

DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
REGION 9  
ALLEGHENY NATIONAL FOREST

Big Pond Timber Sale

FR 160D	Hook Run D	0.8 Mile Reconst. – Maintenance - Level C
FR 160F	Hook Run F	0.9 Mile Reconst. – Maintenance – Level D
FR 160Fa	County Line	0.4 Mile Reconst. – Maintenance -Level D

Bradford Ranger District  
Warren County  
Pennsylvania

1	Title Sheet
2	Vicinity Map
3-5	Schedule of Items & General Notes
6-10	Road Log/Work Description
11-14	Roadbed Details
15	Pit Development Plan

The location and design elements of this facility have been correlated with the plans, policies and constraints of the approved Southwest Reservoir Environmental Assessment.

Plans are to be used with "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03 with Special Project Specifications thereto included in this contract.

Prepared By:

Henry D. Hus

Approved By:

Anthony C. Martopis  
District Ranger

10/3/2011  
Date

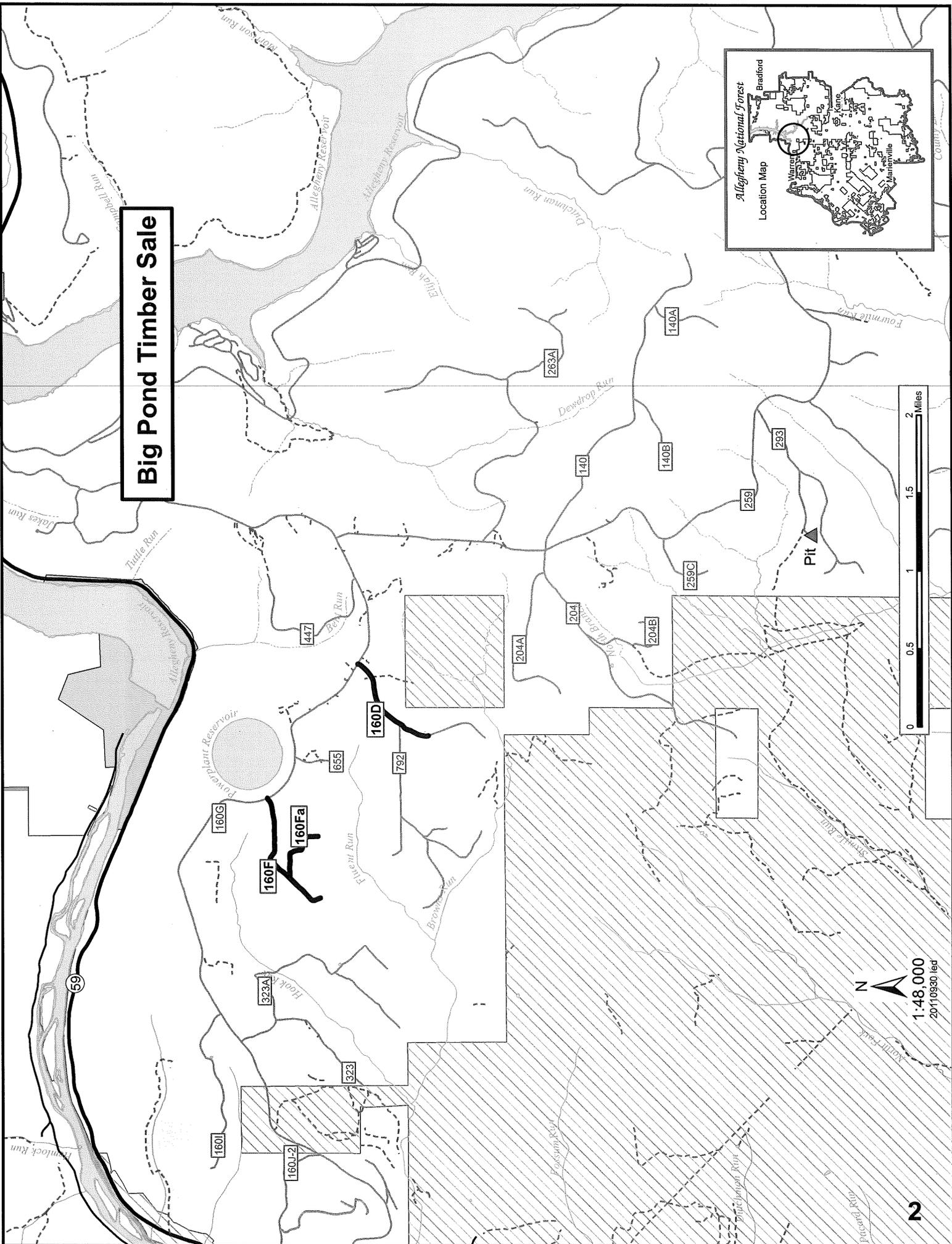
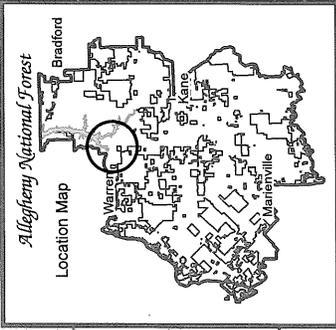
D. Selman  
Forest Engineer

10/4/2011  
Date

T. J. P. [Signature]  
Forest Supervisor

10/4/2011  
Date

# Big Pond Timber Sale



1:48,000  
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## SCHEDULE OF ITEMS

### FR 160D

ITEM	DESCRIPTION	UNIT	QTY
15101	Mobilization (Lump Sum)	All	1
20305	Removal of structures and obstructions	All	1
23050	Brushing	Mile	0.8
30103	Aggregate base, grading pit run, compaction method B	Cubic Yard	24
30115	Aggregate surface course, grading 1" minus, compaction Method B	Ton	46
30326	Road reconditioning	Mile	0.8
60263	18 inch aluminized steel, type 2, corrugated steel pipe, 0.064 inch thickness, method A	Foot	54
62501	Seeding, hydraulic or dry method	All	1
63301	Sign system	Each	2
65101	Pit and quarry development	Each	1

### FR 160F

ITEM	DESCRIPTION	UNIT	QTY
15101	Mobilization (Lump Sum)	All	1
20301	Removal of culverts	Each	2
23050	Brushing	Mile	0.9
30103	Aggregate base, grading pit run, compaction method B	Cubic Yard	36
30326	Road reconditioning	Mile	0.9
60263	18 inch aluminized steel, type 2, corrugated steel pipe, 0.064 inch thickness, method A	Foot	80
62503	Seeding, hydraulic or dry method (Lump Sum)	All	1
65101	Pit and quarry development	Each	1

FR 160 Fa

ITEM	DESCRIPTION	UNIT	QTY
15101	Mobilization (Lump Sum)	All	1
23050	Brushing	Mile	0.4
30326	Road reconditioning	Mile	0.4

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### General Notes

**-Prior to any earth disturbing activities, contractor shall call the Pennsylvania One Call System (800-242-1776) and all Oil & Gas Operators in the work area to determine locations of any underground utility lines.**

-Culvert cleaning and repair will be considered incidental to road reconditioning.

-Contractor is responsible for maintenance of all Forest Service roads over which pit run or commercial stone material is hauled. Roads shall be bladed or shaped to restore travel way to the condition found prior to haul.

-Contractor shall install "ROAD CONSTRUCTION AHEAD" signs on all roads worked on in this project area and at ATV trail crossings. Signs shall conform to the Manual on Uniform Traffic Control Devices (MUTCD). Signs shall be covered when construction activity is not taking place.

-Roads shall be completed in such a manner that water shall not pond on roadbed or in ditch lines.

-All removed corrugated metal pipe culverts shall be hauled off Federal lands and become the property of the contractor, unless otherwise indicated for salvage. Steel pipe casings shall be returned to the Sheffield Work Center unless otherwise directed by the Engineer.

