

# U. S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION



## PLANS FOR PROPOSED PROJECT DENALI COMMISSION STUDY AKHIOK TSUNAMI SHELTER TRAIL VILLAGE OF AKHIOK KODIAK ISLAND ALASKA

LENGTH 892 FEET



INDEX TO SHEETS	
<b>A. GENERAL INFORMATION</b>	
A.1	TITLE SHEET
A.2	NOTES AND FINDINGS
<b>B. SUMMARIES</b>	
B.1	SUMMARY OF QUANTITIES
<b>C. TYPICAL SECTION(S)</b>	
C.1	TYPICAL SECTION
<b>D. PROJECT VICINITY MAP</b>	
D.1	AKHIOK VICINITY MAP
<b>E. CULVERTS</b>	
E.1	CULVERT EXTENSION DETAIL
E.2-3	STANDARD DRAWINGS 602-2, 602-3

**TYPE OF CONSTRUCTION:**

*Culvert extension, road surface regrading, ditch grading*

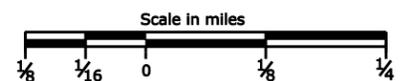
**DESIGN DESIGNATION:**

*UNCLASSIFIED PIONEERED SINGLE LANE TRAIL*

**FOR PLANNING AND SCOPING PURPOSES ONLY  
NOT FOR CONSTRUCTION**



PLANS PREPARED BY  
**U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION**  
WESTERN FEDERAL LANDS HIGHWAY DIVISION  
VANCOUVER, WASHINGTON



Checked by: \$DATE\$  
Designed by: \$DATE\$  
\$PATH\$

PROJECT MANAGER  
**M. TRAFFALIS**

STATE	PROJECT	SHEET NUMBER
AK	DEN 2008	A.2

## DESIGN AND CONSTRUCTION

### MATERIAL SOURCE:

The village has one under developed material source located south of the project in the village.

There are other rock sources that are not developed. These sources have been identified and preliminary tested by Alaska DOT to expand and re-gravel the village airport.

### CONSTRUCTION RESOURCES:

The Village of Akhiok currently owns or leases a small dozer, small excavator and two backhoe loaders. All Village equipment has an operator available.

General labor from the village is available for employment.

### TRANSPORTATION:

The village can be accessed by water with landing boats or small boats. There is no dock for barge access to the village.

The village can be accessed by air.

Local ground transportation is primarily ATVs and four-wheel drive trucks.

## RIGHT-OF-WAY

Land ownership must be verified.

## ENVIRONMENTAL COMPLIANCE

### Projected NEPA Document Type:

Categorical Exclusion

### Projected Permits and Compliance Actions:

Section 404 Nationwide Permit  
 Section 106 Cultural Consultation  
 ESA Section 7 Consultation  
 Coastal Zone Consistency

### Projected Time to Complete Environmental Compliance:

6-12 months

**PROJECT NOTES  
AND FINDINGS**

# SUMMARY OF QUANTITIES

STATE	PROJECT	SHEET NUMBER
AK	DEN 2008	B.1

PLAN SHEET SECTION ----->>			Section C Typical Section	Section D Vinicity Map	Section E Culverts							ESTIMATED QUANTITY		ESTIMATED COST	
ITEM	DESCRIPTION	UNIT										PLAN	BID SCHEDULE	UNIT PRICE	AMOUNT
15101-0000	MOBILIZATION	LPSM										All	All	\$50,000.00	\$50,000.00
20102-0000	CLEARING AND GRUBBING	LPSM										All	All	\$30,000.00	\$30,000.00
20401-0000	ROADWAY EXCAVATION	CUYD			2							2	2	\$125.00	\$250.00
20410-0000	SELECT BORROW	CUYD	10		3							13	13	\$80.00	\$1,040.00
20425-1000	DITCH, EXCAVATION	LNFT	1,000									1,000	1,000	\$50.00	\$50,000.00
30112-0000	AGGREGATE SURFACE COURSE	CUYD	707									707	707	\$90.00	\$63,630.00
60201-1000	36-INCH PIPE CULVERT	LNFT			15.0							15.0	15.0	\$300.00	\$4,500.00
60214-1000	CULVERT COUPLING BAND, 36"	EACH			1							1	1	\$200.00	\$200.00

