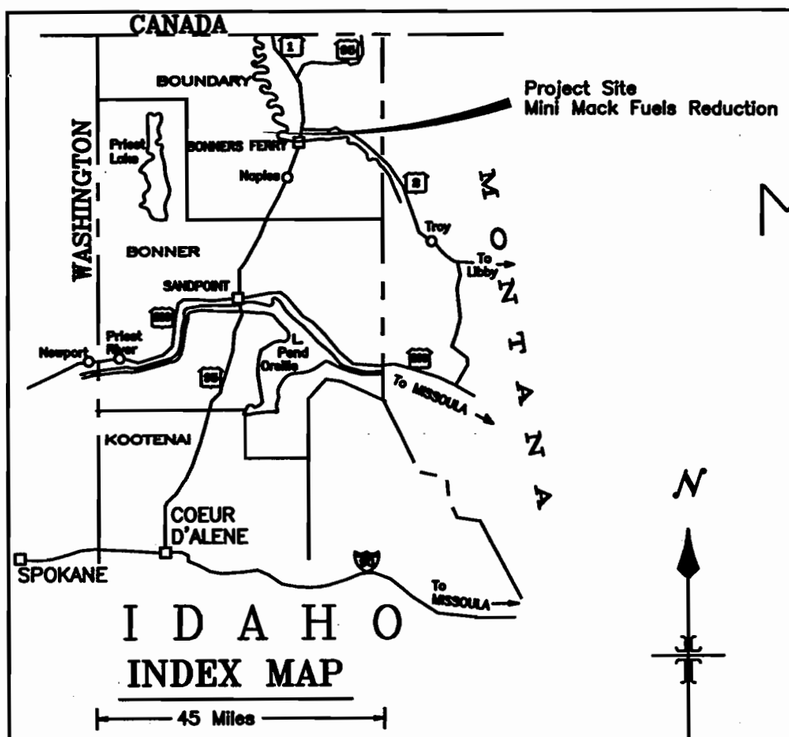
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION ONE

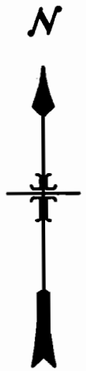
DRAWINGS FOR PROPOSED FOREST DEVELOPMENT ROADS

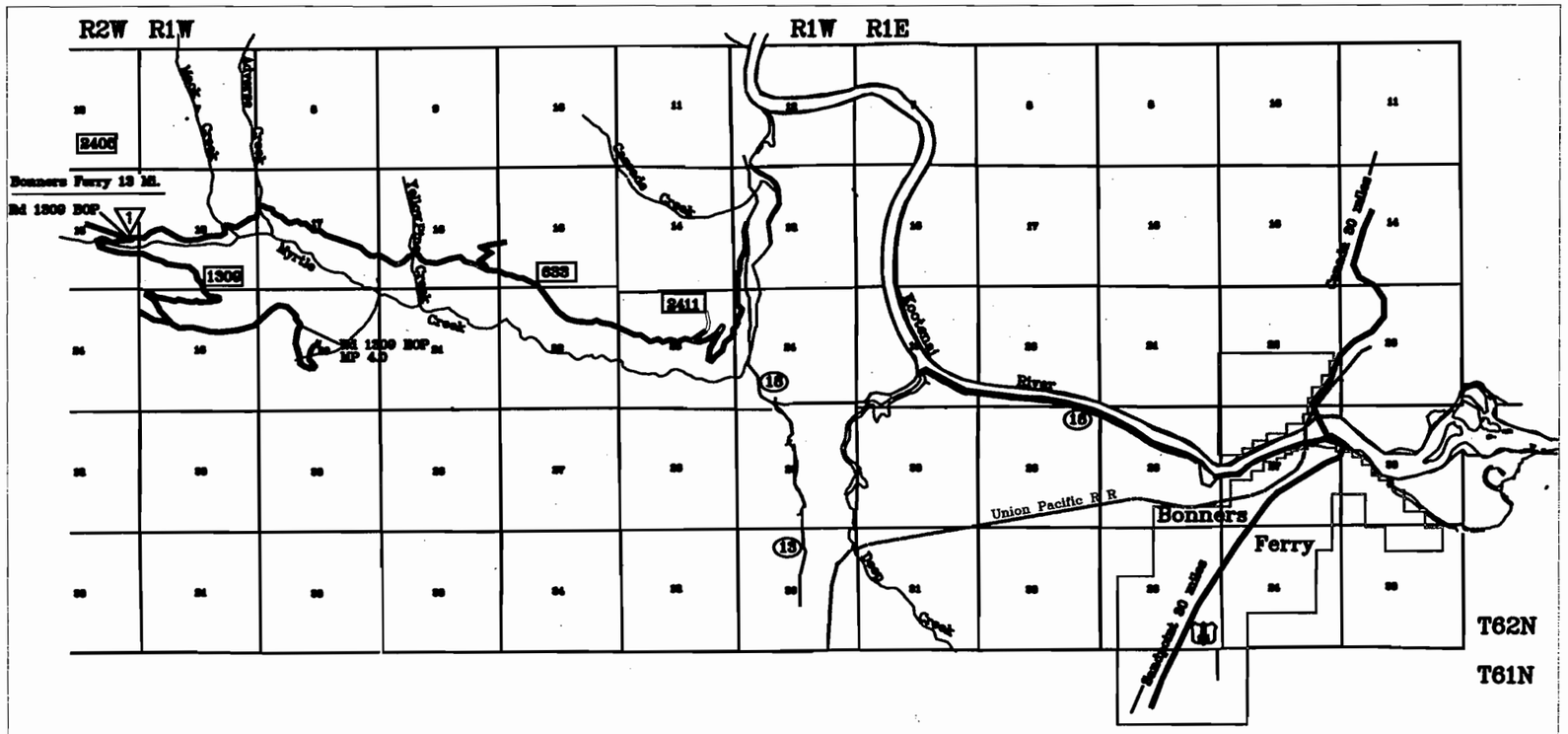
MINI MACK FUELS REDUCTION

FOREST ROADS

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







VICINITY MAP

SCALE: ONE SECTION EQUALS ONE SQUARE MILE

INDEX TO SHEETS

1 Title Sheet
2 Estimate of Quantities
3 Details and Work List
4 Sections
5 Work List
6 Rd 1309
7 Coupling Detail 1
8 Coupling Detail 2
9 Coupling Detail 3
10 Culvert Details

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"

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

Recommended and certified to be technically correct

Project Team Leader 11/16/07

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

Forest Engineer

Approved:

