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LINE 5 WSRP
AFE# 20009293
SELECTED CHANNELS AND APPLICABLE REMEDIATION DRAWING(S)
CWP XXX
ISSUED FOR 60% REVIEW

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INDEX OF SELECTED CHANNELS AND APPLICABLE REMEDIATION DRAWINGS

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DATE: 2020-07-27		SCALE: NTS	STATUS: DESIGN

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Table 1 Channel Remediation Methods

Selected Channels And Applicable Remediation Drawing(s)	MP	Channel Remediation Methods									
		Additional Bank Remediation Options Beyond Standard E&S Controls					Standard E&S Controls				
		Rip-Rap	Biolog	Rootwad	Biostabilization	Re-Grading	Erosion Control Blanket	Berms	Biolog	Silt Fence	Straw Bales
		Figure 1	Figure 2	Figure 3	Figure 4	Figure 5	Figure 6	Figure 7	Figure 8	Figure 9	Figure 10
Bay City Creek	0.6	X			X		X	X	X	X	X
Little Beartrap Creek	2.2			X		X	↓	↓	↓	↓	↓
Beartrap Creek	2.9	X		X	X		↓	↓	↓	↓	↓
Rock Creek	5.0		X		X		↓	↓	↓	↓	↓
UNT Deer Creek	5.9	X		X			↓	↓	↓	↓	↓
UNT Marengo River	12.8		X			X	↓	↓	↓	↓	↓
UNT Brunsweiler River	14.7				X	X	↓	↓	↓	↓	↓
UNT Trout Brook	15.9			X	X		↓	↓	↓	↓	↓
UNT Silver Creek	19.8		X		X		↓	↓	↓	↓	↓
UNT Gehrman Creek	28.6		X			X	↓	↓	↓	↓	↓
Camp Four Creek	29.8						↓	↓	↓	↓	↓
Feldcher Creek	31.7						↓	↓	↓	↓	↓

This table summarizes the type of drawing(s) applicable for the remediation of selected channels whose method of remediation may not be immediately clear. The selected typical drawings in this table are suggestions to aid in the determination of method for remediation, are not mutually inclusive or exclusive with one another, and do not constitute a restriction of methods to be used in the proper remediation and stabilization of channel banks.