TOTAL BID ITEMS;            \$199,620.00

35% CONTINGENCY            \$69,900.00

10% ENVIRONMENTAL MITIGATION:    \$20,000.00

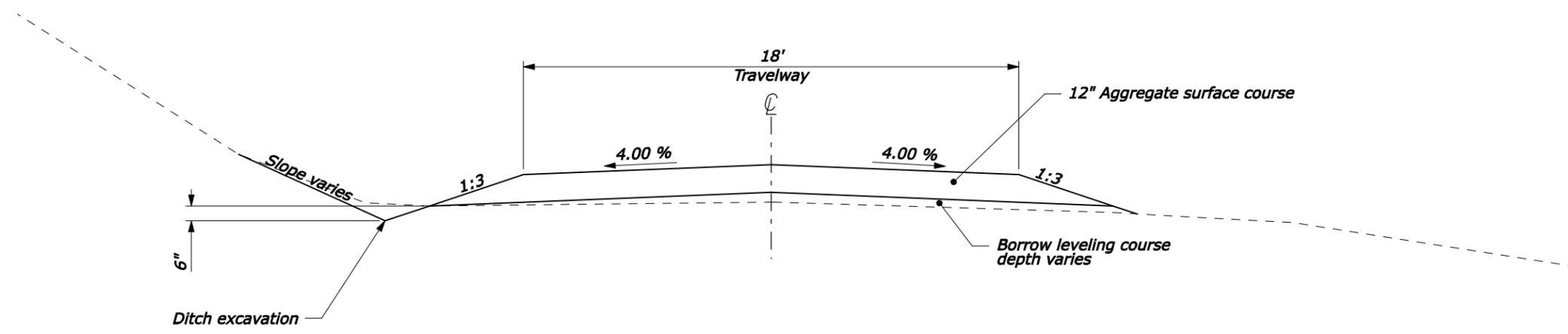
**TOTAL CONSTRUCTION COST:    \$289,520.00**

15% PE COST:            \$43,428.00

10% CE COST:            \$28,952.00

E:\GIS\GIS\_Projects\Denali\_Commission\_recon\AkhioK\Plan\_sheets\Sheets\_B\Estimate.xls]She 14-Dec-2008 10:01 Designed by: A. Designer Checked by: D. Checker --/--

E:\GIS\Projects\Denali\_Commission\_recon\Akhiok\Plan\_sheets\Sheets\_C\Akhiok\_Sheet\_C1.dgn [2/28/2008 10:04 AM] Designed by: Checked by:



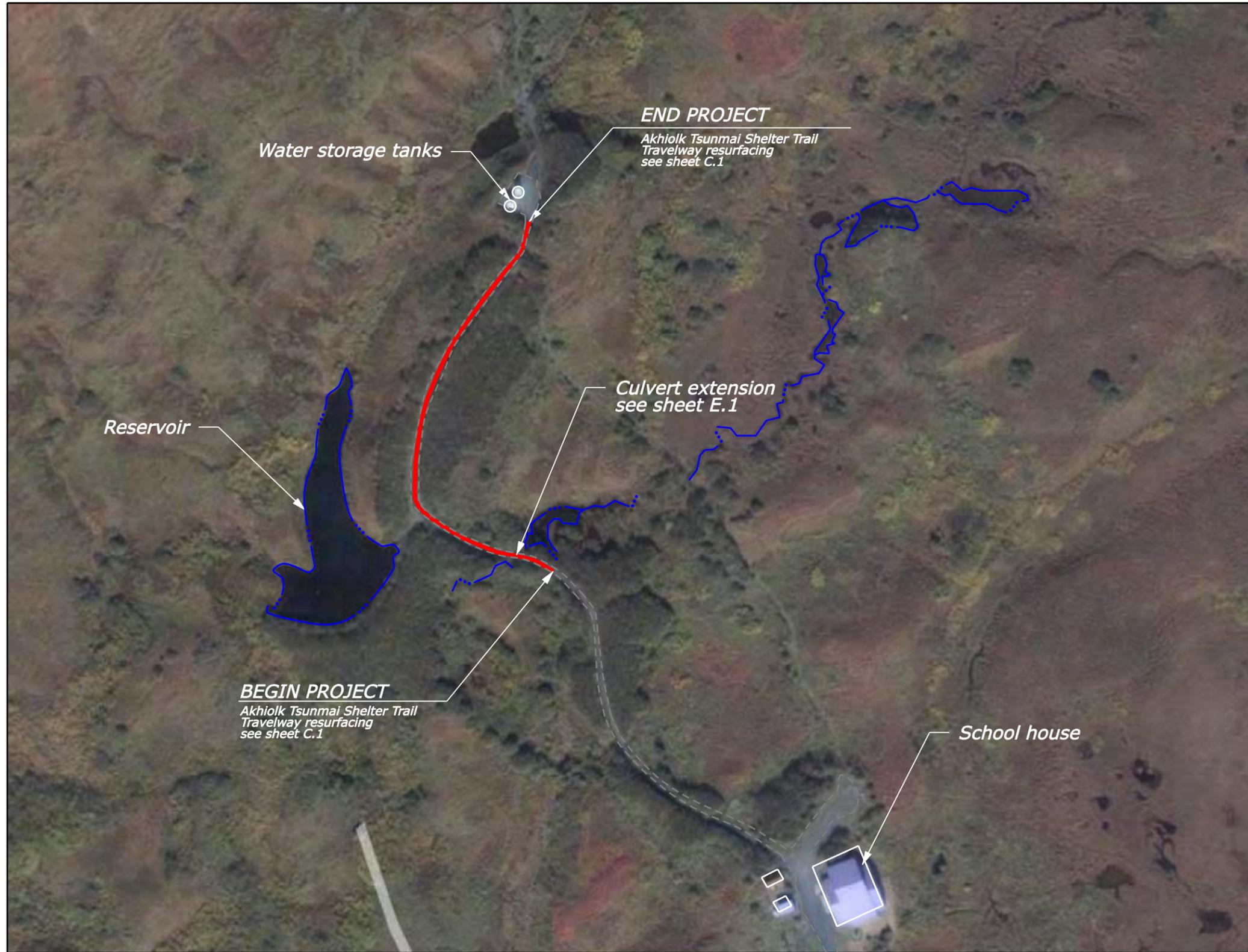
**RESURFACING TYPICAL SECTION**  
 Beginning of project  
 to  
 End of project

