

## ROAD CONSTRUCTION AND MAINTENANCE REQUIREMENTS

### ADL 108655 – Southern Energy, Inc.

1. Road and Landing Construction. The Grantee shall take all measures which the State determines necessary to protect stream banks and stream courses during road construction, and to prevent erosion of exposed soil and fill material. The following road segments, at a minimum must be built to the specifications described below: all road segments within Sections 1, 2, and 3, T 29S, R 55E, CRM:

- A. Spur Road Specifications. Spur Road as defined by Division of Forestry's Forest Road Performance Standards
- B. Section 404 Permits. Obtain required U.S. Army Corps of Engineers issued Section 404 permits for the discharge of dredge or fill material into waters of the U.S.
- C. Grantee shall not cover, encroach on, or alter permanent or intermittent water channels.
- D. Ballast. Ballast shall be obtained from an approved pit. The above roads shall be rocked and shaped according to the specifications as described and shown in Appendix A.
- E. Road Fill. Unless otherwise approved in writing road fill placed by the Grantee must come from an approved pit.
- F. Culverts. Culverts shall be placed as required, or as requested by the State. Drainage structures shall be placed anywhere there are obvious surface waters. Grantee should be prepared to:
  - (1) Increase structure size as required if conditions warrant, i.e. debris problems or drainage modification due to road construction and
  - (2) Install relief culverts every 1000 feet, or less to relieve ditch-line catchment.

3. Bridge Construction.

- A. One end of each new bridge must be firmly anchored;
- B. An earth embankment constructed for use as a bridge approach must be protected from erosion by using planted or seeded ground cover, bulkheads, rock riprap, retaining walls, or other equally effective means;
- C. A bridge must be installed in such a way as to minimize disturbance to the bed and banks of a stream. No part of the finished bridge structure will be below the high-water marks of the stream or obstructing the stream's flow between ordinary high water;
- D. Bridge footers and back walls will be built by the Grantee to the specifications as detailed in 11 AAC 95.300 and Appendix A. Any pressure treated timber will have been treated in accordance with AWPAC1 & C2 for ground contact with ACQ, with a 0.6 retention. The Grantee will be responsible for the mobilization of all materials to the site. The Grantee will also be responsible for all labor, equipment, permits and precautions necessary to transport, handle, fabricate, modify and install the bridge structures.
- E. Bridge footers will be placed on competent material such as bedrock or compacted shot rock adequately protected.
- F. The bridge placement and design will be examined in the field at each crossing by the State's Representative.

4. Road Maintenance. The following road segments, must be maintained to the specifications described below: all portions of Little Salmon River Road within Section 1, T 29S, R 55E, CRM; section 6, T 29S, R 56E, CRM; and Sections 27, 33, & 34, T 28S, R 55E, CRM.

- B. On-going Maintenance. Once initial operations involving road use under this Agreement commence by the Grantee, maintenance shall be an on-going function throughout the duration of the easement.

- C. Existing Road Cross Sections. The Grantee shall maintain existing road cross sections by blading and shaping the surface and shoulders or replacing surfacing as required by the State.
  - D. Avoid Fouling Surface. While performing ordinary road maintenance work the Grantee shall avoid permanently fouling gravel or rock surfaces through covering them with earth or debris from side ditches, slides or other sources. The Grantee shall avoid blading surface material off the road surface.
  - E. Minimize Damage. The Grantee shall minimize damage to ditches, drainage structures, slopes and road surfaces. Where damage does occur, the Grantee shall restore the road and structures to their prior condition within a two-week period, unless the State requires a shorter or longer period.
  - F. Preventative Maintenance. The Grantee shall perform preventative maintenance at the end of each operating season to minimize weather damage during the non-hauling period. This may include cross-ditching, post-haul blading to remove berms, ruts or other surface irregularities that would interfere with normal runoff of water and cleaning ditches and culverts.
  - G. Seasonal Work. The Grantee shall perform all seasonal weather clean-up, removal of bank slough, minor slides and fallen timber, brush road, replace material eroded from slopes, and clean out drainage ditches and culverts at the beginning of each operating season. In removing material from slides or other sources, the Grantee shall deposit the material in a location where it will not erode into streams, lakes or reservoirs. Cut slopes, slumps, or other areas of exposed soil that are at risk for producing sedimentation of surface waters will be grass seeded or otherwise stabilized to reduce sediment transport.
  - H. Upon Termination of Construction Phase. All roads shall be maintained as specified in (E) and (F) above.
5. Transmission Line Installation. During the installation of the buried transmission line within the 66 feet wide Little Salmon River Road right-of-way within may not prevent, impact, or restrict the use of the Little Salmon River Road at any time for its intended use as a forest management road according to the

Haines State Forest Management Plan, excluding approved temporary closure during the placement of the power line by the applicant

5. Additional Road Maintenance Agreements. If other parties engaged in commercial activities use the roads and related facilities subject to this Agreement, those parties shall be required to enter into a joint use road maintenance agreement prior to their commercial use of the roads.
  
6. Road Standards. Roads will be constructed to Spur Road performance standards as established in the Division of Forestry Forest Road and Bridge Standard Design document (Appendix A to this Agreement).
  - A. Road Signage. Road signage shall meet the requirements in Appendix A. or as requested by the State's Representative.
  - B. Clearing and Grubbing
    1. The clearing and grubbing shall not occur outside of the easement area, either 25' or 50' on either side of the centerline, depending on width of the specific easement section.
    2. Snags and trees leaning heavily over the roadway that are outside the clearing limits may be felled with prior approval from the State's Representative.
    3. Debris will not be piled or pushed against existing trees.
  - C. Grading.
    1. All fills 6 feet deep and over shall be widened 2 feet for each 6 feet of centerline depth to a maximum width of 36 feet. Embankment slopes shall not be steeper than 1 1/4:1 for common and 1:1 for rock. Fills shall be compacted in 2-foot layers.
    2. Cut slopes will generally be 3/4:1 below 70%, 1/2:1 above 70%, and vertical in rock.
  