Figure 1	Typical Rip Rap & Erosion Control Stream Bank Stabiliation	Figure 6	Typical Erosion Control Blanket
Figure 2	Typical Biolog Stream Bank Stabilization	Figure 7-1	Typical Temporary or Permanent Berm (Perspective View)
Figure 3-1	Typical Rootwad Stream Bank Stabiliztion (Plan View)	Figure 7-2	Typical Temporary or Permanent Berm (Side View)
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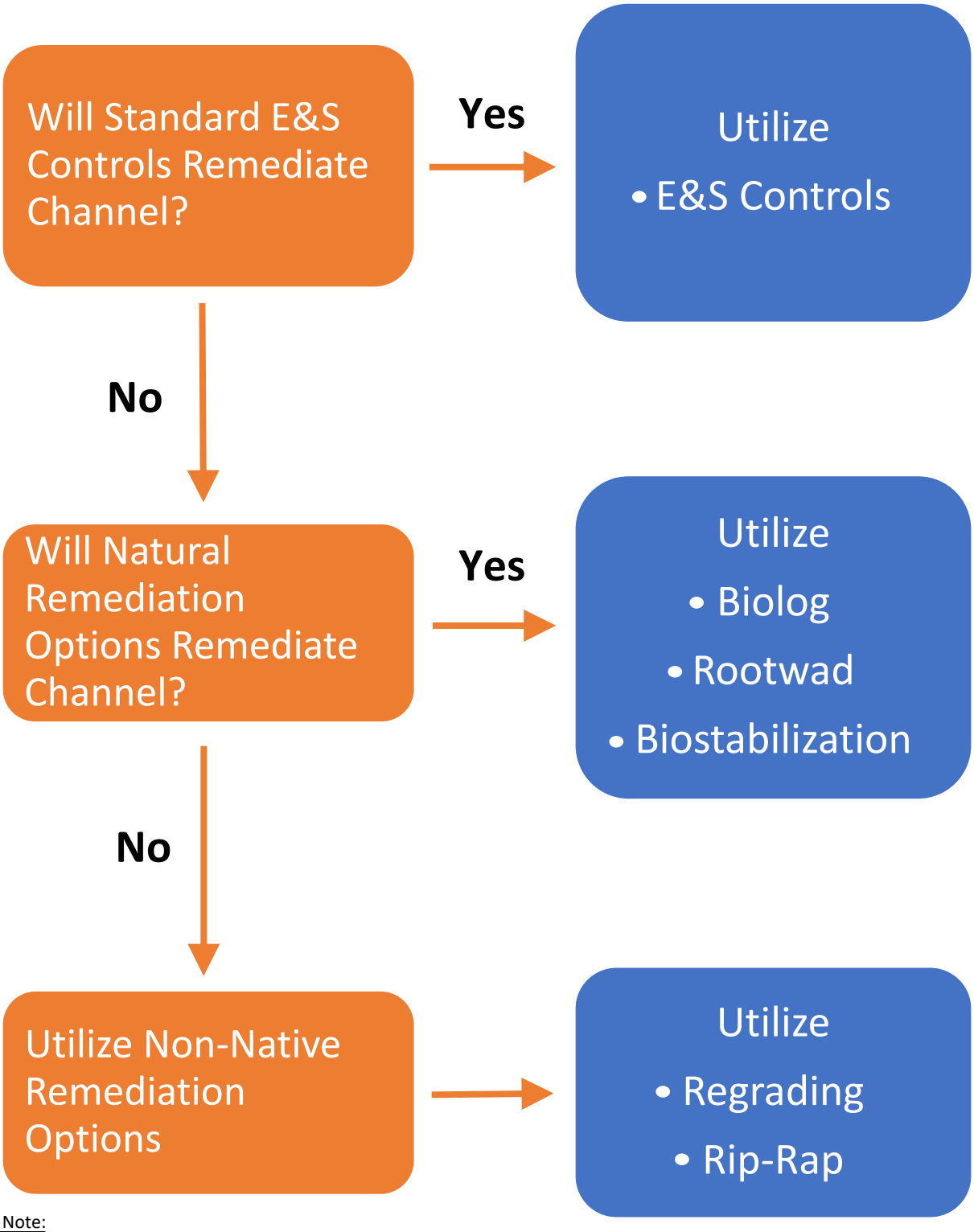
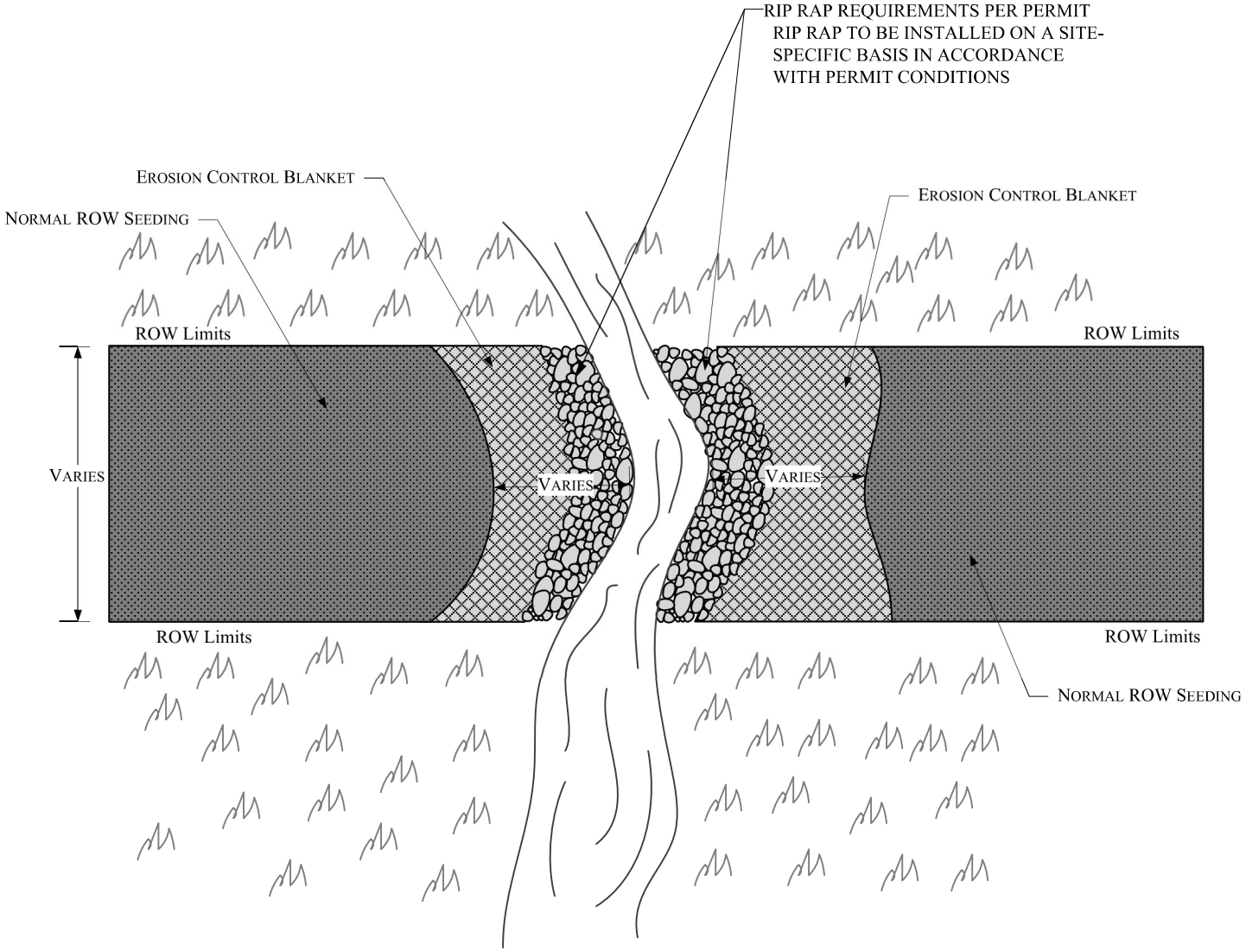
Figure 4	Typical Soil Wraps W/ Branch Layering & Willow Stake Biostabilization	Figure 9	Typical Silt Fence Installation