<b>TYPICAL SECTION QUANTITIES</b>			
ITEM NUMBER	DESCRIPTION	Unit	QUANTITY
20403-0000	Unclassified borrow	CUYD	10
20425-1000	Ditch excavation	LNFT	1000
30112-0000	Aggregate surface course	CUYD	707

**TYPICAL SECTION**

NO SCALE

STATE	PROJECT	SHEET NUMBER
AK	DEN 2008	D.1

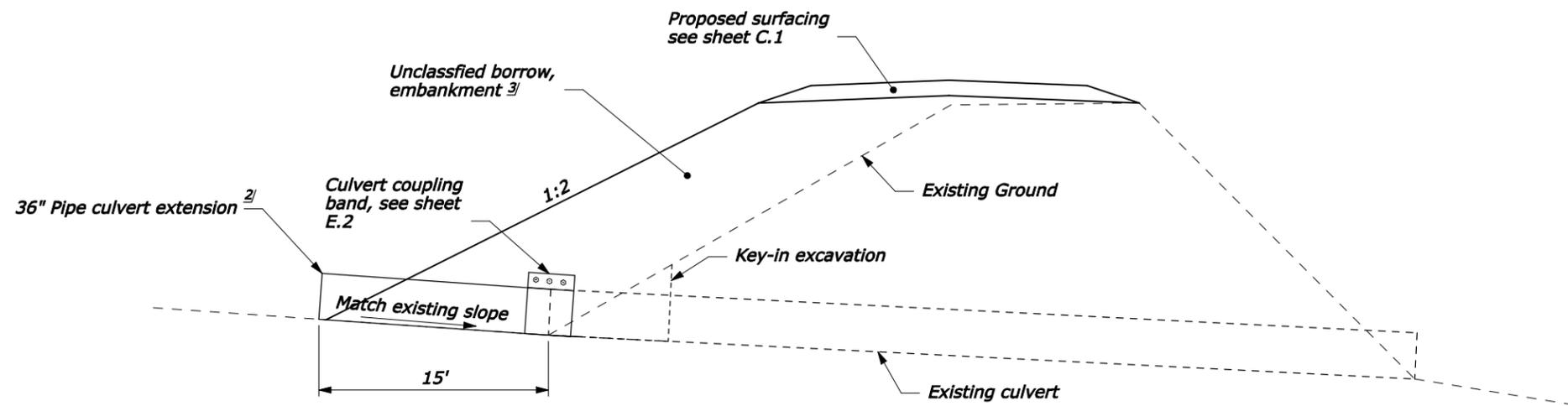


**PROJECT VINICITY  
MAP**

Checked by:

Designed by:

\$PATH\$



**CULVERT EXTENSION SECTION**

**CULVERT EXTENSION QUANTITIES**

ITEM NUMBER	DESCRIPTION	UNIT	QUANTITY
20401-0000	Roadway excavation	cuyd	1
20403-0000	Unclassified borrow	cuyd	3
60201-1000	36-Inch pipe culvert	lnft	15.0
60214-0000	Culvert coupling band, 36"	each	1

**FOOTNOTE:**

- <sup>1/</sup> See sheet D.1 for location.
- <sup>2/</sup> See sheet E.3 for culvert installation.
- <sup>3/</sup> Compact embankment in 12" lifts.

