STATE OF MONTANA
ROAD CONSTRUCTION CONTRACT
ATTACHMENT B

ROAD CONSTRUCTION, IMPROVEMENT AND MAINTENANCE SPECIFICATIONS	
SALE NAME **SHAW EASEMENT**	**REQUISITION NUMBER** **105230**

I. CONSTRUCTION REQUIREMENTS

A. ROADS: The Contractor is required to construct the roads shown in Table B-1 according to the schedules stated, and to the specifications and drawings in Attachment B and other applicable attachments.

TABLE B-1. ROAD CONSTRUCTION REQUIREMENTS

Road Name or Number	Approximate Length (Feet)	Type of Construction	Operation Period	Completion Date or Requirement
Shaw Easement	**780'**	**New**	**June 1-October 31**	**October 31, 2010**

B. ROAD CONSTRUCTION MATERIALS ESTIMATE:

TABLE B-2: MATERIALS FURNISHED AND INSTALLED BY THE PURCHASER:

The Contractor is required to furnish the described material and install as required in Attachment B. Quantities are estimated, and the Attachment B requirements and specifications must be met regardless of the estimated amounts. All materials furnished by the Contractor become the property of the State when installed.

Corrugated Metal Pipe				Other Materials	
No.	Diameter	Length	Gauge	Amount	Description
1	**18"**	**36'**	**18**	**1** **100'** **10-12**	**16' wide "Powder River" gate** **Barbed wire** **6" X 8' treated wooden fence posts**

Fill Material		
Yards	Type	Delivery Location
3	**¾" minus crushed gravel**	**Culvert installation**

TABLE B-2 (CONTINUED): SEED AND FERTILIZER REQUIREMENTS			
The Contractor is required to furnish **and apply** certified noxious weed-free, pure live seed mixture(s) and fertilizer in the amounts shown. Total pounds mixed seed is pure live seed, corrected for germination and purity. Germination and purity tests must have been conducted within the last 6 months prior to delivery. Contractor shall furnish documentation of germination and purity tests to the Contract Supervisor prior to application.			
Certified Noxious Weed-Free Seed		Fertilizer	
Pounds	Description	Pounds	Analysis (N-P-K)
28 lbs. seed	**"Primar" or "Revenue" Slender Wheatgrass-8 lbs. "Luna" or "Mandan" Pubescent Wheatgrass-10 lbs. "Durar" or "Whitmar" Hard Fescue-6 lbs. "Ruebens" or "Talon" Canada Blue grass-4 lbs.**	**100 lbs.**	**16-16-16 fertilizer**

C. **MINOR CHANGES:** The Contractor Supervisor may require minor changes in location, design or specifications of road construction, improvement or maintenance requirements. All changes will be incorporated through a contract change order whether or not there is any monetary impact.

D. **ADJUSTMENT FOR CHANGE IN REQUIREMENTS:** All changes will be incorporated through contract modification. Monetary impact will be negotiated and agreed to in writing between the Contractor and DNRC before any modification in the statement of work is undertaken.

II. RIGHT-OF-WAY CLEARING

A. **CLEAR LIMIT DEFINITIONS** are shown in Section IX. SPECIFICATIONS AND DRAWINGS.

B. **CLEAR LIMIT MARKING:**

1. Clear limits for all new construction are marked **with orange stakes along the centerline of the road right-of-way.**

C. **CLEARING REQUIREMENTS:**

1. Brush or trees on existing roads may be removed by sawing individual stems, cutting with a rotary brush cutter, uprooting with an excavator or other methods approved by the Contract Supervisor..

2. Inside the clear limits, but outside the road prism, trees and brush less than 20 feet tall and less than 3 inches in diameter that do not interfere with visibility or slope stability may be left as directed by the Forest Officer.

3. **All merchantable timber within the clear limits on all roads to be constructed under the terms of this Contract shall be cut to a length convenient to the Contractor then hauled in a vehicle provided by the Contractor, and piled at a designated location, prior to earth moving.**

4. Clearing procedures shall protect residual stands, prevent incorporation of construction slash into the road prism, and protect roadside appearance outside clear limits.

