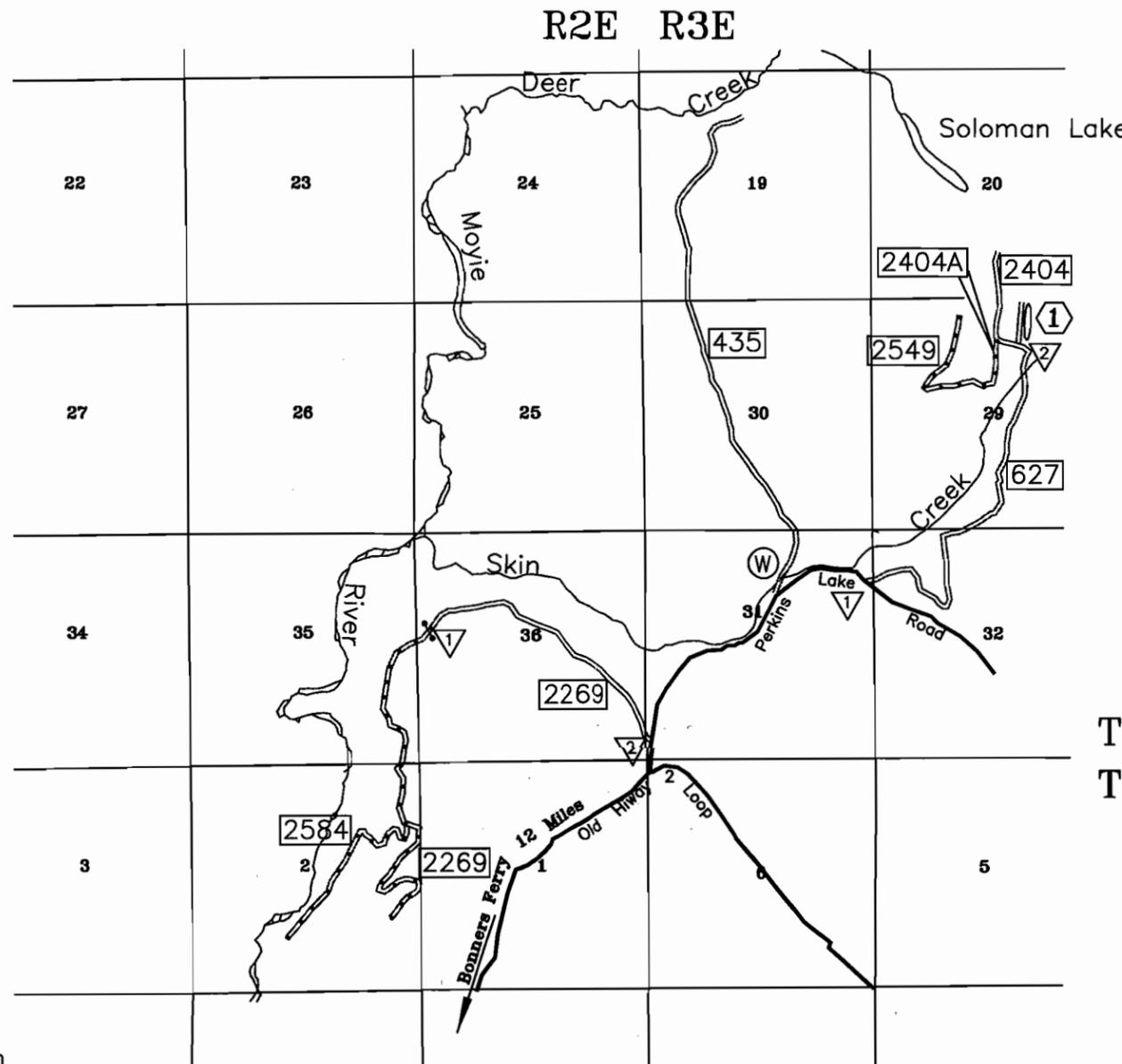
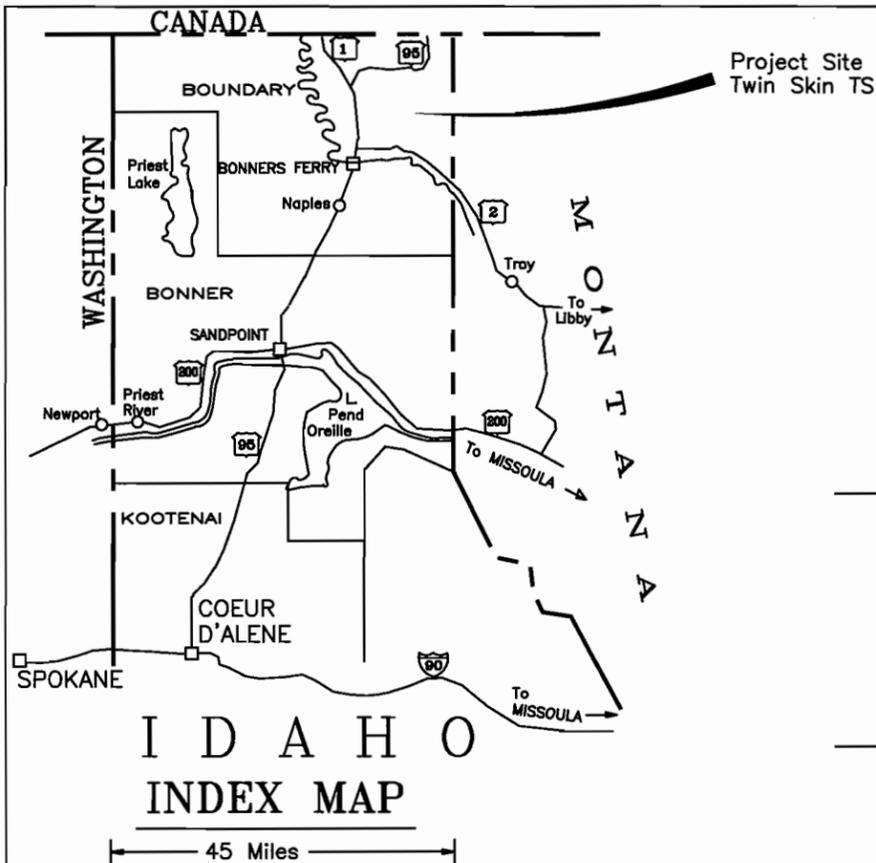


U.S. DEPARTMENT OF AGRICULTURE  
 FOREST SERVICE  
 REGION ONE  
 DRAWINGS FOR PROPOSED FOREST DEVELOPMENT ROADS  
**TWIN SKIN TS**

IDAHO PANHANDLE NATIONAL FORESTS - BONNERS FERRY RANGER DISTRICT - BOUNDARY COUNTY, IDAHO

INDEX TO SHEETS

- 1 Title Sheet
- 2 Summary of Quantities
- 3 Notes and typicals
- 4 Rd 2269/2584
- 5 Rd 2549/2404A
- 6 Coupling Detail 1
- 7 Coupling Detail 2
- 8 Coupling Detail 3
- 9 Culvert Details



VICINITY MAP

SCALE: ONE SECTION EQUALS ONE SQUARE MILE

T63N  
T62N

LEGEND:

- Existing Roads
- Reconstruction Roads
- "Road Construction Ahead", 30" x 30" sign  
Place at beginning of any construction activities  
Traffic Control signs shall conform to the "Manual of Uniform Traffic Control Devices"
- "Trucks Hauling", 30" x 30" sign  
Place at beginning of haul routes and associated junctions  
Traffic Control signs shall conform to the "Manual of Uniform Traffic Control Devices"
- Borrow Source (Riprap)
- Water Source

The following certify that this project is in conformance with environmental assessment requirements.

Recommended and certified to be technically correct

*Dallas Stinson* 6/27/08  
Project Team Leader

Approved and certified to be in conformance with sound engineering practice for safety, structural integrity, and operational requirements.

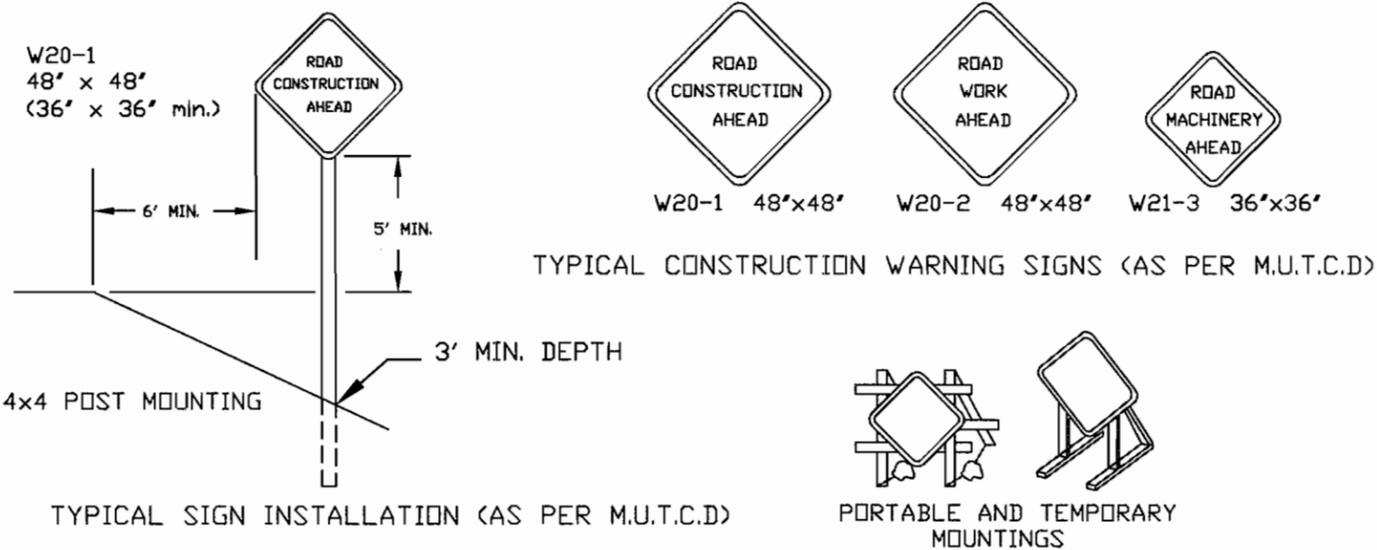
*[Signature]* 7/28/08  
Forest Engineer

Approved:

*Rinda McTiddie* 6/26/08  
District Ranger Date

# SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	METHOD OF MEASURE	UNIT OF MEASURE	COMPONENT CODE	Road Number				TOTAL ESTIMATED QUANTITIES
					2269	2404A	2549	2584	
					Total Road Length (miles)				
					2.00	0.22	0.90	0.90	
					Quantities				
201(06)	Individual Removal of Trees, Medium; Slash Treatment Methods of Tops and Limbs 11, Logs 11, UOT 1	AQ	Each	1				30.00	30.00
201A(01)	Roadway Brushing	DQ	Mile	2	1.10			0.30	1.40
203(19)	Drainage Excavation, Type Outlet Ditch	DQ	Lin Ft	1			250.00	50.00	300.00
304(10)	Crushed Aggregate, Type surfacing, Grading D, Compaction A, (Commercial Source)	DQ	CY	2	500.00			50.00	550.00
306(01)	Reconditioning of Roadbed, Compaction A	AQ	Mile	2	2.00	0.22	0.90	0.90	4.02
601(01)	Mobilization	LSQ	Lump Sum	2	1.00	1.00	1.00	1.00	1.00
603(01)18C	18" CMP (incl culv exc), Thickness: Steel 0.064 Thickness: Aluminum 0.060, Method C	AQ	Lin Ft	3			40.00	56	96.00
619(03)5	Riprap, Machine Placed Riprap, Class V (Govt Source)	DQ	CY	1			80.00		80.00



### SIGN NOTES:

1. The Contractor shall have the responsibility for furnishing, installing, maintaining, and removing construction warning signs in conformance with the latest revision of the Manual of Uniform Traffic Control Devices (M.U.T.C.D).
2. Warning signs shall be installed prior to beginning of work as SHOWN ON THE DRAWINGS and as designated by the Contracting Officer.
3. During periods of non-work (weekends, holidays, end of work day, etc.) all signs shall be covered or removed.
4. All warning signs shall be removed from the project by the Contractor upon completion and acceptance of the project.
5. Payment to the Contractor for furnishing, installing, maintaining, and removing construction warning signs is included in Pay Item 601(01), Mobilization. No separate payment will be made.
6. Signs shall not be attached to trees or existing sign posts.
7. Sign W21-3, 'Road Machinery Ahead', shall be placed on the open road side not more than 500' from activities when directed by the Contracting Officer.

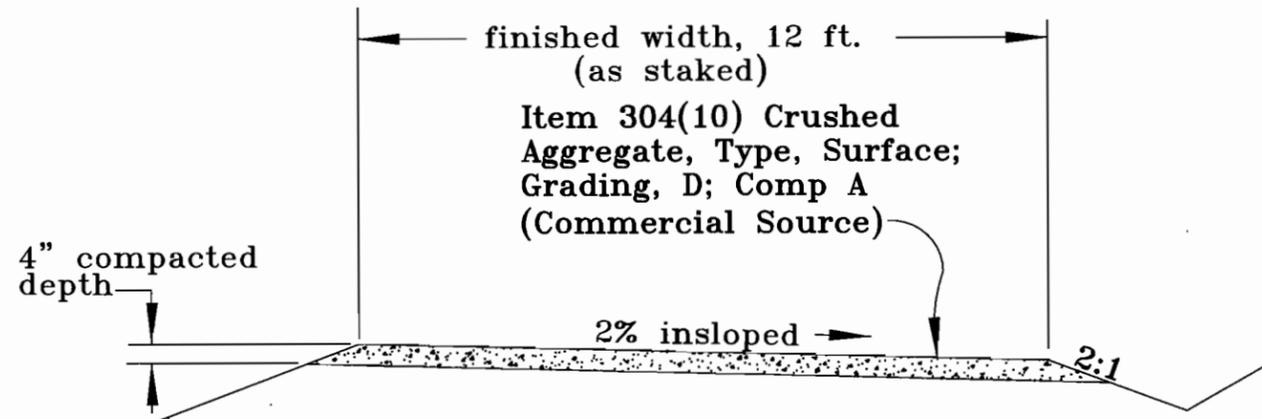
### GENERAL NOTES:

The following construction tolerance designation and construction methods shall be used as described in Section 203 of the STANDARD PROJECT SPECIFICATIONS:  
 Construction Tolerance (E)  
 Embankment Construction Method (1) Side Casting and End Dumping  
 Sections 203, 306 and 206A Unsuitable excavation shall be disposed of as shown on the drawings or as directed by the Contracting Officer.

Service Level

Road #	Service Level
2269	D
2404A	D
2549	D
2584	D

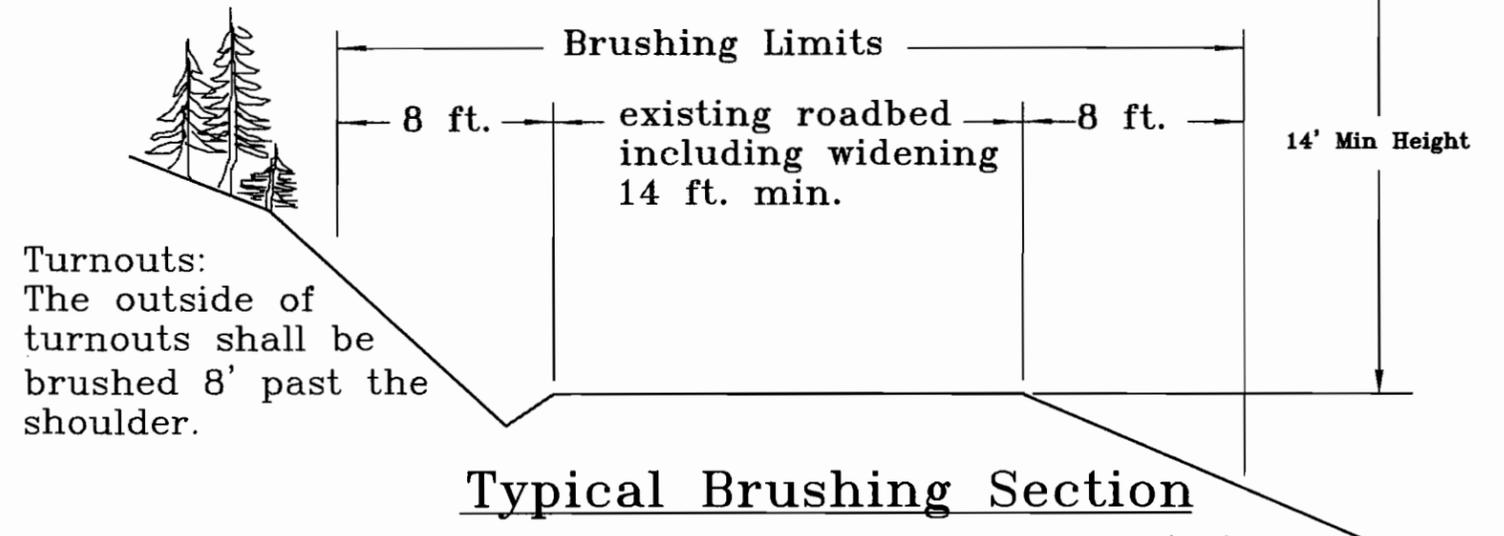
- NOTES: 1. Section 304.06: Water sources for aggregate placement are shown on the drawings and staked on the ground. Watering aggregate is incidental to Item 304(10) and no additional payment shall be made.  
 2. Additional aggregate width for curve widening or turnouts not required.  
 3. Section 306.01 Clean all Open Top Box Culverts encountered during reconditioning operations. This work is incidental to item 306(01) and no additional payment shall be made.  
 4. Section 306.02: Blend marked intersections a distance of 50 feet.  
 5. Section 203.06, 306.02, 206A.04, Excess, oversize or unsuitable material shall be sidecast uniformly over adjacent fill slopes.



Typical Section

Rd. 2269, M.P. 1.30 to 1.60-250 CY; MP  
1.90 to 2.20 250 CY.

Rd. 2584, M.P. 0.16 to 0.22, 50 CY.



Typical Brushing Section

Roads 2269 and 2584, Item 201A(01)

Road 2269:  
 Item 306(01) Recondition roadbed from MP 1.3 to 3.3. Clean all culverts and catch basins. Material from ditch cleaning shall be spread evenly along adjacent fill slopes.

Item 201A(01) Roadway Brushing, brush 1.10 miles as staked on the ground and shown on the drawings.

Road 2584:  
 Item 306(01) Recondition roadbed from MP 0.0 to 0.9. Clean all culverts and catch basins. Material from ditch cleaning shall be spread evenly along adjacent fill slopes.

Item 201A(01) Roadway Brushing, brush 0.3 miles as staked on the ground and shown on the drawings.

Item 304(10) Crushed Aggregate, place 250 CY as staked on the ground and shown on the drawings.

Item 304(10) Crushed Aggregate, place 250 CY as staked on the ground and shown on the drawings.

Item 304(10) Crushed Aggregate, place 50 CY as staked on the ground and shown on the drawings.

