

Schedule of Items

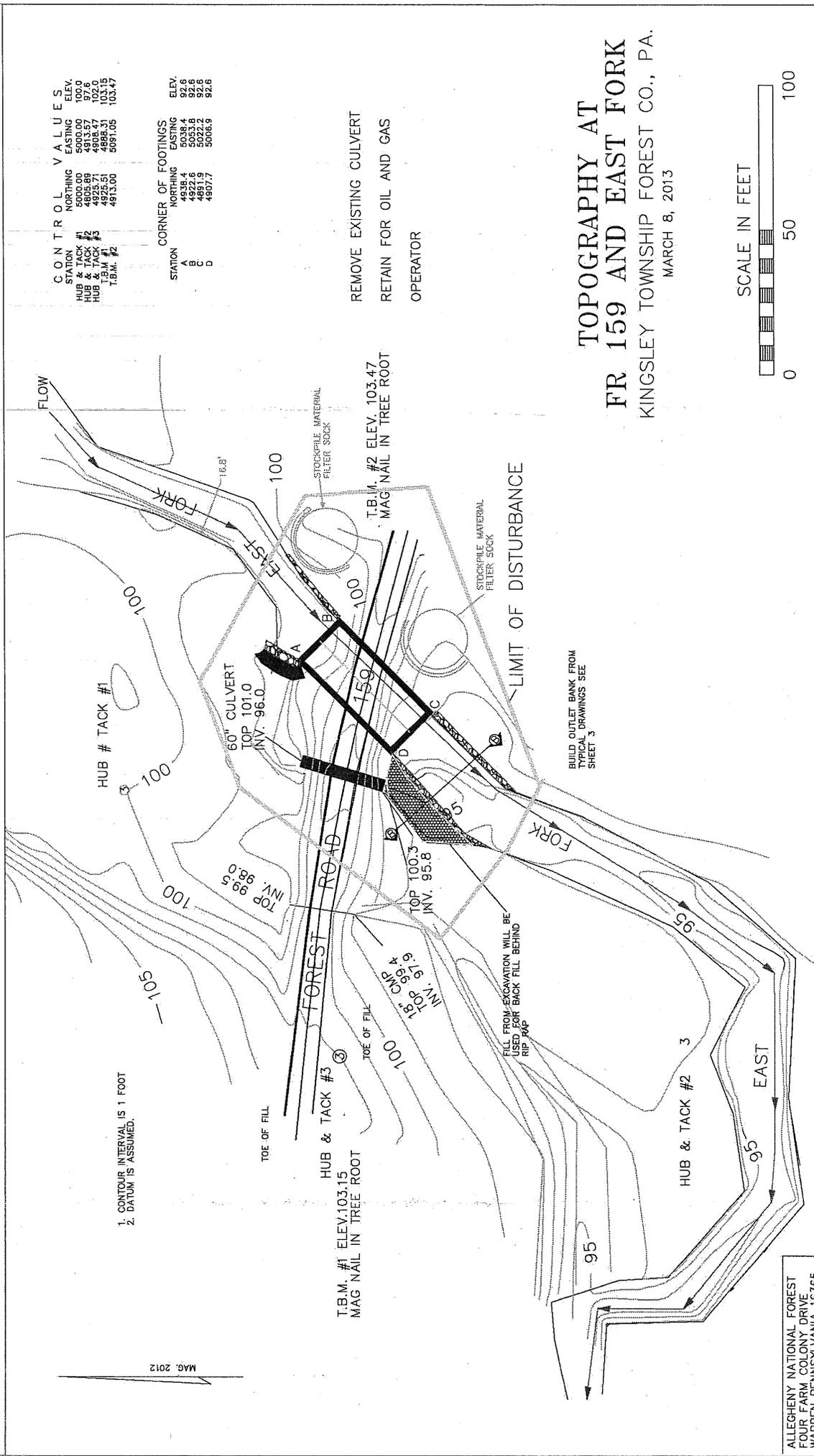
Pay items	Description	Method of Measure	Pay Unit	Estimated Quantity
15101	Mobilization(Lump Sum)	LSQ	ALL	1
15713	Soil Erosion & Pollution Control	LSQ	ALL	1
20102	Clearing and Grubbing (Lump Sum)	LSQ	ALL	1
20301	Removal Of Culvert	CQ	EACH	2
20957	Structural Excavation, Type unclassified Lump Sum	LSQ	ALL	1
25102	Placed riprap, NSA Size #R-5	VQ	TON	105
30101	Aggregate base, grading AASHTO #57, Compaction (footer bedding material)	VQ	TON	14
30103	Aggregate base, grading PA- 2A, compaction method A	VQ	TON	483
30115	Aggregate surface course, Type DSA limestone, compaction method B	VQ	TON	69
30318	Road reconditioning, roadbed, compaction method B	CQ	MILE	0.1
55201	Structural Concrete, Class A	CQ	C.Y.	40
60263	24 inch aluminized type 2, corrugated steel pipe, 0.064 inch thickness, method A	CQ	L.F.	36
60305	18'-9" span, 4' -11" rise, structural plate box	CQ	Foot	42
62503	Seeding, hydraulic or dry method (lump sum)	LSQ	ALL	1
63306	Object Markers , Type 3	CQ	EACH	8
63501	Temporary Traffic Control	CQ	EACH	1
64805	Stream simulation AASHTO #57,mixed on site	VQ	TON	30
64805	Stream simulation, riprap NSA R-3,mixed on site	VQ	TON	30

Work Descriptions

FR 159 Pierson Hill (Level D)

Milepost/Station	Road Log/Work Description
0+00	End of Kingsley Township road 342, Balltown road crossing
0+50	Road number sign right
0+55	Snowmobile trail #1 sign right
0+75	16" x 24' steel pipe casing on left forward skew
1+50	Snowmobile trail sign right
2+50	18" x 28' CMP
3+45	18" x 24' CMP (2025)
7+35	18" x 24' CMP
9+25	18" x 28' CMP
10+75	18" x 22' CMP (2025)
12+85	18" x 22' CMP (2025)
14+50	18" x 28' CMP
15+45	18" x 22' CMP (2025)
16+00	Snowmobile trail sign right
16+00-17+50	Turnout right
16+60	FR 159 bends sharply to left
17+55	18" x 22' CMP (2025)
17+65	Forest Service turnbuckle style gate
19+37	18" x 22' CMP
24+81	18" x 22' CMP
26+50-32+33	Recondition roadbed to TYPICAL RECONDITION SECTION
26+50	Start road reconditioning
27+03	Remove existing 18" x 22' CMP, install 24" x 36' CMP
29+80-31+60	Apply 6" of DSA limestone surfacing
30+33	REMOVE 60" X 28' OWNERSHIP RETAINED OGM OPERATOR
30+69	Install 18'9" x 4'11" x 42' structural plate box skew on concrete footing (See Drawings)
30+78	18" x 22' CMP
32+33	End of reconditioning