**CULVERT EXTENSION  
DETAIL**

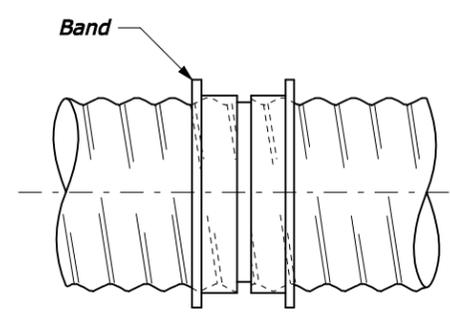
Checked by:

Designed by:

E:\GIS\Projects\Denail\_Commission\_recon\Akhiok\Plan\_sheets\Sheets\_E\Akhiok\_Sheet\_E.dgn 10:07AM

<b>COUPLING BANDS FOR METAL PIPE CULVERT <sup>1/</sup></b>					
CORRUGATION SIZE <sup>2/</sup> INCHES	ROUND PIPE DIAMETER INCHES	PIPE ARCH SPAN x RISE INCHES	MINIMUM BAND WIDTH (INCHES)		
			ANNULAR CORRUGATED BANDS <sup>3/</sup>	HELICALLY CORRUGATED BANDS <sup>4/</sup>	SEMI-CORRUGATED BANDS <sup>5/</sup>
1 1/2 x 1/4	underdrain <sup>6/</sup>	-	10.5	7	10.5
	12 to 36	17 x 13 to 42 x 29	7	12	
2 2/3 x 1/2	42 to 72	49 x 33 to 83 x 57	10.5	12	
	78 to 84	-	10.5	12	10.5
3 x 1	36 to 72	60 x 46 to 81 x 59	12	14	10.5
	78 to 144	87 x 64 to 142 x 91	12	14	10.5
5 x 1	36 to 72	60 x 46 to 81 x 59	20	22	
	78 to 144	87 x 64 to 142 x 91	20	22	

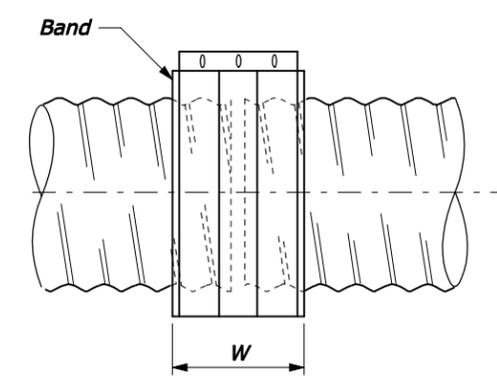
- <sup>1/</sup> Fabricate annular, helical and semi-corrugated type coupling bands from the same metal as the connecting pipe. Provide coupling bands not more than 3 nominal sheet thicknesses thinner than the thickness of the pipe to be connected, and no thinner than 0.052 inch for steel or 0.048 inch for aluminum. Fasten coupling bands with the following diameter of bolt:  
<sup>3/8</sup>" for 18" round culvert (21" x 15" pipe arch) or less  
<sup>1/2</sup>" for 21" round culvert (24" x 18" pipe arch) or more
- <sup>2/</sup> For helically corrugated pipe with rerolled ends, the nominal corrugations size refers to the dimension of the end corrugation in the pipe.
- <sup>3/</sup> Use annular corrugated bands with pipes having annular corrugations or with helical pipe having rerolled end to form annular corrugations. A 10.5 inch band is acceptable on pipe ends rerolled with 2 2/3" x 1/2" corrugations. A 12 inch band is acceptable on pipe ends rerolled with 3" x 1" pipe corrugations.
- <sup>4/</sup> Use helical corrugated bands with pipes having helically corrugated ends.
- <sup>5/</sup> The minimum band widths shown for 3" x 1" and 5" x 1" corrugated sizes apply to 2 2/3" x 1/2" corrugations on rerolled pipe ends.
- <sup>6/</sup> Smooth sleeve-type couplers and flat bands may be used for pipe diameters of 12" or less. Use a matching metal having a nominal thickness of not less than 0.040 inch for steel, or 0.036 inch for aluminum, or a plastic with an equivalent strength to metal.