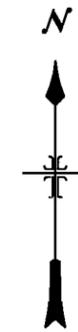
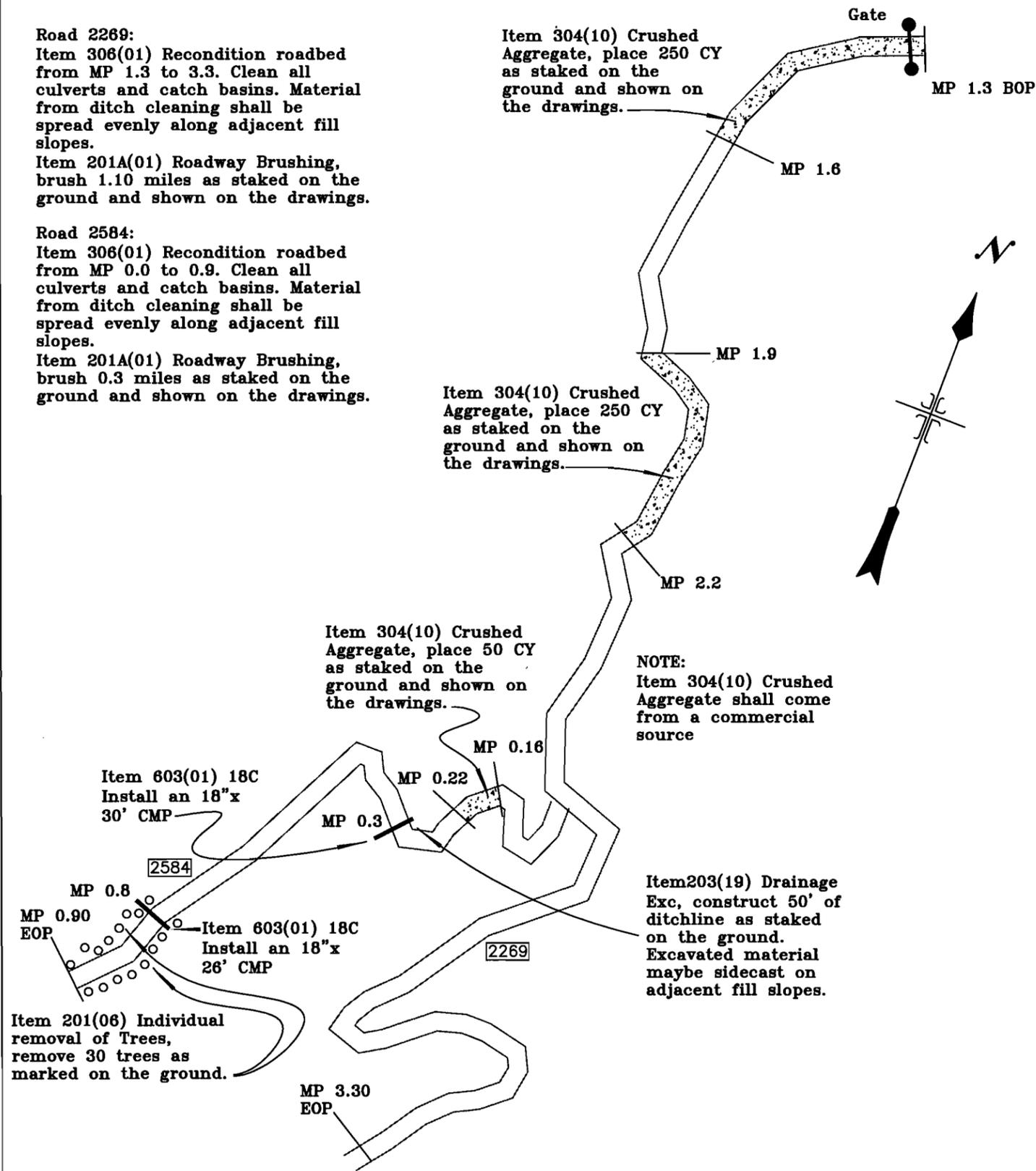
NOTE:  
 Item 304(10) Crushed Aggregate shall come from a commercial source

Item 603(01) 18C  
 Install an 18"x 30' CMP

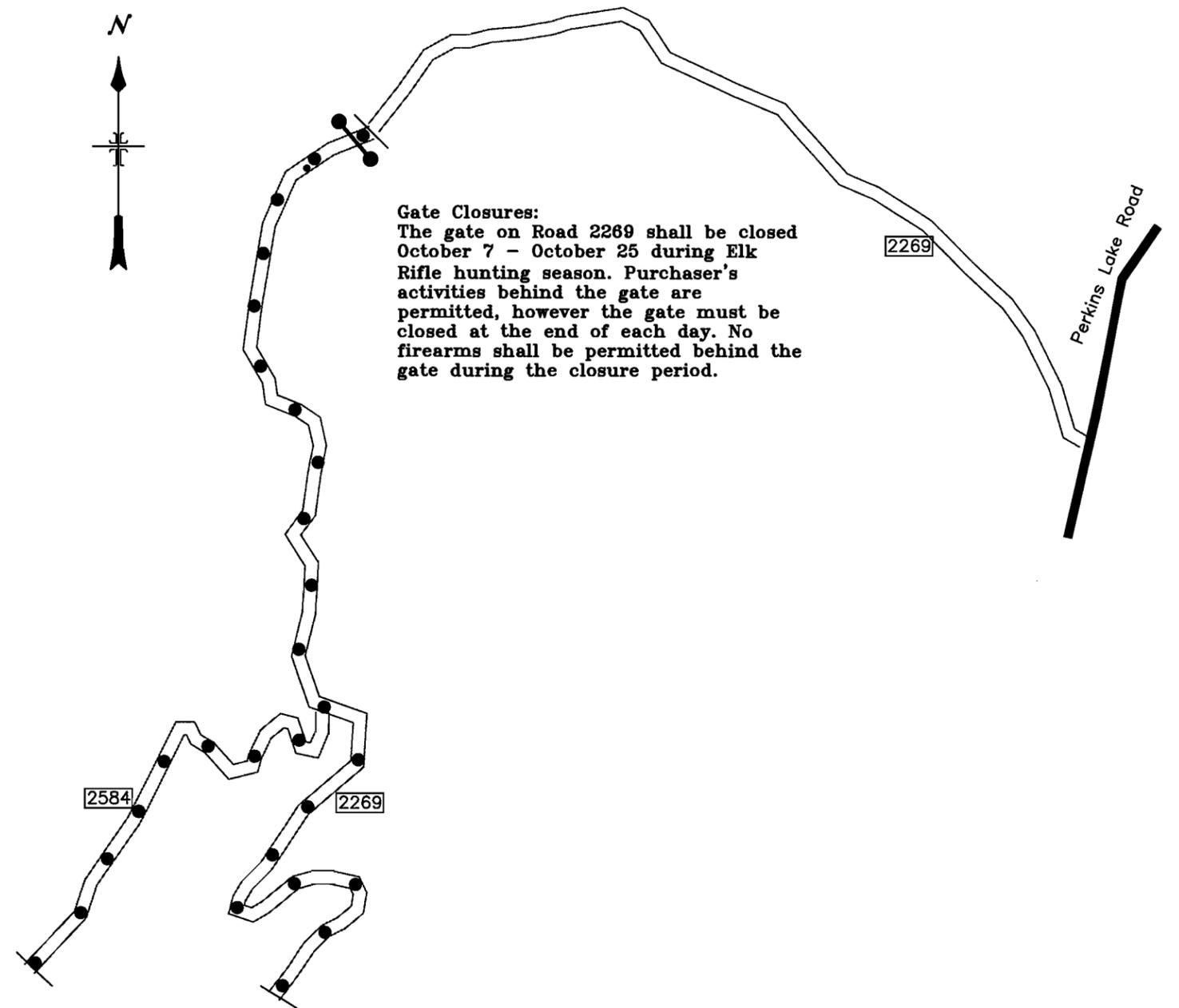
Item 603(01) 18C  
 Install an 18"x 28' CMP

Item 203(19) Drainage Exc, construct 50' of ditchline as staked on the ground. Excavated material maybe sidecast on adjacent fill slopes.

Item 201(06) Individual removal of Trees, remove 30 trees as marked on the ground.



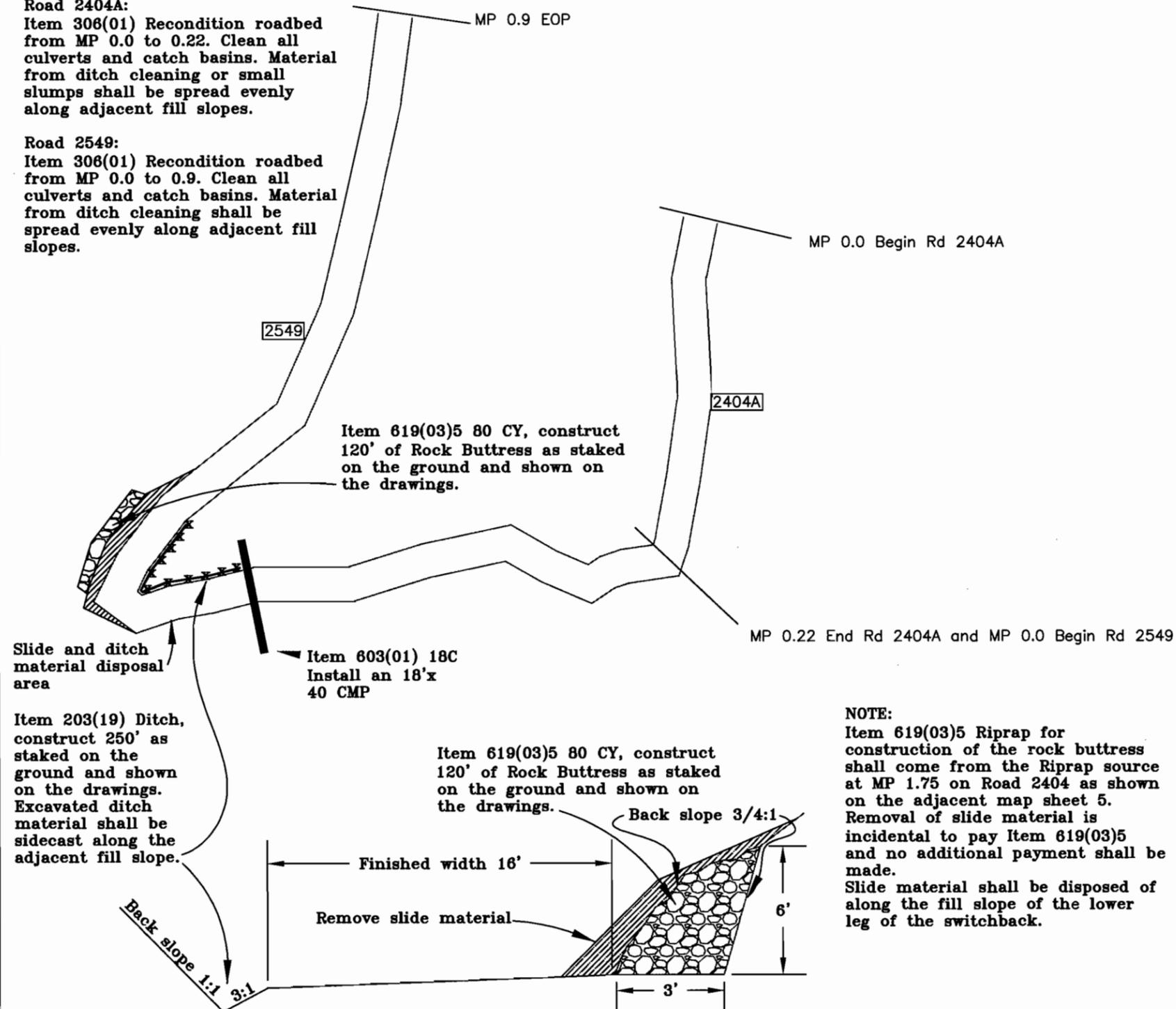
Gate Closures:  
 The gate on Road 2269 shall be closed October 7 - October 25 during Elk Rifle hunting season. Purchaser's activities behind the gate are permitted, however the gate must be closed at the end of each day. No firearms shall be permitted behind the gate during the closure period.