Figure 5	Typical Stream Bank Regrading (Side View)	Figure 10	Typical Straw Bale Installation

Exhibit 1
Stream Remediation Decision Process



Note:
Standard E&S Controls shall be utilized in conjunction with the Natural and Non Native stream remediation options.



NOTE:
PLACE BLANKET A MINIMUM OF ONE (1) FOOT UNDER RIP RAP. EXTEND BLANKET FROM MEAN HIGH WATER LEVEL TO SEVERAL FEET BEHIND HIGH BANK.

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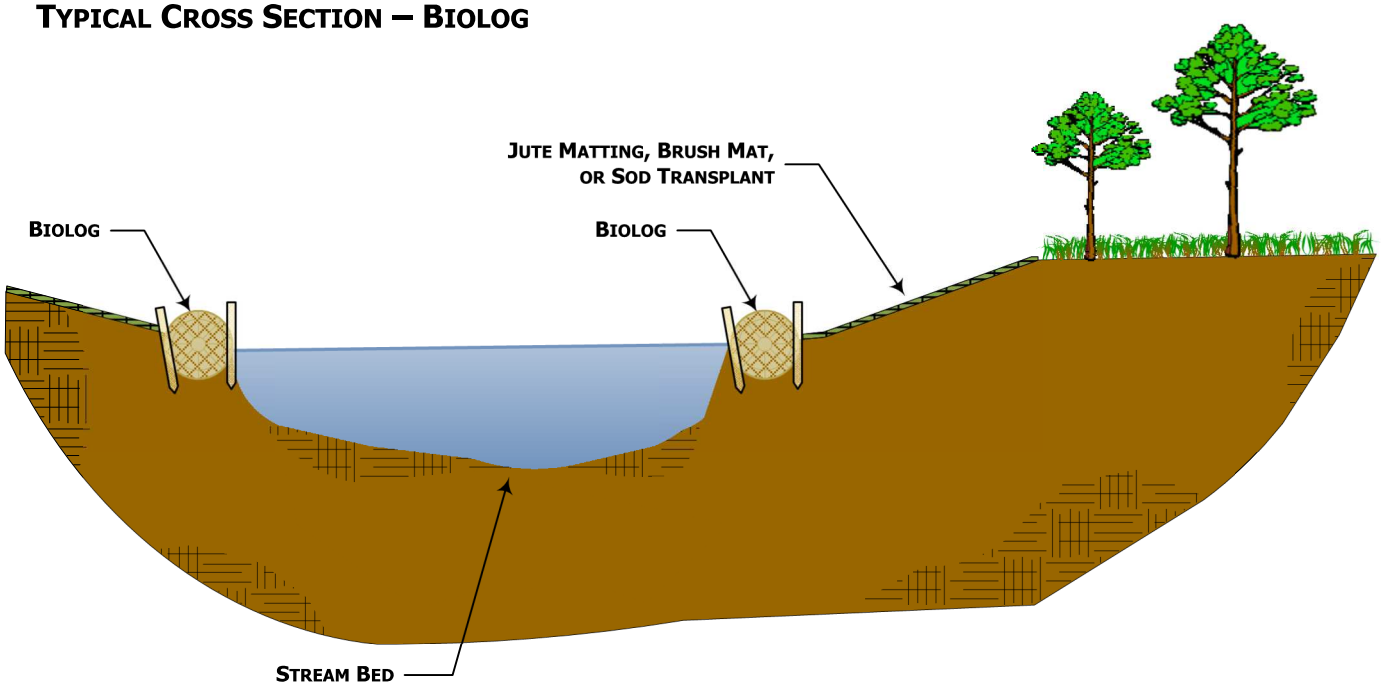
Figure 1