7. Materials Extraction in Haines State Forest.
  - A. Material sites (pits) developed to complete the project design located in

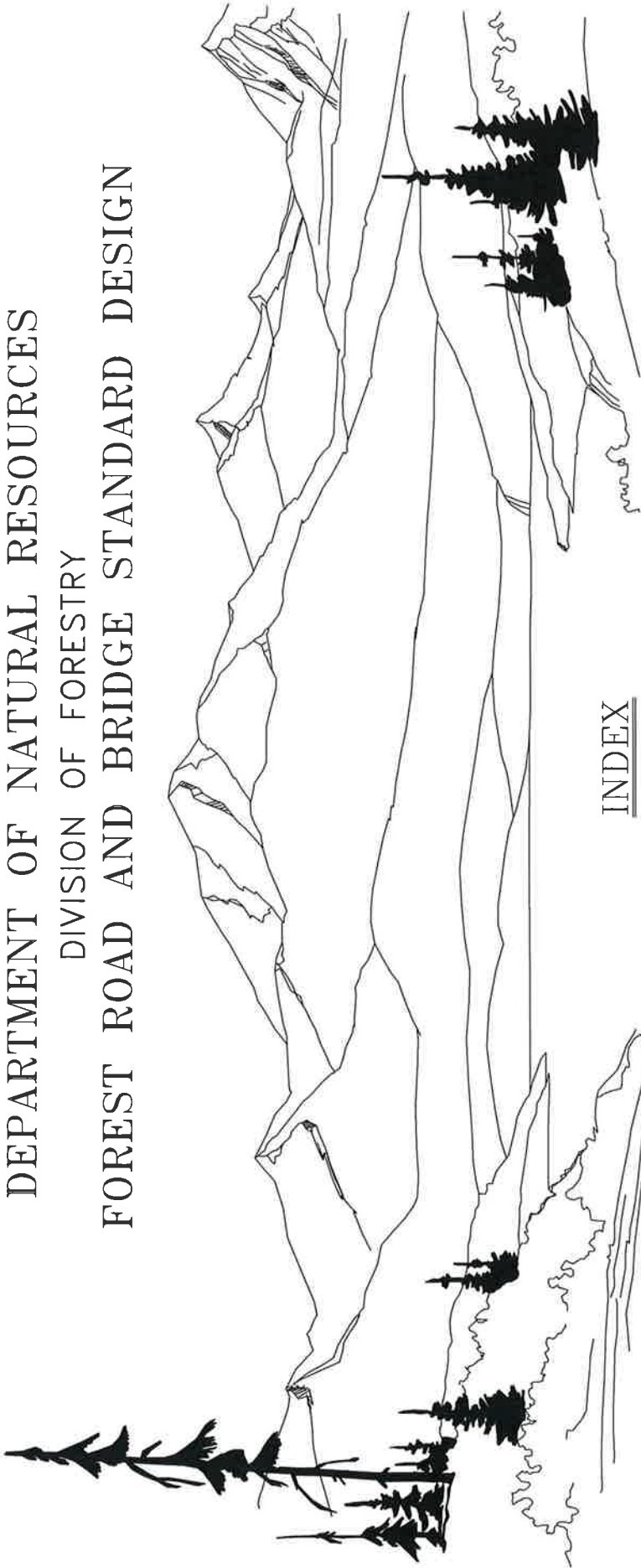
the Haines State Forest must be approved by AKDOF Haines Forester prior to development.

- B. A material site located in productive forest will be required to be reclaimed after closure to conditions which will support forest growth at the applicants' expense. Additionally, a forest "production loss" cost will be determined on a per acre value based on the market value of timber present at the stage of growth when the site development occurs. The applicant will compensate the State for this loss in production of commercial forest in the amount assessed.
- C. If a material site located in productive forest will remain in use through the lease period or cannot be returned to a condition that supports forest regeneration, the area removed from forest productivity will be assessed a per acre value based on the market value of timber expected at the end of a rotation, or end of lease period if terminated.
- D. All material sites located on the Haines State Forest will follow policy management guidelines for the protection of other resources.

7. Administrative Conditions.

- A. In accordance with AS 41.17.120 the designated State Representative under this Agreement will be the Haines State Forester or designee. The State Representative may issue stop work orders in accordance with AS 41.17.125.
- B. Nothing in this Agreement shall limit the ability of DNR, Division of Mining, Land and Water (DMLW) to enforce any portion of this Agreement in relation to land uses authorized by DMLW.
- C. This Agreement shall remain in effect for the duration of any easement authorizations under ADL 108655.
- D. The Grantee shall not transfer any duties under this agreement to any party without the expressed written consent of DNR, DMLW or its successor in interest.

STATE OF ALASKA  
 DEPARTMENT OF NATURAL RESOURCES  
 DIVISION OF FORESTRY  
 FOREST ROAD AND BRIDGE STANDARD DESIGN



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Revisions		
No.	Date	Description

Approved: \_\_\_\_\_  
 STATE OF ALASKA  
 Department of Natural Resources  
 Division of Forestry  
 Project Engineer or Forester \_\_\_\_\_ Date \_\_\_\_\_  
 Project or Contract No. \_\_\_\_\_

FOREST ROAD PERFORMANCE STANDARDS

1. ALL ROADS SHALL BE BUILT TO THE STANDARDS LISTED WITHIN THIS PERFORMANCE STANDARD UNLESS THE PROJECT ENGINEER HAS DETERMINED THAT A SITE SPECIFIC DESIGN IS PRUDENT. THE PERFORMANCE STANDARD FOR ADNR FOREST ROADS AND THE ADNR FOREST ROADS STANDARD DRAWINGS CONVEY THE DEPARTMENT'S INTENT. IN THE EVENT OF A CONFLICT BETWEEN DOCUMENTS, THE PROJECT ENGINEER WILL DETERMINE THE ORDER OF PRECEDENCE.

2. REFERENCE THE FOLLOWING RESOURCES FOR ADDITIONAL INFORMATION:  
 A. ALASKA FOREST RESOURCES & PRACTICES REGULATIONS (FRPA), 11 AAC 95, OCTOBER 2013;  
 B. ALASKA STATUTE 41.17, FOREST RESOURCES AND PRACTICES.

3. ROAD LOCATION AND CLASSIFICATION ARE IDENTIFIED IN THE TIMBER SALE CONTRACT OR THE BID DOCUMENTS. DEVIATION FROM THESE DOCUMENTS IS PERMITTED ONLY WITH THE WRITTEN PERMISSION OF THE PROJECT ENGINEER.