Culvert Installation Drawings



CONTROL VALUES

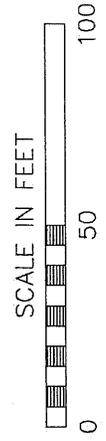
STATION	NORTHING	EASTING	ELEV.
HUB & TACK #1	5000.00	5000.00	100.0
HUB & TACK #2	4925.71	4908.57	102.0
HUB & TACK #3	4925.51	4888.31	103.15
T.B.M. #1	4973.00	5091.05	103.47

CORNER OF FOOTINGS

STATION	NORTHING	EASTING	ELEV.
A	4938.4	5038.4	92.6
B	4937.8	5032.2	92.6
D	4907.7	5006.9	92.6

REMOVE EXISTING CULVERT
 RETAIN FOR OIL AND GAS
 OPERATOR

TOPOGRAPHY AT FR 159 AND EAST FORK KINGSLEY TOWNSHIP FOREST CO., PA. MARCH 8, 2013



PROJECT
 FR 159 East Fork Culvert

SHT. NAME
 FR 159 - East Fork Culvert
 STA.
 PLAN VIEW
 NOT TO SCALE

SHT. NO.
 1/5

1. CONTOUR INTERVAL IS 1 FOOT
2. DATUM IS ASSUMED.

MAG. 2012

T.B.M. #1 ELEV. 103.15
 MAG NAIL IN TREE ROOT

T.B.M. #2 ELEV. 103.47
 MAG NAIL IN TREE ROOT

FILL FROM EXCAVATION WILL BE
 USED FOR BACK FILL BEHIND
 RIP RAP

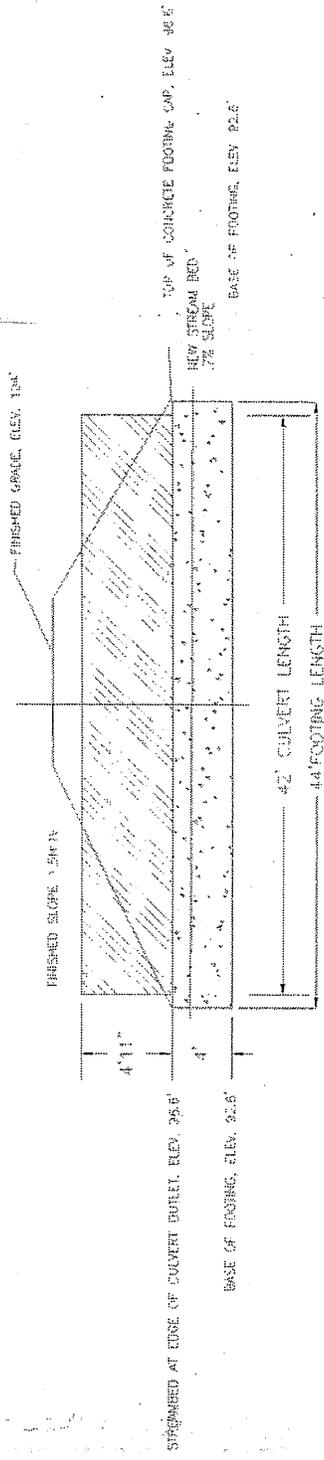
BUILD OUTLET BANK FROM
 TYPICAL DRAWINGS SEE
 SHEET 3

DRAWN BY: D. Embry
 CHECKED: G. Porter

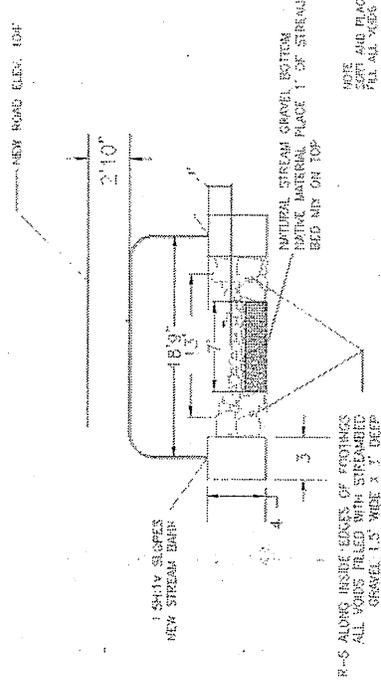
DATE: 3/8/2013
 PROJ. NO.