Typical For Remediation

Typical Final Stream Bank Stabilization
Rip Rap & Erosion Control

Scale: NTS
Date: 11/30/2016
Revised: 3/21/2017
Location: M:\Department Tasks\EPP Figures wBorders\

TYPICAL CROSS SECTION – BIOLOG



TYPICAL PLAN VIEW – BIOLOG

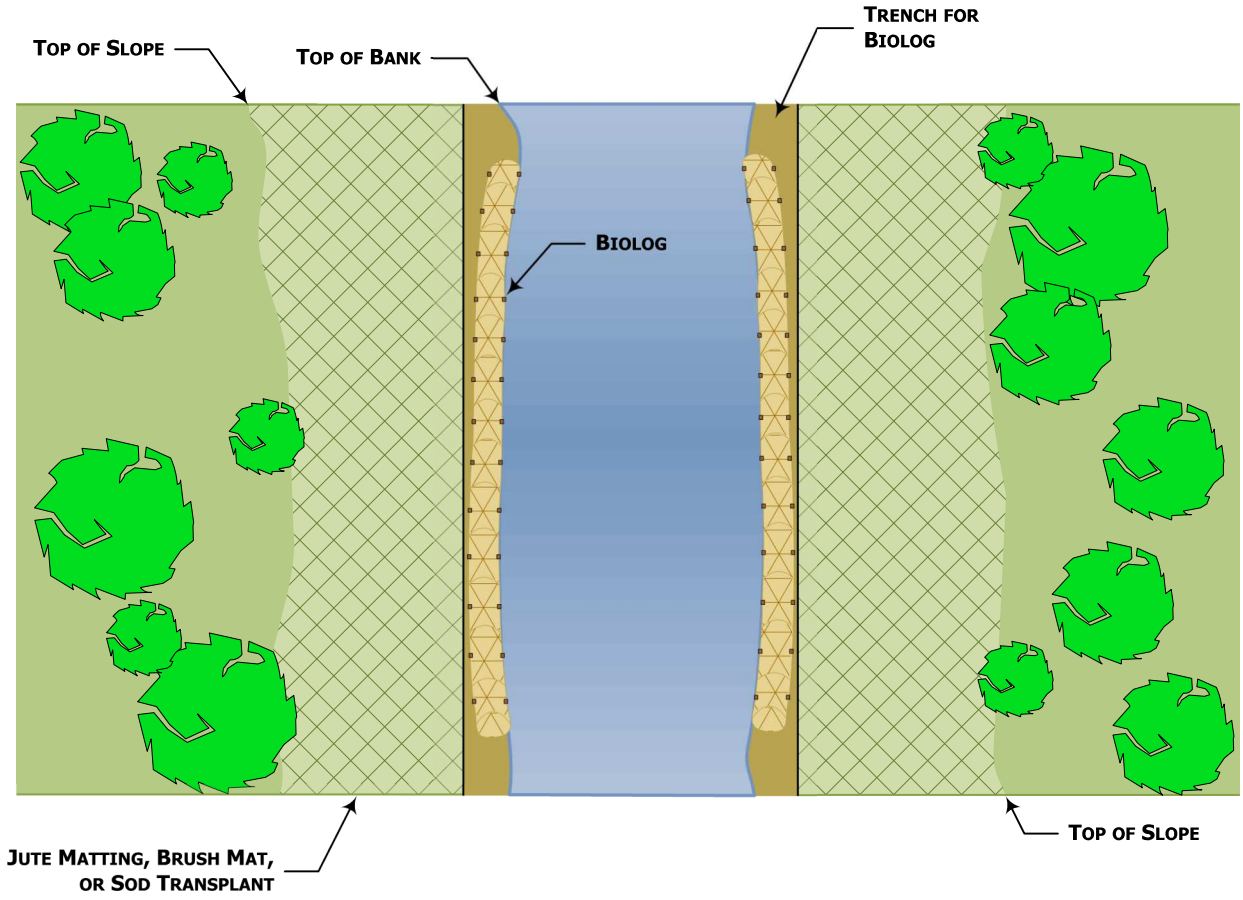


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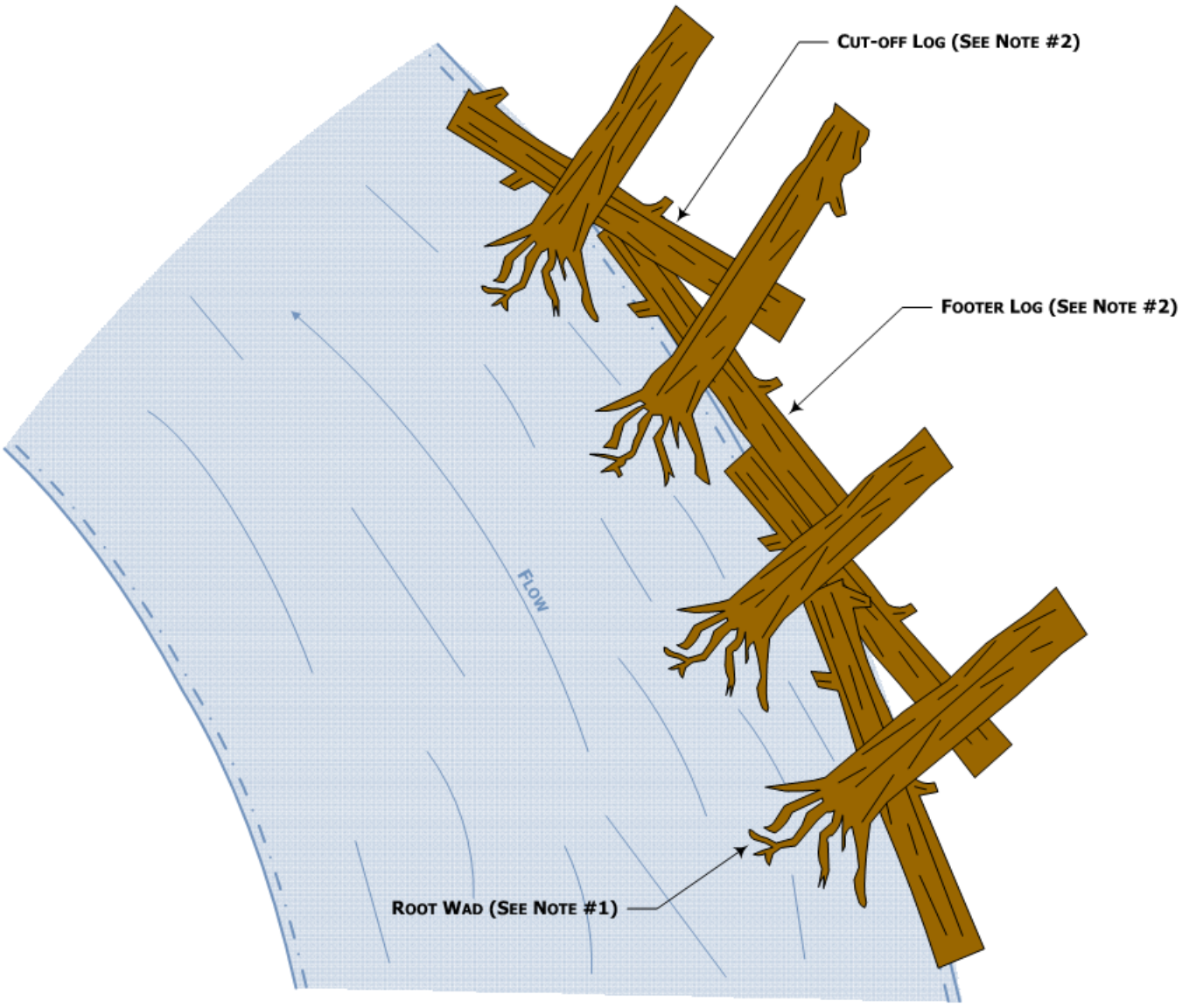
Figure 2

Typical For Remediation

Biolog Stream Bank Stabilization

04/17/2013

TYPICAL PLAN VIEW – NATURAL MATERIAL REVETMENT



Notes:

#1 – Root wad logs to be used on steep banks or based on agency recommendations.
#2 - Root wad logs to be anchored appropriately based on site-specific conditions or agency recommendations.

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Figure 3-1

Typical For Remediation

Typical Rootwad Stream Bank Stabilization (Plan View)