District Ranger 11/16/07 Date

ESTIMATE OF QUANTITIES

		ROAD NUMBER			1309	-	-	-	-	-	
		MILE POST (MILES)			4.00	-	-	-	-	-	
ITEM NO.	DESCRIPTION	METHOD OF MEASURE	UNIT	COMPONENT CODE	QUANTITIES						REMARKS
201A(01)	Roadway Brushing	A.Q.	Mile	2	4.00						
203(01)H	Excavation Placement Method 1, Includes Sta. Yd. Haul	D.Q.	C.Y.	1	100.00						
203(20)	Drainage Excavation, Type Rolling Dip	A.Q.	Each	1	14.00						
304(10)	Crushed Aggregate, Type surface, Grading D, Compaction A	D.Q.	C.Y.	2	20.00						
306(01)	Reconditioning of Roadbed, Compaction A	A.Q.	Mile	2	4.00						
412(16)	Calcium Chloride Flake @77% Min. Concentration Preparation Method1	A.Q.	Ton	2	28.00						
601(01)	Mobilization	L.S.Q.	L.S.	0	1.00						
603(01)18C	18" CMP (incl culv exc), Thickness: Steel 0.064 Thickness: Aluminum 0.060, Method C	A.Q.	L.F.	3	160.00						
603(01)24C	24" CMP (incl culv exc), Thickness: Steel 0.064 Thickness: Aluminum 0.060, Method C	A.Q.	L.F.	3	192.00						
605(27)	Under Drain	L.S.Q.	L.S.	1	1.00						
619(03)	Machine-Placed Riprap Class 5	D.Q.	C.Y.	1	120.00						

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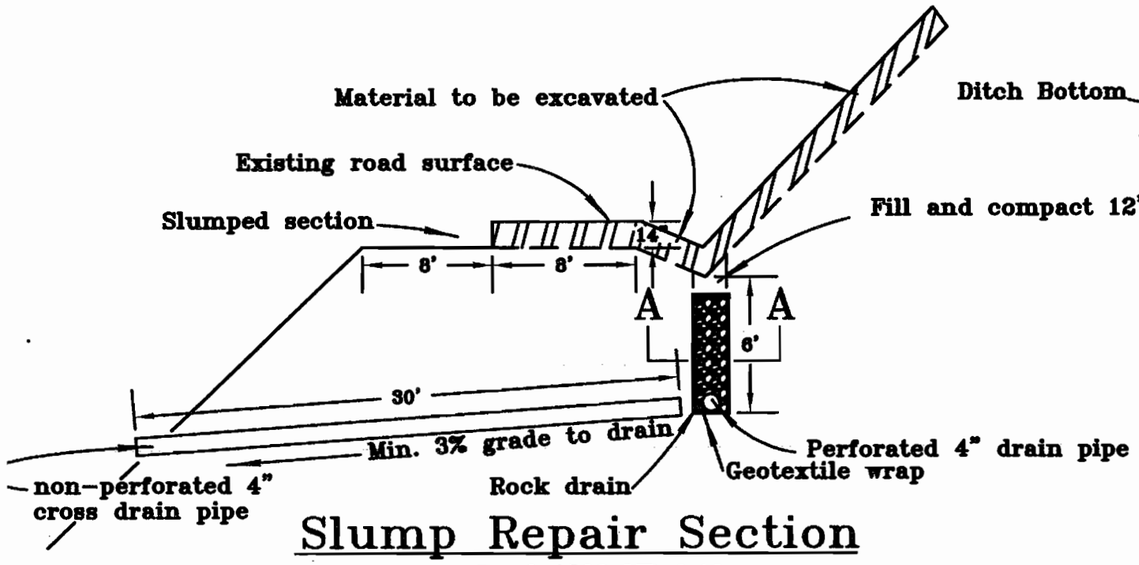
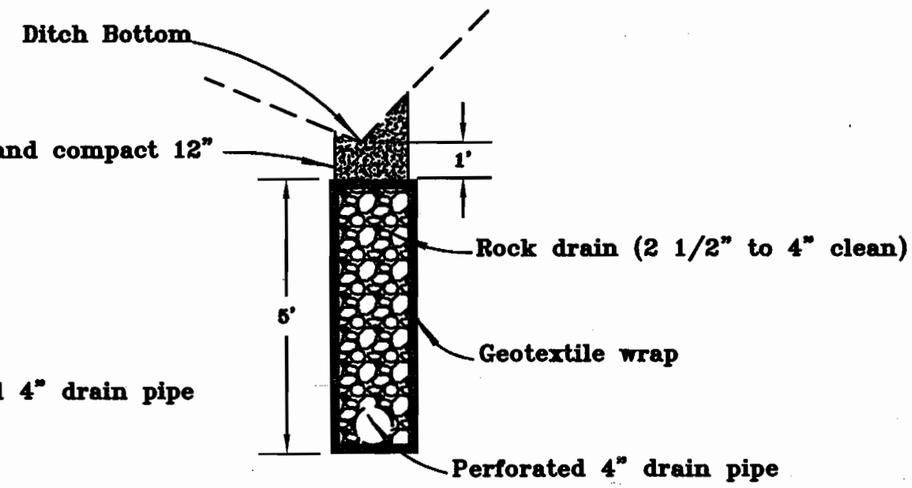
Forest
Idaho Panhandle
Project Name
Mini Mack Fuels Reduction

Sheet Title
Summary of Quanities
Sheet 2 of 10



Slump Repair Section

Road 1309 MP 0.10



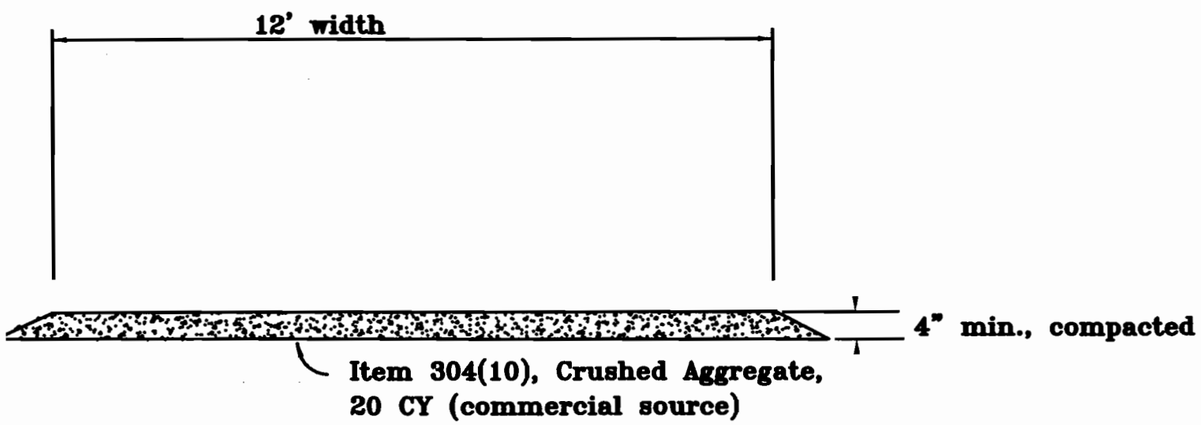
A–A Section

Materials List

4" Perforated Pipe – 90LF
4" elbow – 1EA
4" Non-perforated Pipe – 40LF
Non-woven Geotextile – 150SY
Drain Rock – 20CY