FILE PATH: K:/ops/drawings

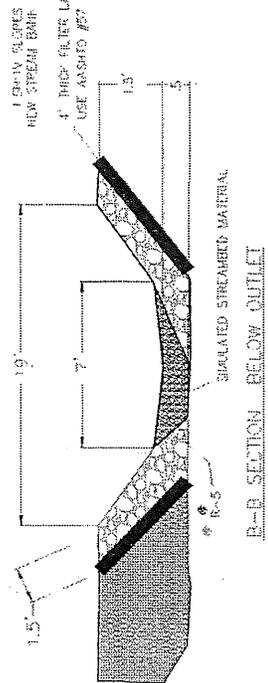




SECTION ALONG STREAM



SECTION AT OUTLET
LOOKING UPSTREAM



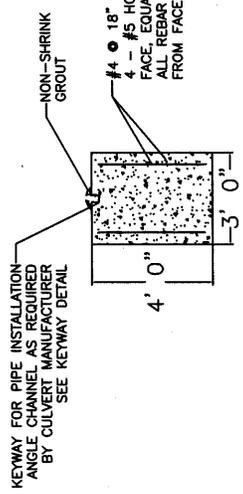
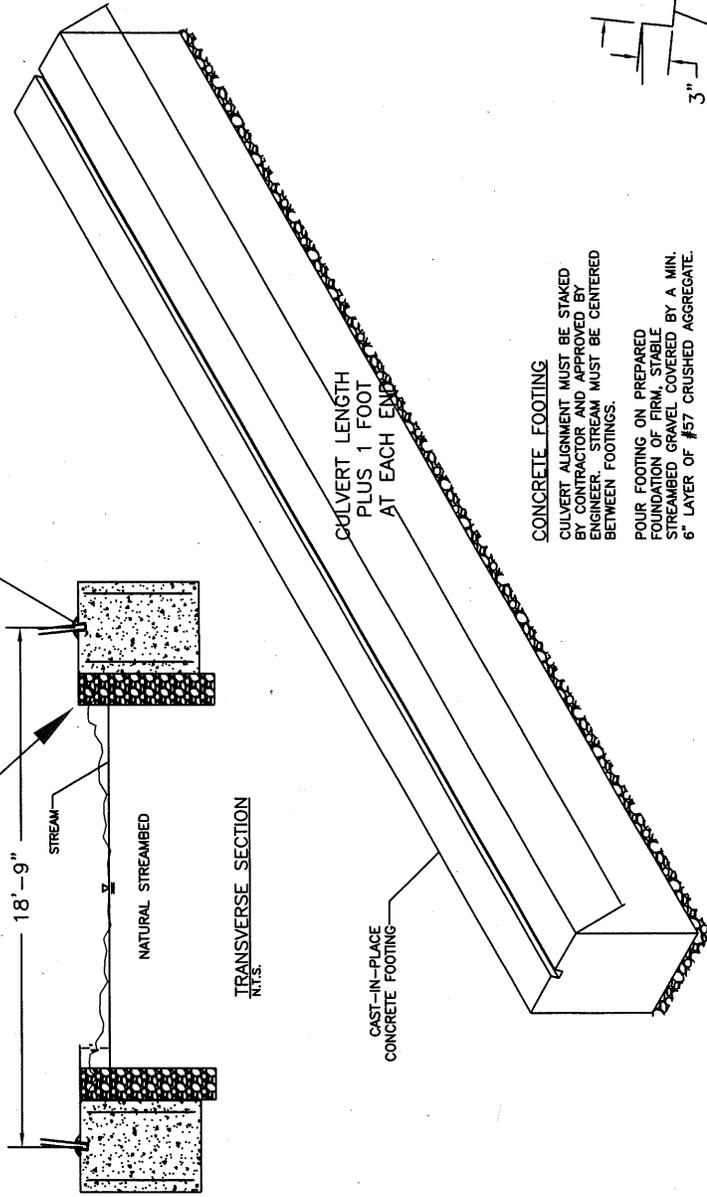
R-B SECTION BELOW OUTLET

NOTE: SOFT AND PLACE BARR (R-5) ALONG BARR JOINTS AS SHOWN IN OUTLET SECTION. FILL ALL JOINTS WITH STREAM BED GRAVEL.

	DRAWN BY: D. Erdly DATE: 3/8/2013 FILE DATA: 13/0328/0328	CHECKED: C. Pugh PAPER NO.	PROJECT: FR 159 - East Fork Culvert	SHEET NO.: 3/5
	REVISIONS:	PROJECT: FR 159 - East Fork Culvert	SHEET NAME: FR 159 - East Fork Culvert STA. SECTIONS NOT TO SCALE	

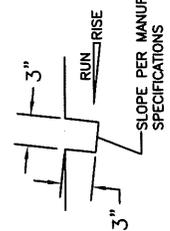
NOTES
 ALL CONCRETE SHALL BE CLASS A AIR ENTRAINED.
 DO NOT DROP UNCONFINED CONCRETE A DISTANCE OF MORE THAN 5 FEET.
 PLACE CONCRETE AS NEAR AS POSSIBLE TO ITS FINAL POSITION.
 ALL DETAILS SUBJECT TO CHANGE PER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS AND FOREST SERVICE APPROVAL.

R-5 RIPRAP, 18" WIDE ALONG INSIDE FACE OF FOOTING FULL DEPTH VOIDS FILLED WITH STREAMBED GRAVEL.
 18'-9"
 STREAM
 NATURAL STREAMBED
 TRANSVERSE SECTION
 N.T.S.



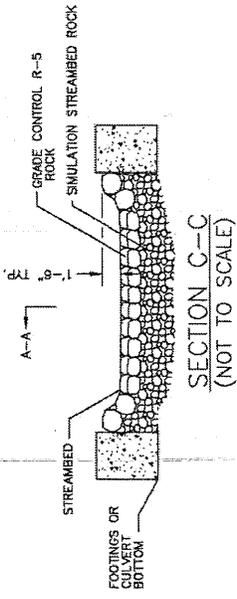
SECTION THROUGH FOOTING
 N.T.S.

CONCRETE FOOTING
 CULVERT ALIGNMENT MUST BE STAKED BY CONTRACTOR AND APPROVED BY ENGINEER. STREAM MUST BE CENTERED BETWEEN FOOTINGS.
 POUR FOOTING ON PREPARED FOUNDATION OF FIRM, STABLE STREAMBED GRAVEL COVERED BY A MIN. 6" LAYER OF #57 CRUSHED AGGREGATE.
 FOUNDATION MATERIAL MUST BE APPROVED BY ENGINEER BEFORE PROCEEDING. UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED BY SUITABLE COMPACTED GRAVEL PER ENGINEER'S DIRECTION.



KEYWAY DETAIL
 N.T.S.

	DRAWN BY: D. Embry DATE: 3/8/2013 FILE PATH: K:\ops/drawings	CHECKED: G. Porter PROJ. NO.	PROJECT FR 159 EAST FORK Culvert	SHT. NAME FR 159 - EAST FORK Culvert STA. PLAN VIEW NOT TO SCALE	SHT. NO. 4/5
	REVISIONS				



NOTE:
 SORT AND PLACE BOULERS (R-5) ALONG BANK LINES AS SHOWN SECTION B-B.
 FILL ALL Voids WITH STREAM SIMULATION ROCK
 CONSTRUCT GRADE CONTROLS IN A GENTLE CURVE ORIENTED CONVEX UPSTREAM SECTION C-C.
 TYPICAL, PLACE BOULERS IN A CONTINUOUS ROW ACROSS THE ENTIRE WIDTH.