4. REGARDLESS OF REGION ROADS WILL BE CLASSIFIED AS PRIMARY, SECONDARY, OR SPUR.

A. A PRIMARY ROAD IS A HIGH USE PERMANENT ROAD WITH THE FOLLOWING CHARACTERISTICS:  
 I. MINIMUM 14 FOOT WIDE RUNNING SURFACE;  
 II. TYPICALLY SINGLE LANE;  
 III. VERTICAL GRADE: MAXIMUM FAVORABLE GRADE IS 10%, MAXIMUM ADVERSE GRADE IS 6%;  
 IV. MINIMUM HORIZONTAL CURVE RADIUS OF 360 FEET; AND

B. A SECONDARY ROAD IS MODERATE TO LOW USE, YEAR ROUND, PERMANENT ROAD WITH THE FOLLOWING CHARACTERISTICS:  
 I. MINIMUM 14 FOOT WIDE RUNNING SURFACE;  
 II. SINGLE LANE;  
 III. VERTICAL GRADE: MAXIMUM FAVORABLE GRADE IS 10%, MAXIMUM ADVERSE GRADE IS 8%;  
 IV. MINIMUM HORIZONTAL CURVE RADIUS OF 140 FEET; AND

C. A SPUR ROAD IS A TEMPORARY, LOW USE ROAD WITH THE FOLLOWING CHARACTERISTICS:  
 I. MINIMUM 14 FOOT WIDE RUNNING SURFACE;  
 II. VERTICAL GRADE: MAXIMUM FAVORABLE GRADE IS 20%, MAXIMUM ADVERSE GRADE IS 12%;  
 III. MINIMUM HORIZONTAL CURVE RADIUS OF 50 FEET; AND

D. A WINTER ROAD SUPPORTS VEHICLE TRAFFIC DURING WINTER MONTHS ONLY. IT IS CONSTRUCTED USING FROST, SNOW, AND/OR ICE. CHARACTERISTICS:  
 I. MINIMUM 14 FOOT WIDE RUNNING SURFACE;  
 II. SINGLE LANE;  
 III. VERTICAL GRADE: MAXIMUM FAVORABLE GRADE IS 10%, MAXIMUM ADVERSE GRADE IS 10%;  
 IV. MINIMUM HORIZONTAL CURVE RADIUS OF 75 FEET; AND

V. DESIGN SPEED OF 20 MPH.

5. CROWN OR SLOPE TRAVELED WAY OR ROADBED 3-5% FOR ALL SECTIONS.

6. ALL FILL SLOPES SHALL BE 2:1 (OR FLATTER) AND ALL CUT SLOPES SHALL BE 1:1 (OR FLATTER) IN COMMON MATERIAL OR 1/4:1 (OR FLATTER) IN BEDROCK. TERRACED SLOPES ARE PERMITTED IF THEY FIT WITHIN THE RIGHT-OF-WAY.

7. UTILIZE APPROVED MATERIAL LOCATED WITHIN THE RIGHT-OF-WAY TO CONSTRUCT THE ROAD. IF SUFFICIENT MATERIAL IS NOT AVAILABLE OR OF SUITABLE QUALITY, THE PROJECT ENGINEER MAY AUTHORIZE THE IMPORT OF BORROW. IN GENERAL, ALL ROADS EXCEPT WINTER ROADS ARE TO BE CONSTRUCTED AS FOLLOWS:  
 A. GRAVEL (HOT ROCK) OR A POORLY GRADED NATURAL SAND AND GRAVEL MIX WITH A MAX GRAIN SIZE OF 12" (PT. RUN GREATER (HOT ROCK) OR A POORLY GRADED NATURAL SAND AND GRAVEL MIX WITH A MAX GRAIN SIZE OF 12" (PT. RUN GRAVEL) IF AUTHORIZED BY THE PROJECT ENGINEER, THAT MATERIAL MAY ALSO BE USED AS THE RUNNING SURFACE.

B. REGION II AND III ROADS HAVE A 12"-24" SUBGRADE CONSISTING OF SAND, GRAVEL, ROCK, OR COMBINATIONS THEREOF CONTAINING NO MUCK, PEAT, FROZEN MATERIAL, ROOTS, SOIL, OR OTHER DELETERIOUS MATTER (DOT&P TYPE "C" MATERIAL). THE PROJECT ENGINEER MAY AUTHORIZE THE USE OF NATIVE MATERIAL FROM DITCHES A SURFACING MATERIAL MEETING THE REQUIREMENTS OF DOT&P TYPE E-1 MATERIAL, MAY BE REQUIRED.

C. CLEARING LIMITS WILL VARY WITH GROUND CONDITIONS. CLEAR AS NECESSARY TO MEET ROAD TYPICAL CROSS SECTIONS AND SAFE SIGHT DISTANCE AS DIRECTED BY THE PROJECT ENGINEER AND SUBJECT TO THE CONDITIONS IN THE CONTRACT DOCUMENTS.

8. DURING ROAD CLEARING OPERATIONS, ALL MERCHANTABLE TIMBER WITHIN THE CLEARING LIMITS SHALL BE FELLED, LIMBED AND DECKED. MERCHANTABLE TIMBER SHALL BE DECKED ALONG THE ROAD IN A MANNER THAT DOES NOT CREATE A HAZARD TO THE PUBLIC. LOSS SHALL BE DECKED IN AN ORDERLY MANNER AND NOT OBSTRUCT SURFACE WATERS. LOG DECKS SHALL BE CONFIGURED TO EFFICIENTLY AND SAFELY LOAD LOG TRUCKS. LOG DECKS GENERALLY SHALL BE CONSOLIDATED IN A MANNER THAT FACILITATES THE LOADING OF FULL LOG TRUCKS. LOG DECKS SHALL BE CONSTRUCTED TO PREVENT EROSION AND DEBRIS SHALL BE TREATED AS APPROVED IN THE OPERATING PLAN UNLESS DIRECTED OTHERWISE IN WRITING BY THE PROJECT ENGINEER.

9. PRIOR TO BURNING CONSTRUCTION DEBRIS, CONTACT DOF AND THE LOCAL WILDLAND FIRE JURISDICTIONAL AGENCY FOR WRITTEN APPROVAL.