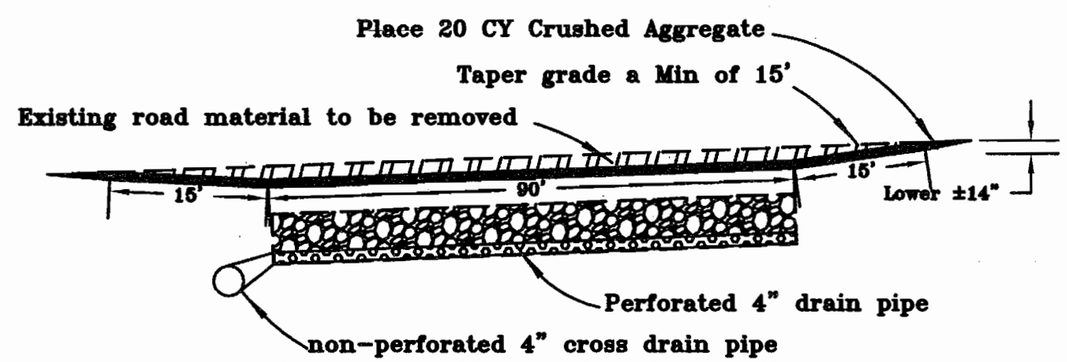
Work List

Excavate ~100CY from road surface, ditchline/trench and cut slope. Haul excess excavated material to disposal site located at MP 7.30 Road 633 Approx. ¼ mile as staked on the ground. Conserve enough excavated material to backfill over the drain field and cross drain. Place geotextile and drain pipe in the trench, back fill with drain rock, bring geotextile over the drain rock to cover and compact 12" of excavated material to seal the ditchline area.
At the lower end of the drain field connect an elbow to the perforated pipe and then connect the non-perforated to form a cross drain, backfill with excavated material.



Typical Section

Road 1309 MP 0.10
(not to scale)



Slump Repair Profile

Road 1309 MP 0.10

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
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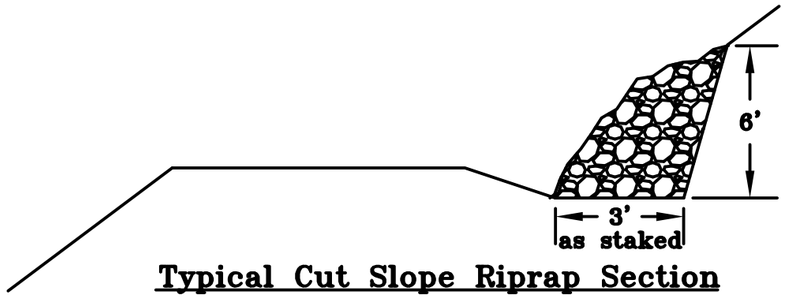
NORTHERN REGION

Drawn: Ned Davis
Design:
Checked:
Reviewed:

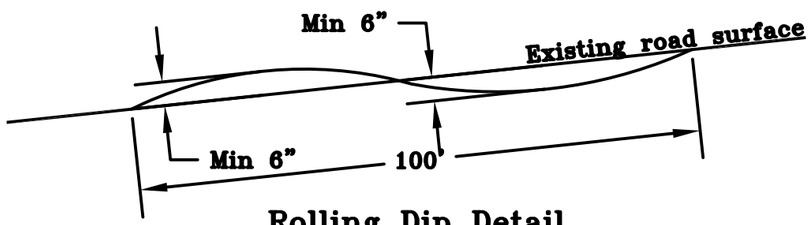
Forest: Idaho Panhandle
Project Name: Mini Mack Fuels Reduction

Sheet Title: Notes and Typicals
Sheet 3 of 10



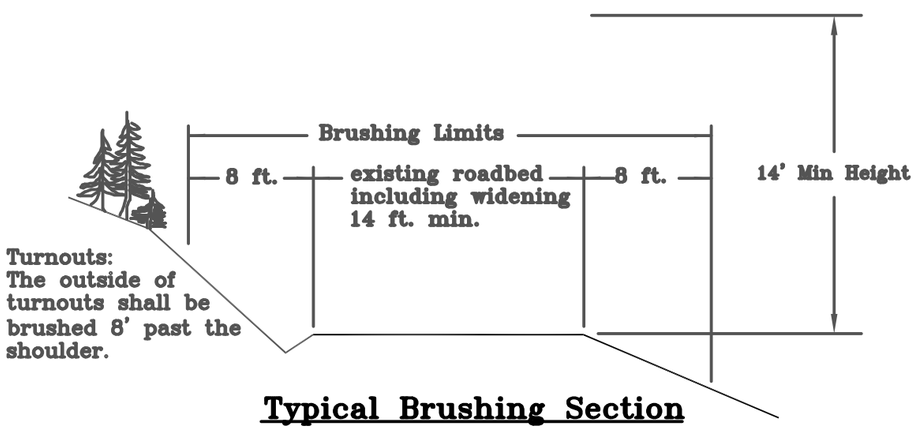
Typical Cut Slope Riprap Section

Road 1309 – MP 2.08 Item 619(03)5 Riprap, Class V, 70 CY.



Rolling Dip Detail

Item 203(20) Rolling Dip, Road 1309
Locations as shown on the drawings and staked on the ground

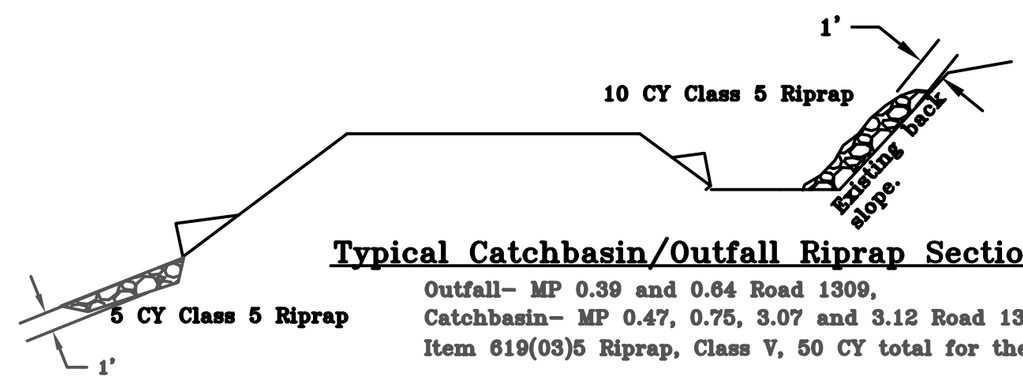


Typical Brushing Section

All specified roads, Items 201A(01)

NOTES:

1. Sections 203, excess material shall be hauled to disposal site as shown on the plans. Haul is incidental to 203(01)H no additional payment shall be made under 205a..
2. Section 304 Crushed Aggregate shall come from a commercial source for all roads. The cost of watering is incidental to Item 304(10).
3. Section 306 – Scarification is not required.
4. Section 306.02 – Ditch sections adjacent to crushed aggregate surfaces shall be cleaned in a manner that does not contaminate the aggregate surface, excess and unsuitable material shall be sidecast uniformly along adjacent fill slopes.
5. Item 412(16) – Application rate for CaCl Flake shall be 2.00 lbs/SY and 12' wide on road 1309. Calcium Chloride Flake may be substituted as follows: Magnesium Chloride Brine, .50 gal/sq.yd. (two applications of .25 gal/sq.yd.) Calcium Chloride Brine, .72 gal/sq.yd. (two applications of .36 gal/sq.yd.). See SPS 412.
The cost of watering the surface prior to application is incidental to Item 412(16).