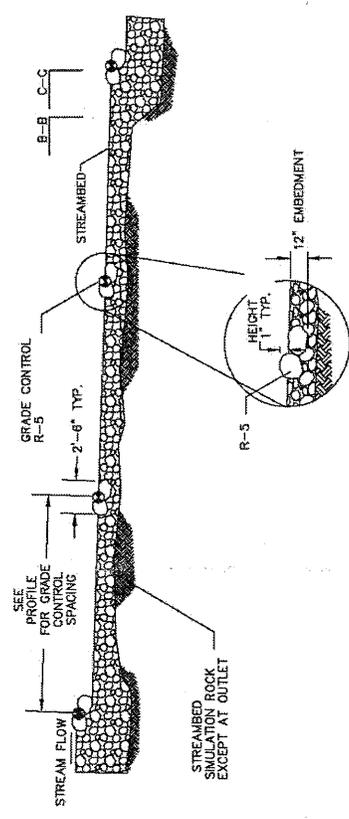
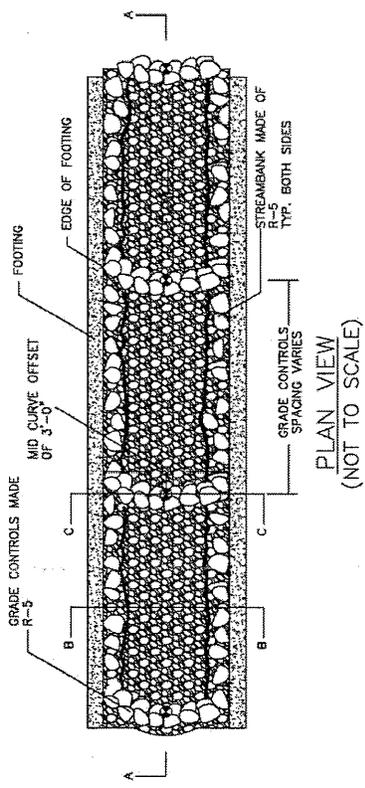
Streambed Mix

PROPORTIONS	SIZE
30 TONS	R-3
30 TONS	AASHTO #57

STREAMBED SIMULATION ROCK

* USE THIS MATERIAL TO MIX WITH R-5 ROCK IN CHANNEL BED FROM BEGINNING TO END.

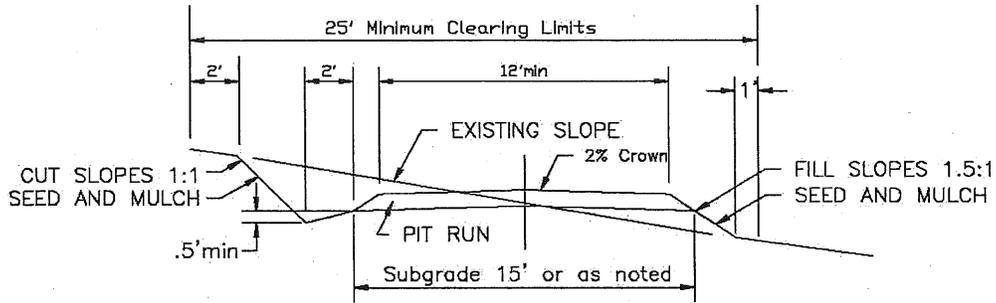
SCATTER 3 TONS OF R5 FROM BEGINNING OF CULVERT TO END OF CULVERT BURIED TO STREAM BED ELEVATION



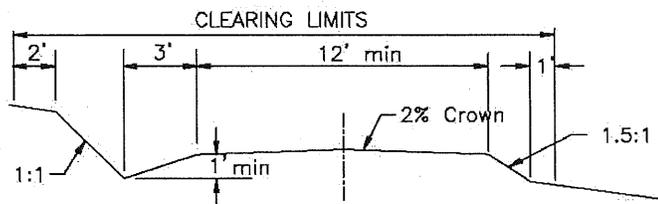
SECTION A-A
 (PROFILE VIEW AT STREAM CENTERLINE)
 (NOT TO SCALE)

	DRAWN BY: D. Embry DATE: 3/8/2013 FILE PATH: K:/ops/drawings	CHECKED: G. PORTER PROJ. NO.	REVISIONS	PROJECT FR 159 -- East Fork Culvert	SHT. NAME CHANNEL TYPICAL DETAIL