10. DITCHES SHALL BE 2' WIDE MINIMUM OR AS REQUIRED FOR ADEQUATE DRAINAGE AND SNOW STORAGE AS DETERMINED BY THE PROJECT ENGINEER.

11. PRELIMINARY LOCATION OF DRAINAGE STRUCTURES ARE IDENTIFIED IN THE BID DOCUMENTS. ADDITIONAL DRAINAGE STRUCTURES MAY BE REQUIRED.

A. FORDING OF ANY STREAM BY ROADS SHALL BE IN ACCORDANCE WITH 11 AAC 95.295 (C) AND 95.305.

B. MINIMUM CULVERT DIAMETER IS 18".

C. CULVERTS MUST EXTEND A MINIMUM OF 36" BEYOND THE TDE OF FILL ON BOTH SIDES OF THE ROAD.

D. CULVERT ENDS SHALL BE CONSTRUCTED TO PREVENT SCOUR OF THE ROAD BED.

13. FISH PASSAGE LOCATIONS ARE IDENTIFIED IN THE BID DOCUMENTS.  
 A. FISH PASSAGE DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALASKA DEPARTMENT OF FISH AND GAME PERMIT AND GUIDELINES.  
 B. CHANGES TO THE COURSE OF AN ANADROMOUS FISH BEARING WATERWAY MUST BE APPROVED, IN WRITING, BY THE ALASKA DEPARTMENT OF FISH AND GAME PERMISSION FROM ALASKA DEPARTMENT OF FISH AND GAME PRIOR TO FORDING ANADROMOUS FISH WATERS.  
 C. THE INLET AND OUTLET OF FISH PASSAGES SHALL MATCH THE NATURAL COURSE OF THE STREAM CHANNEL.  
 D. DO NOT PERCH CULVERT ENDS.  
 E. CONTROL OR PREVENT EROSION, SILTATION, WATER DEGRADATION AND POLLUTION PER AS 41.17 AND 11 AAC 95 (FRPA) AND AS SPECIFIED IN THE DRAWINGS FOR SITE SPECIFIC CONCERNS AS DETERMINED BY THE ENGINEER. AT A MINIMUM, FRPA SIGNS SHALL BE USED FOR EROSION CONTROL AND MAINTENANCE AND ARE A REQUIREMENT OF ALL CONTRACTS.

14. TURNOUTS SHALL BE PLACED ON PRIMARY ROADS AT INTER-VISIBLE LOCATIONS OR AS DETERMINED BY THE PROJECT ENGINEER. TURNOUTS ON SECONDARY AND SPUR ROADS AT LOCATIONS DETERMINED BY THE PROJECT ENGINEER. SEE SHEET E-02.00 FOR TURNOUT AND TURNAROUND DETAIL.

15. INSTALL SIGNAGE AS DIRECTED BY THE PROJECT ENGINEER.  
 A. AT A MINIMUM, SIGNS WILL BE PLACED AT THE FOLLOWING LOCATIONS:  
 I. R-10 SERIES SIGNS AT STOP CONTROLLED INTERSECTIONS;  
 II. D-10 SERIES SIGNS AT FULL MILE INTERVALS ALONG PRIMARY AND SECONDARY ROADS;  
 III. DM-3 SERIES OBJECT MARKERS AT ALL OBSTACLES AND HAZARDS E.G. BRIDGE ENDS; AND  
 IV. "ACTIVE LOGGING ROAD..." SIGN AT ENTRANCE TO THE ROAD.

16. YEAR ROUND ROADS ARE NOT TO BE USED FOR HAULING OPERATIONS WHEN ROADS ARE NOT SAFE, SUSCEPTIBLE TO EXCESSIVE DAMAGE OR UNREASONABLE WEAR, AS DETERMINED BY THE PROJECT ENGINEER.  
 A LAYER IS TOO THIN TO PREVENT SURFACE DEFORMATION.

GEOMETRIC STANDARDS		
ROAD CLASSIFICATION	DESIGN SPEED (MPH)	MIN. HORIZONTAL CURVE RADIUS
PRIMARY OR MAIN HAUL ROADS	35	360'
SECONDARY ROAD	20	140'
SPUR ROAD	10	50'
WINTER ROAD	15 OR BY CLASSIFICATION	75'

MINIMUM HORIZONTAL CURVE RADIUS TAKEN FROM EXHIBIT 16 OF THE AASHTO GUIDELINES FOR GEOMETRIC DESIGN OF RURAL LOW VOLUME LOCAL ROADS (NOT-HQD) USING A TRACTION COEFFICIENT OF 0.3 FOR NON-WINTER ROADS AND 0.4 FOR WINTER ROADS.

Revisions		
No.	Date	Description
1	11/9/2015	GS

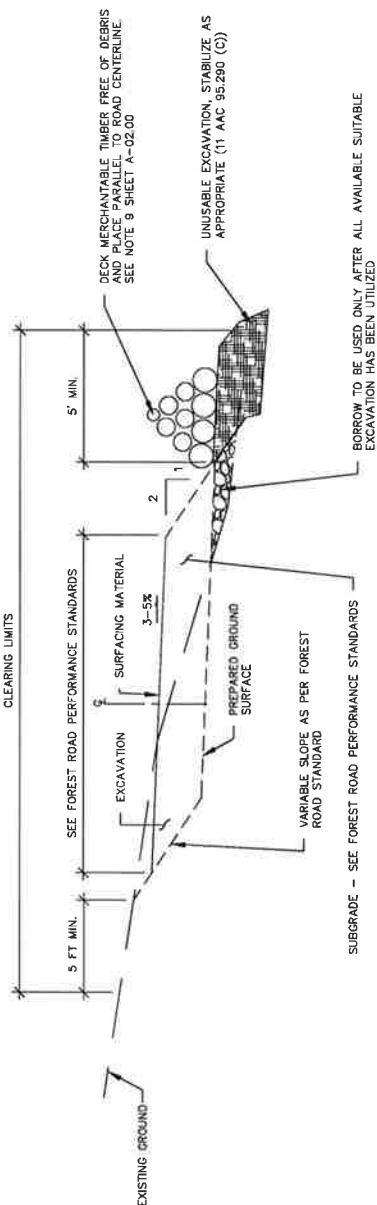
PREPARED: JDM	SHEET
DRAWN: JDM	
REVIEWED: SRA	
DATE: 03/04/15	A-02.00