5. Grubbing will be limited to only those stumps and large roots within the road prism. **Any stumps and/or large roots removed during grubbing will have as much soil removed from them as possible and will then be hauled a designated location.**

III. TREATMENT OF RIGHT-OF-WAY CLEARING MATERIALS

A. GENERAL TREATMENT REQUIREMENTS:

1. Road construction slash more than 3 inches in diameter and 6 feet long and all concentrations of slash which would adversely affect the stability of the road shall be disposed of by the methods described in this section.

2. Slash and debris shall not be placed in drainages, roadside ditches or heads of culverts where the flow of water may be obstructed and shall be removed if placed therein.

3. Lopping and scattering is defined as delimbing and sawing slash materials into lengths which will easily scatter to a maximum depth of 18 inches. Materials shall be scattered outside the road prism.

B. SIDESLOPES OF 35% OR LESS AND EXISTING ROADS:

1. Disposal will be by hand or machine piling as directed by the Contract Supervisor..

2. Minor concentrations of slash or individual trees may be disposed of outside of the road prism by lopping and scattering as directed by the Contract Supervisor..

3. Large boulders and cull logs may be scattered outside the road right-of-way clear limits if approved in writing by the Contract Supervisor. Boulders shall be placed away from trees and positioned so they will not roll.

IV. EXCAVATION AND EMBANKMENT OF FILL MATERIALS

A. EXCAVATION OF ROAD CROSS SECTION:

1. All grubbing and clearing shall be completed prior to the beginning of any excavation.

2. Surface organic layer and ash cap (surface reddish-brown soils with low gravel content) will be bladed to the side of the road and not incorporated into fills.

3. **Wasted soils and organic layer will be hauled to a location approved by the Contract Supervisor.**

4. When excavating on tangents and when balanced section construction is indicated, the following table will be used as a guideline to determine if sufficient excavation of road solid has occurred. Tolerances for road solid will be +1.0 feet and -0.5 feet.

TABLE B-3: EXCAVATION OF ROAD SOLID			
SIDESLOPE PERCENT	ROAD WIDTH		
	12 FT.	14 FT.	16 FT.
	FEET OF ROAD SOLID		

5	8.7	10.1	11.4
10	8.8	10.2	11.5
15	8.9	10.2	11.6
20	8.3	9.5	10.8
25	7.8	8.9	10.1
30	7.6	8.9	10.1
35	7.8	9.0	10.2
40	8.1	9.2	10.6
45	8.5	9.4	11.0
50	8.8	9.8	11.6
55	9.4	10.2	12.2
60	10.1	11.7	13.3
65 & over	12.0	14.0	16.0

B. EMBANKMENT OF FILL MATERIALS:

1. Fill materials shall be unfrozen and free of snow and ice.

2. Fill materials shall be sorted to remove large rocks over 6 inches diameter near the surface, which may interfere with surface blading.

3. Where possible all fill materials shall be applied in layers not to exceed 18 inches and each layer compacted with heavy equipment prior to application of the next layer.

4. If fill materials are too dry to allow compaction, the Contract Supervisor may require watering of layers followed by heavy equipment compaction.

5. Gravel used for surfacing shall be compacted into place using loaded dump trucks or a vibratory drum roller if specified in the Road Log.

V. DRAINAGE STRUCTURES

A. CORRUGATED METAL PIPE: The corrugated metal pipe required in Table B-2 will be installed as follows:

1. All pipes shall be installed with a backhoe or excavator. The exact locations shall be determined and approved by the Contract Supervisor after the right-of-way is brushed and cleared.

2. The excavation trench for culvert installation shall not be wider than necessary to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe.

3. The bedding surface shall be constructed to provide a firm foundation of uniform density through the entire length of the culvert and shall be slightly cambered along the centerline to correct for expected settlement.