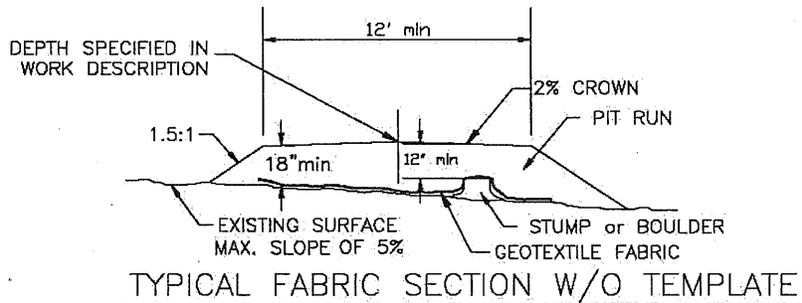
Roadbed Details



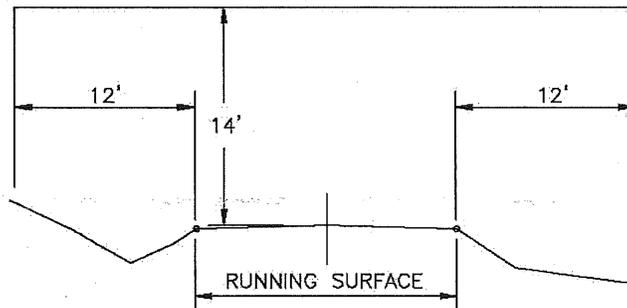
TYPICAL CONSTRUCTION SECTION



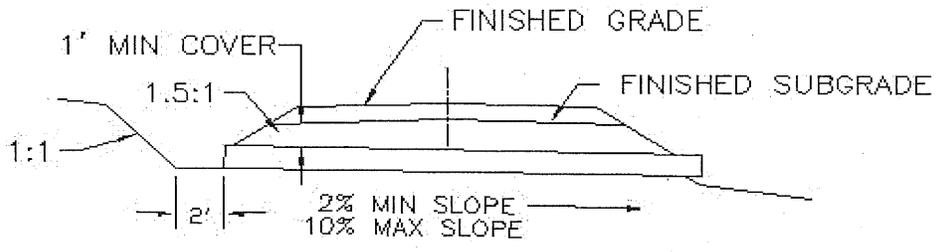
TYPICAL RECONDITION SECTION



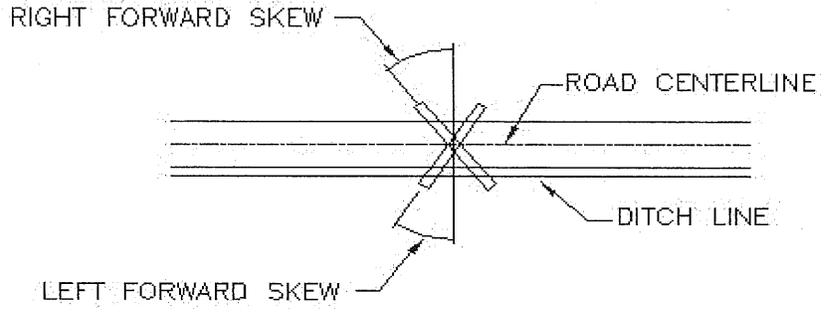
TYPICAL FABRIC SECTION W/O TEMPLATE



ROADSIDE BRUSHING DETAIL

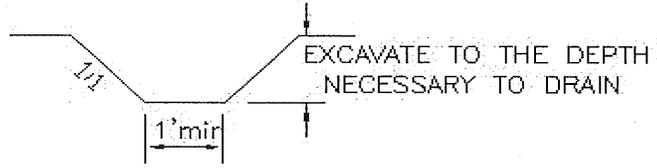


CULVERT SECTION

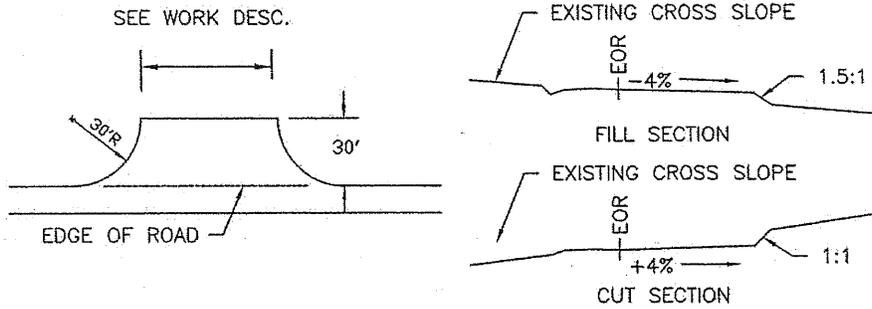


SKEW DETAIL

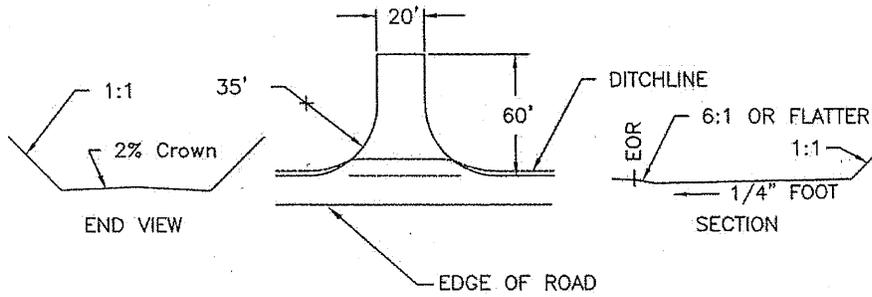
NOTE: Field locate ditch to minimize new clearing