FOREST ROAD PERFORMANCE STANDARDS



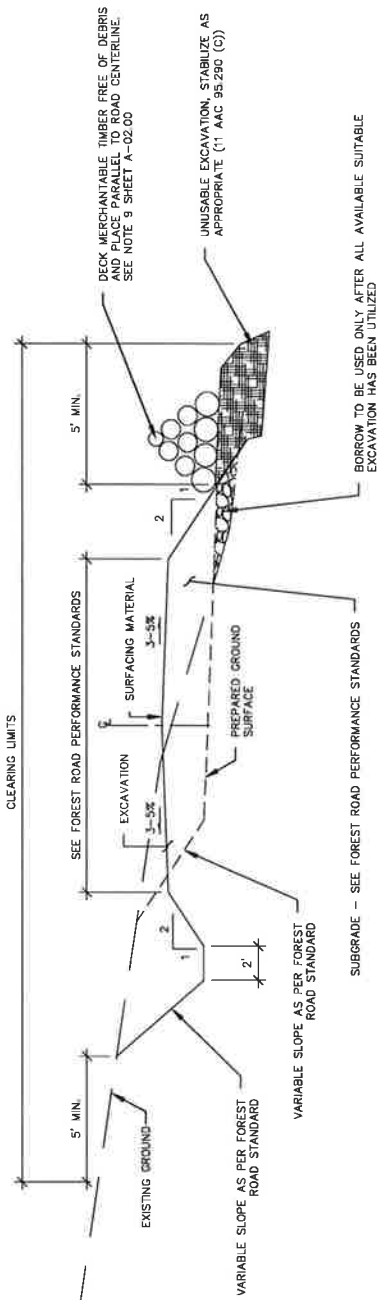
ROADS, INFRASTRUCTURE AND BRIDGES SECTION

DEPARTMENT OF NATURAL RESOURCES  
 DIVISION OF FORESTRY  
 STATE OF ALASKA



**TYPICAL SIDEHILL SECTION - NO DITCH**

NOT TO SCALE



**TYPICAL SIDEHILL SECTION - WITH DITCH**

NOT TO SCALE

Revisions		
No.	Date	Description
1	11/6/2015	GS

PREPARED: JDM	SHEET
DRAWN: JDM	
REVIEWED: SFA	
DATE: 03/04/15	B-01.00

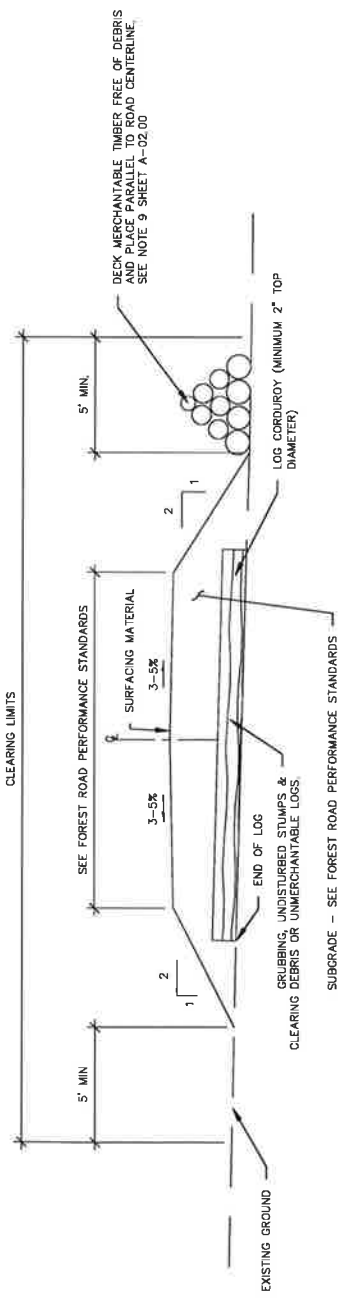


ROADS, INFRASTRUCTURE AND BRIDGES SECTION

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF FORESTRY  
STATE OF ALASKA

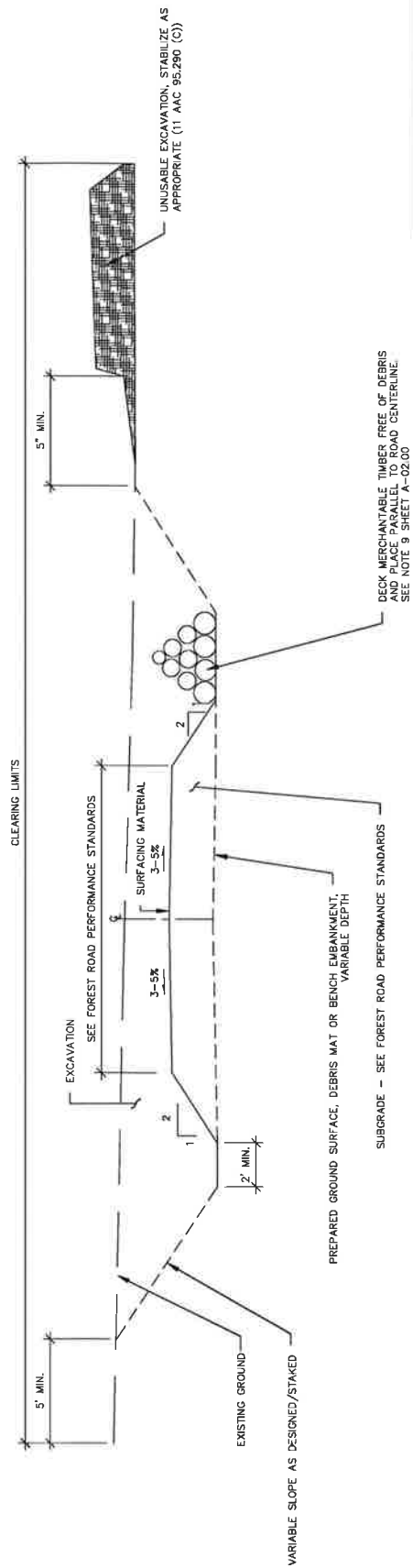
TYPICAL SECTIONS





NOTES:  
 1. IF CROSS DRAINAGE IS A CONCERN PLACE A LAYER OF GEOTEXTILE FABRIC ON TOP OF LOGS.