-Forest Service gate plans are available at the Allegheny National Forest Supervisor's Office, Warren, PA. 16365. The following are gate manufacturers:

Gary Asel  
Marienville, PA.  
(814) 927-8380

ADM Welding  
2818 Penna. Ave. West  
Warren, PA. 16365  
(814) 723-7227

-Contouring, topsoil respreading, seeding and mulching of disturbed areas as determined by the Forest Service is required.

-DSA limestone shall be shipped at optimum moisture content not exceeding 15%. Limestone loads that fail test parameters will be rejected.

-When replacing culverts in live streams, contractor shall install silt fence and straw bales at approaches to live stream crossings to eliminate sediment in the stream course. Any sediment collected will be removed and ground will be stabilized with seed and mulch. Dewatering pumps will be used to redirect water out of the stream course at the time of stream crossing installation. Silt fence and straw bales will be removed only after vegetation is clearly re-established as determined by the Engineer. Contractor is responsible for obtaining any Department Of Environmental Protection GP-11 or GP-7 stream crossing permits and preparing a Soil Erosion and Sediment Control Plan. This work will be considered incidental to Section 151 Mobilization.

-Roadway sod encountered during road reconditioning operations will be spread and leveled outside the road template avoiding piles. Natural terrain depressions and openings are the preferred waste locations. Seeding and mulching may be required to supplement natural revegetation.

-Vegetation cut down during roadside brushing will be pulled beyond the clearing limits and the toe of any roadway template construction. Mixing of soil and cut vegetation shall be avoided. All material will be scattered and lopped within 3' of the ground.

-Aggregate stockpiled for culvert replacement will be located on the existing road surface to assure maximum utilization of the material and eliminate disturbance of existing vegetated areas.

## FR 160D Hook Run D

Station	Road Log/Work Description
0+00	FR 160 station 339+81
<b>0+00-41+00</b>	<b>Recondition roadbed to TYPICAL RECONDITION SECTION, perform ditching along entire length, clean all culverts, and perform roadside brushing 12' from shoulder and 14' high</b>
<b>0+00-35+80</b>	<b>CAUTION: Gas and oil line in ditch right</b>
<b>0+00-1+50</b>	<b>Place 4 inches of 1" minus surfacing (46 tons)</b>
<b>0+08</b>	<b>Maintain drivable ditch</b>
<b>0+15</b>	<b>Replace STOP sign left</b>
0+35	Road number sign right
0+35	Oil and gas line crosses road
0+70	NO OUTLET sign right
<b>0+80</b>	<b>Re-locate Forest Service gate to station 7+75</b>
<b>0+80</b>	<b>Re-locate WELCOME TO WALK IN sign to station 7+75</b>
0+97	Narrow rough road
1+25-2+75	Turnout right
3+78	18" x 22' CMP (1991), <b>inlet end plugged needs cleaning</b>
5+88	Dispersed site right
6+55	Road to private land left, existing widening left
6+80	Access road right, blocked
<b>7+75</b>	<b>Remove Forest Service gate, (cross arm needs fixed, too low, hard to close), re-install Forest Service gate from entrance</b>
10+00	18" x 22' CMP (1991)
16+40	18" x 22' CMP (1991)
16+90	Gas valve right
19+75-21+25	Turnout left
26+00	Edge of cleared right of way
26+00	18" x 50' CMP (1991) across intersection of roads, <b>outlet end ditch needs cleaning</b>
26+20	FR 792 right
26+36	Intersection of power line right of way road left

27+40	Edge of cleared right of way
28+55	<b>Remove 18" x 24' CMP, install 18" x 26' CMP, apply 12 CY pit run</b>
32+48	<b>Remove 18" x 28' CMP, install 18" x 28' CMP, apply 12 CY pit run</b>
32+25-33+75	Turnout right, <b>move rocks right (2)</b>
33+48	Camping spur left, road to well site
35+50	18" x 24' CMP
35+80	OGM road right
35+80-41+00	Electric line now on left side of road
37+32	18" x 24' CMP (1991)
40+70	Turnaround right
40+86	18" x 24' CMP (1991), <b>needs cleaning</b>
41+00	<b>End reconditioning, road continues</b>

**NOT PART OF THIS CONTRACT**

43+05	<b>18" x 24' CMP, outlet end needs cleaning</b>
44+00	Oil well and tank battery
44+68	18" x 24' CMP, <b>needs cleaning</b>
44+75-46+25	Turnout right
46+85-50+20	<b>Apply 6" DSA limestone (115 tons)</b>
47+85	<b>Install 18" x 28' CMP on left forward skew, apply 12 CY pit run</b>
48+85	Spring right
48+98	18" x 22' CMP
50+12	18" x 22' CMP
51+15	Well location right
52+25-53+75	Turnout right
55+96	18" x 24' CMP
56+70	Trail right, OGM road right, tank battery
59+10	Pulloff left, steep drop-off
59+80	End of road

## FR 160F Hook Run F

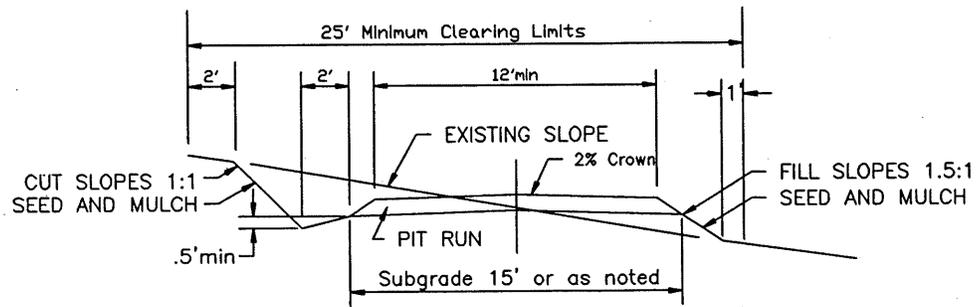
Station	Road Log/Work Description
0+00	FR 160 station 281+42
<b>0+00-45+00</b>	<b>Recondition roadbed to TYPICAL RECONDITION SECTION, clean all culverts, and perform roadside brushing 12' from shoulder and 14' high</b>
0+36	18" x 30' steel casing
0+50	Road number sign right
0+85	Forest Service gate
1+50	OGM road left
4+80	18" x 30' CMP, plugged, <b>needs cleaned</b>
5+00	OGM storage tank right
5+85	18" x 26' CMP, inlet end plugged, <b>needs cleaned</b>
<b>5+85-8+85</b>	<b>Ditch needs cleaned so ditch will drain into pipe</b>
14+35-16+90	Edge of pit right
19+25	Edge of power line right of way
20+35	Center of power line right of way
21+22	Road begins running parallel to power line right of way
<b>25+20</b>	<b>Remove 18" x 24' CMP on left forward skew, install 18" x 24' CMP, apply 12 CY pit run</b>
<b>27+50</b>	<b>Remove 18" x 40' CMP on left forward skew, install 18" x 28' CMP, apply 12 CY pit run, add 20' of leadoff ditch</b>
30+70	OGM equipment, pipelines right
31+05	Well site right, FR 160Fa left
<b>31+70</b>	<b>Install 18" x 28' CMP on left forward skew, construct leadoff ditch, apply 12 CY pit run</b>

33+20	18" x 24' CMP on left forward skew, <b>clean outlet end</b>
36+30	18" x 26' steel casing, <b>clean outlet end, filled with silt</b>
38+53	18" x 25' steel casing, <b>clean outlet end</b>
39+40	Well site 40' right, large turnaround landing area
41+80	Road loops back across power line right of way, spring left
43+57	18" x 25' steel casing
45+00	End of road at well site, turnaround left

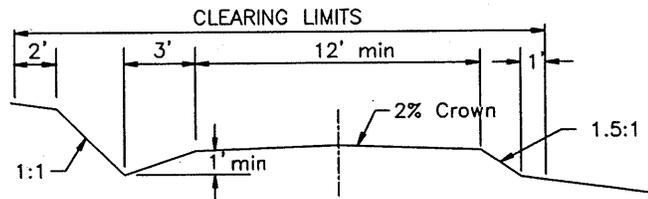
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**FR 160Fa Hook Run Fa**