Typical Catchbasin/Outfall Riprap Section

Outfall– MP 0.39 and 0.64 Road 1309,
Catchbasin– MP 0.47, 0.75, 3.07 and 3.12 Road 1309,
Item 619(03)5 Riprap, Class V, 50 CY total for the above sites

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Forest: Idaho Panhandle
Project Name: Mini Mack Fuels Reduction

Sheet Title: Sections
Sheet 4 of 10

Road 1309:

MP 0.0 to 4.0–Item 201A(01) Roadway Brushing

MP 0.0 to 4.0–Item 306(01) Reconditioning of Roadbed, Comp A

MP 0.0 to 4.0–Item 412(16) Calcium Chloride Flake, apply 2 pounds per SY 12' wide

MP 0.08–Item 203(20) Construct a rolling Dip

MP 0.10–Repair slump See sheet 3 for work items and details

MP 0.25–Item 203(20) Construct a rolling Dip

MP 0.39–Item 619(03)5 Class V Riprap place 5 CY at outlet to form an outfall.

MP 0.47–Item 619(03)5 Class V Riprap place 10 CY at inlet to armor back slope of catch basin.

MP 0.55–Item 603(01)24 24" CMP remove existing CMP and install a 32'x 24" CMP

MP 0.58–Item 603(01)24 24" CMP remove existing CMP and install a 32'x 24" CMP

MP 0.62–Item 203(20) Construct a rolling Dip

MP 0.64–Item 619(03)5 Class V Riprap place 5 CY at outlet to form an outfall.

MP 0.75–Item 619(03)5 Class V Riprap place 10 CY at inlet to armor back slope of catch basin.

MP 1.12–Item 603(01)24 24" CMP remove existing CMP and install a 32'x 24" CMP

MP 1.27–Item 603(01)24 24" CMP remove existing CMP and install a 32'x 24" CMP

MP 1.46–Item 603(01)18 18" CMP install a 32'x 18" CMP

MP 1.78–Item 203(20) Construct a rolling Dip

MP 1.88–Item 203(20) Construct a rolling Dip

MP 2.07–Item 203(20) Construct a rolling Dip

MP 2.08 TO 2.10–Item 619(03)5 Class V Riprap place 70 CY of riprap to form a 3' thick 6' high buttress

MP 2.10–Item 203(20) Construct a rolling Dip

MP 2.11–Item 203(20) Construct a rolling Dip

MP 2.15–Item 603(01)18 18" CMP install a 32'x 18" CMP

MP 2.27–Item 603(01)18 18" CMP install a 32'x 18" CMP

MP 2.50–Item 603(01)24 24" CMP remove existing CMP and install a 32'x 24" CMP

MP 2.62–Item 203(20) Construct a rolling Dip

MP 2.79–Item 603(01)24 24" CMP remove existing CMP and install a 32'x 24" CMP

MP 3.00–Item 603(01)18 18" CMP install a 32'x 18" CMP

MP 3.07–Item 619(03)5 Class V Riprap place 10 CY at inlet to armor back slope of catch basin.

MP 3.12–Item 619(03)5 Class V Riprap place 10 CY at inlet to armor back slope of catch basin.

MP 3.25–Item 203(20) Construct a rolling Dip

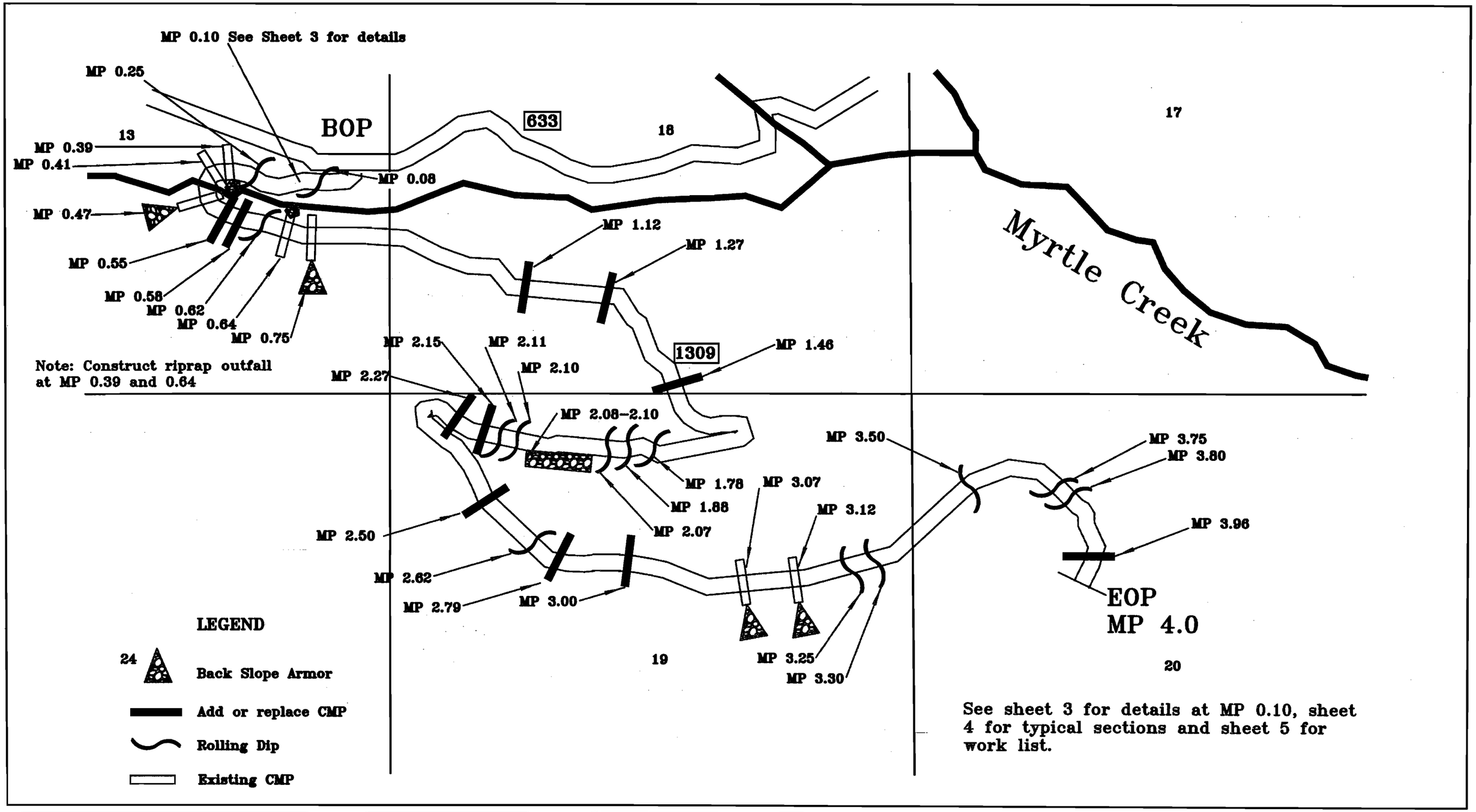
MP 3.30–Item 203(20) Construct a rolling Dip