**TYPICAL OVERLAY SECTION**  
 NOT TO SCALE



**TYPICAL THRU-CUT SECTION**  
 NOT TO SCALE

No.	Date	Description	By

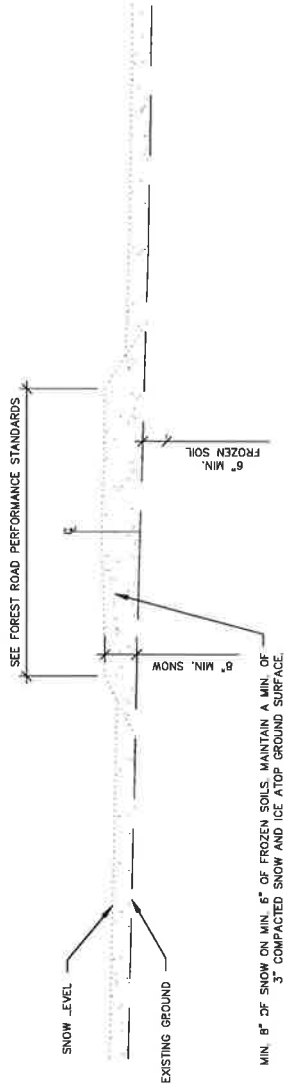
PREPARED: JDM  
 DRAWN: JDM  
 REVIEWED: SRA  
 DATE: 03/04/15

SHEET  
 B-02.00



ROADS, INFRASTRUCTURE  
 AND BRIDGES SECTION

DEPARTMENT OF NATURAL RESOURCES  
 DIVISION OF FORESTRY  
 STATE OF ALASKA



MIN. 8" OF SNOW ON MIN. 6" OF FROZEN SOILS. MAINTAIN A MIN. OF 3" COMPACTED SNOW AND ICE ATOP GROUND SURFACE.

**WINTER ROAD**  
NOT TO SCALE

Revisions		
No.	Date	Description
1	11/24/2015	CS



ROADS, INFRASTRUCTURE  
AND BRIDGES SECTION

DEPARTMENT OF NATURAL RESOURCES  
STATE OF ALASKA

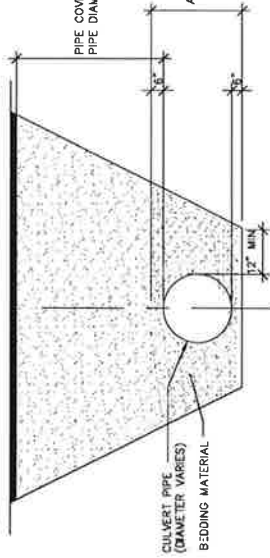
DIVISION OF FORESTRY

WINTER ROAD SECTION

PREPARED: JDM  
DRAWN: JDM  
REVIEWED: SRA  
DATE: 03/04/15

SHEET  
B-03.00

DIRECTION OF TRAFFIC

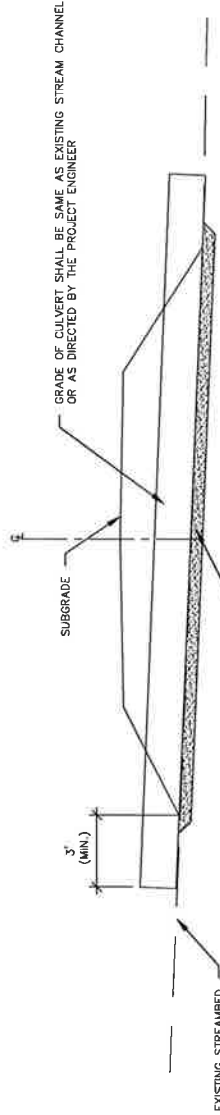


**TYPICAL CULVERT TRENCH SECTION**

NOT TO SCALE

**NOTES:**

1. CULVERT JOINTS SHALL HAVE WATERTIGHT GASKETS AND SHALL NOT LEAK.
2. CULVERT PLACEMENT SHALL BE APPROVED BY THE PROJECT ENGINEER BEFORE BACKFILLING.
3. ALL USABLE MATERIAL (COMMON EXCAVATION) SHALL BE USED AS BACKFILL FOR EMBANKMENT CONSTRUCTION.
4. SIDE SLOPES SHALL BE EXCAVATED AT 0.5H:1V OR FLATTER IN ACCORDANCE WITH ALL APPLICABLE SAFETY REQUIREMENTS.
5. BEDDING MATERIAL SHALL AT A MINIMUM MEET THE SAME REQUIREMENTS AS THE SUBGRADE MATERIAL. DO NOT PLACE ROCKS LARGER THAN 6 INCHES IN DIAMETER AGAINST CULVERT. PLACE AND COMPACT BEDDING IN LIFTS TO ADEQUATELY SUPPORT THE PIPE.
6. FOLLOW MANUFACTURER'S REQUIREMENTS FOR INSTALLATION UNLESS DIRECTED OTHERWISE BY THE PROJECT ENGINEER.
7. WHEN JOINING TWO PIPES TOGETHER, THE MINIMUM LENGTH OF PIPE TO BE JOINED SHALL BE SIX FEET.



MINIMUM CULVERT SPACING 11 AAC 95.295 (B)		
PERCENT OF LONGITUDINAL GRADE	REGION I	REGION II & REGION III
0 TO 2	SEE NOTE #7	SEE NOTE #7
2 TO 7	1,000	1,500
8 TO 15	800	1,000
OVER 15	500	800

**NOTES:**

1. DO NOT PERCH CULVERTS.
2. PLACE CULVERT IN ALIGNMENT WITH THE NATURAL STREAM CHANNEL. WHERE NO CHANNEL IS APPARENT, INSTALL CULVERTS AT SKEW AND SLOPE TO DRAIN OR AS DIRECTED BY THE PROJECT ENGINEER.
3. MINIMUM CULVERT GRADES SHALL BE 5% OR 1/2 OF THE TRIBUTARY DITCH GRADE.
4. CAMBER WILL DEPEND ON SITE CONDITIONS. MAXIMUM CAMBER IS 2% (STEEL OR ALUMINUM CULVERTS) OR 1% (POLYETHYLENE CULVERTS) OF CULVERT LENGTH BY NO MORE THAN 2.5 INCHES AT CENTER.
5. MINIMUM CULVERT DIAMETER IS 18".
6. CULVERT INLETS AND OUTLETS SHALL EXTEND 36 INCHES BEYOND THE TCE OF THE FILL UNLESS OTHERWISE AGREED TO BY THE PROJECT ENGINEER.
7. CULVERTS MUST BE SPACED TO PREVENT POOLING OF WATER CAUSED BY THE PRESENCE OF THE ROADBED.
8. PROVIDE ENERGY DISSIPATORS AT OUTLETS OF STORM DRAIN CULVERTS (FRPA 11 AAC 95.305 (C)).
9. RELIEF CULVERT SPACING WILL DEPEND ON SITE CONDITIONS. PROJECT ENGINEER TO ADVISE.