04/17/2013

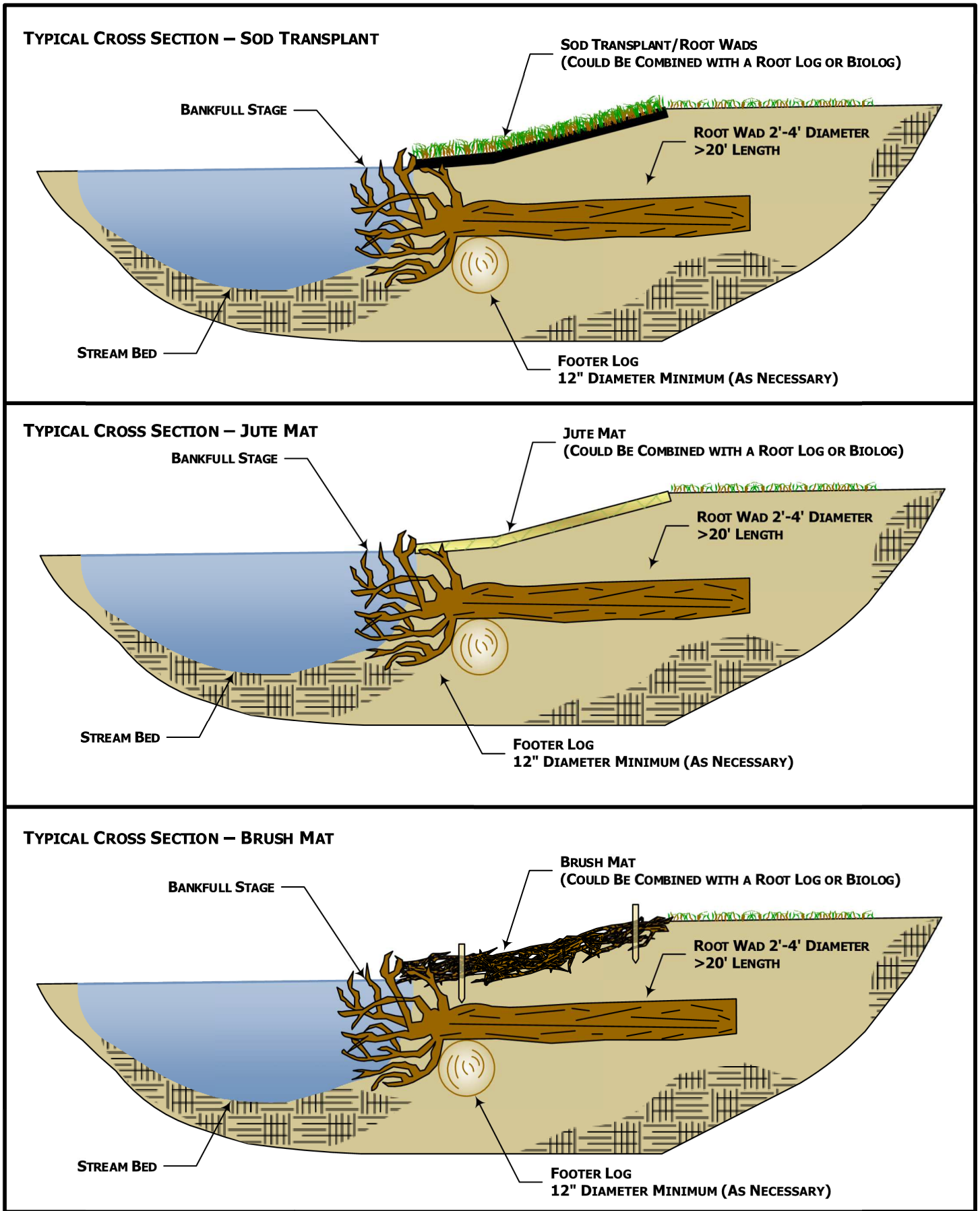

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Figure 3-2

Typical For Remediation

Typical Rootwad Stream Bank Stabilization (Side View)