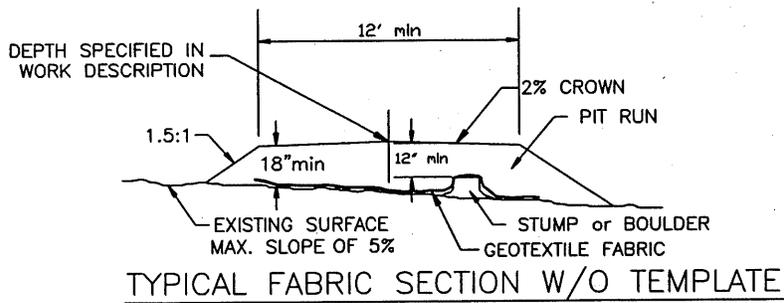
<b>Station</b>	<b>Road Log/Work Description</b>
0+00	Intersection FR160 F station 31+05, <b>enlarge intersection so trucks can turn, apply 72 CY pit run</b>
<b>0+00-22+00</b>	<b>Recondition roadbed see TYPICAL RECONDITION SECTION, clean all culverts, perform roadside brushing</b>
0+00-3+00	Road crosses under power line right of way
0+70	Road number sight right
3+83	Oil well 12' right
5+10	18" x 25' steel casing
7+88	18" x 25' steel casing
<b>8+30-9+30</b>	<b>Reconstruct turnout left, blade and re-shape</b>
12+71	18" x 25' steel casing
15+06	18" x 25' steel casing
<b>16+60-17+40</b>	<b>Reconstruct widening right, blade and re-shape</b>
20+35	18" x 25' steel casing, spring left
21+00	Turnaround left, good landing area
21+50-22+00	Cul-de-sac end of road



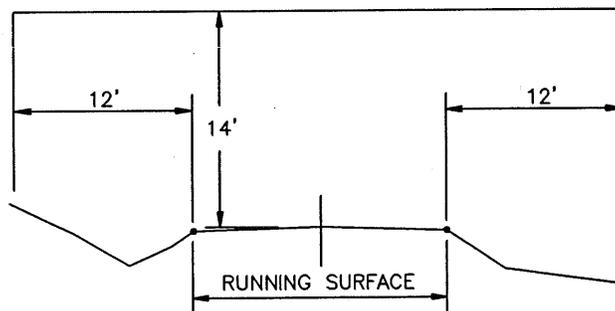
TYPICAL CONSTRUCTION SECTION



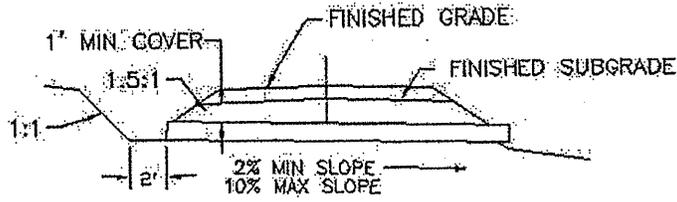
TYPICAL RECONDITION SECTION



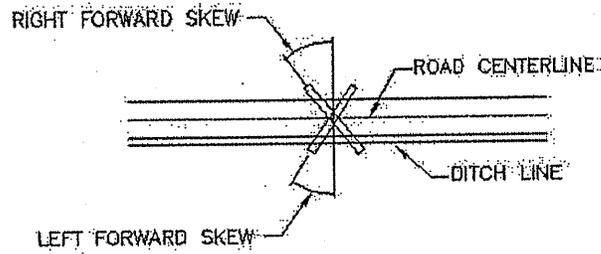
TYPICAL FABRIC SECTION W/O TEMPLATE



ROADSIDE BRUSHING DETAIL

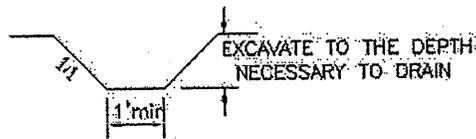


CULVERT SECTION

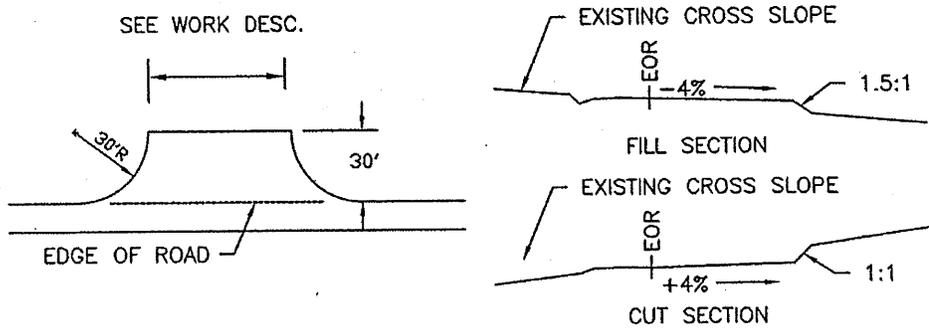


SKEW DETAIL

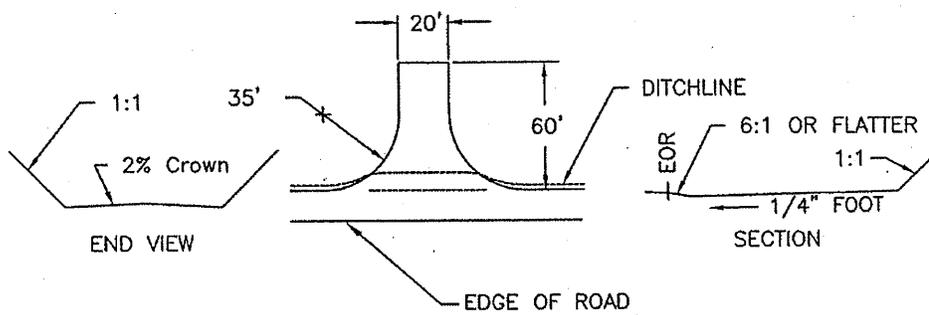
NOTE: Field locate ditch to minimize new clearing