MP 3.50–Item 203(20) Construct a rolling Dip

MP 3.75–Item 203(20) Construct a rolling Dip

MP 3.80–Item 203(20) Construct a rolling Dip

MP 3.96–Item 603(01)18 18" CMP install a 32'x 18" CMP



See sheet 3 for details at MP 0.10, sheet 4 for typical sections and sheet 5 for work list.

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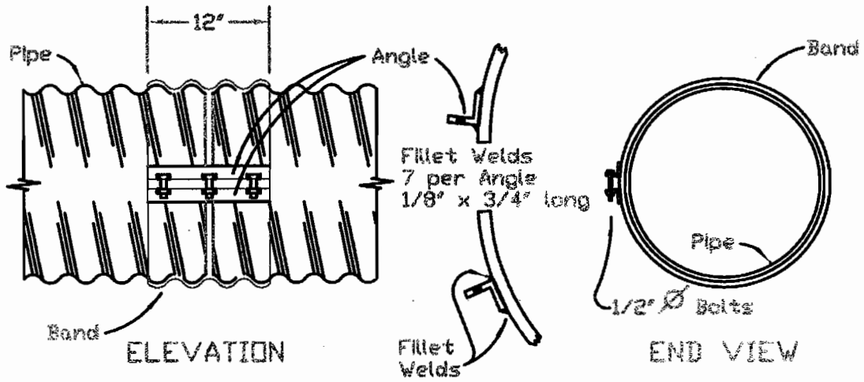
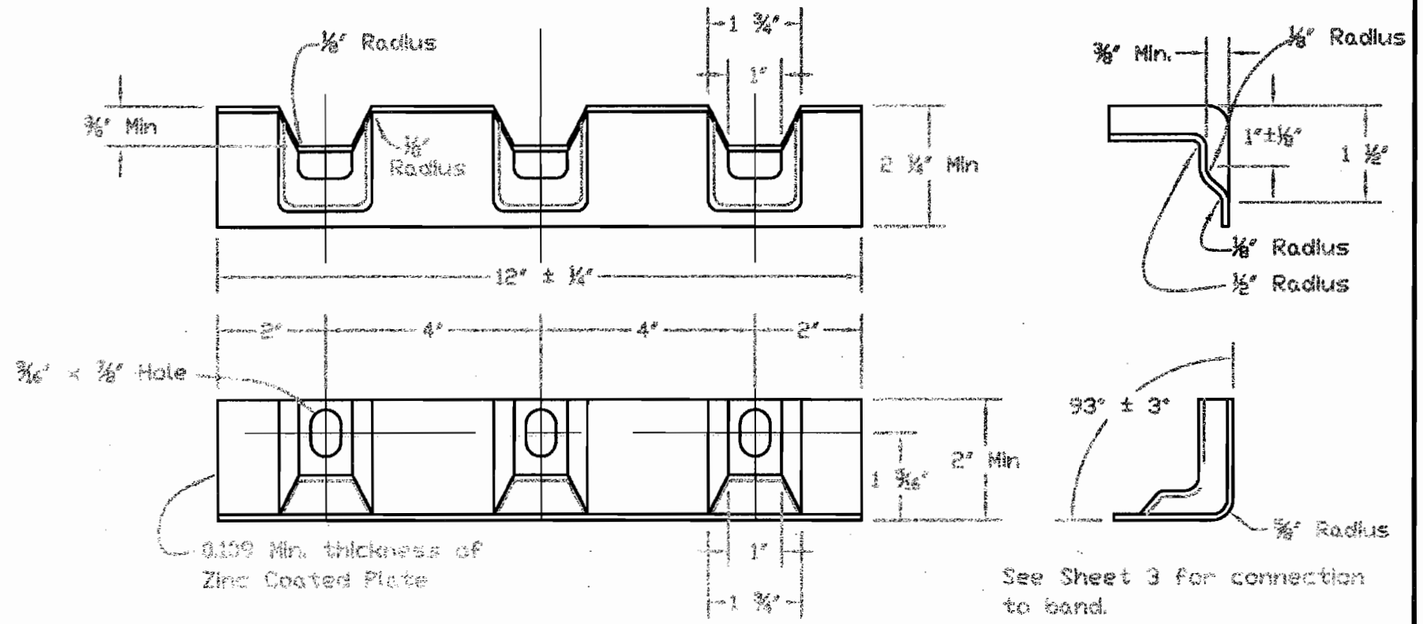
Project Name
Mini Mack Fuels Reduction