NOTE:  
 Item 201(06) deck logs along the road in a stable location. Slash shall piled in a location staked by the Contracting Officer.

Road 2404A:  
Item 306(01) Recondition roadbed from MP 0.0 to 0.22. Clean all culverts and catch basins. Material from ditch cleaning or small slumps shall be spread evenly along adjacent fill slopes.

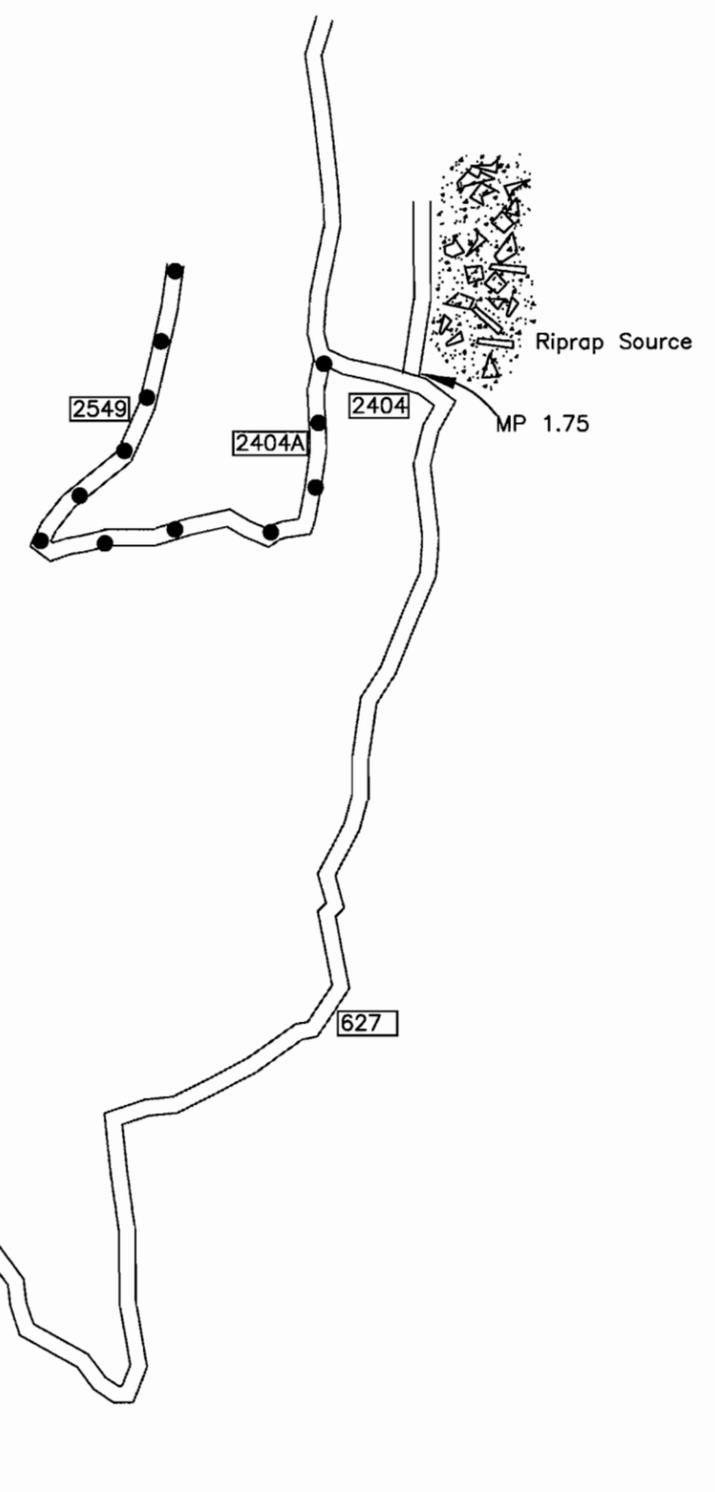
Road 2549:  
Item 306(01) Recondition roadbed from MP 0.0 to 0.9. Clean all culverts and catch basins. Material from ditch cleaning shall be spread evenly along adjacent fill slopes.



**Riprap, Ditch and Widening Section**

Items 619(03)5 80 CY, 203(19) 250 LF and 306(01)

NOTE:  
Item 619(03)5 Riprap for construction of the rock buttress shall come from the Riprap source at MP 1.75 on Road 2404 as shown on the adjacent map sheet 5. Removal of slide material is incidental to pay Item 619(03)5 and no additional payment shall be made. Slide material shall be disposed of along the fill slope of the lower leg of the switchback.