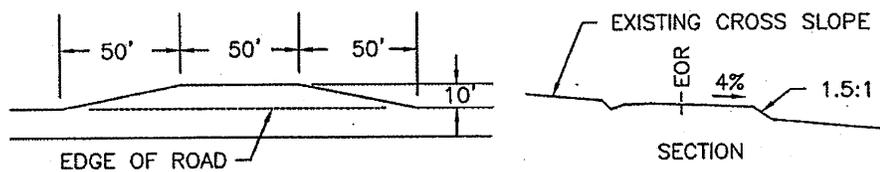
OUTLET/LEAD OFF DITCH SECTION



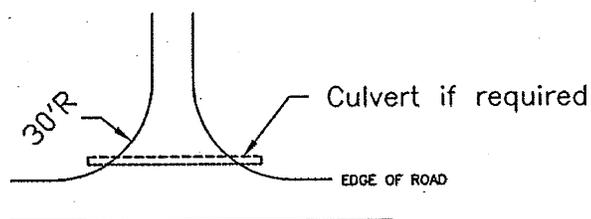
PARKING LOT DETAIL



TURNAROUND DETAIL

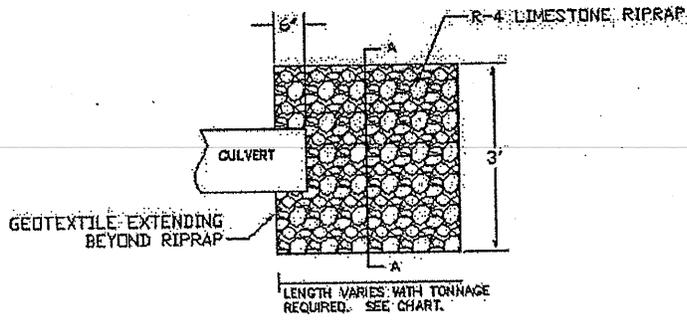


TURNOUT DETAIL

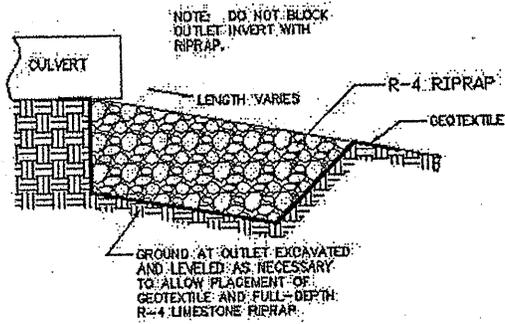


INTERSECTION DETAIL

## CULVERT OUTLET RIPRAP DETAIL

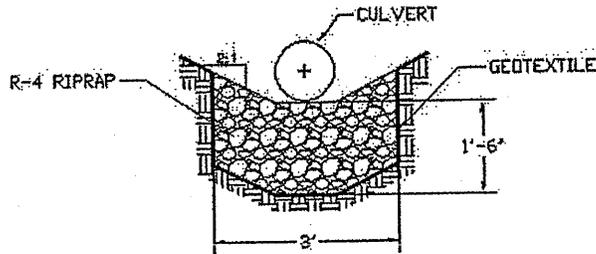


PLAN VIEW



R-4 RIPRAP	
QUANTITY	APPROXIMATE COVERAGE
2 TONS	3' X 7' X 1.5'
3 TONS	3' X 10' X 1.5'
4 TONS	3' X 13' X 1.5'

PROFILE



SECTION A-A

## Pit Development Plan

Pit run for this project will come from the pit at the end of FR 293.

### A. Pit Development

1. The overburden removed will be stockpiled in a location agreed upon by the Forest Service and the contractor, and used for pit reclamation.
2. Only ONE face of the pit is to be open and worked on at any given time.
3. High walls are a violation of OSHA regulations.
4. The pit floor will be sloped to prevent pooling of water.
5. Any oversized material left over in the pit area shall be stockpiled at a mutually agreed upon, by Forest Service and contractor, location.
6. No disposed equipment, trash, vehicles, pipe, or miscellaneous supplies will be allowed to accumulate or be stored in the pit and surrounding areas unless first agreed to by the Forest Service.
7. Operator will not undermine any boundary of the pit area.
8. No slash, soil or stumps will be permitted against live trees. No undercutting of roots of live trees allowed.

### B. Timber

1. Slash resulting from this project will be scattered outside the clearing limits of the road and pit site. Stumps will be scattered at random and set upright. Stumps will be pulled into the pit floor not out into the woods.
2. The Forest Service will mark any further pit expansion after being notified, in advance by the Operator.
3. Any timber stored within the pit area that is decked for a timber sale shall not be damaged or buried. Timber shall be decked at a location designated by the Forest Service.
4. No timber may be cut or pushed over unless it is marked by the Forest Service and compensated for.

### C. Pit Reclamation

1. As each open face is depleted of suitable rock material, that area will be reclaimed promptly to a slope of 1.5:1 or greater using the previously stockpiled overburden.
2. The slope/reclaimed area will then promptly be seeded, fertilized, and mulched using a non-exotic seed mixture designed by the Forest Service.
3. Areas seeded that are not receiving 50% or greater germination will be reseeded within 30 days, or the next suitable seeding season.
4. No open face of the pit will be closed without prior notification to the Forest Service.
5. When excavation of material is complete, the Forest Service will be notified to approve and document the reclamation work.

## **SCHEDULE OF ITEMS, SPECIFICATIONS & DRAWINGS FOR SPECIFIED ROADS**

<b>I. Road Summary</b>	<b>2</b>
<b>II. Schedule of Items</b>	<b>3-5</b>
<b>III. Specification List and Special Project Specifications</b>	<b>1-37 pages</b>
<b>IV. Road Plans: Big Pond Timber Sale</b>	<b>15 pages</b>

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## ROAD SUMMARY

### SPECIFIED ROADS

#### a. Description of Work:

##### **Reconstruction: FR 160D, 160F, 160Fa**

Pit run, Crushed Aggregate, Reconditioning of Roadbed, Mobilization, Culvert Installation, Seeding & Mulching, Removal of Culverts, Pit Development and Brushing

#### b. Construction Costs:

<u>Road No.</u>	<u>Miles</u>	<u>Estimated road cost</u>	<u>Engineer's Estimate</u>	<u>Reconst. Deposits</u>
160D	0.8	\$7,881.00	\$9,370.90	\$1,600.00
160F	0.9	\$7,090.00	\$8,860.00	\$1,400.00
160Fa	0.4	\$2,000.00	\$2,700.00	\$400.00
<b>Total</b>		<b>\$16,971.00</b>	<b>\$20,930.90</b>	<b>\$3,400.00</b>

Completion dates: 9/30/2012



FR 160F

Pay Item	Description	Pay Unit	Estimated Quantity	Unit Price	Extended Total	Engineer's Estimate Unit Price	Engineer's Extended Total
15101	Mobilization (Lump Sum)	All	1	1000.00	\$ 1,000.00	2000.00	\$ 2,000.00
20301	Removal of culverts	Each	2	100.00	\$ 200.00	110.00	\$ 220.00
23050	Brushing	Mile	0.9	1500.00	\$ 1,350.00	1800.00	\$ 1,620.00
30103	Aggregate base, grading pit run, compaction method B	Cubic Yard	36	20.00	\$ 720.00	22.00	\$ 792.00
30326	Road reconditioning	Mile	0.9	1000.00	\$ 900.00	1200.00	\$ 1,080.00
60263	18 inch aluminumized steel, type 2, corrugated steel pipe, 0.064 inch thickness, method A	Linear Foot	80	31.50	\$ 2,520.00	33.35	\$ 2,668.00
62501	Seeding, hydraulic or dry method (Lump Sum)	All	1	300.00	\$ 300.00	360.00	\$ 360.00
65101	Pit and quarry development	Each	1	100.00	\$ 100.00	120.00	\$ 120.00
<b>TOTAL</b>					\$ 7,090.00		\$ 8,860.00

FR 160Fa

Pay Item	Description	Pay Unit	Estimated Quantity	Unit Price	Extended Total	Engineer's Estimate Unit Price	Engineer's Extended Total
15101	Mobilization (Lump Sum)	All	1	1000.00	\$ 1,000.00	1500.00	\$ 1,500.00
23050	Brushing	Mile	0.4	1500.00	\$ 600.00	1800.00	\$ 720.00
30326	Road reconditioning	Mile	0.4	1000.00	\$ 400.00	1200.00	\$ 480.00
<b>TOTAL</b>					\$ 2,000.00		\$ 2,700.00

## Specification List

The following specifications will be used for this contract:

Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects – FP-03 U.S. Customary Units. FP-03 is available on the internet at the following site: <http://flh.fhwa.dot.gov/resources/pse/specs/>

Supplemental Specifications – These specifications were prepared by the Forest Service and are a supplement to or change the FHWA specifications. These are designated SS.

Special Project Specifications – Are specifications prepared on the Allegheny National Forest and pertain to Pennsylvania Department of Transportation nomenclature. These are designated SPS.