4. Where the bedding surface is not firm at the grade established, all unstable soil under the pipe and for a width of at least one diameter on each side of the pipe shall be removed and replaced with suitable selected material. Rock encountered in the bedding foundation will be removed to at least 12 inches below the bottom of the pipe and one diameter on each side. The final bedding area shall consist of fine, compacted granular material.

5. Selected material shall be placed alongside the pipe for backfill in alternating layers not exceeding six inches in depth and thoroughly compacted by a hand held mechanical tamper (wacker packer). Special care must be taken to compact the fill thoroughly under the haunches of the

pipe. Wacker packer compaction of backfill must be done for a horizontal distance on each side of the pipe equal to either one pipe diameter or to the outside limits of the trench, whichever is less. The depth of wacker packer compaction must extend at least to the top of the pipe.

6. Selected native fill material will be free from rocks and hard earth clods larger than 3 inches in size. Frozen material, sod or a high percentage of organic matter is not permitted.

7. The remainder of the fill above the top of the pipe may be compacted by tractor or rubber-tired roller. Fill is to extend above each pipe at least one-half the pipe diameter or a minimum of 12 inches, whichever is greater.

8. The pipe shall be protected by adequate fill cover before heavy equipment is permitted to cross during roadway construction.

9. Pipe that is damaged or improperly installed shall be repaired or replaced at Contractor expense as directed by the Contract Supervisor.

10. The Contract Supervisor must be contacted two days before any culvert installation and must be present at any wet site culvert installation.

11. **Riprap consisting of angular native rock of graded sizes 6 to 12 inches in diameter shall be installed to armor cuts and fills at both ends of all culverts installed.**

VI. ROAD MAINTENANCE

A. ROAD MAINTENANCE SCHEDULE AND REQUIREMENTS:

1. Road maintenance may be required on all native material or gravel roads **used during construction activities**.

2. Road maintenance is defined to include all operations listed under Section VI.

3. The Contract Supervisor will determine the number, type, extent and frequency of intermediate maintenance operations. Road maintenance shall be repeated as needed to facilitate traffic and proper road drainage. The Contractor will be advised of the time limitations to complete each maintenance project.

B. SURFACE BLADING:

1. Description: Surface blading is keeping a native or aggregate roadbed in a condition to facilitate traffic and provide proper drainage. It includes maintaining the crown or slope, shoulder, drainage dips, leadoff ditches, berms and turnouts, and provides a level of smoothness appropriate for the amount and kind of traffic served and consistent with existing surfacing.

2. Specifications:

   a. The existing roadbeds, including turnouts, shall be bladed and shaped to reasonably conform to the designed cross section, and to eliminate ruts **if damaged by the Contractor's equipment during new road construction**. Existing aggregate surfacing shall be bladed to conserve material and to prevent segregation of particle sizes. Rocks or other material remaining on the traveled way surface after final blading which are 4 inches or larger in size shall be removed from the road surface.

   b. Roadside cutslopes should not be undercut when cleaning ditches or removing road sloughs.

Berms shall be removed from road shoulders when blading, except where berms are located as part of road design.

c. Cutslopes that have been undercut may require backsloping, seeding and fertilizing.

C. **NOXIOUS WEED MANAGEMENT:** The Contractor may be required to perform noxious weed management on any of the roads designated as part of the haul route and on landings. Noxious weed management may include grass seeding and equipment washing.

1. Grass seeding, if required, is shown in Section IX, GRASS SEEDING SPECIFICATIONS.

2. All road construction equipment and equipment used in road construction activity must be pressure-washed by the Contractor and inspected by the Contract Supervisor prior to entering the project area. This cleaning will remove all dirt, plant parts, and material that may carry noxious weed seeds into the sale area. Other equipment and vehicles entering and leaving the project area shall be cleaned prior to start up and kept reasonably clean during the course of operations. All subsequent move-ins of construction equipment shall be treated the same as the initial move-in.