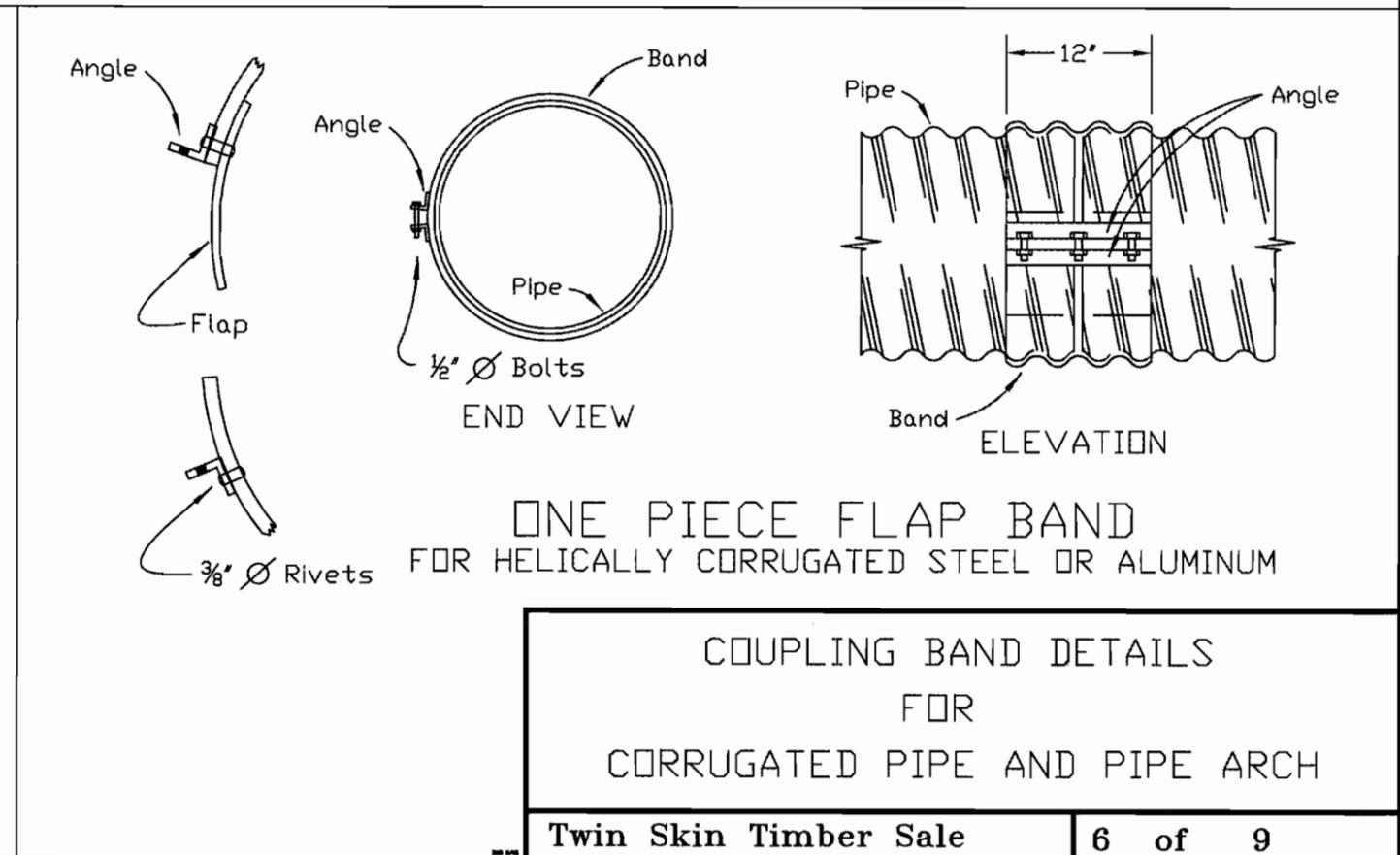
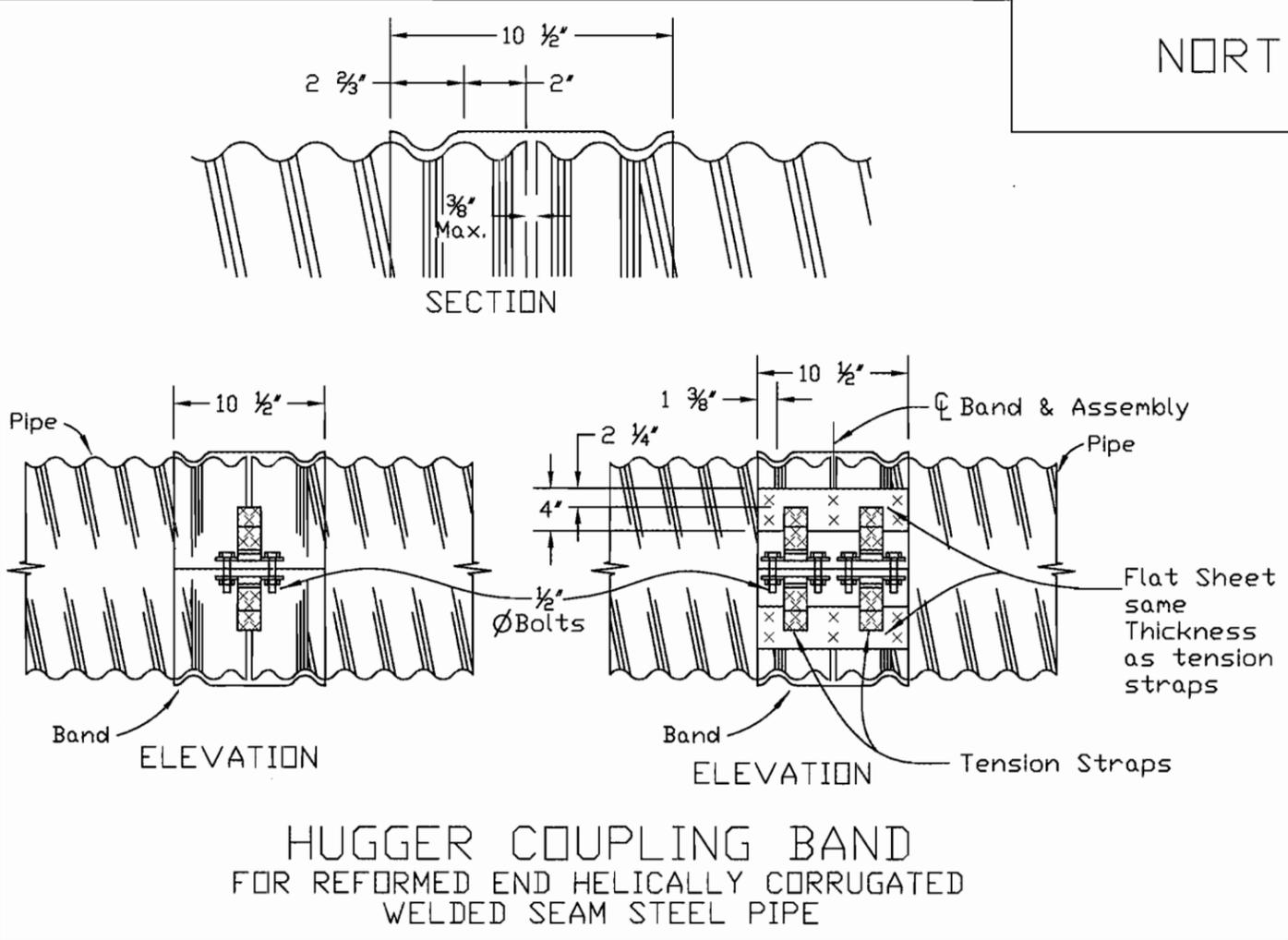
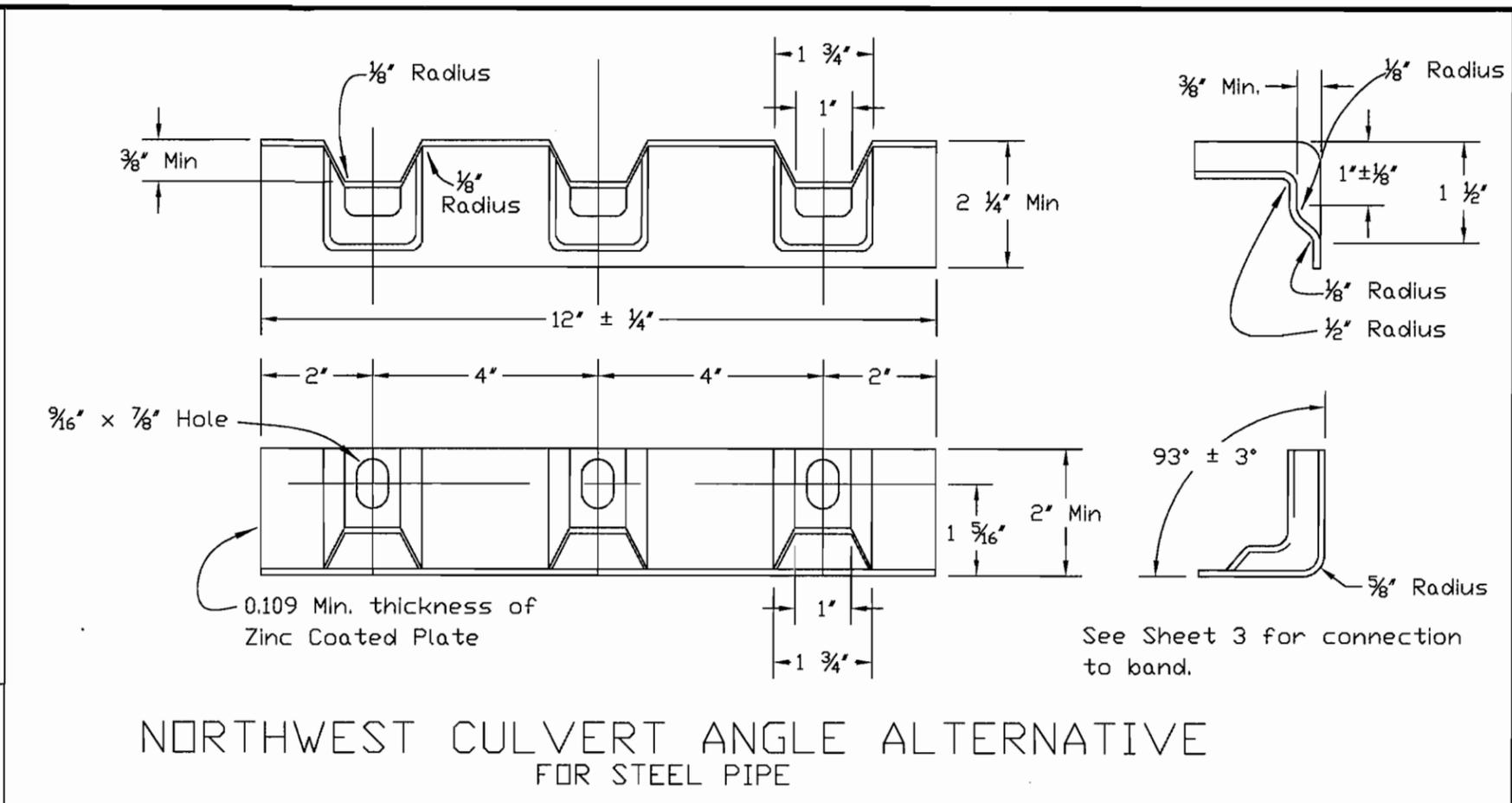
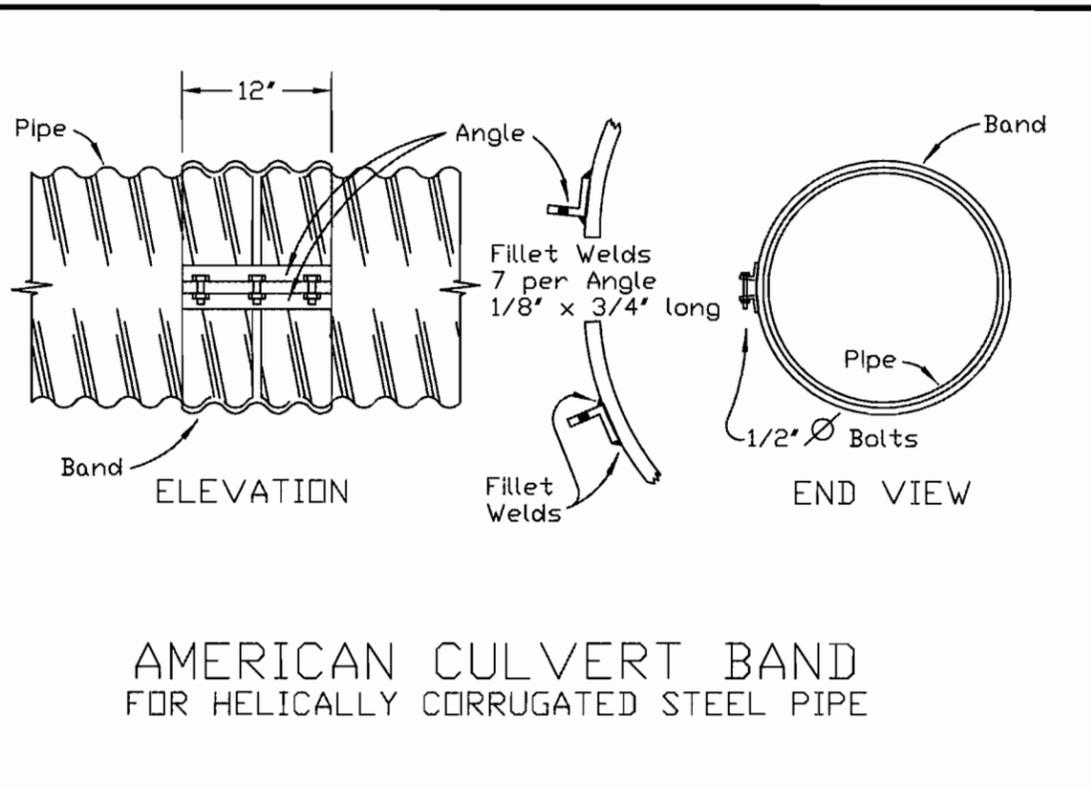
U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
R-1  
NORTHERN REGION

