened Aggregate.

(a) Subbase or base aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-2
(2) Liquid limit, AASHTO T 89	25 max.
(3) Plastic limit, AASHTO T 90	Nonplastic
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	50% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(b) Surface course aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-3
(2) Liquid limit, AASHTO T 89	35 max.
(3) Plastic Index, AASHTO T 90	
a) If the percent passing the No. 200 sieve is less than 12%	2 to 9
b) If the percent passing the No. 200 sieve is greater than 12%	Less than 2
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	75% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Do not furnish material that contains asbestos fibers.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(c) Screened aggregate – Furnish hard, durable particles or fragments of stone, slag, or gravel conforming the following:

(1) Gradation	Table 703-16
(2) Plastic Index, AASHTO T 90	Less than 9
(3) Los Angeles abrasion, AASHTO T 96	55% max.
(4) Free from organic matter and lumps or balls of clay.	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary.

Delete Table 703-2 and replace with the following:

Table 703-2
Target Value Ranges for Subbase and Base Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)				
	Grading Designation				
	A (Subbase)	B (Subbase)	C (Base)	D (Base)	E (Base)
2½ inch	100				
2 inch	97 – 100	100	100		
1½ inch		97 – 100			
1 inch	65 – 79 (6)		80 – 100 (6)	100	
3/4 inch			64 – 94 (6)	86 – 100 (6)	100
1/2 inch	45 – 59 (7)				
3/8 inch			40 – 69 (6)	51 – 82 (6)	62 – 90 (6)
No. 4	28 – 42 (6)	40 – 60 (8)	31 – 54 (6)	36 – 64 (6)	36 – 74 (6)
No. 40	9 – 17 (4)			12 – 26 (4)	12 – 26 (4)
No. 200	4.0 – 8.0 (3)	4.0 – 12.0 (4)	4.0 –7.0 (3)	4.0 – 7.0 (3)	4.0 – 7.0 (3)

( ) The value in the parentheses is the allowable deviation (±) from the target values..

Delete Table 703-3 and replace with the following:

Table 703-3
Target Value Ranges for Surface Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)					
	Grading Designation					
	F	G	H	S	T	U
1 1/2 inch	100			100		
1 inch	97-100	100		72 – 92 (6)	100	
3/4 inch	76-89 (6)	97 - 100	97 - 100			100
1/2 inch					71 – 91 (6)	
3/8 inch	56-68 (6)	70 – 80 (6)	80 – 92 (6)	51 – 71 (6)		71 – 90 (6)
No. 4	43-53 (7)	51 – 63 (7)	58 – 70 (7)	36 – 53 (7)	43 – 60 (7)	50 – 68 (7)
No. 8				26 – 40 (6)	30 – 46 (6)	34 – 51 (6)
No. 16	23-32 (6)	28 – 39 (6)	28 – 40 (6)			
No. 40	15-23 (5)	19 – 27 (5)	16 – 26 (5)	14 – 25 (5)	16 – 28 (5)	19 – 30 (5)
No. 200	10.0-16.0 (4)	10.0 – 16.0 (4)	9.0 – 14.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)

( ) The value in the parentheses is the allowable deviation (±) from the target values.
If the plasticity index (PI) is greater than 0, the TV range for the No. 200 sieve size is 8-12 (4).

Add Table 703-16:

Table 703-16

Gradation Requirements for Screened Aggregate

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)						
	Grading Designation						
	L	M	N	O	P	Q	R
6 inch	100	100					
4 inch			100	100			
3 inch					100	100	
2 inch							100
No. 4		15-45		15-45		15-45	

703.10_nat_us_04_11_2011

703.10(e) Flakiness Index.

Delete and replace with the following:

Flakiness Index, FLH T 508 30% max.

703.10(i) Adherent Coating.

Add the following:

Adherent coating on the aggregate, FLH T 512 0.5% max.

703.10_nat_us_03_02_2005

Delete Table 703-7 and substitute the following:

Table 703-7 Target Value Ranges

Table 703-7
Target Value Ranges for
Single and Multiple Course Surface Treatment Aggregate Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 & T 11)					
	Grading Designation					
	A	B	C	D	E	F
1½ inch	100[1]					
1 inch	90-100(3)	100[1]				
¾ inch	0-35(5)	90-100(3)	100[1]			
½ inch	0-8(3)	0-35(5)	90-100(3)	100[1]		
⅜ inch	—	0-12(3)	0-35(5)	85-100(3)	100[1]	100[1]
No. 4	—	—	0-12(3)	0-35(5)	85-100(3)	85-100[1]
No. 8	—	—	—	0-8(3)	0-23(4)	—
No. 200	0-1(1)	0-1(1)	0-1(1)	0-1(1)	0-1(1)	0-10[1]

(1) Statistical procedures do not apply.

( ) The value in the parentheses is the allowable deviation (±) from the target values.

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.

704.11_05_us_07_27_2005

Add the following subsection:

Section 704.11 Special Structural Backfill

Use sources approved by the CO and meet the gradation in table 704-4 (a).