VIII. ROAD LOG AND SITE DESCRIPTIONS

0+00 **Begin construction at edge of existing road**

0+02 **Install 18" X 36' CMP in existing roadside ditch**

0+05 **Begin construction of ≈125' of ditch on the south side of new construction from the existing roadside ditch to summit of slope.**

7+80 **End of road. Install 16' "Powder River" gate. Gate will be installed on the section line and must be connected to the existing barbed wire fence with a four-strand barbed wire fence with wooden posts.**

Contractor must also install two (2) Drain Dips at locations specified by the Contract Supervisor.

IX. SPECIFICATIONS AND DRAWINGS

A. **REQUIREMENTS:** Any construction requirements or structures shown in Attachment B shall be constructed and installed by the Contractor to specifications in this section. Structures shall be constructed at locations shown in the Road Log and as specified or staked by the Contract Supervisor.

B. SPECIFICATION DRAWINGS:

GENERAL SPECIFICATIONS

GRASS SEEDING SPECIFICATIONS

CLEAR LIMITS AND TYPICAL CROSS SECTIONS

STANDARD DRAIN DIP FOR SINGLE LANE ROAD

TUBULAR STEEL CATTLE GATE AND BARBED WIRE FENCE BRACE CONSTRUCTION

GENERAL SPECIFICATIONS

ALIGNMENT

Minimum Curve Radius:

Switchbacks:	50 Feet
Curves:	As marked on the ground

CUT SLOPE RATIO

Common excavation:	1:1
Angular Rock:	3/4:1
Solid Rock:	1/4:1
Maximum tolerance:	plus 15% minus 0%

ROAD GRADE MAXIMUM

Favorable:	12%
Adverse:	8%

Grades as shown in the Road Log

FILL SLOPE RATIO

Common material:	1-1/2:1
Angular rock:	1-1/3:1
Maximum tolerance:	plus 15% minus 0%

DITCHES

Width:	3 feet
Depth:	1 foot

Located as shown in the Road Log or as directed by the Contract Supervisor

TURNOUTS

Length:	75 feet
Width:	7 feet

Located by Contractor and approved by the Contract Supervisor. Spacing will be intervisible as topography allows.

USABLE ROAD SURFACE

Tangents:	14 feet
Curves:	16 feet (radius over 75 feet) 20 feet (radius under 75 feet)
Switchbacks:	22 feet
Slough widening: (in addition to usable road surface)	Tangents: 1foot Curves and all fills over 6 feet height: 2 feet.

TURNAROUNDS

Dimensions: large enough to safely turn around a long wheel base 2-wheel-drive pickup.

Location: at or near the end of all dead end roads as approved by the Contract Supervisor.

GRASS SEEDING SPECIFICATIONS

A. SEED REQUIREMENTS: The Contractor shall furnish certified noxious weed-free, pure live seed mixture(s) and fertilizer in the amounts shown in Table B-2. Total pounds mixed seed is pure live seed, corrected for germination and purity. Germination and purity tests must have been conducted within the last 6 months prior to delivery. Contractor shall furnish documentation of germination and purity tests to the Contract Supervisor prior to application.

B. APPLICATION REQUIREMENTS:

1. Fertilizer and seed may be applied with a hand spreader or power blower, which adjusts to distribute seed evenly at the specified rate while limiting application to the desired area. Seed and fertilizer shall be applied separately. Mixing of seed and fertilizer is prohibited.

2. Seed and fertilizer shall be applied as listed in the following tables. In the event weather conditions or time of year are not conducive for successful seed establishment, the Contract Supervisor may require a different application schedule from the ones stated.

3. Application estimates are approximate figures only to be used for estimating purposes.

SEEDING CONCURRENT WITH ROAD CONSTRUCTION

Areas shown in this table shall be seeded and fertilized concurrent with initial road construction according to the following schedule:

Cut slopes must be seeded promptly, no more than 7 calendar days of the day that each segment of cut slope is rough shaped with the dozer or excavator, while rough and preferably before rain for better seed take. A cut slope segment is defined as one day's work regardless of the amount of work accomplished or the length of the cut slope. Even if the driving portion of the road is not shaped, graded or drivable, cut slope seeding is still required.