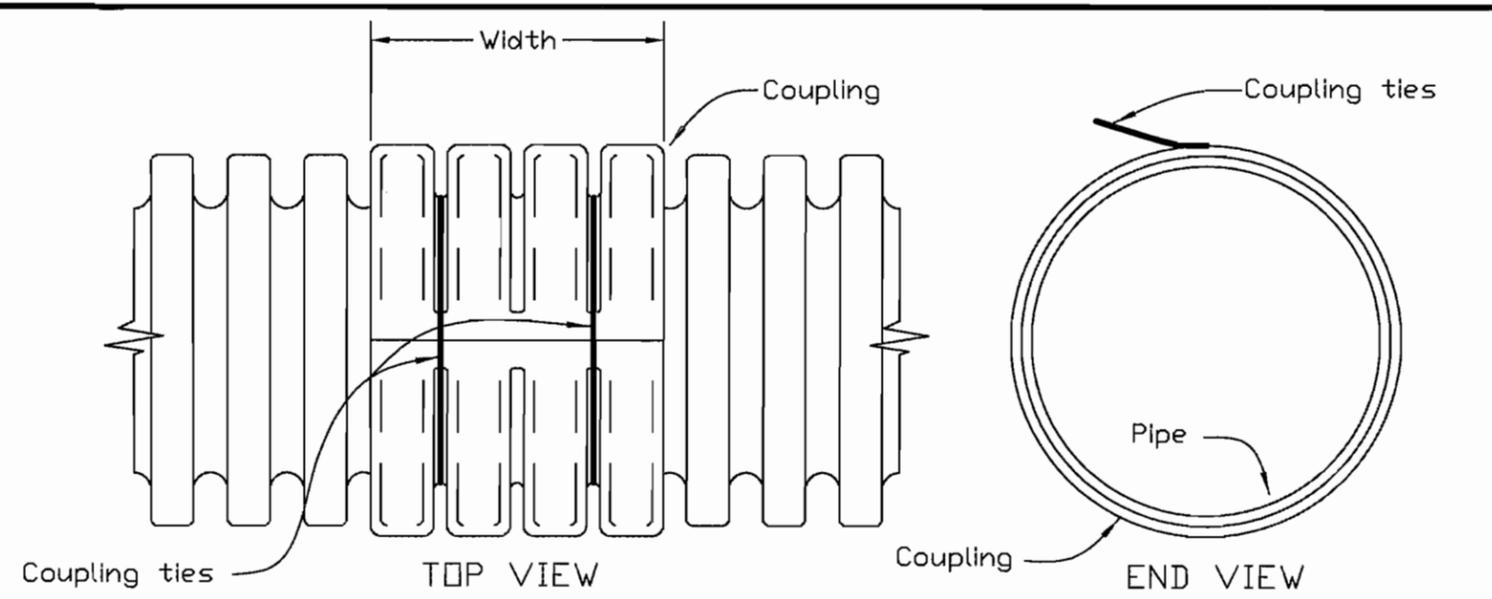
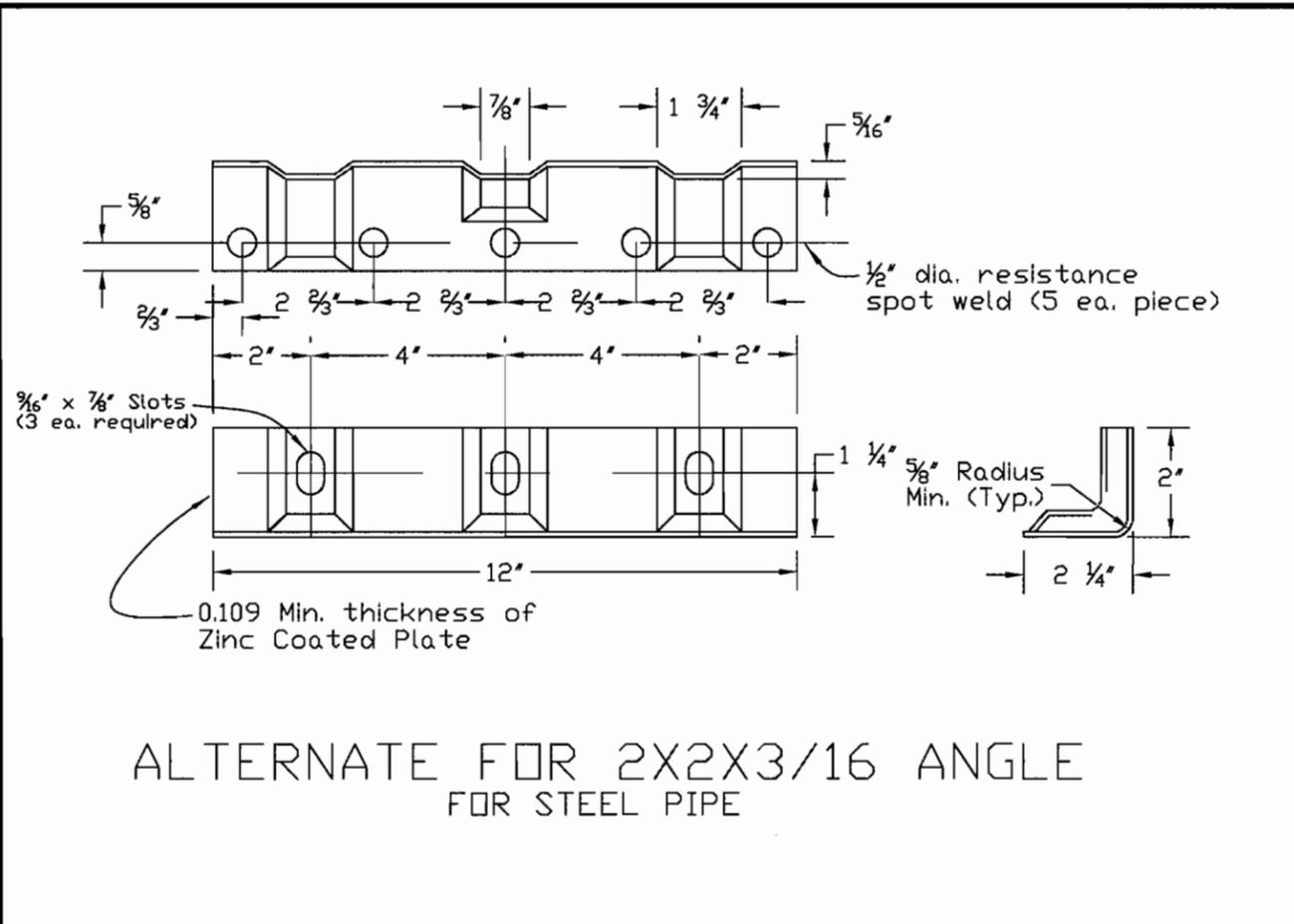


Drawn Ned Davis  
Design \_\_\_\_\_  
Checked \_\_\_\_\_  
Reviewed \_\_\_\_\_

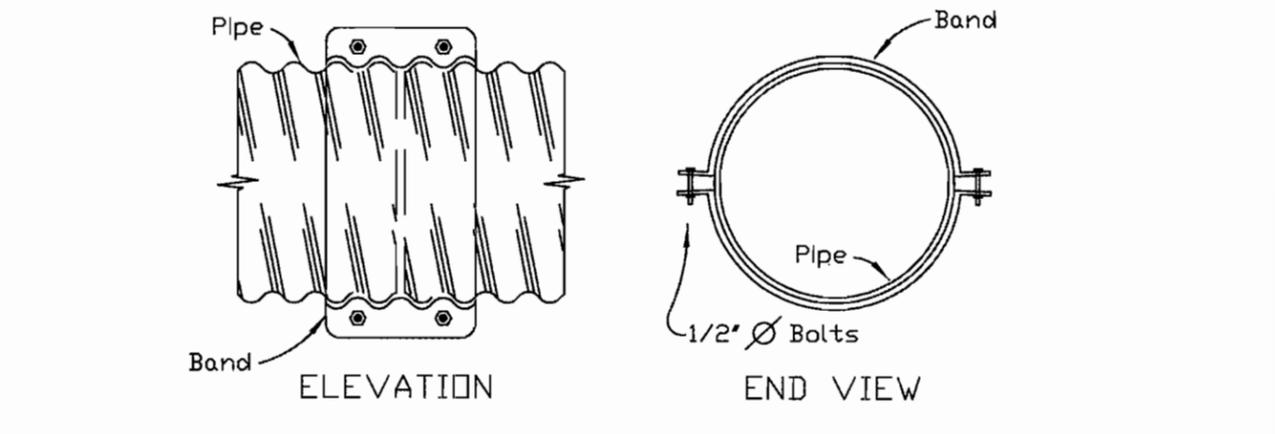
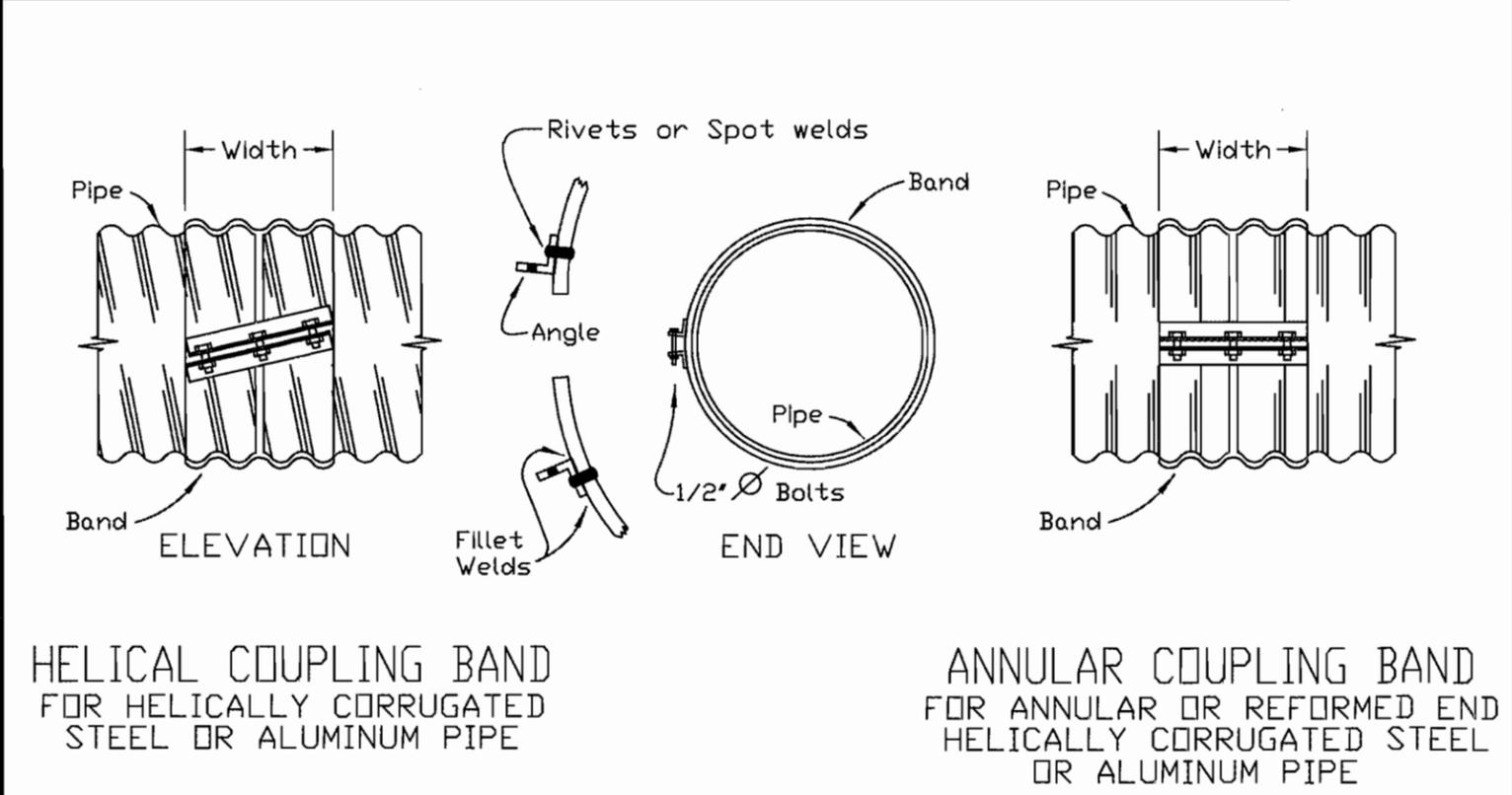
Forest  
Idaho Panhandle  
Project Name  
Twin Skin Timber Sale