### Preface

101 - Terms, Format, and Definitions

SS101 - Terms, Format, and Definitions

102 - Bid, Award, and Execution of Contract

SS102 - Bid, Award, and Execution of Contract

103 - Scope of Work

SS103 - Scope of Work

104 - Control of Work

SS104 - Control of Work

105 - Control of Materials

SS105 - Control of Materials

106 - Acceptance of Work

SS106 - Acceptance of Work

107 - Legal Relations and Responsibility to the Public

SS107 - Legal Relations and Responsibility to the Public

108 - Prosecution and Progress

SS108 - Prosecution and Progress

109 - Measurement and Payment

SS109 - Measurement and Payment

151 - Mobilization

155 - Schedules for Construction Contracts

SS155 - Schedule for Construction Contracts

203 - Removal of Structures and Obstructions

SPS206 - Alkaline Road Runoff Channels

SS230 - Roadside Brushing

301 - Untreated Aggregate Courses

SS301 - Untreated Aggregate Courses

303 - Road Reconditioning

SS303 - Road Reconditioning

602 - Culverts and Drains

SS602 - Culverts and Drains  
625 - Turf Establishment  
SS625 - Turf Establishments  
633 - Permanent Traffic Control  
635 - Temporary Traffic Control  
SS635 - Temporary Traffic Control  
SS651 - Development of Pits & Quarries  
703 - Aggregate  
SPS703 - Aggregate  
705 - Rock  
SPS705 - Rock

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## Preface

Preface\_wo\_03\_15\_2004\_m

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-03 for construction of National Forest System Roads.

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# 101 - Terms, Format, and Definitions

101.00\_nat\_us\_07\_25\_2005

101.01\_nat\_us\_01\_22\_2009

## 101.01 Meaning of Terms

Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.03\_nat\_us\_06\_16\_2006

## 101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	<u>National Institute of Standards and Technology</u>
NESC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau

Add the following to (b) SI symbols:

mp	Milepost
ppm	Part Per Million

101.04\_nat\_us\_03\_29\_2007

## 101.04 Definitions.

Delete the following definitions and substitute the following:

**Bid Schedule**--The Schedule of Items.

**Bridge**--No definition.

**Contractor**--The individual or legal entity contracting with the Government for performance of prescribed work. In a timber sale contract, the contractor is the "purchaser".

**Culvert**--No definition.

**Right-of-Way**--A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) Real property necessary for the project, including roadway, buffer areas, access, and drainage areas.

Add the following:

**Adjustment in Contract Price**--“Equitable adjustment,” as used in the Federal Acquisition Regulations, or “construction cost adjustment,” as used in the Timber Sale Contract, as applicable.

**Change**--“Change” means “change order” as used in the Federal Acquisition Regulations, or “design change” as used in the Timber Sale Contract.

**Design Quantity**--“Design quantity” is a Forest Service method of measurement from the FS-96 *Forest Service Specifications for the Construction of Roads and Bridges*. Under these FP specifications this term is replaced by the term “Contract Quantities”.

**Forest Service**--The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

**Neat Line**--A line defining the proposed or specified limits of an excavation or structure.

**Pioneer Road**--Temporary construction access built along the route of the project.

**Purchaser**--The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

**Protected Streamcourse**--A drainage shown on the plans or timber sale area map that requires designated mitigation measures.

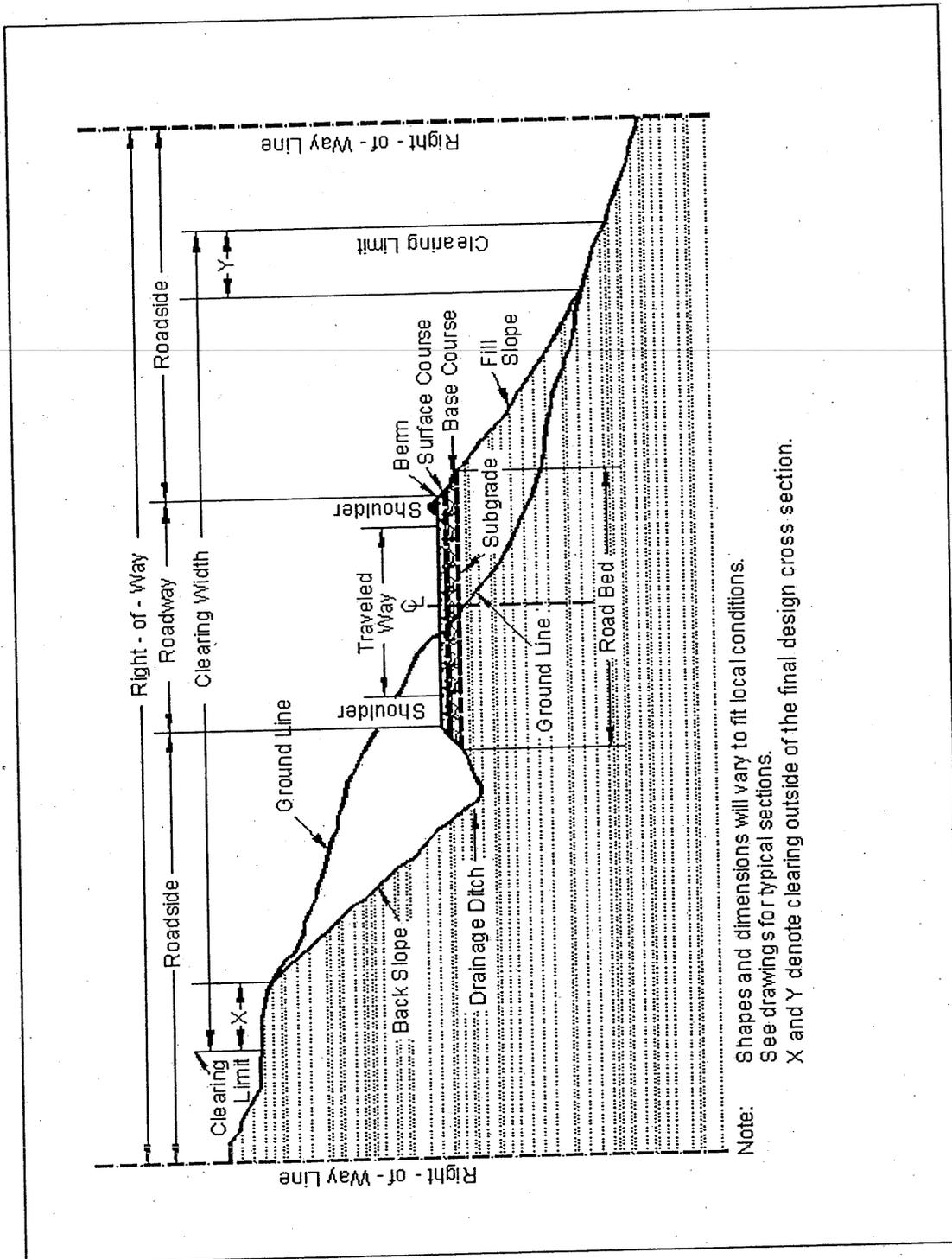
**Road Order**--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

**Schedule of Items**--A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, unit price, and amount.

**Utilization Standards**--The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

Add Figure 101-1—Illustration of road structure terms:

Figure 101-1—Illustration of road structure terms.



## 102 - Bid, Award, and Execution of Contract

102.00\_nat\_us\_02\_16\_2005

### 102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.

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## 103 - Scope of Work

103.00\_nat\_us\_02\_16\_2005

### Deletions

Delete all but subsection 103.01 Intent of Contract.

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## 104 - Control of Work

104.00\_nat\_us\_06\_16\_2006

### Deletions

Delete Sections 104.01, 104.02, and 104.04.

104.06\_nat\_us\_02\_17\_2005

Add the following subsection:

### **104.06 Use of Roads by Contractor**

The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.

## 105 - Control of Material

105.02\_nat\_us\_01\_18\_2007

### 105.02 Material Sources.

#### 105.02(a) Government-provided sources.

Add the following:

Comply with the requirements of 30 CFR 56, subparts B and H. Use all suitable material for aggregate regardless of size unless otherwise designated. When required, re-establish vegetation in disturbed areas according to section 625.

105.05\_nat\_us\_05\_12\_2004

#### 105.05 Use of Material Found in the Work.

Delete 105.05 (a) and (b) and the last sentence of the second paragraph and substitute the following:

Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.