Fill slopes, ditches, shoulders of the road and other disturbed areas shall be seeded within 15 calendar days after completion of each road segment.

SEED MIXTURE - SEEDING CONCURRENT WITH CONSTRUCTION

Species	Pounds per acre
"Primar" or "Revenue" Slender Wheatgrass	**11**
"Luna" or "Mandan" Pubescent Wheatgrass	**13**
"Durar" or "Whitmar" Hard Fescue	**8**
"Ruebens" or "Talon" Canada Blue grass	**5**
Total Pounds mixed seed per acre	**37**
Estimated acres	**.75**
Total Pounds mixed seed	**28**

FERTILIZER

Analysis (N-P-K)	**16-16-16**	Pounds Per Acre	**133**
		Total Pounds Fertilizer	**100**

APPLICATION ESTIMATES – SEEDING CONCURRENT WITH CONSTRUCTION		
Road Name	Length	Estimated Acres
Shaw Easement	**780'**	**.75**
	Total Acres	**.75**

GRAVEL AND ROCK SPECIFICATIONS	
Material	**Specifications**
3/4" minus crushed gravel	Crushed gravel. Well graded. Fine fraction (minus 200 sieve) not to exceed 15%
Pit run gravel	Native gravel, well graded, with binder, compactable and not containing any rocks over 4" diameter.
Drain rock	1"- 3" diameter, screened clean rock.
General Large Rock Requirements Stone shall be hard, durable, angular in shape, resistant to weathering and weather action, and free from overburden, soil, and organic matter. Stone must be hard enough so pieces do not fracture or break during the loading, hauling, or placement activities. Neither breadth nor thickness of stone shall be less than one-third its length. Rounded stone or boulders from a streambed will not be accepted unless authorized by the State.	
Rock armor	Large rock with most sizes ranging from 6" to 12" diameter, used to armor fill slopes and catch basins.
Talus rock	Large rock of variable sizes used as load-bearing fill or drainage rock in soft areas or French drains, as approved by Contract Supervisor.
Energy dissipaters	Large rock 18-24" diameter placed in streams at culvert outlets.