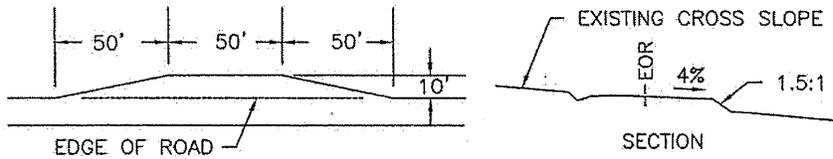
OUTLET/LEAD OFF DITCH SECTION



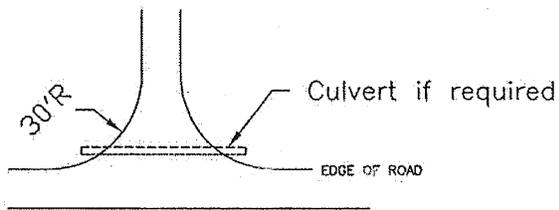
PARKING LOT DETAIL



TURNAROUND DETAIL



TURNOUT DETAIL



INTERSECTION DETAIL

GENERAL NOTES

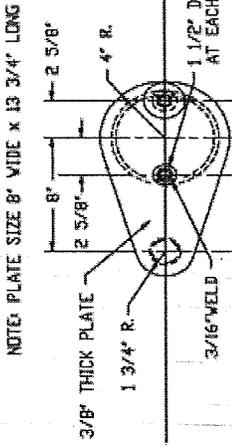
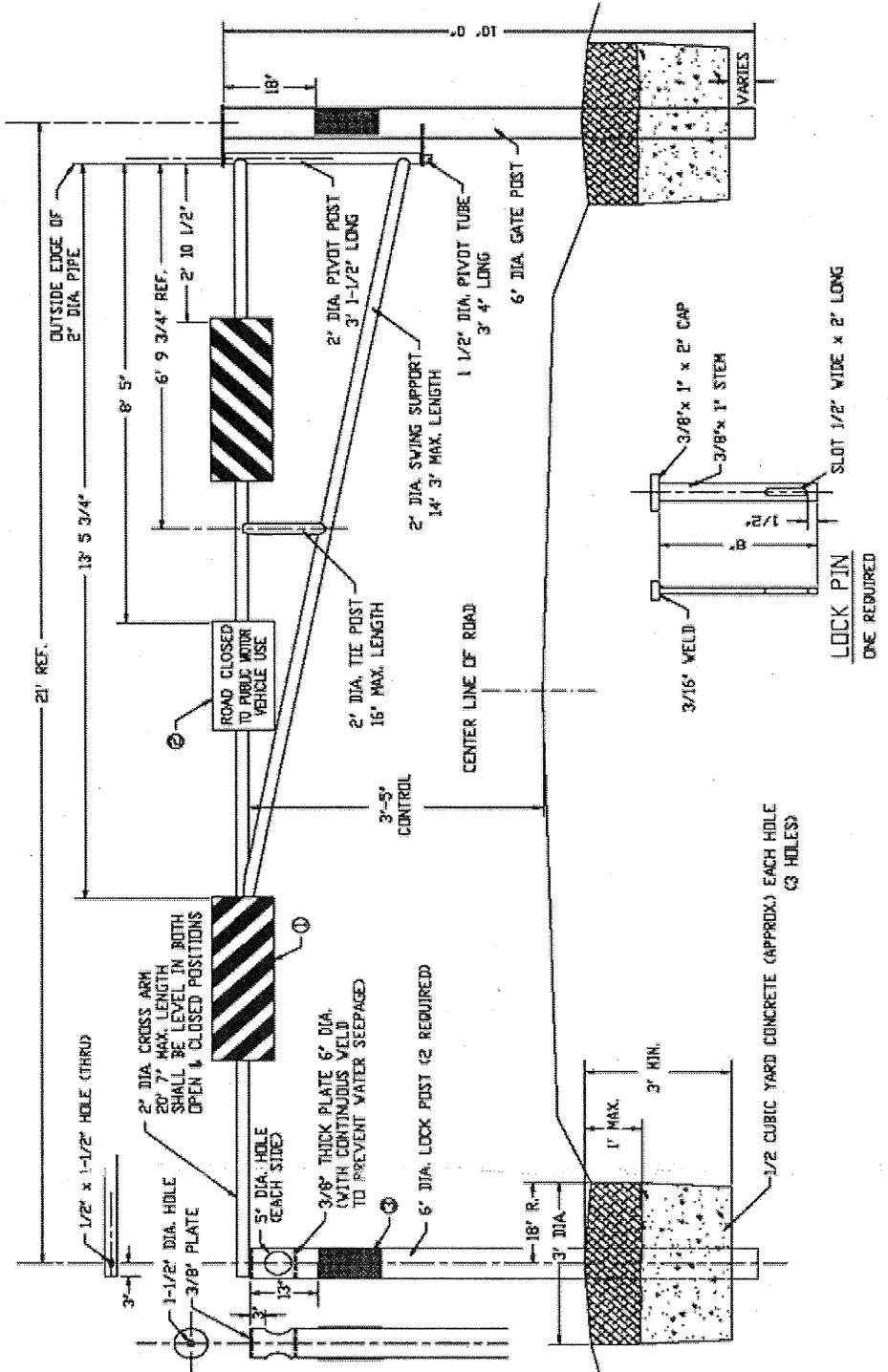
- ALL STEEL SHALL BE PAINTED WITH (2) COATS OF IRON OXIDE RED PRIMER AND (3) COAT OF WALNUT BROWN PAINT, FED. STANDARD 595 A PAINT NO. 20140 (EXCEPT PIVOT TUBE)
- ALL STEEL SHALL BE NEW MATERIAL
- WELD ALL CROSS ARM ASSEMBLY JOINTS WITH 3/16" FILLETS ALL AROUND
- ALL WELDS ON GATE ASSEMBLY SHALL BE STRUCTURALLY SOUND
- DRILL 1/4" DIAMETER HOLES 4" ON CENTER IN BOTTOM OF CROSS ARM TO FACILITATE DRAINAGE.
- APPLY GREASE TO OUTSIDE OF PIVOT TUBE, ENTIRE LENGTH, PRIOR TO INSTALLATION OF CROSS ARM ASSEMBLY. TYPE OF GREASE SHALL BE EXTREME PRESSURE MULTIPURPOSE WHEEL BEARING GREASE OR EQUAL
- POSTS SHALL BE ENCASED WITH CONCRETE TO WITHIN 1 FT. OF GROUND LEVEL AND BACKFILL COMPACTED (3 POSTS)
- PRIOR TO GATE INSTALLATION, NOTIFY FOREST SERVICE FOR LOCATION ON ROAD
- PARTS MAY BE FLAME CUT AND ALL BURRS REMOVED
- INSTALL SIGNS AFTER INSTALLATION OF GATE
- TECHNICAL CONTACT IS JOH DUCKETT, FOREST SERVICE, WARREN, PA. (814) 726-6257

SIGN CODE

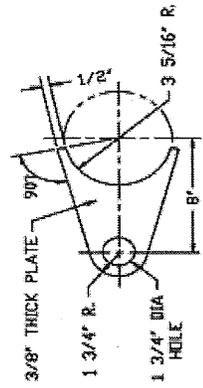
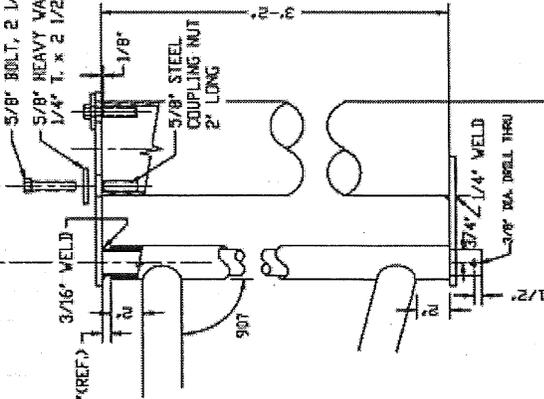
- (1) L-R AND (2) R-R TYPE 1 BARRICADE MARKERS - RED ON WHITE - 12" x 36"
 - (3) ROAD CLOSED TO PUBLIC MOTOR VEHICLE USE - YELLOW (REFLECTORIZED) - 6' x 12"
 - (4) ON GATE POST AND (5) ON CLOSED POSITION LOCK POST
 - (6) ON OPEN POSITION LOCK POST FACED TO ONCOMING TRAFFIC
- NOTE: ALL SIGNS SHALL BE FURNISHED BY THE FOREST SERVICE AND INSTALLED BY THE CONTRACTOR.