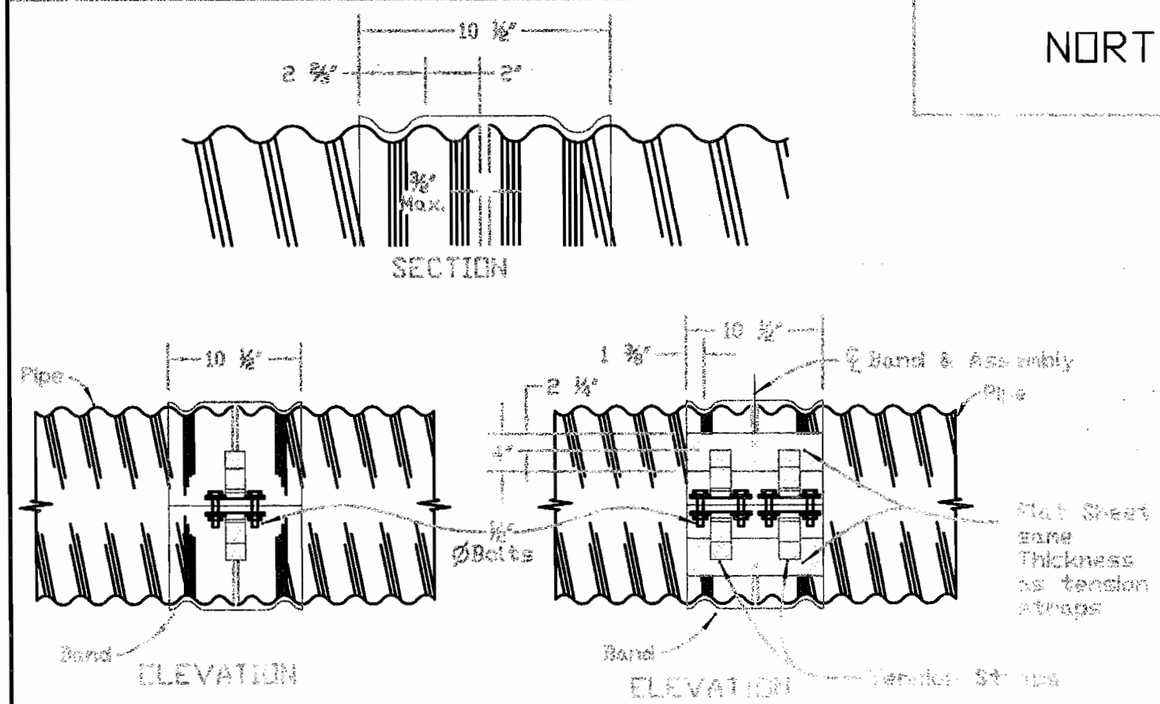
Sheet Title
Rd 1309
Sheet 6 of 10



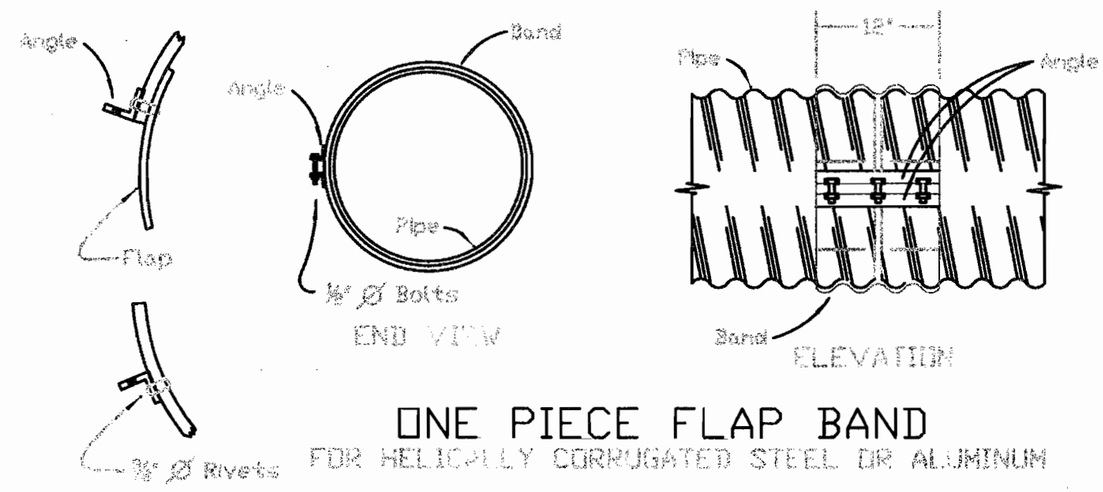
AMERICAN CULVERT BAND
FOR HELICALLY CORRUGATED STEEL PIPE



NORTHWEST CULVERT ANGLE ALTERNATIVE
FOR STEEL PIPE

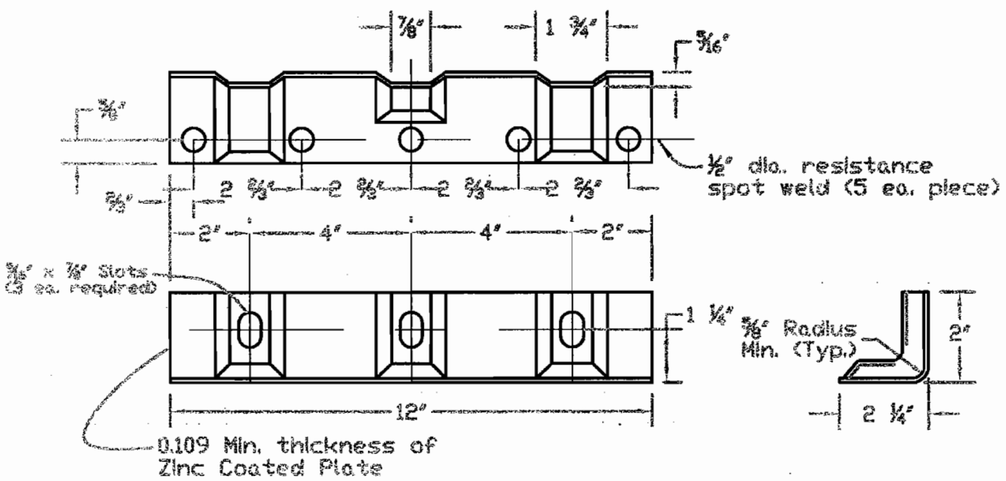


HUGGER COUPLING BAND
FOR REFORMED END HELICALLY CORRUGATED
WELDED SEAM STEEL PIPE



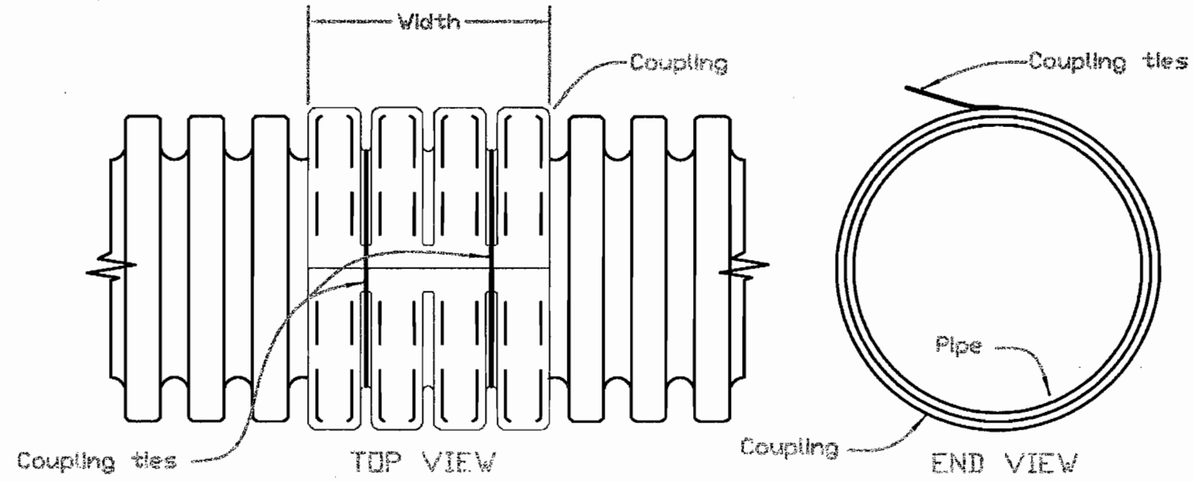
ONE PIECE FLAP BAND
FOR HELICALLY CORRUGATED STEEL OR ALUMINUM

COUPLING BAND DETAILS
FOR
CORRUGATED PIPE AND PIPE ARCH



ALTERNATE FOR 2X2X3/16 ANGLE

FOR STEEL PIPE

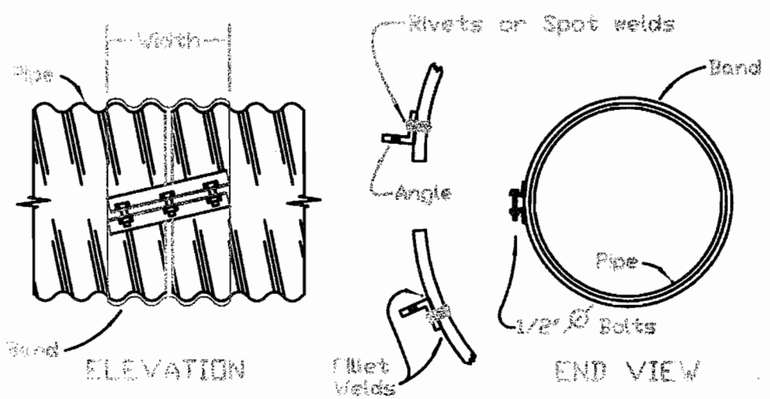


SPLIT COLLAR COUPLING

FOR ANNULAR CORRUGATED POLYETHYLENE PIPE

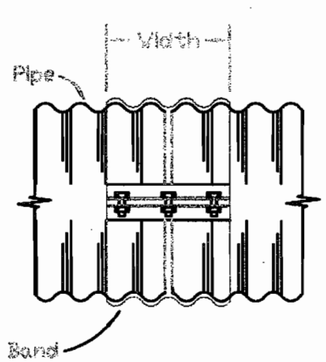
Notes:

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.



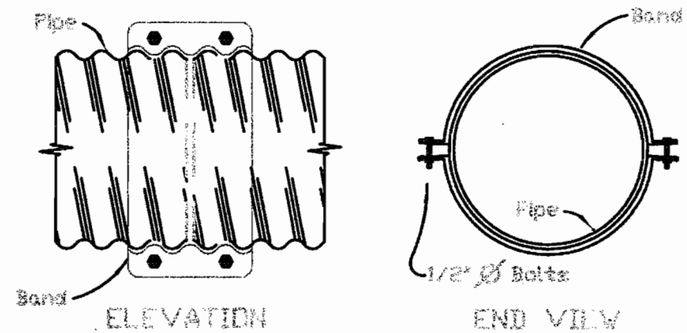
HELICAL COUPLING BAND

FOR HELICALLY CORRUGATED STEEL OR ALUMINUM PIPE



ANNULAR COUPLING BAND

FOR ANNULAR OR REFORMED END HELICALLY CORRUGATED STEEL OR ALUMINUM PIPE



TWO PIECE INTEGRAL FLANGE

FOR HELICALLY CORRUGATED STEEL OR ALUMINUM PIPE

Notes:

1. Use 8x12x0.150 thickness 5052-H34 aluminum plate washer under bolt head & nut on aluminum pipe flange.
2. Use 8x12x0.125 thickness galvanized steel plate washer under bolt head & nut on steel pipe flange.

COUPLING BAND DETAILS
FOR
CORRUGATED PIPE AND PIPE ARCH

COUPLING TYPE	CORRUGATION Inches	PIPE DIAMETER Inches	WIDTH Inches	SPECIFIED THICKNESS See Note 1-C: Pipe Wall	SPECIFIED THICKNESS See Note 1-C: Band	ANGLE - See Note 1-H: DIMENSION	ANGLE: BOLTS NO / DIAMETER	ANGLE TO BAND: RIVETS	ANGLE TO BAND: SPOT WELDS
Metal Pipe Annular and Helical	2-2/3x1/2 (Steel or Aluminum)	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