8/25/2015

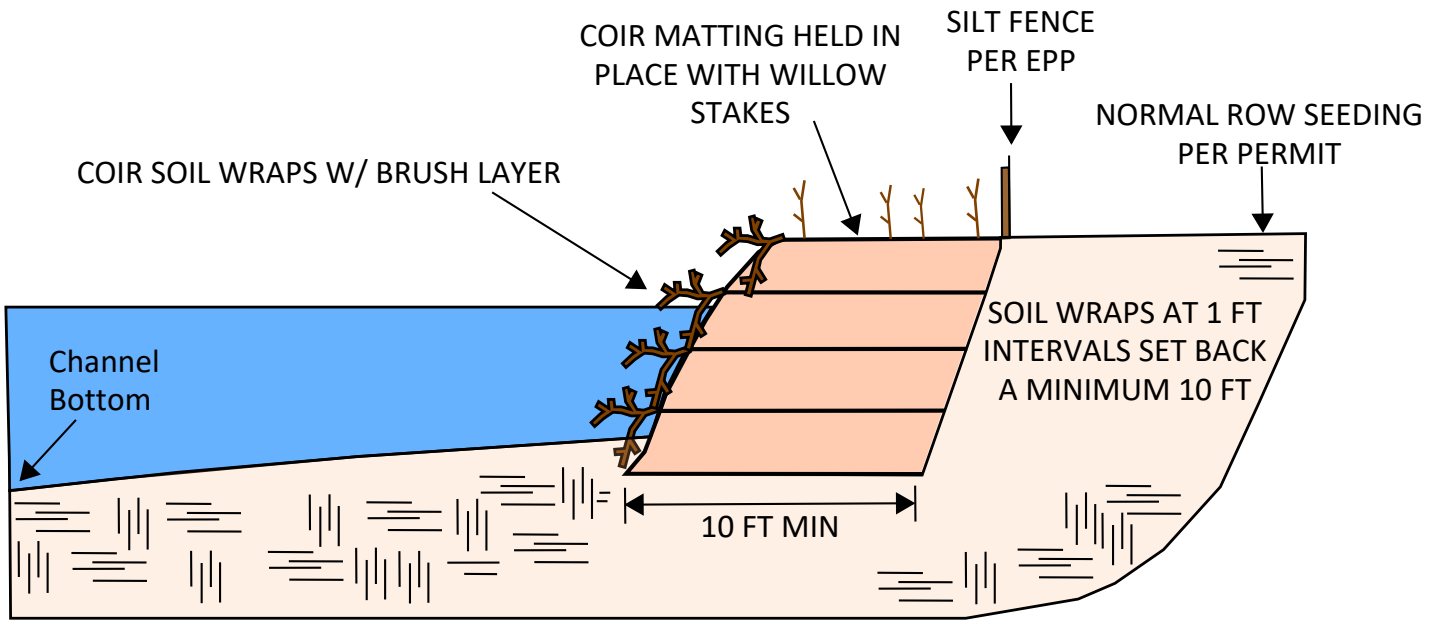


Figure 4

Typical For Remediation

Typical Soil Wraps With Branch Layering & Willow Stake Biostabilization

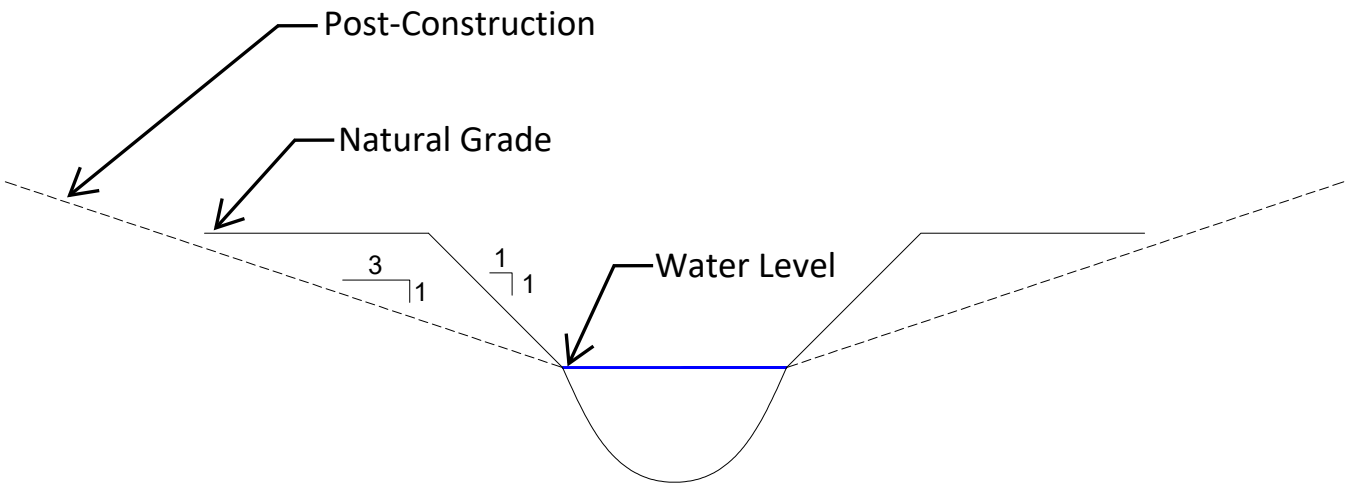
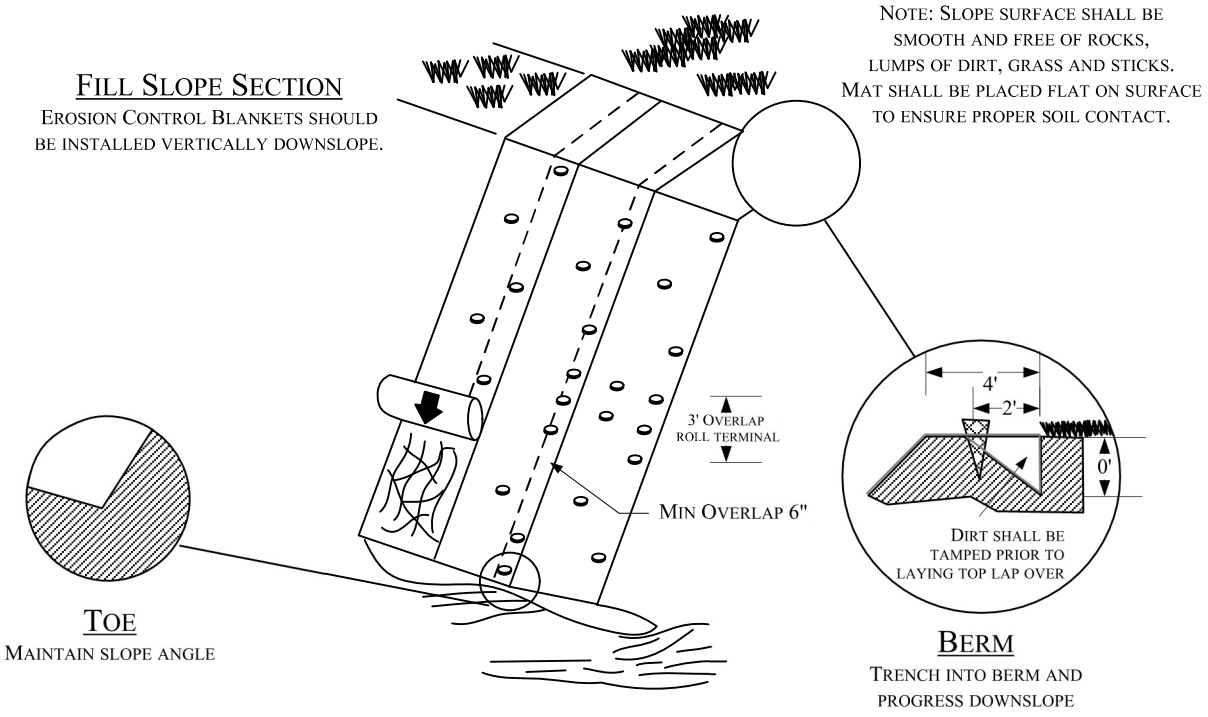


Figure 5

Typical For Remediation

Typical Stream Bank Regrading (Side View)

Scale: NTS
Date: 11/14/2000
Revised: 7/23/2020
Location: M:\Department Tasks\EPP Figures w\Border\