ESTIMATED QUANTITIES

MATERIAL	QUANTITY (LF)	REMARKS
1-1/2" DIA PIPE (NOM)	3' 4"	PIVOT TUBE
2" DIA PIPE (NOM)	39' 4"	CROSS ARM ASSEMBLY
6" DIA PIPE (NOM)	30' 0"	GATE POSTS (3)
3/8" x 1" STRAP	0' 10"	LOCK PIN
3/8" x 8" PLATE	4' 1"	MISC.
BOLTS, NUTS, WASHERS		TWO (2) OF EACH



DETAIL



LEVEL 'D' FOREST SERVICE GATE	
ALLEGHENY NATIONAL FOREST WARREN, PA	
DES. RICHARD S. LONGSHOR, R0410-9/21/99	
DWG. S. JOHNSON & R0410-10/99	
NOT TO SCALE	

Schedule of Items

FR159

Pay items	Description	Method of Measure	Pay Unit	Estimated Quantity	Engineer's Estimated unit Price	Engineer's Extend Total
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15713	Soil Erosion & Pollution Control	LSQ	ALL	1		
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63501	Temporary Traffic Control	CQ	EACH	1		
64805	Stream simulation AASHTO #57,mixed on site	VQ	TON	30		
64805	Stream simulation NSA R-3,mixed on site	VQ	TON	30		
TOTAL						

**EROSION & SEDIMENTATION CONTROL PLAN
FOR
FR 159 Culvert Replacement Project
KINGSLEY TOWNSHIP, FOREST COUNTY, PENNSYLVANIA**

March 2013

Prepared by:

**U.S.D.A. Forest Service Allegheny National Forest
4 Farm Colony Drive
Warren, PA 16365
814-728-6169**

GENERAL PLAN DESCRIPTION:

The USDA Forest Service, Allegheny National Forest plans to replace a 5' x 30' corrugated metal pipe (CMP). The existing culvert is located along FR 159, a snowmobile trail on Forest Service property. It conveys water from East Fork, a tributary to Fork Run in Forest County. The existing culvert is undersized and in need of replacement. The new crossing will be an 18' 9" span, 4' 11" rise, 42' long bottomless galvanized steel structural plate box culvert with concrete footers that will allow for the passage of high flows and aquatic organisms.

DIRECTIONS TO THE SITE:

Refer to the enclosed portion of the Kelletville USGS quadrangle map for the project location. To access this site from SR 62, take SR-666 east for 9.7 miles. Take a sharp left on Pierson Hill Road and travel 2.8 miles. The road becomes FR 159. Go straight through main intersection and drive 0.3 miles. Turn left on FR 159. Drive 0.2 miles. Park at the culvert.

PROJECT DESCRIPTION:

East Fork is currently constricted to a 5' x 30' corrugated metal pipe (CMP) at the FR 159 crossing. The aggradation above the culvert and scour below the culvert was caused by the existing undersized culvert. A new alignment is needed for the new culvert because of the upstream migration of the channel. The new crossing will be an 18' 9" span, 4' 11" rise, 42' long bottomless galvanized steel structural plate box culvert with concrete footers. The stream bankfull width ranges from 16 to 19 feet. The waterway opening will be increased from 19.6 square feet to 83 square feet. This pipe installation is designed to allow the

passage of 100 year flood flows with minimal constriction. The Head Water to Depth ratio is 0.7 for a 100 year flow. 100 year flows were calculated using USGS StreamStats. The contributing watershed area is 1414 acres, and 100 year flood flow is 583 cfs. The new culvert alignment will increase the slope in this section of stream from 0.5% slope to 0.7% slope. This stream has good armoring in the channel bed material and is expected to have only minor adjustments from this change in slope. The stream bottom will be constructed using R-5 riprap rock for the channel banks, and a mixture of R-3 and AASHTO #57 for the stream bottom material. This size rock has been designed to mimic natural stream conditions. 3 cross-channel ribs will be built inside the culvert to provide cross channel structure to the stream bed.

A new channel will be constructed for 46' downstream of the new culvert alignment. Fill from the new crossing will be placed in the old channel to fill in some of the large scour pool. This material will be built up no higher than the surrounding floodplain height. This fill material will be covered with 4" of AASHTO # 57 to provide a filter layer. Then this layer will be covered with R-5 Riprap to build the channel banks. The stream bed mixture of R3 and AASHTO #57 will be placed in the channel bottom and to fill in the voids of the R-5. Channel bank slopes will be 1.5 to 1.

The limits of earth disturbance are shown on the plan map. Stream and floodway impacts will be limited to a 120' x 39' area, or 0.1 acres. All construction activities must be performed within the designated disturbance limits. Excess fill material will be removed from the floodway and stockpiled, seeded, and mulched. The proposed crossing will be backfilled with roadway sides sloped at (2:1), seeded, and mulched. The project is expected to be completed within two weeks of beginning construction. Construction is anticipated to be completed during low flows in June through September.

RECEIVING STREAM CLASSIFICATION:

The existing culvert is located on East Fork. The Chapter 93 classification is High Quality-CWF. This stream is a Wild Trout Stream. In-stream work will not be completed between October 1 and December 31.

SOILS TYPES:

The material properties of the native soils have no impact on this project because the proposed excavation will take place in the Forest Service roadway consisting of approximately 1.5 feet of non-native compacted fill material. Disturbance off of the roadway will be minimized as much as possible

The native soil type encountered onsite has been identified using the Soil Map online access information presented by Penn State Cooperative Extension Geospatial Technology Program. The following soils have been identified.