		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		
Nor-Shield 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 48	12	0.138	0.064-0.109				
		Thru 84	12	0.064-0.168	0.064-0.109			5-1/2 Spot	
						BAR AND STRAP			
						NUMBER/ THICKNESS	BOLT DIAMETER	BAR DIAMETER	BAR YIELD STRENGTH P.S.I.
Nugget	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	0.138-0.164	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
		66-84	10-1/2	0.109-0.168	0.109	Two 0.109	1/2	7/8	45,000
	3x1 (Steel Only)	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
		51-120	10-1/2	0.109	0.109	Two 0.109	1/2	7/8	45,000
Pi" Pipe Spun Other		Thru 84	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 minum 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 culvert being joined.

2. Polyethylene (PE) Couplings

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

A. Where the slope of the culvert will not be more than 5%.

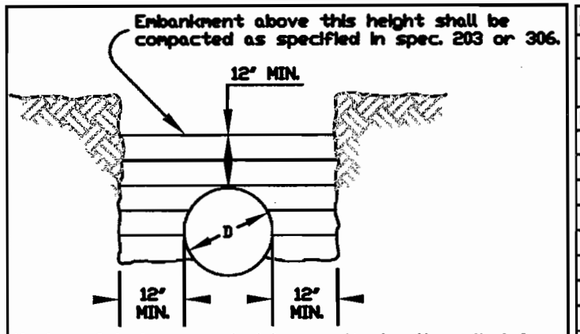
B. Where the fill below the culvert is less than 8 feet.

C. In areas of flat soils. This excludes marshes where the backfill is specially designed and approved by the engineer.

3. Other

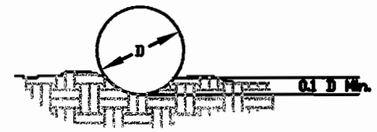
Couplings other than those shown on this drawing may be used upon submission of testing data (see 1-A above) and approval by the Engineer.

COUPLING BAND DETAILS
FOR
CORRUGATED PIPE AND PIPE ARCH

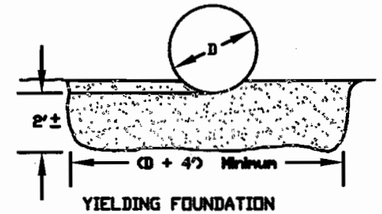


Maximum 6-inch compacted layers to density called for in the specifications. Bedding shall be suitable material uniformly compacted and shaped to fit the bottom of the pipe.