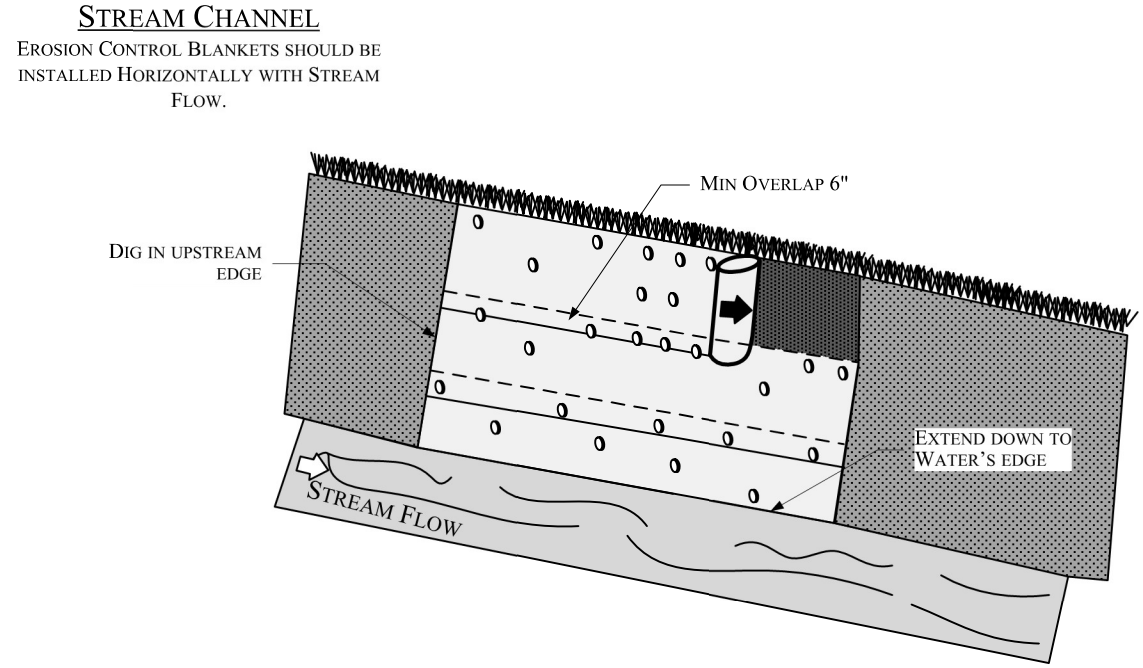


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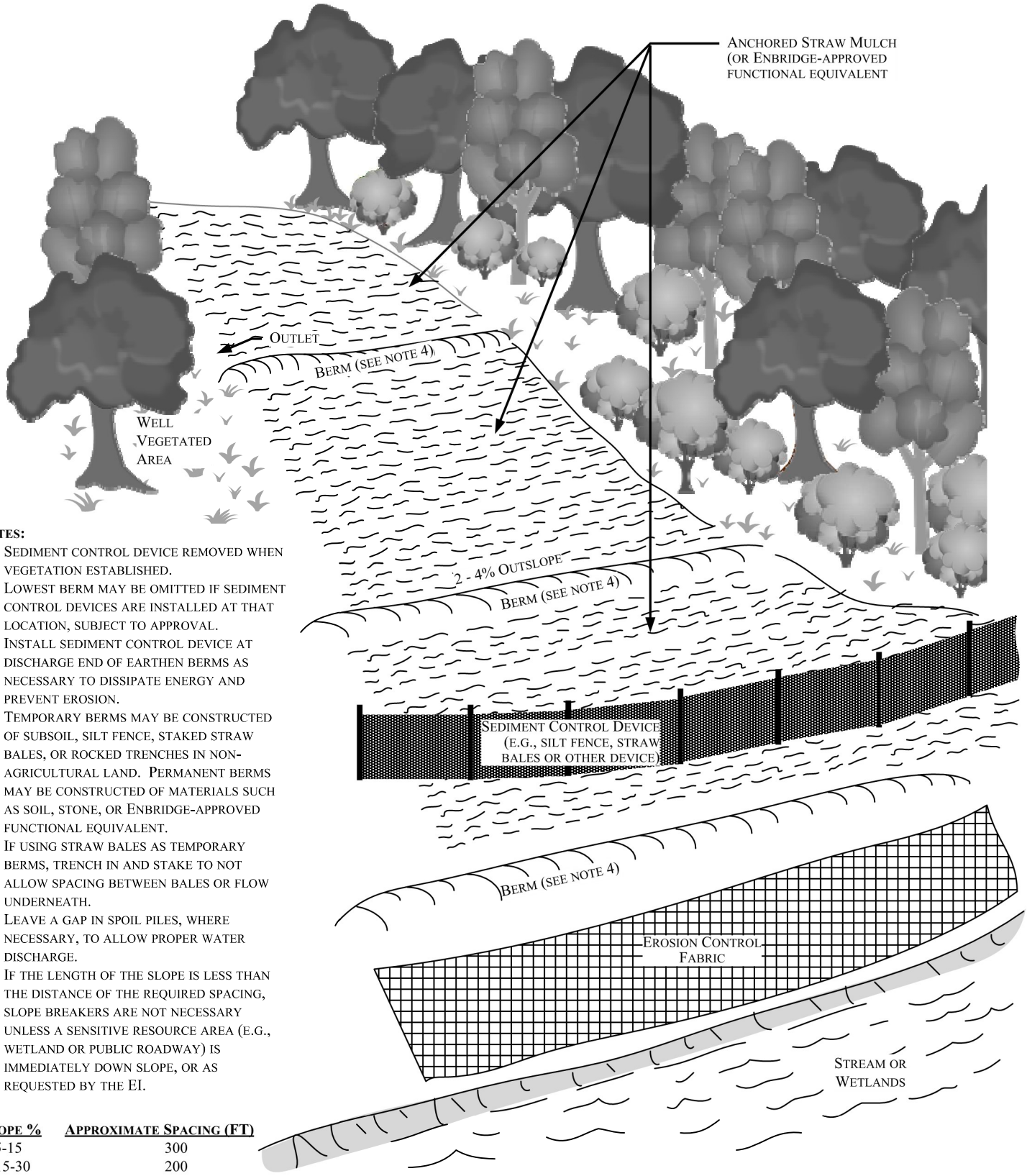
Figure 6

Typical For Remediation

Typical Erosion Control Blanket Installation

Scale: NTS
Date: 11/3/2016
Revised: 3/21/2017
Location: M:\Department Tasks\EPP Figures wBorders\



NOTES:

1. SEDIMENT CONTROL DEVICE REMOVED WHEN VEGETATION ESTABLISHED.
2. LOWEST BERM MAY BE OMITTED IF SEDIMENT CONTROL DEVICES ARE INSTALLED AT THAT LOCATION, SUBJECT TO APPROVAL.
3. INSTALL SEDIMENT CONTROL DEVICE AT DISCHARGE END OF EARTHEN BERMS AS NECESSARY TO DISSIPATE ENERGY AND PREVENT EROSION.
4. TEMPORARY BERMS MAY BE CONSTRUCTED OF SUBSOIL, SILT FENCE, STAKED STRAW BALES, OR ROCKED TRENCHES IN NON-AGRICULTURAL LAND. PERMANENT BERMS MAY BE CONSTRUCTED OF MATERIALS SUCH AS SOIL, STONE, OR ENBRIDGE-APPROVED FUNCTIONAL EQUIVALENT.
5. IF USING STRAW BALES AS TEMPORARY BERMS, TRENCH IN AND STAKE TO NOT ALLOW SPACING BETWEEN BALES OR FLOW UNDERNEATH.
6. LEAVE A GAP IN SPOIL PILES, WHERE NECESSARY, TO ALLOW PROPER WATER DISCHARGE.
7. IF THE LENGTH OF THE SLOPE IS LESS THAN THE DISTANCE OF THE REQUIRED SPACING, SLOPE BREAKERS ARE NOT NECESSARY UNLESS A SENSITIVE RESOURCE AREA (E.G., WETLAND OR PUBLIC ROADWAY) IS IMMEDIATELY DOWN SLOPE, OR AS REQUESTED BY THE EI.