Soil Map Unit- BkB:

Brinkerton silt loam, 0 to 8 percent slopes

- Potential Erosion Hazard: Moderate due to Slope/erodibility

Bedrock Depth- Very deep

CONSTRUCTION SEQUENCE:

1. Stage necessary equipment and materials to begin work.
2. Install filter sock as necessary to prevent sediment from entering the stream.
3. If possible, maintain stream flow through the existing culvert using a temporary diversion dam during stream channel construction. Various methods (e.g. pipe flume, coffer dam) will be used by the contractor to divert the stream around the disturbed areas during construction of the footers and culvert. The project will be scheduled during low flows and instream work will be completed as quickly as possible. Suitable excavated material will be stockpiled and protected from rain away from the stream. Filter sock will be placed around stockpile. All unsuitable material will be hauled off-site.
4. Construct footers in accordance with Contract Drawings, backfill sump hole and place riprap along inside edge of footing. All voids in riprap should be filled with streambed gravel.
5. Construct cross-channel ribs using R-5. Scatter 5 tons of R-5 throughout channel inside culvert so that rock will be near stream bed elevation. Place 40 tons of streambed mixture (R-3 and AASHTO # 57) into channel between footers to rebuild natural stream channel.
6. Assemble the structural plate low profile box culvert following manufacturer's specifications. Backfill and compact fill material around the pipe. Place riprap as indicated on the contract drawings.
7. Remove existing pipe and channel water as necessary to confine water to stream center line. Implement stream diversion BMPs (e.g. pump-around, coffer dam) to construct downstream channel. Place fill in old channel below culvert to construct new channel bank. Place a filter layer 4" thick of AASHTO # 57 on both banks of the new channel. Place 1.5' of R5 on top of AASHTO #57. Place 24 tons of stream bed mixture in the center of downstream channel. Use the same method and materials to block off the old upstream channel to the height of the floodplain.
8. Retain removed pipe for OGM operator off-site.

9. Permanently seed and mulch all disturbed areas outside of the roadway.
10. All erosion and sediment control practices will be inspected at least every 7 days and after rainfall events. Needed repairs will be made immediately.
11. Permanently seed and mulch all disturbed areas outside of the roadway.

NOTE: Site stabilization is achieved when a minimum of 70% perennial vegetated cover is established on all disturbed areas.

12. After site stabilization is achieved, contractor is to remove temporary erosion control measures (e.g. Filter sock).

Temporary Planned Erosion and Sedimentation Control Practices

(Note: Best Management Practices and drawing details are from the Department of Environmental Protection's Erosion and Sediment Pollution Control Manual)

1. Pumped Water Filter Bags

Sump holes will be constructed on the downstream end of each footer excavation in order to drain any water from the area. The water shall be pumped to a filter bag located in a well vegetated area on the edge of the road. This shall be done prior to placement of the gravel bedding and concrete.

2. Compost Filter Socks– used to control sheet flow runoff from disturbed areas or material stockpiles.

3. Pipe Flume

A natural barrier will be created upstream of the pipe inlet to serve as a temporary dam and will be maintained across the stream channel. Downstream of the pipe is manmade weir. A flexible pipe will be installed through the upstream dam to funnel the stream away from the construction past the downstream weir. The pipe flume is intended to keep the construction in the stream channel dry and away from the excavation and construction of the footers. It will isolate the water to the pipe and place it back into the stream channel outside construction limits. This will help to mitigate sedimentation from the construction of the new culvert pipe into the stream.

4. Seed & Mulch

All disturbed areas shall be seeded and mulched 5 days after the completion of ground disturbing activities. Seeding and mulching shall be done in accordance with Contract Specifications Section 625 and Supplemental Specifications 625 Turf Establishment (see Appendix C)

Permanent Planned Erosion and Sedimentation Control Practices

The new culvert installation and riprap placement has been designed to help minimize erosion in the stream channel. The following erosion control measures are permanent controls:

1. Vegetative cover
2. Riprap placement at the toe of the stream banks and around the culvert.

Soil Preparation in areas of compacted soils and/or addition of rock/surfacing material: Loosen soil to a depth of one inch or depth sufficient to allow soil to seed contact. If rock material is placed for stabilization, it must be scraped-off/removed from planting areas to allow sufficient amount of soil to be exposed/manipulated for planting.

Recommended Seed Mixes and Rates of Application:

ERNMX-181 Native Steep Slope Mix with Annual Ryegrass Seeding Rate 30 lb per acre or 1 lb per 1,000 sq ft. <http://www.ernstseed.com/seed-mix/?category-id=60>

- 24% Little Bluestem, FIG PA Ecotype (Schizachyrium scoparium, FIG PA Ecotype)
- 20% Annual Ryegrass (Lolium multiflorum (L. perenne var. italicum))
- 12% Canada Wild Rye (Elymus canadensis)
- 11% Indiangrass, 'Prairie View', IN Ecotype (Sorghastrum nutans, 'Prairie View', IN Ecotype)
- 8% Virginia Wild Rye, PA Ecotype (Elymus virginicus, PA Ecotype)
- 4% Switchgrass, 'Cave-In-Rock' (Panicum virgatum, 'Cave-In-Rock')
- 3% Autumn Bentgrass, APB (Agrostis perennans, APB)
- 3% Ticklegrass (Rough Bentgrass), PA Ecotype (Agrostis scabra, PA Ecotype)
- 3% Purple Top (Tridens flavus)
- 2% Partridge Pea, PA Ecotype (Chamaecrista fasciculata (Cassia f.), PA Ecotype)
- 2% Wild Bergamot (Monarda fistulosa)
- 2% Tall White Beard Tongue, PA Ecotype (Penstemon digitalis, PA Ecotype)
- 2% Black Eyed Susan, CP NC Ecotype (Rudbeckia hirta, CP NC Ecotype)
- 2% Lance Leaved Coreopsis, CP NC Ecotype (Coreopsis lanceolata, CP NC Ecotype)
- 1% Marsh (Dense) Blazing Star (Spiked Gayfeather) (Liatris spicata)
- 1% Purple Coneflower (Echinacea purpurea)

Total: 100%

Mulching

- One ton per acre of straw or hydroseed.
- No fertilizer or lime is to be applied.

Site stabilization is achieved when a minimum of 70% perennial vegetated cover is established on all disturbed areas.

MAINTENANCE OF EROSION CONTROL FACILITIES:

Inspections should be conducted weekly and/or after each significant storm event. All necessary cleaning, repair, and/or maintenance should be made immediately to maintain all erosion control measures.

The following maintenances must be performed until stabilization is achieved onsite.

1. **Compost Filter Socks**– used to control sheet flow runoff from disturbed areas or material stockpiles.
2. **Vegetative Surface Stabilization** – Disturbed area’s failing to establish vegetation shall be re-seeded and re-mulched according to the original specifications.
3. **Pump Filter Bag** - A new bag and properly disposed when the bag has been filled to ½ its total capacity.
4. **Sandbag Headwall** – Inspect sandbag headwall and check for washout. Make necessary repairs maintain the integrity of the dam.