Add the following table:

Table 704-4 (a)
Special Structural Backfill Gradation Requirements

Sieve size	Percent Passing
6 inch	100
3 inch	75-100
No. 200	0-50

705 - Rock

705.02 Riprap Rock.

Delete Table 705-1 and replace it with the following:

Gradation Requirements for Riprap

Class	Percent of Rock by Mass	Mass (pounds)	Approximate Cubic Dimension [b,c] (inches)
1	20	22 to 33	6 to 8
	30	11 to 22	5 to 6
	40	1 to 11	2 to 5
	10[a]	0 to 1	0 to 2
2	20	55 to 110	8 to 10
	30	22 to 55	6 to 8
	40	2 to 22	3 to 6
	10[a]	0 to 2	0 to 3
3	20	220 to 330	14 to 16
	30	110 to 220	10 to 14
	40	11 to 110	5 to10
	10[a]	0 to 11	0 to 5
4	20	550 to 770	18 to 20
	30	220 to 570	14 to 18
	40	22 to 220	6 to 14
	10[a]	0 to 22	0 to 6
4a	20	770 to1353	20 to 24
	30	330 to 770	16 to 20
	40	33 to 330	7 to16
	10[a]	0 to 33	0 to 7
5	20	1540 to 2200	26 to 28
	30	1100 to 1540	20 to 26
	40	55 to 1100	8 to 20
	10[a]	0 to 55	0 to 8
6	20	1870 to 3520	28 to 34
	30	1100 to 1870	22 to 28
	40	110 to 1100	10 to 22
	10[a]	0 to 110	0 to 10
7	20	4400 to 5940	35 to 39
	30	2200 to 4400	28 to 35
	40	220 to 2200	14 to 28

	10[a]	0 to 220	0 to 14
8	20	7000 to 10000	42 to 47
	30	4000 to 7000	35 to 42
	40	400 to 4000	16 to 35
	10[a]	0 to 400	0 to 16

(a) Furnish spall and rock fragments graded to provide a stable dense mass.
(b) The volume of a rock with these cubic dimensions has a mass approximately equal to the specified rock mass.
(c) Furnish rock with breadth and thickness at least one-third its length.

713 - Roadside Improvement Material

713.05_nat_us_03_02_2005

713.05 Mulch.

Add the following:

Assure that mulch used on the project is certified noxious weed free by the appropriate authority in the jurisdiction of use.

713.05_06_us_08_20_2009

713.05 Mulch

Add the following:

(i) Wood strand. Furnish processed wood strand conforming to the following:

(1) Weight is target green weight at time of manufacture;

(2) Moisture content for target green weight 50 ± 10 percent;

(3) Nontoxic to seed or other plant material;

(4) Free of growth or germination inhibiting substances;

(5) Free of weed seed;

(6) Free of mold;

(7) Typical strand size:

(a) Length	2-6 inches
(b) Width & thickness	¼ inch max.

714 - Geotextile and Geocomposite Drain Material

Tables 714-1 and 714-4.

Add the following note to both tables:

(4) Woven slit film will not be allowed.

Add the following:

714.03 Geogrids.

Furnish geogrids consisting of polymeric materials such as polypropylene, polyethylene, or polyester formed into a stable network of bars or straps fixed at their junctions such that the bars retain their relative position to each other.

Elevate and protect rolls with a waterproof cover if stored outdoors.

(a) Physical requirements. Furnish geogrid treated to resist ultraviolet degradation, and conforming to the physical strength requirements shown in table 714-7 according to ASTM D 4595 for the specified geogrid category. Strength values shown in table 714-7 represent minimum average roll values and are for the direction of primary reinforcement. Ensure that the aperture size for all geogrids is between ¾ to 3 inches.

(b) Evaluation procedures. Geogrids will be evaluated under Subsection 106.03. Furnish a certification and a sample of the geogrid.

Table 714-7—Physical strength requirements for geogrids.

Category	Minimum Ultimate Strength at Breakage *(lbs/ft)*
1	890
2	1985
3	2875
4	4110
5	5475
6	8215

718 - Traffic Signing and Marking Material

718.02_nat_us_03_02_2005

718.02 Reserved.

Replace this section with the following:

718.02 Protective Overlay Film and Edge Film.

Protective overlay film will be a high performance flouropolymer film such as 3M Scotchlite Premium Protective Overlay Film Series 1160 or approved equal.

Edge film will be a pressure-sensitive, premium-quality, clear, ultraviolet-resistant, 3 inches wide vinyl film.

718.05_nat_us_08_05_2009

718.05 Aluminum Panels

Delete the third paragraph and replace with the following:

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

718.08_nat_us_03_27_2007

718.08 (b)(2)(*c*)Signpost - Square tubular steel posts

Delete the existing subsection and substitute the following:

(c) Galvanizing after punching (inside and outside of post)	ASTM A 653M, coating Z275 designation

718.14_nat_us_03_02_2005

718.14 (g)Waterborne Traffic Paint - Daylight reflectance

Delete the existing subsection and substitute the following:

(g) Daylight reflectance. (Without glass beads)

(1) White, ASTM E 1347	84% relative to magnesium oxide standard

(2) Yellow, ASTM E 1347	55% relative to magnesium oxide standard

718.15_nat_us_03_27_2007

718.15 (a)Epoxy Markings Pigments

Delete the existing subsection and substitute the following:

(2) Yellow.

(a) Chrome yellow ($PbCrO_4$), ASTM D 126, type III.	23% min.
(b) Epoxy resin	70 to 77%

718.15_nat_us_03_27_2007

718.15 (g)Epoxy Marking - Drying Time

Delete the existing subsection and substitute the following:

(g) Drying time. 15 mil film thickness with beads.

(1) Laboratory at 72° F, ASTM D 711	30 minutes maximum to no-pick-up condition
(2) Field at 77 °F, viewed from 50 feet	10 minutes maximum to no-pick-up condition

720 - Structural Wall and Stabilized Embankment Material

Section 720.01 Mechanically-Stabilized Earth Wall Material.

Add the following to section (h):

Assure that maximum wire spacing is 8 inches by 21 inches and the wire size is W 9.5 X W 4.0 or greater.