## 106 - Acceptance of Work

106.07\_nat\_us\_05\_11\_2004

**106.07 Delete**

Delete subsection 106.07.

---

## 107 - Legal Relations and Responsibility to the Public

107.05\_nat\_us\_05\_11\_2004

### 107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06\_nat\_us\_06\_16\_2006

### 107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.  
"except as provided in Subsection 106.07".

107.09\_nat\_us\_06\_16\_2006

### 107.09 Legal Relationship of the Parties.

Delete the entire subsection.

107.10\_nat\_us\_06\_16\_2006

### 107.10 Environmental Protection.

Add the following:

Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on Government land.

Before beginning any work, submit a Hazardous Spill Plan. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report and include the following:

- Description of the item spilled (including identity, quantity, manifest number, and other identifying information).
- Whether amount spilled is EPA or state reportable, and if so whether it was reported, and to whom.
- Exact time and location of spill including a description of the area involved.
- Containment procedures.
- Summary of any communications the Contractor had with news media, Federal, state and local regulatory agencies and officials, or Forest Service officials.
- Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue.

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.

## 108 - Prosecution and Progress

108.00\_nat\_us\_02\_16\_2005

**108 Delete.**

Delete Section 108 in its entirety.

---

## 109 - Measurement and Payment

109.00\_nat\_us\_02\_17\_2005

### 109 Deletions

Delete the following entire subsections:

**109.06 Pricing of Adjustments.**

**109.07 Eliminated Work.**

**109.08 Progress Payments.**

**109.09 Final Payment.**

109.02\_nat\_us\_06\_16\_2006

### 109.02 Measurement Terms and Definitions.

#### **(b) Contract quantity.**

Add the following:

Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

Change the following:

“(b) Cubic yard” to “(c) Cubic yard”.

Add the following definition:

**(p) Thousand Board Feet (Mbf).** 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.

## 155 - Schedules for Construction Contracts

155.00\_nat\_us\_05\_11\_2004

**155 Delete.**

Delete Section 155 in its entirety.

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## 201 - Clearing and Grubbing

201.00\_nat\_us\_05\_01\_2006

### 201.02 Delete:

Delete Tree wound dressing material reference.

### 201.03 General.

Delete the last sentence.

### 201.04 Clearing.

Delete the last sentence of (d).

201.01\_nat\_us\_02\_18\_2005

### 201.01 Description

Replace with the following

This work consists of clearing and grubbing within clearing limits and other designated areas.

201.04\_nat\_us\_02\_18\_2005

### 201.04 Clearing.

Add the following:

When marked in advance, remove dead trees over 6 inches in diameter measured at 12 inches above the ground that lean toward the road and are tall enough to reach the roadbed.

201.04\_nat\_us\_03\_03\_2005

### Construction Requirements

### 201.04 Clearing.

Add the following:

Utilization standards for merchantable timber are listed below. Fall and buck merchantable material into lengths not to exceed 40 feet. Pieces (logs) meet utilization standards when such pieces would have met Utilization Standards if bucking lengths were varied to include such material.

## Minimum Utilization Standards

Length	Diameter (Inside Bark) at Small End	33-1/3% Net Scale in % of Gross Scale
8 feet	9.6 inches	

201.04\_nat\_us\_02\_22\_2005

### 201.04 Clearing. (c)

Delete paragraph (c) and replace with the following:

(c) In areas outside the excavation, embankment, and slope rounding limits, cut stumps to within 12 inches or one-third of the stump diameter of the ground, whichever is higher, measured on the side adjacent to the highest ground. For timber sales, stump heights will meet the requirements of the Timber Sale contract.

### 201.04 Clearing.

Delete subsection (d) and replace with the following:

(d) Do not cut vegetation less than 3 feet tall and less than 3 inches in diameter, that is within the clearing limits but beyond the roadway and not in a decking area, and that does not interfere with sight distance along the road.

Add the following:

(e) Trim branches of remaining trees or shrubs to give a clear height of 14 feet above the roadbed unless otherwise indicated. Trim tree limbs as near flush with the trunk as practicable.

(f) Remove brush from log decks. Deck logs so that logs are piled parallel to one another; can be removed by standard log loading equipment; will not damage standing trees; will not interfere with drainage, and will not roll. Keep logs in log decks free of brush and soil.

**201.06 Disposal.**

Delete the first sentence of this subsection and substitute the following:

Merchantable timber removed from Forest Service land is subject to the Forest Resources Conservation and Shortage Relief Act of 1990 (PL 101-382; 104 Stat. 714-726; 16 USC 620 et. seq.). Do not export timber from the United States or use in direct or indirect substitution for unprocessed timber exported from the United States, from private lands by Purchaser, or any person as defined in Section 493 (16 USC 620e) of the Act.

Unless Forest Service determines that circumstances warrant a written waiver or adjustment, (1) hammer brand all products on both ends with an assigned contract brand before removal from the project site, (2) hammer brand each product exempt from domestic processing on both ends with an exempt brand registered for use on exempt logs from National Forest, and (3) paint all domestic processing products on both ends with 2 inch circle of yellow paint according to Interim Specification 2400-400 (available upon request). Paint or brand products before removing them from project site unless approved by the CO. Brands and yellow paint must remain on logs until they are processed.

Contractor may remanufacture logs into different log lengths as approved. Repaint or rebrand all remanufactured pieces. Pay all surveillance costs except that Forest Service may waive such payment if such costs are minor and part of normal remanufacturing operations.

## 203 - Removal of Structures and Obstructions

203.01\_nat\_us\_02\_25\_2005

### 203.01 Description.

Delete and replace with the following:

This work consists of disposing of construction slash and debris, salvaging, removing, and disposing of buildings, fences, structures, pavements, culverts, utilities, curbs, sidewalks, and other obstructions.

203.08\_nat\_us\_02\_24\_2005

### 203.08 Payment

Add the following:

Disposal of construction slash will be compensated under the designated pay item in Section 201.

## 230 - Roadside Brushing

230.00\_0114\_us\_08\_04\_2005

### Description

**230.01 Work.** This work consists of removing all vegetative material including limbs, residual slash, live roadside brush, and small trees within the brushing limits designated on the plans.

### Construction

**230.02 Brushing.** Cut all brush and small trees (6 inches diameter, or less, at the point of cut) inside the brushing limits and outside the roadbed no higher than 4 inches above ground level (6 inches for machine brushing). If rocks or other obstructions are encountered, cut no higher than 6 inches above the obstruction. Limb live trees with a diameter larger than 6 inches to provide a clear height of 14 feet above the road surface.

Cut all brush and trees located on the roadbed as nearly flush to the road surface as possible so stumps will not become a hazard to vehicle tires.

**230.03 Windfalls.** Limb windfalls lying within or across the brushing limits, cut off at the top of the existing cut slope or 5 feet from the shoulder on the fill slope. Dispose of windfall material as slash.

**230.04 Road Junctions.** Do not deposit brushing debris on the roadway of adjoining roads.

**230.05 Slash Treatment.** Scatter slash outside the brushing limits without damaging residual trees. Slash is defined as any material that has a length greater than 36 inches or a diameter greater than 2 inches at any point. Do not deposit material in streams, streambeds, culvert inlets or outlets, drainage ways, or cattle guards.

**230.06 Acceptance.** Roadside brushing will be evaluated under Subsection 106.02.

### Measurement

**230.07 Method.** Measure the Section 230 items listed in the bid schedule according to Subsection 109.02 and the following.

Linear measurements will be horizontal along the road centerline.

Quantities will be the number of miles (or stations) and fractions thereof along the road centerline.

## Payment

**230.08.** The accepted quantities will be paid at the contract price per unit of measurement for the section 230 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 109.05.

## 301 - Untreated Aggregate Courses

301.00\_nat\_us\_03\_03\_2005

### 301 Title Change.

Change the title to: Section 301 Aggregate Courses

301.01\_nat\_us\_03\_03\_2005

### 301.01 Work.

Add the following:

Work includes producing aggregate by pit-run, grid rolling, screening, or crushing methods, or placing Government-furnished aggregate. Work may include additive mineral filler, or binder.

