MEMORANDUM
DEPARTMENT OF NATURAL RESOURCES

TO: Forestry Management Team
    Area Foresters

FROM: John “Chris” Maisch
    Director

DATE: February 4, 2016

FILE: PPM

PHONE: 269-8463

SUBJECT: DOF Road and Bridge Standards

The Division of Forestry (DOF) constructs and maintains forest road on State Forest as well as other State land in support of forest management activities. Forest road typically is constructed through timber sales, public works or force account projects to meet the State’s forest management objectives. The DOF managed transportation infrastructure generally is accessible and is incidentally used by the public for a variety reasons. The DOF Road and Bridge Standards, adopted with this memo, represent a standard meeting guidelines for safety and engineered design of a forest road used by public and industrial users. The standards represent the minimum acceptable condition of State forest roads. The standards are applied based on a classification of a road’s type of use. They shall guide all work on DOF managed roads during new construction, reconstruction and maintenance unless site specific plans are otherwise approved by the Resource Program Manager or his designee.

The standards are designed to meet regional conditions. They represent best management practices of the Alaska Forest Practices Act and Regulations, guidelines of professional organizations and are consistent with other forest road design practices used in western states. They are presented in a modular format that allows managers to focus the “boiler plate” as needed for the tasks being performed. The set of standards are predominately graphic in nature and will print full size in 11x17 format. The goal is to impart intent to a wider group of users without loosing important detail.

Application:
1. Timber Sale Contracts:
   a. The Forest Road Performance Standard A-2 sheet and other sheets as applicable from the DOF Road and Bridge Standards set as listed on the Title Sheet A-1, shall replace in its entirety Exhibit “E” (Road Construction and Maintenance Requirements) in long form timber sale contracts requiring road construction or maintenance.
   b. Road maintenance agreements or management requirements previously referenced in long form Exhibit “E” are to be addressed in the long form timber sale contract by adding language to the requirements of the Exhibit “D” “Operating Plan Requirements” and subsequently acknowledged by the DOF and the timber purchaser in Exhibit “H” the purchaser’s “Approved Operating Plan”.

2. Public Work Contracts (less than $100,000)
   a. All force account and contract work on roads by Areas shall be based on the DOF Road and Bridge Standards.
3. Public Work Contracts (Greater than $100,000)
   a. Unless issues require a site specific engineered solution all work will be developed based on the DOF Road and Bridge Standards. All work greater than $100,000 is required to be stamped by an Alaska Licensed Professional Engineer per AS 38.95.160.

4. Non-typical Infrastructure and Bridges.
   a. Infrastructure such as sort yards, log transfer facilities, bridges and areas having notable public use shall be appropriate for its use and engineered by a knowledgeable professional.
   b. Regardless, all bridge work managed by the DOF shall conform to the DOF Road and Bridge Standards. All DOF owned or managed bridge structures shall be designed by a Professional Engineer licensed in the State of Alaska. Records for these structures shall be centrally retained by the DOF throughout the life of the bridge. The DOF standards assume conditions that shall be verified or inspected regularly. Bridge use and maintenance is a nationally recognized ownership risk. Care and fore thought is required with all action regarding bridges.

Attachments
   DOF Road and Bridge Standards
INDEX

- A-01.00 TITLE SHEET
- A-02.00 FOREST ROAD PERFORMANCE STANDARDS
- B-01.00 TYPICAL SECTIONS
- B-02.00 TYPICAL SECTIONS
- B-03.00 WINTER ROAD SECTION
- E-01.00 CULVERT DETAILS
- E-02.00 ROADWAY DETAILS
- H-01.00 TYPICAL SIGN PLACEMENT
- H-02.00 SIGN DETAILS
- N-01.00 BRIDGE PROJECT NOTES
- N-02.00 STANDARD PRECAST CONCRETE AND TIMBER ABUTMENTS
- N-03.00 STANDARD PRECAST CONCRETE ABUTMENT STANDARDS
- N-04.00 STANDARD MODULAR BUM AND WELDED WIRE ABUTMENT DETAILS
- N-05.00 MISCELLANEOUS STANDARD DETAILS
- N-06.00 STANDARD LOG ABUTMENT
- N-07.00 STANDARD TIMBER SILL WITH GEOCELL FOUNDATION
- S-01.00 TRAFFIC CONTROL DETAILS
1. All roads shall be built to the standards listed within this performance standard unless the project engineer has determined they are not feasible. The performance standards for some forest roads and the Alaska Forest Roads Standards Manual contain the performance standards. In the event of a conflict between documents, the project engineer shall determine the order of precedence.

2. Reference the following resources for additional information:
   B. Alaska Forest Resources and Practices Regulations (FRPR), Title 17, Forest Resources and Practices.
   C. 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.

3. A primary road is a high-use, permanent road with the following characteristics:
   A. Minimum 14 foot width running surface;
   B. Single lane;
   C. Vertical grade: minimum favorable grade is 10%, maximum adverse grade is 12%.
   D. Minimum horizontal curve radius of 75 feet, and
   E. Design speed of 50 mph.