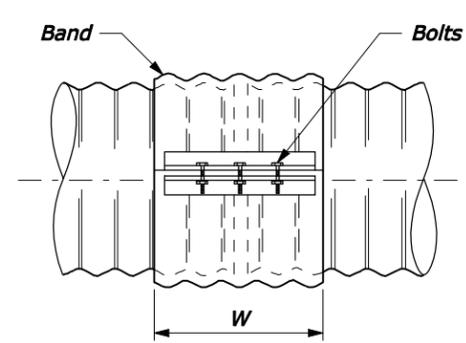
**SLEEVE JOINT**

Smoother sleeve with center stop.  
 Stab type joint

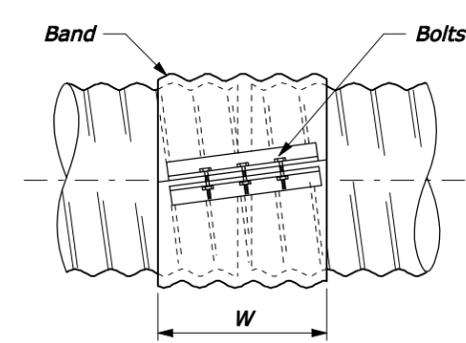
**SMOOTH SLEEVE BAND**



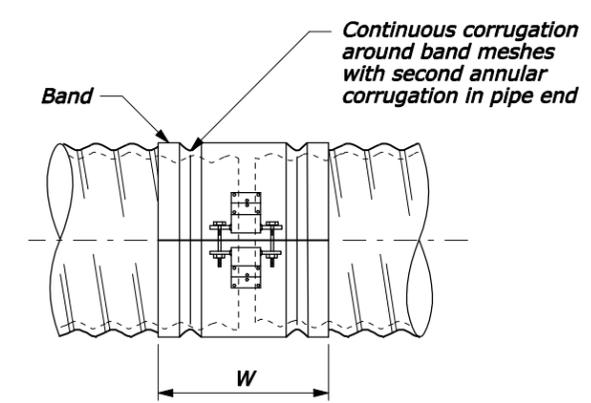
**FLAT BAND**



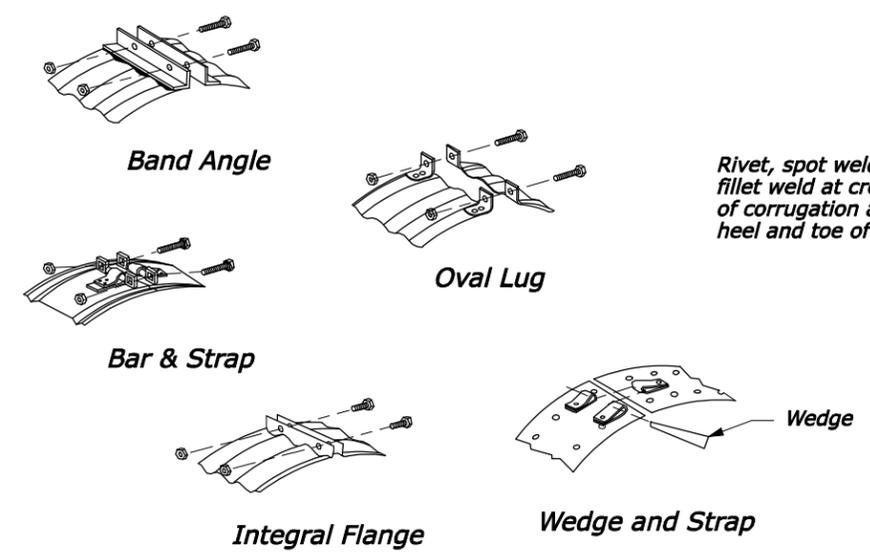
**SIDE VIEW**



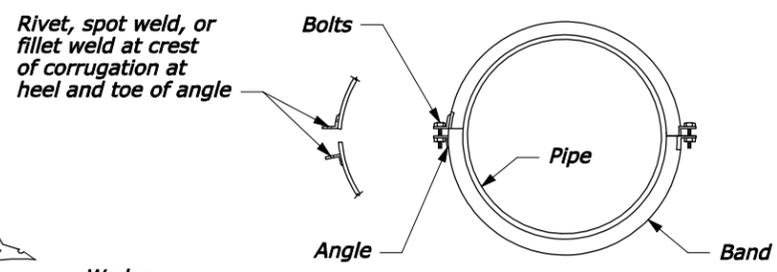
**SIDE VIEW**



**SIDE VIEW**



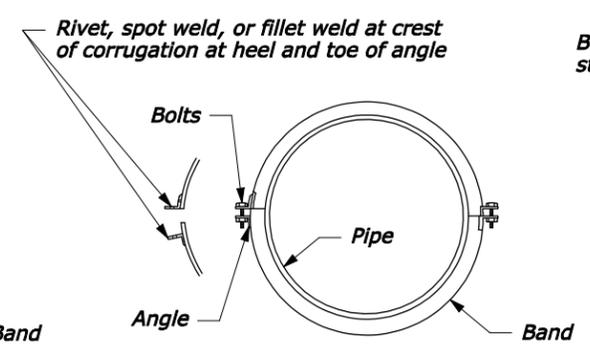
**STANDARD BAND CONNECTIONS**



**END VIEW**

Second angle connection optional to 42" diameter, required above 42" diameter

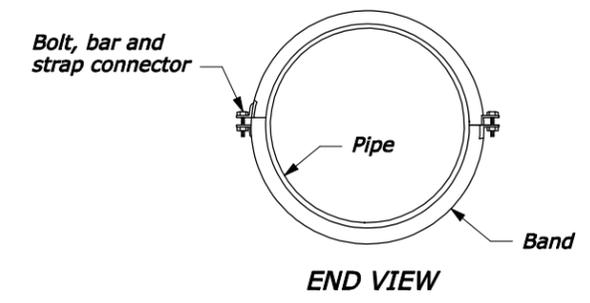
**ANNULAR BAND**



**END VIEW**

Second angle connection optional to 42" diameter, required above 42" diameter

**HELICAL BAND**



**END VIEW**

**SEMI-CORRUGATED BAND**

- NOTE:**
- Watertight pipe joints are not required unless specified in the Special Contract Requirements.
  - Other types of coupling bands or fastening devices that comply with the joint performance criteria of AASHTO Standard specifications for Highway Bridges, Division II Section 26 may be used.

U.S. DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION  
 FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