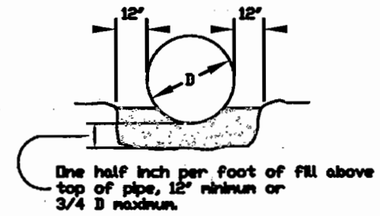
METAL THICKNESS AND GAGE TABLES			
Steel		Aluminum	Approx. Gage
Zinc Coated	Un-Coated		
Metal Thickness in Inches			
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8
0.188	0.1838		7
0.218	0.2145		5
0.249	0.2451		3
0.280	0.2758		1



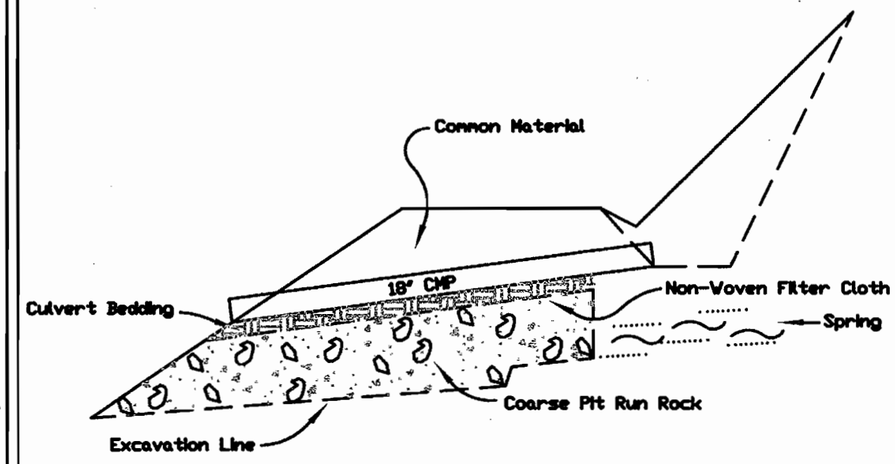
TYPICAL BEDDING MATERIAL



YIELDING FOUNDATION



ROCK FOUNDATION



UNDERDRAIN TYPICAL SECTION

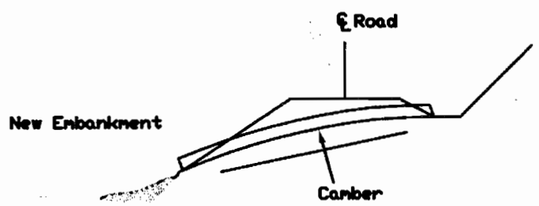
GENERAL NOTES:

TREATMENT OF DAMAGED SPELTER: The damaged or corroded ends of metal pipe to be extended shall be removed. If the damaged end is flame cut, the burned spelter 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.

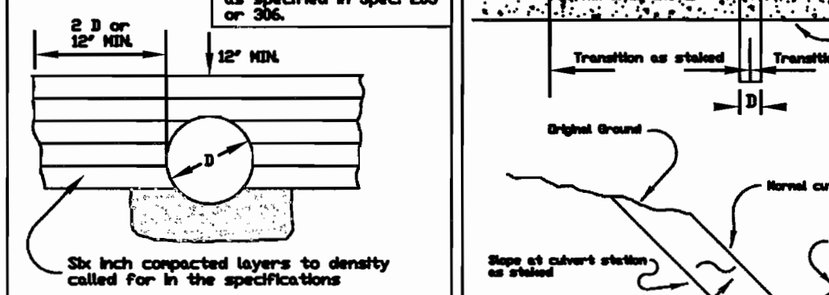
EMBANKMENT AND FOUNDATION SOIL CONDITION
Existing Fills, Regardless of Foundation Soils

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



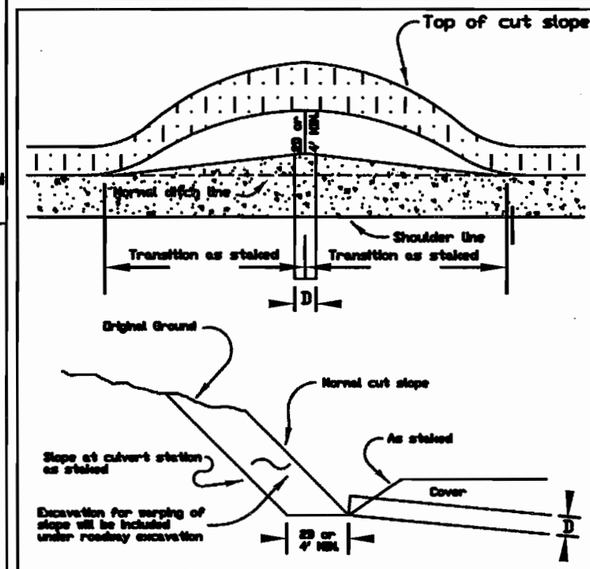
1% of pipe length, not to exceed 3/4 of pipe span or as determined by the engineer.

TYPICAL INSTALLATION IN EMBANKMENT

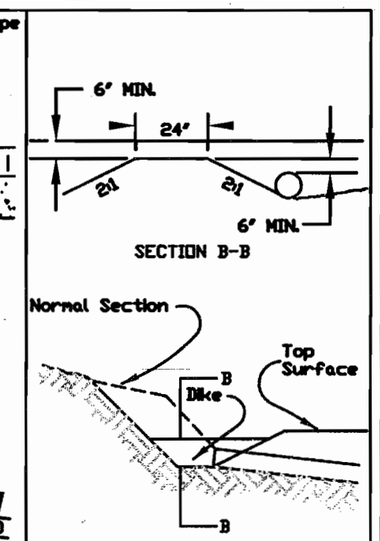


TYPICAL BACKFILL DETAIL

Bedding shall be suitable material uniformly compacted and shaped to fit the bottom of the pipe

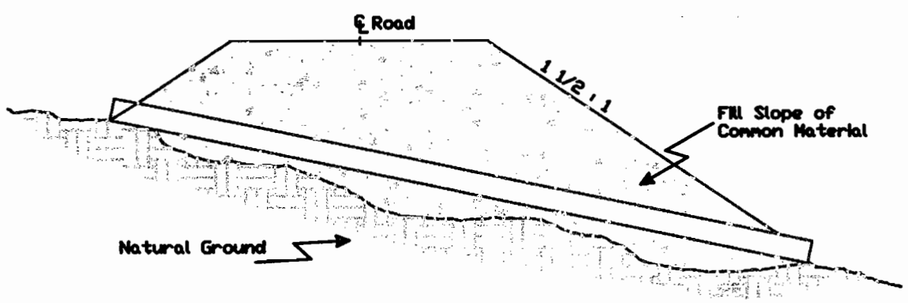


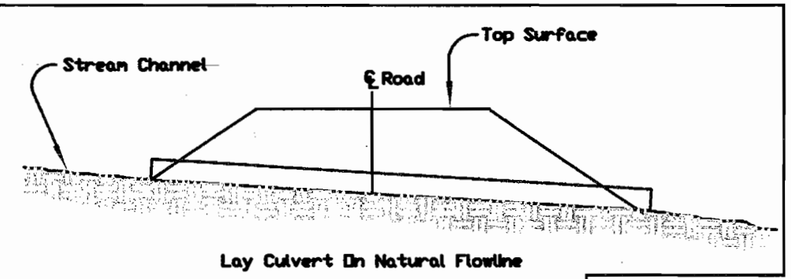
TREATMENT OF CUT SLOPE AT CULVERT INLET



SECTION B-B

DITCH DIKE





TYPICAL INSTALLATION IN STREAM CHANNEL

NO SCALE

CULVERT DETAILS