4. A secondary road is a moderate to low use, year-round, permanent road with the following characteristics:
   A. Minimum 14 foot width running surface;
   B. Single lane;
   C. Vertical grade: minimum favorable grade is 15%, maximum adverse grade is 12%.
   D. Minimum horizontal curve radius of 140 feet, and
   E. Design speed of 35 mph.

5. A winter road supports vehicular traffic during winter months only. It is constructed using frost, snow, and/or ice. Winter roads have the following characteristics:
   A. Minimum 14 foot width running surface;
   B. Single lane;
   C. Vertical grade: minimum favorable grade is 10%, maximum adverse grade is 10%.
   D. Minimum horizontal curve radius of 75 feet, and
   E. Design speed of 20 mph.

6. Crown or slope traveled may be required for all sections.

7. All fill slopes shall be 2.1:1 (2.4:1 for fillers) and all cut slopes shall be 1:1 (1:2 for fillers) in common material or 1:4:1 (1:5 fillers) in rock. All terrain slopes are permitted if they fit within the right-of-way.

8. Utilized 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 material in general. Roads are to be constructed as follows:
   A. Region I roads have a 12-24 square surface consisting of gravel and a minimum of 5 feet of gravel mix, 6 inches, placed on the site.
   B. Region II and III roads have a 12-24 square surface consisting of gravel base, gravel over, or other approved material.

9. During road clearing operations, all reasonable and necessary precautions shall be taken to ensure that logging vehicles are kept off the main road. The project engineer shall ensure that the clearing is done in a manner that does not create a hazard to the public. Logs shall be removed from the road in a manner that does not cause damage to the road. Log trucks shall be controlled to efficiently and safely handle the logs. Log trucks shall generally be consolidated in a manner that facilitates the loading of railroad (logs) without log truck movement. Underwater or main roads, the work shall be done as approved by the project engineer.

10. Prior to clearing construction debris, contact the local wildlife protection agency for written approval.

11. Road slopes shall be 2:1, or as required for adequate drainage and snow storage as determined by the project engineer.

12. Preliminary location of drainage structures are identified in the bid documents. Additional drainage structures may be required:
   A. Furrowing of any stream by roads shall be in accordance with 11 AAC 05.09.25 (C) and 95.300.
   B. Bridge located on 15 X 15 feet.
   C. Culverts must extend a minimum of 36' beyond the toe of fill on both sides of the road.
   D. Drainage ditches shall be constructed to prevent scour of the road bed.

13. Fish passage locations are identified in the bid documents. Fish passage design and construction shall be in accordance with Alaska Department of Fish and Game permit and guidelines.

14. Control or prevent erosion, sediment, water pollution and alteration of fish habitat as required by the permit.

15. Road turnouts shall be placed on primary roads at inter-visible locations or as determined by the project engineer. Turnouts shall be placed on secondary and spur roads at locations determined by the project engineer. See sheet E-020 for turnout and turnaround detail.

16. Install signage as directed by the project engineer.

17. Year round roads are not to be used for hauling operations when roads are not safe, susceptible to excessive damage or obstructed by snow, as determined by the project engineer. Litter is too thin to prevent surface deterioration.
TYPICAL SIDEHILL SECTION – NO DITCH

TYPICAL SIDEHILL SECTION – WITH DITCH

NOT TO SCALE

Rev. Sheet

No.  Date   Description   By

1  11/8/2016  GS

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FORESTRY
STATE OF ALASKA
ROADS, INFRASTRUCTURE
AND BRIDGES SECTION

TYPICAL SECTIONS

B-01.00
NOTES:
1. If cross drainage is a concern place a layer of geosynthetic fabric on top of log.

TYPICAL OVERLAY SECTION
NOT TO SCALE

TYPICAL THRU-CUT SECTION
NOT TO SCALE
MIN. 6" OF SNOW ON MIN. 6" OF FROZEN SOILS, MAINTAIN A MIN. OF 3" COMPACTED SNOW AND ICE AT TOP GROUND SURFACE.

WINTER ROAD

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. See 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 8 inches in diameter against culvert plate 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.

TYPICAL CULVERT TRENCH SECTION

NOT TO SCALE

MINIMUM CULVERT SPACING 17 AAC 95.295 (9)

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NOTES:
1. Do not pitch 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 8% or 1/2 of the tributary ditch grade.
4. Camber will depend on site conditions. Maximum camber is 0% (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 inlet and outlets shall extend 36 inches beyond the toe 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 roadway.
8. Provide energy dissipators at outlets of storm drain culverts (FIP 11 AAC 95.305 (c)).
9. Relief culvert spacing will depend on site conditions. Project engineer to advise.

TYPICAL CULVERT INSTALLATION

NOT TO SCALE
NOTES:
1. PLACE 0.1 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 5-01.00 FOR ADDITIONAL BRIDGE SIGNS.