Sheet Title  
Rd 2549/2404A  
Sheet **5** of **9**





- Notes:
1. Minimum width 4 corrugations, 2 on each culvert segment.
  2. The opening of the coupling shall be within 15° of the top of the culvert.



- Notes:
1. Use 2x12x0.150 thickness 5052-H141 aluminum plate washer under bolt head & nut on aluminum pipe flange.
  2. Use 2x12x0.125 thickness galvanized steel plate washer under bolt head & nut on steel pipe flange.

						ANGLE - See Note 1-H			
COUPLING TYPE	CORRUGATION Inches	PIPE DIAMETER Inches	WIDTH Inches	SPECIFIED THICKNESS See Note 1-C		DIMENSION	BOLTS NO / DIAMETER	ANGLE TO BAND	
				Pipe Wall	Band			RIVETS	SPOT WELDS
<i>Metal Pipe</i>  Annular and Helical	2-2/3x1/2	Thru 36	12	0.064-0.138	0.064-0.079	2x2x3/16	3-1/2	3-3/8	5-1/2
		42-60	12	0.064-0.079	0.064	2x2x3/16	3-1/2	3-3/8	5-1/2
	(Steel or Aluminum)	42-60	12	0.064-0.168	0.064-0.109	2x2x5/16	3-1/2	5-3/8	
		66-84	24	0.109-0.168	0.064-0.109	2x2x5/16	5-1/2	7-3/8	
	3x1 and 5x1 (Steel Only)	36-60	14	0.064-0.079	0.064	2x2x3/16	3-1/2	3-3/8	5-1/2
		42-60	14	0.109	0.064	2x2x5/16	3-1/2	5-3/8	
66-120	25	0.064-0.109	0.064	2x2x5/16	5-1/2	9-3/8			
One Piece Flap Band & Two Piece Integral Flange	2-2/3x1/2 (Steel or Aluminum) see Note 1-I	18-24	12	0.064-0.079	0.064		3-1/2	4-3/8*	* Flap Band Only
								WELDS ANGLE TO BAND	
American Culvert Band	2-2/3x1/2 (Steel Only)	Thru 24	12	0.064-0.109	0.064-0.079	2x2x0.183	3-1/2	7-1/8x3/4 Long Fillet	
		30-36	12	0.064-0.109	0.064	2x2x0.183	3-1/2		
		42-48	12	0.064-0.079	0.064	2x2x0.183	3-1/2		
Northwest Culvert Alternative	2-2/3x1/2 (Steel Only)	Thru 84	12	0.064-0.079	0.064-0.109			5-3/16x3/4 Long Fillet	
		Thru 54	12	0.109	0.064-0.109				
		Thru 42	12	0.138	0.064-0.109			5-1/2 Spot	
		Thru 84	12	0.064-0.168	0.064-0.109				
						BAR AND STRAP			
						NUMBER/THICKNESS	BOLT DIAMETER	BAR DIAMETER	BAR YIELD STRENGTH P.S.I.
Hugger	2-2/3x1/2 (Steel Only)	Thru 48	10-1/2	0.064-0.109	0.064-0.109	One 0.079	1/2	7/8	32,000
		36-48	10-1/2	0.138-0.168	0.079-0.109	One 0.109	1/2	7/8	45,000
		54-60	10-1/2	0.079-0.168	0.064-0.109	Two 0.079	1/2	7/8	32,000
	3x1 (Steel Only)	66-84	10-1/2	0.109-0.168	0.109	Two 0.109	1/2	7/8	45,000
		36-66	10-1/2	0.064-0.109	0.064	Two 0.079	1/2	7/8	32,000
		72-84	10-1/2	0.109	0.079	Two 0.079	1/2	7/8	32,000
61-120	10-1/2	0.109	0.109	Two 0.109	1/2	7/8	45,000		
<i>PE Pipe</i> Split Collar		Thru 24	See Drawing	per AASHTO M-294	per AASHTO M-294				

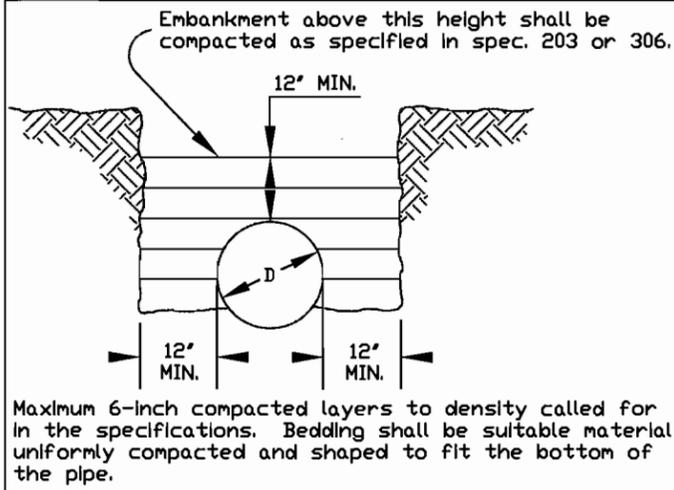
GENERAL NOTES

1. Metal Coupling Bands
  - A. These coupling bands meet the strength requirements for special Joint Types under Non-erodible Soil Conditions, Table 2.23.3 of AASHTO's "Standard Specifications for Highway Bridges".
  - B. For pipe walls and bands, the Specified Thickness for steel is given. For aluminum, the Specified Thickness is that for steel less the allowance for the zinc coating which is 0.003 to 0.004 of an inch per AASHTO M-36, M-196 and M-197.
  - C. The minimum specified Thickness for bands is two Specified Thicknesses less than that for the pipe, but in no case thinner than 0.064 inches, (0.060 for aluminum).
  - D. For pipe arches, use the same width band as for round pipe of equal periphery.
  - E. A two-piece band is required for pipe greater than 42 inches in diameter.
  - F. Tension straps may be connected to bands of plates with either spot or fillet welds that develop minimum required strength of strap.
  - G. For helically corrugated coupling bands, the connection angles may be oriented parallel to the pipe axis, provided connecting holes are slotted lengthwise sufficiently to allow adjustment for the helix angle.
  - H. Use 1 1/4 inch center to center gauge line dimension on attached angle leg for rivets and spot welds.
  - I. The Two Piece Integral Flange coupling band shall not be used on pipe arches.
  - J. Culvert bands shall be made of the same metal as the culverts being joined.
  
2. Polyethylene (PE) Couplings
 

Testing standards for Corrugated Polyethylene (PE) Pipe couplings have not been established nor have couplings been tested for shear or bending moment. Therefore, until further information is available, PE couplings shall be used only where bending moment and shear requirements are minimal. Typical situations are:

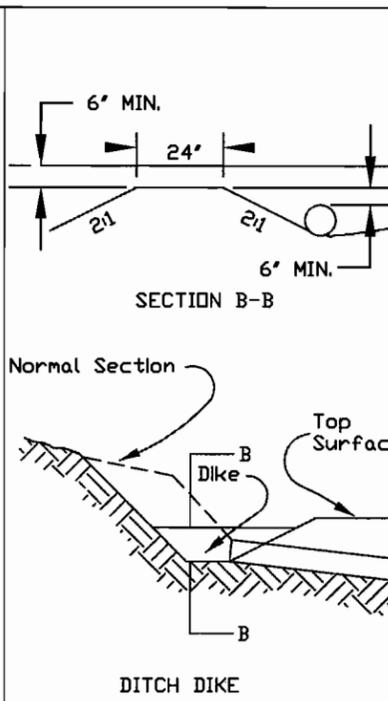
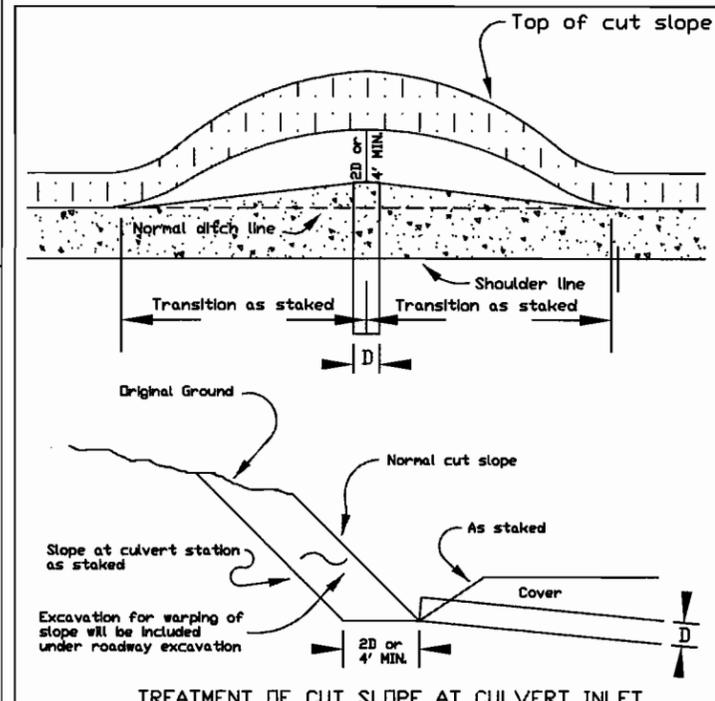
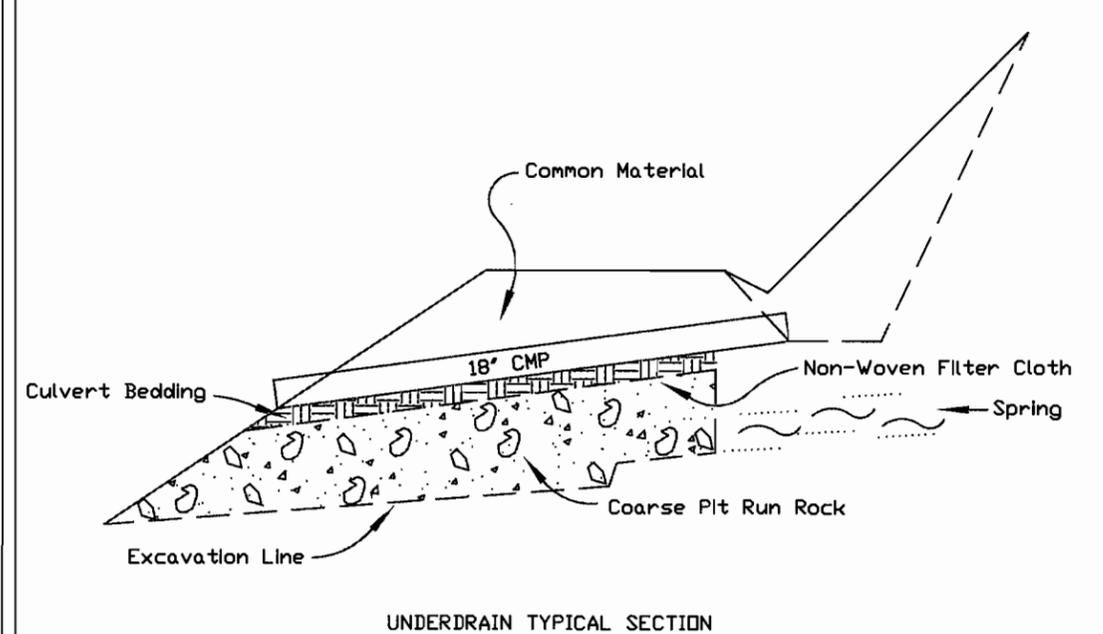
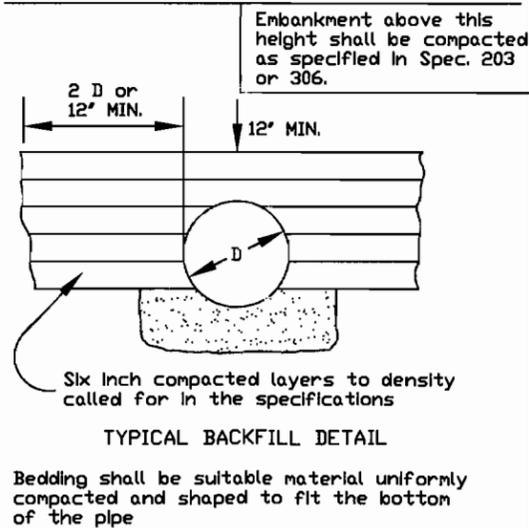
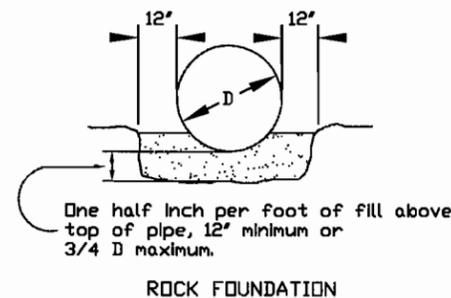
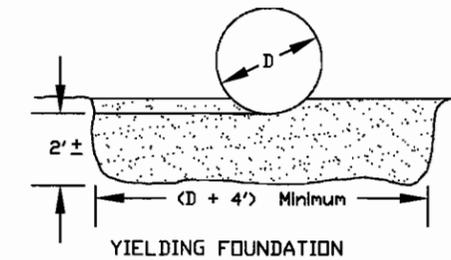
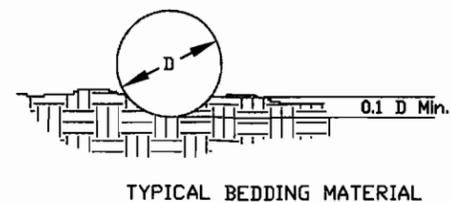
  - A. Where the slope of the culvert will not be more than 5%.
  - B. Where the fill below the culvert is less than 2 feet.
  - C. In areas of firm soils. This excludes marshes unless the bedding is specially designed and approved by the engineer.
  
3. Other
 

Couplings other than those shown on this drawing may be used upon submission of testing data (see 1-A above) and approval by the Engineer.



METAL THICKNESS AND GAGE TABLES

Steel		Aluminum	Approx. Gage
Zinc Coated	Un-Coated		
Metal Thickness in inches			
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8
0.188	0.1838		7
0.218	0.2145		5
0.249	0.2451		3
0.280	0.2758		1



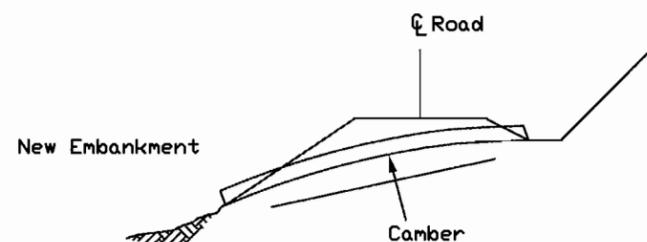
GENERAL NOTES:

**TREATMENT OF DAMAGED SPALTER:** The damaged or corroded ends of metal pipe to be extended shall be removed. If the damaged end is flame cut, the burned spalter on the galvanized pipe shall be wire brushed to clean metal and the area shall be painted with two coats of paint, high in zinc content, for repair of the galvanized surfaces.

**SETTLEMENT AND CAMBER:** Pipes shall be cambered as necessary to compensate for any anticipated settlement in the foundation or bed. Camber shall be on a parabolic curve with no point along the invert being higher than the invert at the inlet.

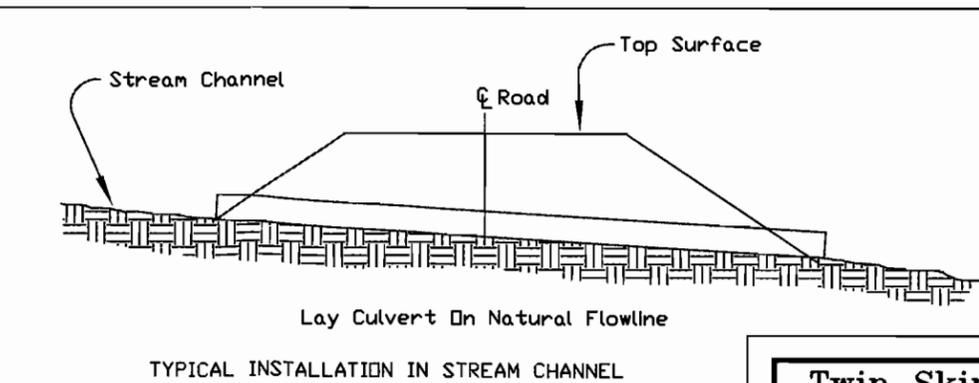
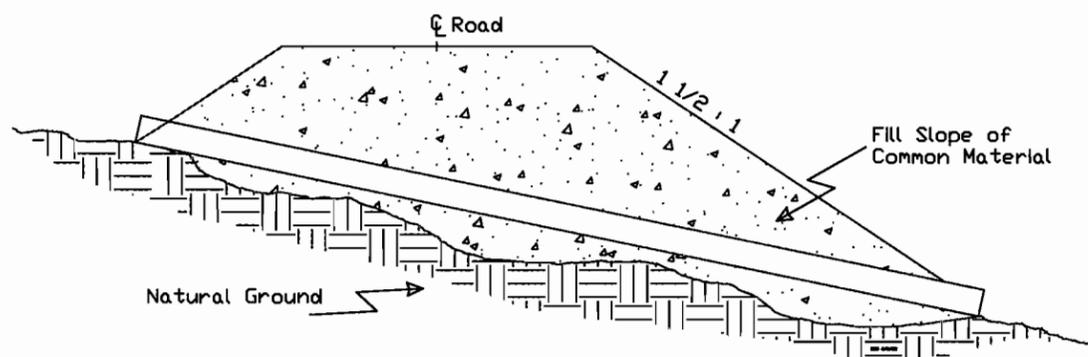
**EMBANKMENT AND FOUNDATION SOIL CONDITION**  
Existing Fills, Regardless of Foundation Soils

**CAMBER**  
1% of pipe length, not to exceed 3/4 of pipe span.



1% of pipe length, not to exceed 3/4 of pipe span or as determined by the engineer.

TYPICAL INSTALLATION IN EMBANKMENT



NO SCALE

CULVERT DETAILS