ATTACHMENT B

SPECIFICATION DRAWINGS

Clear Limits and Typical Cross Sections

CLEARTPK.WPG

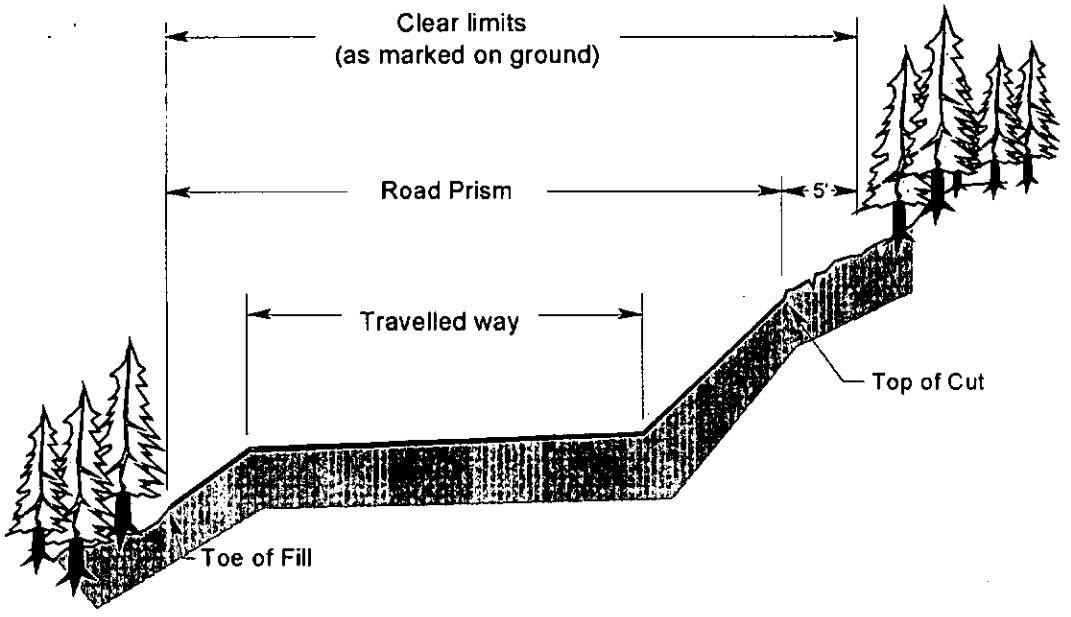


Figure I: Clear limits for New Construction

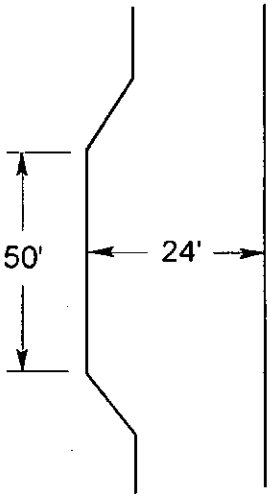


Figure II:
Typical turn out construction

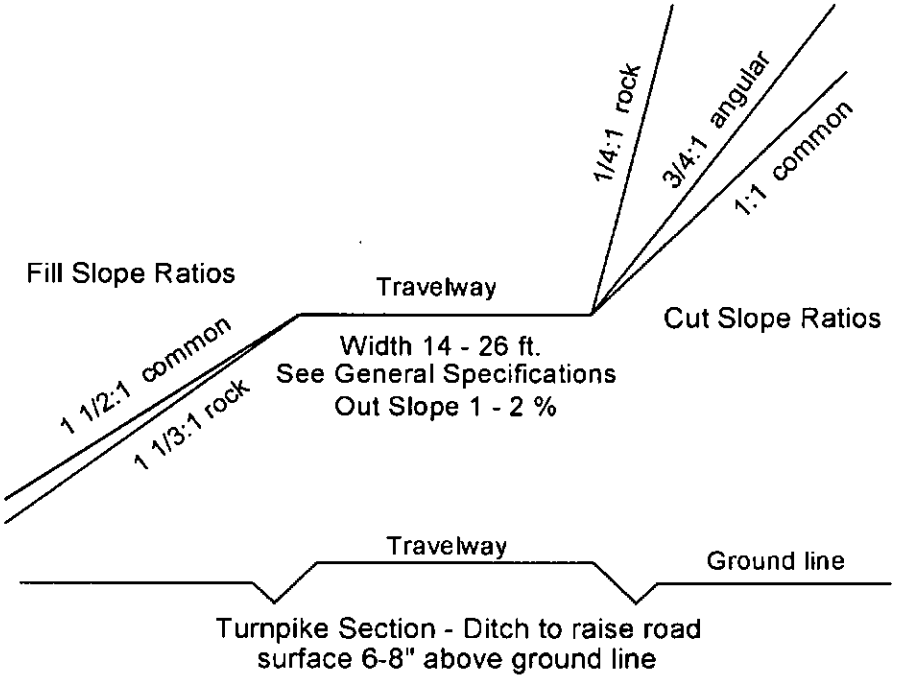
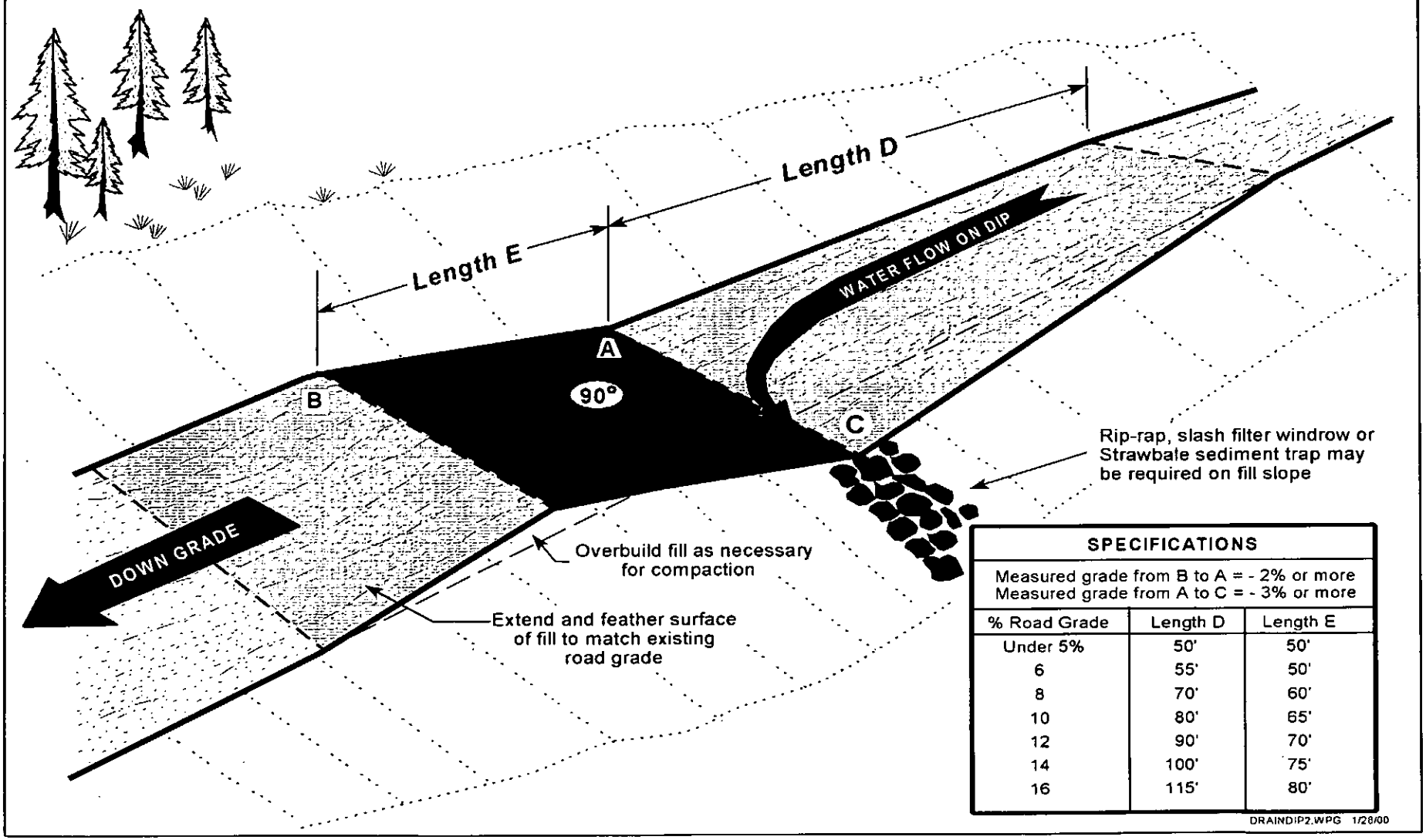


Figure III: Typical Cross Sections

ATTACHMENT B

STANDARD DRAIN DIP FOR SINGLE LANE ROAD



SPECIFICATIONS

Measured grade from B to A = - 2% or more
Measured grade from A to C = - 3% or more

% Road Grade	Length D	Length E
Under 5%	50'	50'
6	55'	50'
8	70'	60'
10	80'	65'
12	90'	70'
14	100'	75'
16	115'	80'