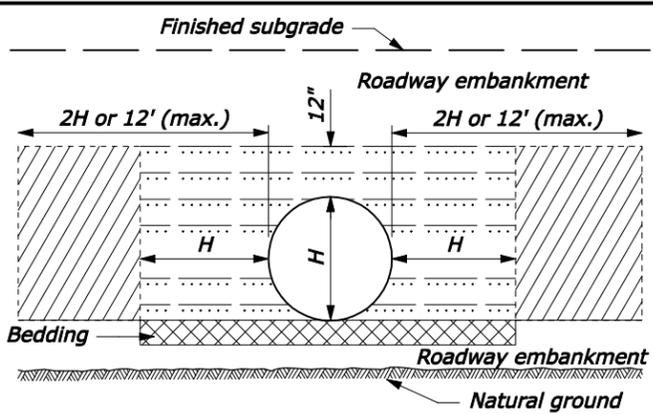
**METAL PIPE CULVERT  
 COUPLING BAND**

STANDARD APPROVED FOR USE 12/1993  
 REVISED: 4/1994 6/2005

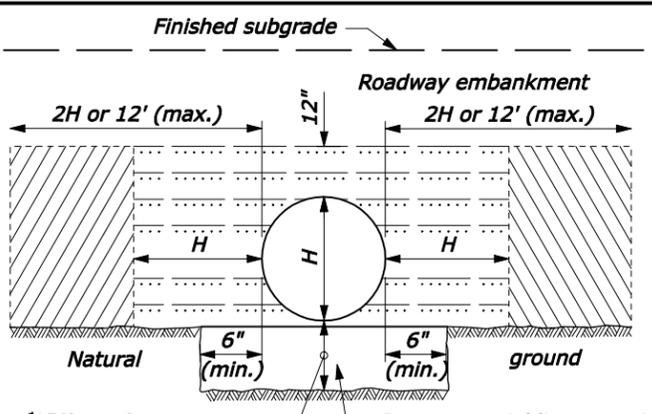
STANDARD  
 602-2

NO SCALE

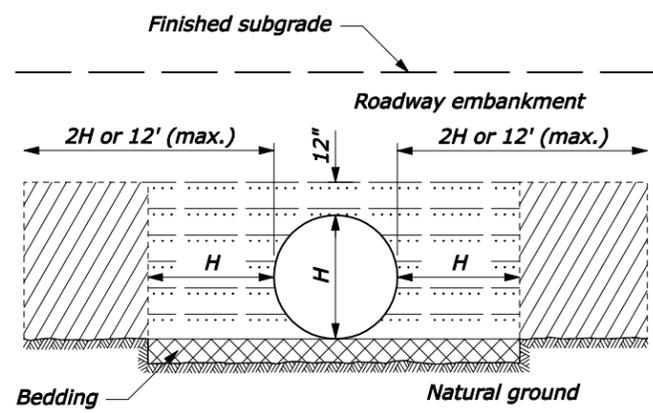
E:\GIS\GIS\_Projects\Denali\_Commission\_recon\Akhiok\Plan\_sheets\Sheets\_E\st6202.dgn [US Custom] 6/20/08 10:08AM



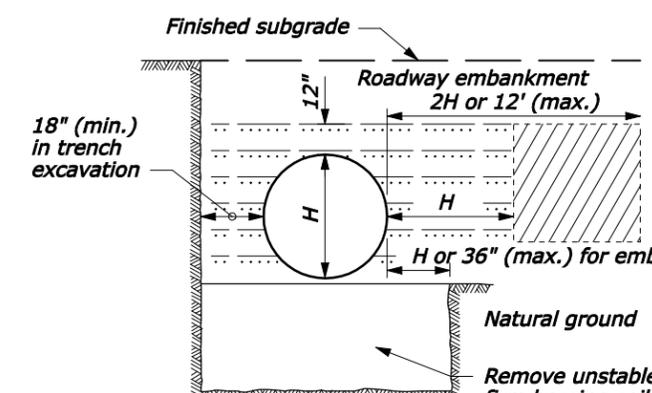