**TYPICAL CULVERT INSTALLATION**

NOT TO SCALE

Revisions		
No.	Date	Description
0	11/9/2015	

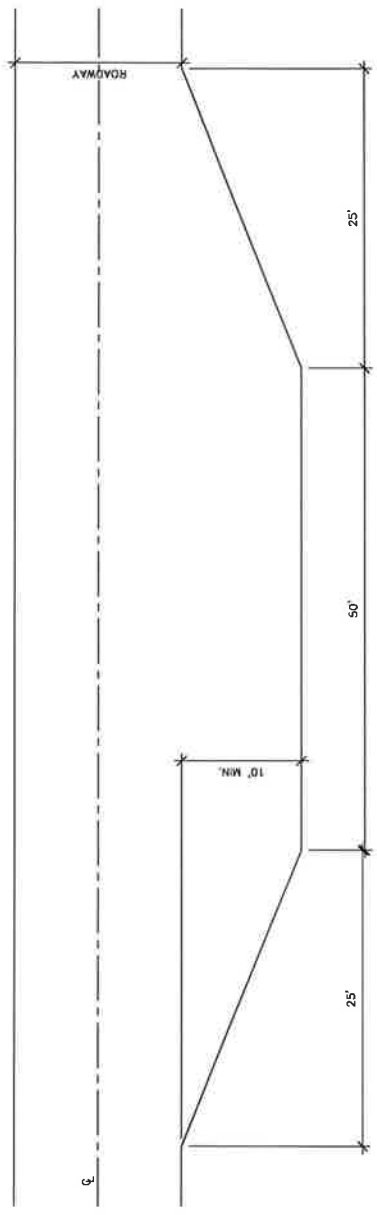


ROADS, INFRASTRUCTURE  
AND BRIDGES SECTION

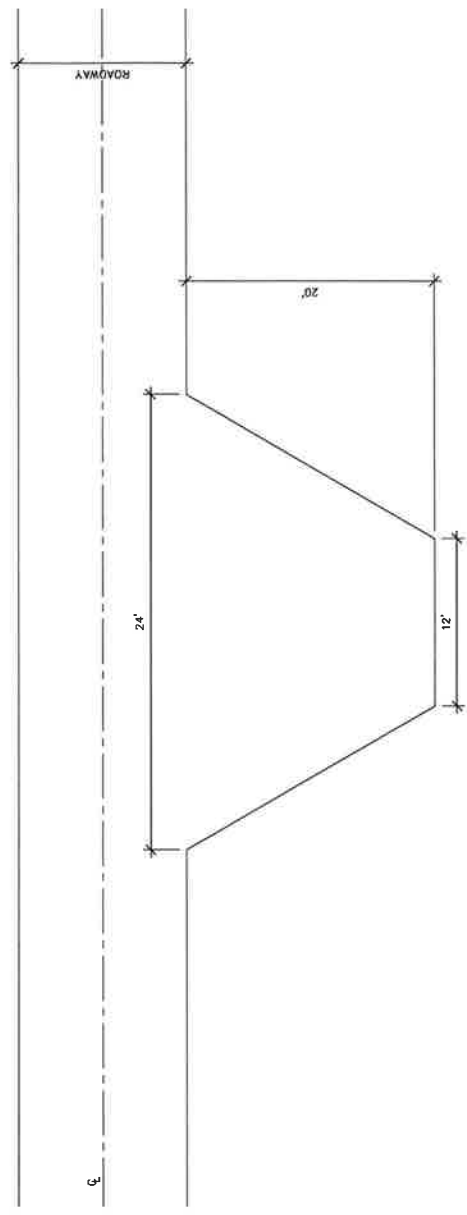
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF FORESTRY  
STATE OF ALASKA