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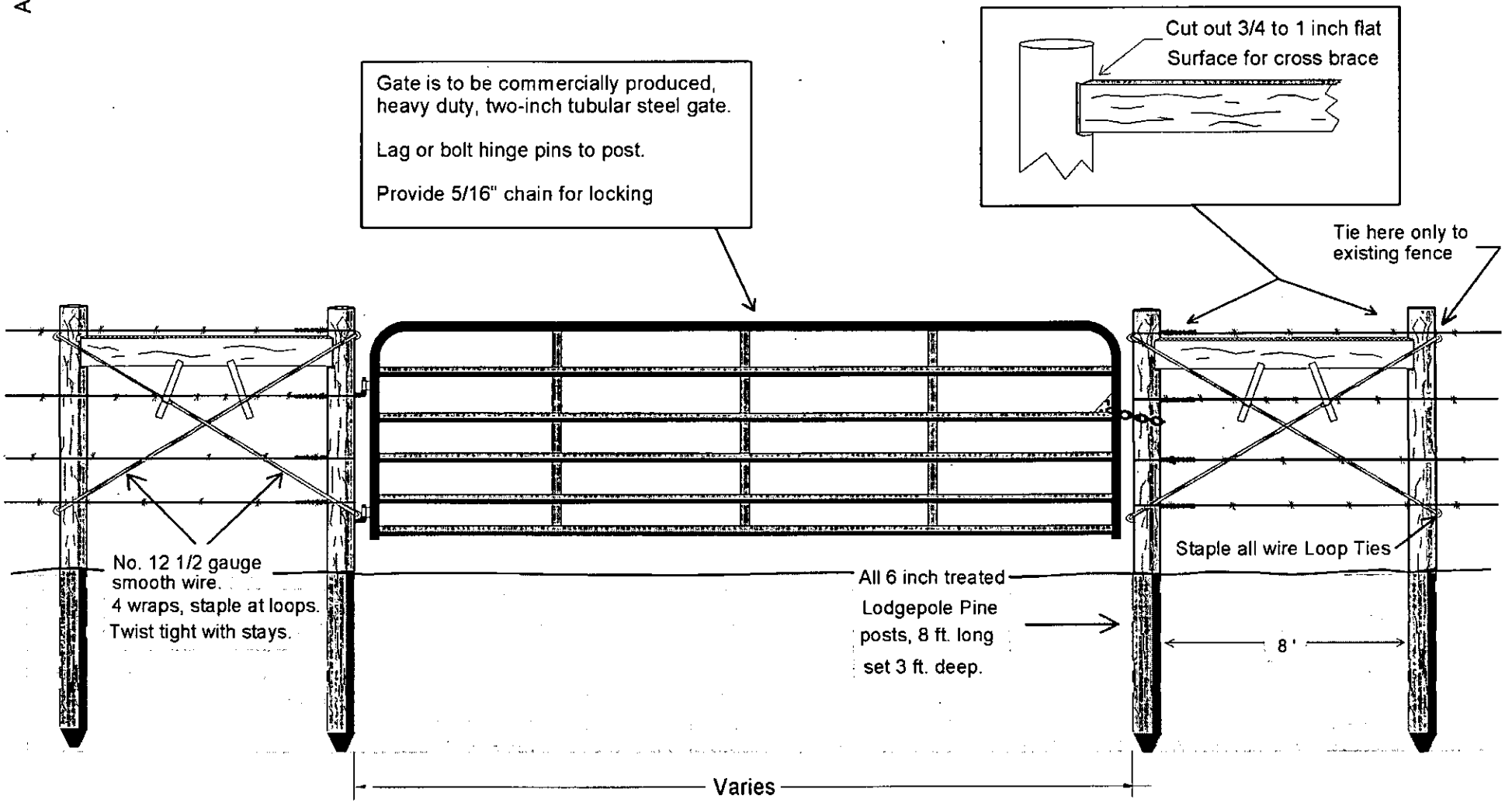
ATTACHMENT B

TYPICAL TUBULAR STEEL CATTLE GATE AND BARBED WIRE FENCE BRACE CONSTRUCTION



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