301.02\_nat\_us\_05\_16\_2005

### 301.02 Material.

Add the following:

Bentonite	725.30
Calcium Chloride Flake	725.02
Lignon Sulfonate	725.20
Magnesium Chloride Brine or Calcium Chloride Liquid	725.02

301.03\_nat\_us\_09\_14\_2005

### 301.03 General.

Add the following:

Written approval of the roadbed is required before placing aggregate.

For pit run or grid-rolled material, furnish material smaller than the maximum size. No gradation other than maximum size will be required for pit-run or grid-rolled material. For grid rolling, use all suitable material that can be reduced to maximum size. After processing on the road, remove all oversize material from the road and dispose of it as directed by the CO.

Provide additives or binder, if required, at the proportions specified.

Develop and use Government furnished sources according to Section 105.

If the aggregate is produced and stockpiled before placement, handle and stockpiled according to Section 320. Establish stockpile sites at locations approved. Clear and grub stockpile sites according to Section 201.

### 301.04 Mixing and Spreading.

Delete the first sentence of the first paragraph and add the following:

Ensure that aggregate and any required additives, water, mineral filler, and binder are mixed by the specified method except, if crushed aggregate products are being produced and mineral filler, binder, or additives are required, uniformly blend following crushing. Control additive proportions to 0.5 percent dry weight.

**(a) Stationary Plant Method.** Mix the aggregate with other required materials in an approved mixer. Add water during the mixing operation in the amount necessary to provide the moisture content for compacting to the specified density. After mixing, transport the aggregate to the jobsite while it contains the proper moisture content, and place it on the roadbed or base course using an aggregate spreader.

**(b) Travel Plant Method.** After placing the aggregate for each layer with an aggregate spreader or windrow-sizing device, uniformly mix it with other required materials using a traveling mixing plant. During mixing, add water to provide the necessary moisture content for compacting.

**(c) Road Mix Method.** After placing the aggregate for each layer, mix it with other required materials at the required moisture content until the mixture is uniform throughout. Mix aggregate, water, and all other materials until a uniform distribution is obtained.

Spread the aggregate in a uniform layer, with no segregation of size, and to a loose depth that will provide the required compacted thickness.

When placing aggregate over geotextile, place aggregate in a single lift to the full depth specified.

Route and distribute hauling and leveling equipment over the width and length of each layer.

301.05\_nat\_us\_05\_17\_2005

### 301.05 Compacting

Delete and replace with the following:

Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and all places not accessible to the roller, compact the material with approved tampers or compactors.

Compact the aggregate using one of the following methods as specified:

**Compaction A.** Operating spreading and hauling equipment over the full width of the travelway.

**Compaction B.** Operate rollers and compact as specified in Subsection 204.11(a)(1).

**Compaction C.** Moisten or dry the aggregate to a uniform moisture content between 5 and 7 percent based on total dry weight of the mixture. Operate rollers and compact as specified in Subsection 204.11(a)(1).

**Compaction D.** Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

**Compaction E.** Compact to a density of at least 96 percent of the maximum density, as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

**Compaction F.** Compact to a density of at least 95 per-cent of the maximum density, as determined by AASHTO T 180, method C or D.

**Compaction G.** Compact to a density of at least 100 percent of the maximum density as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

301.06\_nat\_us\_03\_03\_2005

### **301.06 Surface Tolerance.**

Add the following:

#### Thickness and Width requirements:

The maximum variation from the compacted specified thickness is  $\frac{1}{2}$  inch. The compacted thickness is not consistently above or below the specified thickness and the average thickness of 4 random measurements for any  $\frac{1}{2}$  mile of road segment is within  $+\frac{1}{4}$  inch of the specified thickness.

The maximum variation from the specified width will not exceed +12 inches at any point. The compacted width is not consistently above the specified width and the average of any four random measurements along any  $\frac{1}{2}$  mile of road segment is within +4 inches of the specified width.

301.08\_nat\_us\_03\_30\_2005

Add the following to the 301.08(b) Plasticity Index first sentence:  
“and under 703.05(c)(1)”.

301.09\_nat\_us\_07\_07\_2005

**301.09 Measurement.**

Replace the second paragraph with the following:

Measure aggregate by cubic yard compacted in place when payment is by contract quantities.

301.10\_nat\_us\_03\_03\_2005

**301.10 Payment**

Delete the following:

adjusted according to Subsection 106.05

## 602 - Culverts and Drains

602.03\_nat\_us\_09\_06\_2005

### 602.03 General.

#### Add the following:

Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 1.0 feet, whichever is less.

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## 625 - Turf Establishment

625.03\_nat\_us\_07\_02\_2007

### 625.03 General.

Delete this subsection and replace with the following:

Apply turf establishment to prepared ground or any disturbed area between April 15<sup>th</sup> and October 15<sup>th</sup>. Apply turf establishment to the areas shown on the plans or worklists within 7 days after completion of ground disturbing activities. Unless otherwise specified in writing by the CO apply turf establishment after each 1000 foot section of road has been constructed to template lines. Seeded areas damaged by construction activities shall be reseeded within 10 days of the damage. Do not seed during windy weather or when the ground is excessively wet, frozen, or snow covered.

Assure that all seed and mulch used in the work conforms to the weed free requirements of Section 713.

### 625.04 Preparing Seedbed.

Delete entire subsection and replace with the following:

Ensure that the surface soil is in a roughened condition favorable for germination and growth.

### 625.05 Watering

Delete entire subsection.

### 625.06 Fertilizing.

Delete entire subsection and replace with the following:

Apply fertilizer having a chemical analysis as listed below by the following methods.

(a) **Dry Method.** Apply the fertilizer with approved mechanical equipment. Hand operated methods are satisfactory on areas inaccessible to mechanical equipment.

(b) **Hydraulic method.** Use hydraulic-type equipment capable of providing a uniform application using water as the carrying agent. Add fertilizer to the slurry and mix before adding seed. Add the tracer material when designated by the CO.

**Fertilizer.** Apply fertilizer at the rate of 450 pounds per acre. Insure that the fertilizer meets the following chemical analysis:

<u>Nutrient</u>	<u>Percent</u>
Nitrogen, N .....	<u>10</u>
Phosphorus, P <sub>2</sub> O <sub>5</sub> .....	<u>20</u>
Potassium, K .....	<u>20</u>

**625.07 Seeding.**

Delete the first sentence and add the following.

Apply seed mix by the following methods:

(a) **Dry method.** Delete the third sentence.

Add the following after subsection (b).

**Seed Mix.** Furnish and apply the following kinds and amounts of pure live seed from Ernst Conservation Seeds, 9006 Mercer Pike, Meadville, PA (800) 873-3221 or Fax (814) 336-5191 or [www.ernstseed.com](http://www.ernstseed.com) Native Right-of Way Woods Seed Mix with Annual Ryegrass-ERNMX-132-1:

<u>Type of Seed</u>	<u>Quantity of Pure Live Seed (Lbs/Acre)</u>
1. 30% Virginia Wild Rye	9
2. 20% Annual Rye Grass	6
3. 15% Shelter Switchgrass	4.5
4. 10% Creeping Red Fescue	3
5. 5% Autumn Bentgrass	3
6. 5% Fox Sedge	3
7. 5% Showy Tick Trefoil	3
8. 5% Nimble Will	3
9. 5% Tioga Deer Tongue	3

Total Seeding Rate 30lb per acre

Determine the pounds of seed to be furnished per acre by dividing the pounds of pure live seed required per acre by the product of the percent purity and percent germination.

**625.08 Mulching.**

Delete the entire subsection and replace with the following:

Apply Mulch within 24 hours after seeding by the following methods.