**ABOVE NATURAL GROUND**



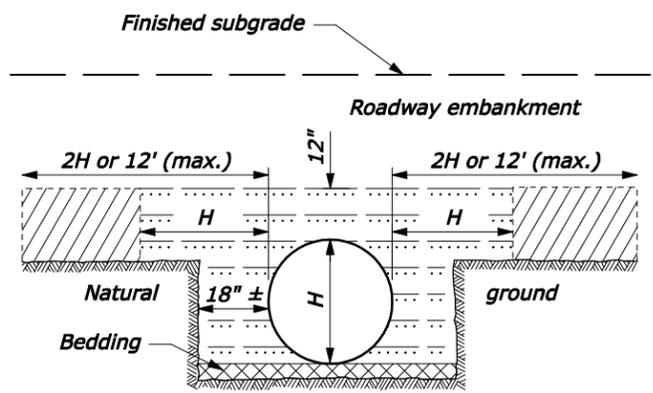
**ON UNYIELDING MATERIAL**



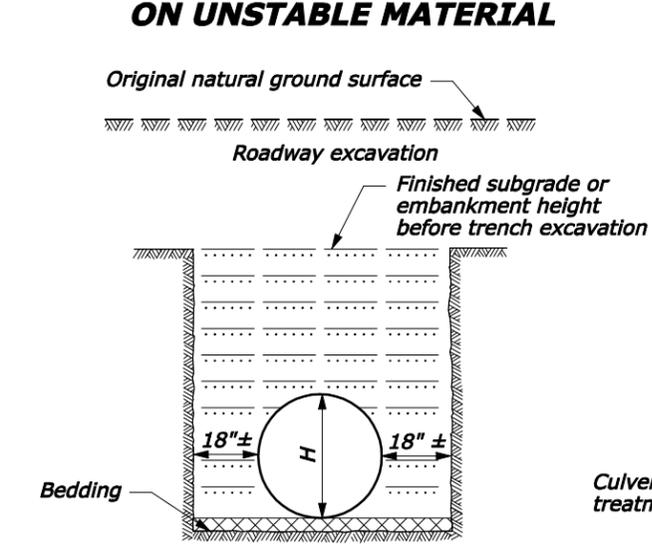
**ON NATURAL GROUND**



**ON UNSTABLE MATERIAL**

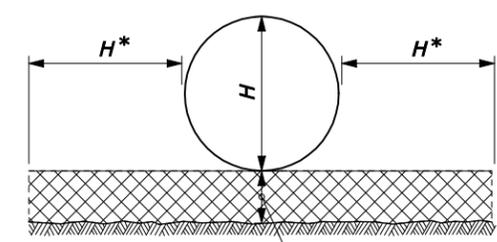


**ABOVE AND BELOW NATURAL GROUND**



**BELOW NATURAL GROUND OR TRENCH EXCAVATION IN EMBANKMENT**

BEDDING DEPTH	
PIPE SIZE (H)	DEPTH
12" to 54"	4"
> 54"	6"