CULVERT DETAILS

PREPARED BY: JDM	DATE: 03/04/15
DRAWN: JDM	
REVIEWED: SRA	
SHEET E-01.00	



**TURNOUT DETAIL**  
NOT TO SCALE



**TURNAROUND DETAIL**  
NOT TO SCALE

Revisions		
No.	Date	Description

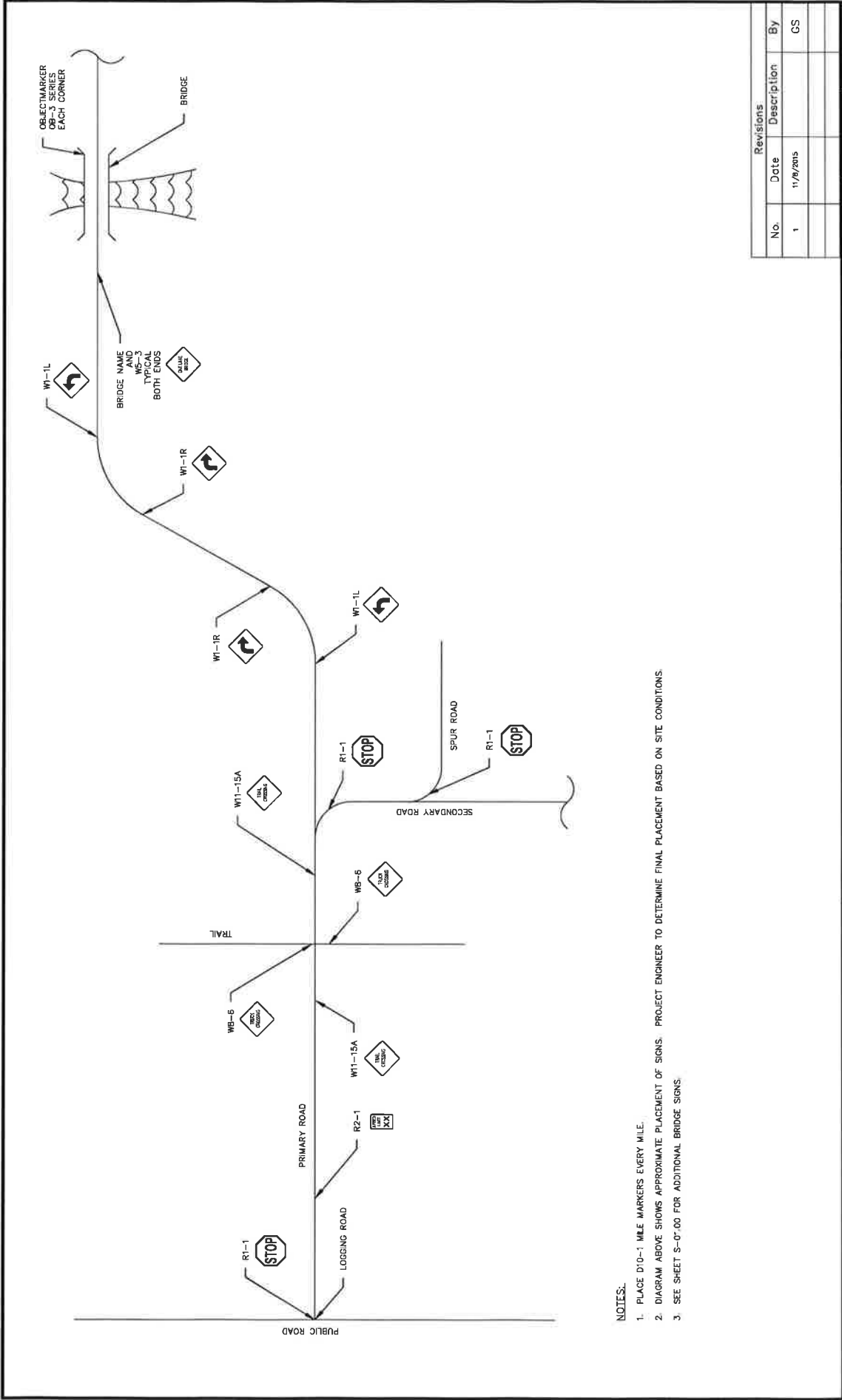
PREPARED: JDM	SHEET
DRAWN: JDM	E-02.00
REVIEWED: SRA	
DATE: 03/04/15	

ROADWAY DETAILS



ROADS, INFRASTRUCTURE  
AND BRIDGES SECTION

DEPARTMENT OF NATURAL RESOURCES  
STATE OF ALASKA  
DIVISION OF FORESTRY



- NOTES.**
1. PLACE D10-1 MILE MARKERS EVERY MILE.
  2. DIAGRAM ABOVE SHOWS APPROXIMATE PLACEMENT OF SIGNS. PROJECT ENGINEER TO DETERMINE FINAL PLACEMENT BASED ON SITE CONDITIONS.
  3. SEE SHEET S-0-00 FOR ADDITIONAL BRIDGE SIGNS.

Revisions		
No.	Date	Description
1	11/9/2015	CS

	<b>TYPICAL SIGN PLACEMENT</b>	SHEET <b>H-01.00</b>
	DEPARTMENT OF NATURAL RESOURCES DIVISION OF FORESTRY STATE OF ALASKA	ROADS, INFRASTRUCTURE AND BRIDGES SECTION



R1-1 (MUTCD)  
24" X 24"  
18" X 18"



R2-1 (MUTCD)  
18"W X 24"H



D10-1 (MUTCD)  
10" X 18"



W1-1L (MUTCD)  
24" X 24"  
18" X 18"



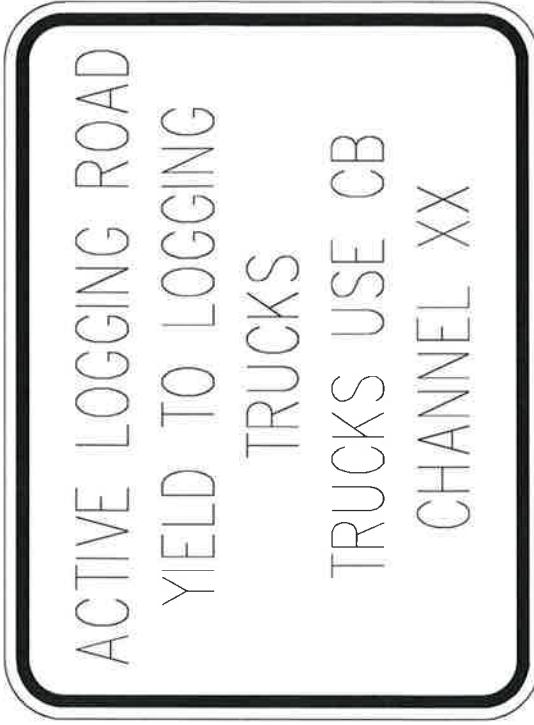
W1-1R (MUTCD)  
24" X 24"  
18" X 18"



W5-3 (MUTCD)  
24" X 24"



W16-9P (MUTCD)  
24" X 18"



72" X 54" BLACK MESSAGE AND BORDER ON WHITE BACKGROUND (CUSTOM)



OV-3L (MUTCD)  
12" X 36"



OV-3L (MUTCD)  
12" X 36"



WB-6 (MUTCD)  
24" X 24"



W1-15A (MUTCD)  
24" X 24"

Revisions		
No.	Date	By

NOTE: FOR SIGN FRAMING AND POST SPACING SEE ALASKA DEPARTMENT OF TRANSPORTATION STANDARD DETAIL S-0011



ROADS, INFRASTRUCTURE  
AND BRIDGES SECTION

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF FORESTRY

SIGN DETAILS

PREPARED: DM  
DRAWN: JDM  
REVIEWED: SFA  
DATE: 03/04/15

SHEET  
H-02.00