(a) **Dry Method.** Apply mulch with a hand spreader or a spreader utilizing forced air at a rate of 4000 pounds per acre. Anchor the mulch with an approved stabilizing emulsion tackifier at a rate of 0 gallons per acre. Do not mark or deface structure, pavements, utilities, or plant growth with tackifier.

(b) **Hydraulic Method.** Apply mulch in a separate application from the seed using hydraulic-type equipment according to Subsection 625.07(b).

Apply wood fiber or grass straw cellulose fiber mulch at a rate of 775 pounds per acre.

Apply bonded fiber matrix hydraulic mulch at a minimum rate of 775 pounds per acre. Apply so no hole in the matrix is greater than 0.04 inches. Apply so that no gaps exist between the matrix and the soil.

Inaccessible areas may be mulched by hand. Apply mulch uniformly over the entire disturbed area.

**625.09 Protecting and Caring for Seeded Areas**

Delete the first sentence and add the following:

Protect and care for seeded areas until final acceptance.

**625.11 Measurement.**

Delete the entire Subsection and replace with the following:

Measure the Section 625 items listed in the bid schedule according to Subsection 109.02.

## 633 - Permanent Traffic Control

633.02\_nat\_us\_03\_03\_2005

### 633.02 Material.

#### Add the following subsections

Protective Overlay Film	718.02
Edge Film	718.02

633.03\_nat\_us\_03\_03\_2005

### 633.03 General.

#### Delete the subsection and add the following:

Furnish traffic control devices and guide signs according to the MUTCD, approved USDA-FS and state supplements, the current edition of USDA-FS EM-7100-15 Sign and Poster Guidelines for the Forest Service, and Standard Highway Signs published by FHWA. Submit the sign list for approval before ordering.

633.05\_nat\_us\_03\_03\_2005

### 633.05 Panels.

#### Add the following:

Apply protective overlay film and top edge film as required and according to with manufacturer's recommendations.

Delete the sentence: "Use antitheft fasteners where possible" in the fifth paragraph and replace it with the following: "For each sign panel use at least one antitheft fastener."

## 635 - Temporary Traffic Control

635.03\_nat\_us\_05\_13\_2004

### 635.03 General.

#### Add the following:

Install temporary traffic control signs to temporary posts or approved temporary sign mounts.

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## 651 - Development of Pits & Quarries

651.00\_nat\_us\_03\_02\_2005

### Description

**651.01** This work consists of clearing, grubbing, stripping topsoil, removing overburden, constructing access roads, conducting restoration activities, and performing other incidental work required for pit or quarry development.

### Construction Requirements

**651.02 General.** Submit a plan of operations according to Section 105. Perform all work in accordance with Sections 105, 201, 203, 204, 625, and 635, landscape preservation requirements, and the approved pit and quarry development plan of operations. Perform the work in accordance with MSHA 30 CFR, part 56.

**651.03 Acceptance.** Developing pits and quarries will be evaluated under Subsections 106.02 and 106.04.

### Measurement

**651.04** Measure the Section 651 items listed in the bid schedule according to Subsection 109.02.

### Payment

**651.05** The accepted quantities will be paid at the contract price per unit of measurement for the Section 651 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

## SPS 703 AGGREGATE

Add the following: **703.20 Driving Surface Aggregate**. All Driving Surface Aggregate (DSA) is to be derived from natural limestone formations. Stone is defined as rock that has been crushed; rock is defined as consolidated mineral material. For use in this program, both are restricted to that which has been mined or quarried from existing bedrock formations.

All components of the aggregate mix are to be derived from crushed parent rock material that meets program specifications for abrasion resistance, pH and freedom from contaminants. Ninety-eight percent (98%) of the fines passing the #200 sieve must be parent rock material. No clay or silt soil may be added. The amount of particles passing the #200 sieve shall be determined using the washing procedures specified in PTM No. 100.

Size: The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%
1 ½ inch	100%	
¾ inch	65%	90%
#4	30%	65%
#16	15%	30%
#200	10%	20%

LA Abrasion: The acceptable limit is measured by weight loss is "less than 40% loss". Los Angeles Abrasion test, AASHTO T-96 (ASTM C 131) shall be used to determine this property. Existing tests made for and approved by PennDOT will be accepted.

Sulfate Test: Soundness or resistance to freeze/thaw (i.e. sulfate test) is not specified for this application because a gravel road driving surface aggregate is not bound within a concrete or asphalt mix.

pH: Aggregate must be within the range of pH 6 to pH 9 as measured by EPA 9045C.

Optimum Moisture: Material is to be delivered and placed at optimum moisture content as determined for the particular source. The optimum percentage moisture is to be identified by the supplier in the bid purchasing documents. Loads with excessive moisture shall be rejected. Water draining from the tailgate, excess material sticking to the roller drum or the inability to compact the material are field indicators of excess moisture. In addition, if a load is too dry or does not have enough fines it will be rejected. Visual inspection of the load and poorly consolidated material after compactive effort are field indicators of low moisture or poor product gradation.

Transport: Tarps are to be used to cover 100% of the load's exposed surface from the time of loading until immediately before dumping. This requirement includes standing time waiting to dump.

Aggregate producers are required by the program to certify that the aggregate they deliver conforms to the program specifications. To eliminate segregation of material, stockpiling of material at jobsite will not be permitted unless authorized by COR.

The following are "Local" sources for this material:

Hawbaker - Turtlepoint, PA. 814-237-1444 or 814-642-2500

New Enterprise Stone & Lime Co. Tyrone, PA 814-695-4405

Road Preparation Specifications: The road surface to receive the aggregate should have template with crown of 2% or  $\frac{1}{4}$  inch per foot. The receiving surface is to be scarified to permit knitting of the aggregate.

Driving Surface Aggregate Placement: Minimum compacted depth of four inches is to be established for driving surface. Driving Surface Aggregate is to be applied by tailgate spreading full depth in small quantities and with a spreader box in quantities over 5000 tons. Material when placed shall be compacted as follows: Beginning on the lower or berm side of the crown, begin rolling and work your way to the top of the crown by overlapping the successive longitudinal passes. Do not run the roller lengthwise directly on the crown. Compaction with truck tires is not accepted. Steel wheel rollers other than vibratory shall be capable of exerting a force of not less than 250 pounds per inch of width of the compression roller or rollers. Rollers shall be self propelled with a minimum weight of 6 tons. Contractor must have certification in writing that material placed is Driving Surface Aggregate meeting this specification.

1" Minus Aggregate (DSA Gravel non limestone) Size: The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%	
1 $\frac{1}{2}$ inch	100%		
$\frac{3}{4}$ inch	65%	95%	
#4	30%	65%	LA Abrasion < 40%
#16	15%	30%	Sulfate Test - Not Applicable
#200	10%	15%	PH between 6 and 9

Material available at Glenn O. Hawbacker - Pittsfield Pit 814-563-7911.

**Pennsylvania 2A Gradation:**

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%	
2 inch	100%		
$\frac{3}{4}$ inch	52%	100%	
#4	24%	50%	LA Abrasion < 40%
#16	10%	30%	Sulfate Test - Not Applicable
#200	0%	10%	PH between 6 and 9

## SPS 705 - Rock

Replace 705.02 with the following:

705.02 **Riprap Rock.** Furnish rock sound, free from structural defects and foreign substances such as soil, shale, and organic materials. Use rock conforming to the following requirements:

No shale seams

Hard and angular shaped rock with neither width nor thickness less than one-third its length.

Minimum specific gravity of 2.5 as determined according to AASHTO T 85, bulk saturated, but surface-dry basis.

Each load of rock well-graded, from smallest to the largest size

Class, Size No.	Percent Passing (Square Openings)				
	R-7	R-6	R-5	R-4	R-3
Rock Size (inches)					
30	100				
24		100			
18	15-50		100		
12	0-15	15-50		100	
9			15-50		
6		0-15		15-50	100
4			0-15		
3				0-15	15-50
2					0-15
Nominal					
Thickness	36	30	24	18	12