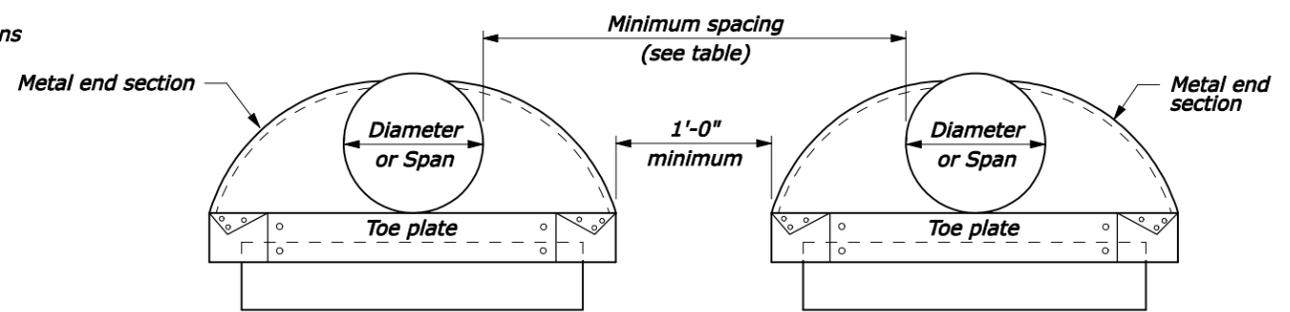


**PIPE BEDDING**

**NOTE:**

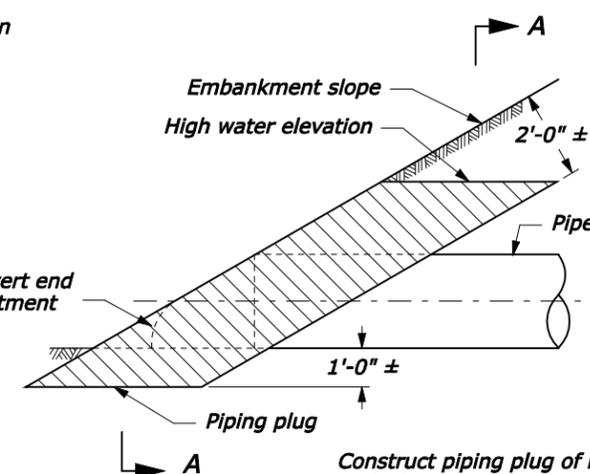
1. When directed, camber pipe culverts upward from a chord through the inlet and outlet inverts an ordinate amount equal to 1% of the pipe length. Develop camber on a parabolic curve. If the midpoint elevation on the parabolic curve as designed exceeds the elevation of the inlet invert, reduce the amount of camber or increase the pipe culvert gradient.
2. H equals the diameter of all round pipe culverts or the rise dimension of all pipe arch culverts.

MINIMUM SPACING	
DIAMETER or SPAN	SPACING
UP to 48"	24"
48" and UP	Half diameter or span OR 36" whichever is less



**ELEVATION MULTIPLE PIPE INSTALLATION**

- Bedding material (uncompacted)
- Embankment material placed in layers not exceeding 6" compacted depth.
- Compacted backfill material placed in layers not exceeding 6" compacted depth meeting the following:
  - Metal Pipe: Maximum particle size = 3"
  - Soil classification: A-1, A-2, or A-3
  - Plastic Pipe: Maximum particle size: 1 1/2"
  - Soil classification: A-1, A-2-4, A-2-5, or A-3
  - Or lean concrete backfill in accordance with Section 614.



**PIPING PLUG**

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

**METAL AND PLASTIC PIPE CULVERT BEDDING**

STANDARD APPROVED FOR USE 12/1993  
REVISED: 4/1994 6/2005

STANDARD  
602-3

E:\GIS\GIS\_Projects\Denali\_Commission\_recon\Akhlok\Plan\_sheets\Sheets\_E\st6203.dgn [US Customary] 2008 10:08AM