SLOPE %	APPROXIMATE SPACING (FT)
5-15	300
>15-30	200
>30	100

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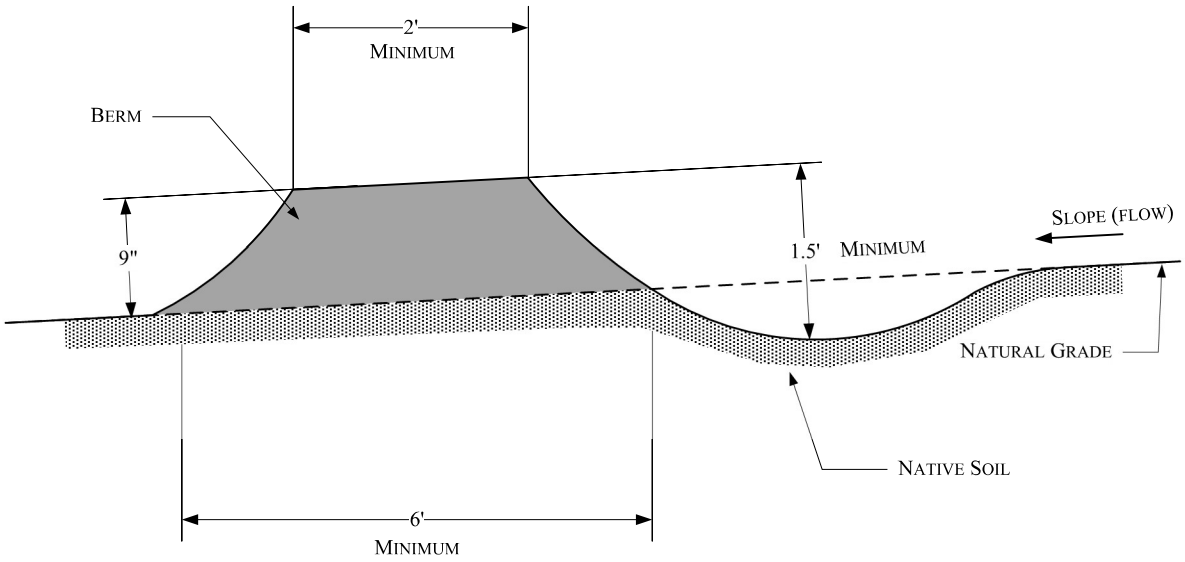
Figure 7-1

Typical For Remediation

Typical Temporary or Permanent Berm
(Perspective View)

Scale: NTS
Date: 11/14/2000
Revised: 3/21/2017
Location: M:\Department Tasks\EPP Figures wBorders\



NOTES

1. BERMS SHALL BE CONSTRUCTED WITH 2 TO 4 PERCENT OUTSLOPE.
2. BERMS SHALL BE OUTLETED TO WELL-VEGETATED STABLE AREAS, SEDIMENT CONTROL DEVICES OR ROCK APRONS.
3. BERMS SHALL BE SPACED AS DESCRIBED IN CONSTRUCTION SPECIFICATIONS.
4. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS.
5. DIMENSIONS ARE GUIDELINES AND MAY BE MODIFIED SUBJECT TO FIELD CONDITIONS.

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Figure 7-2

Typical For Remediation

Typical Temporary or Permanent Berm
(Side View)

Scale: NTS
Date: 11/14/2000
Revised: 3/21/2017
Location: M:\Department Tasks\EPP Figures wBorders\

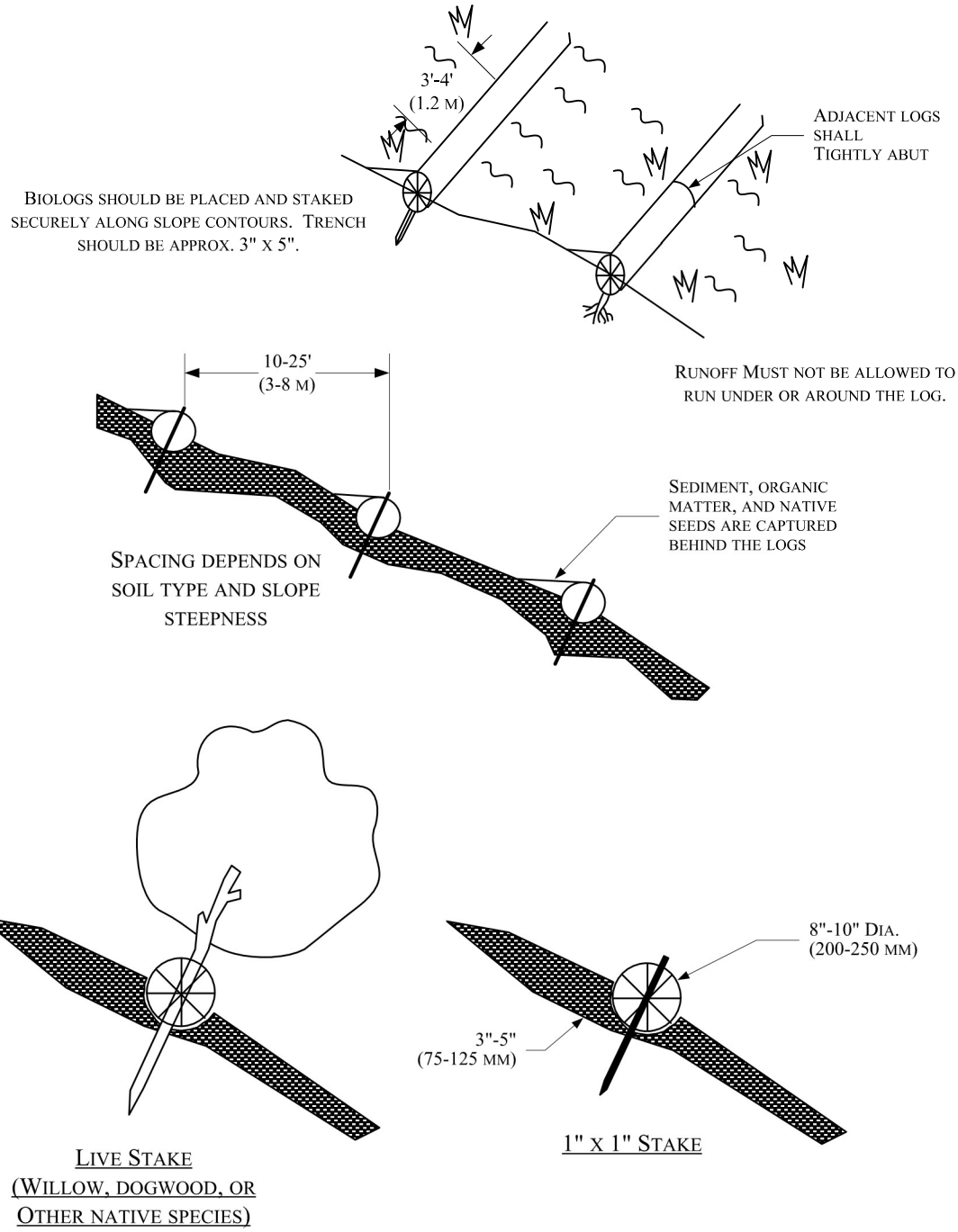

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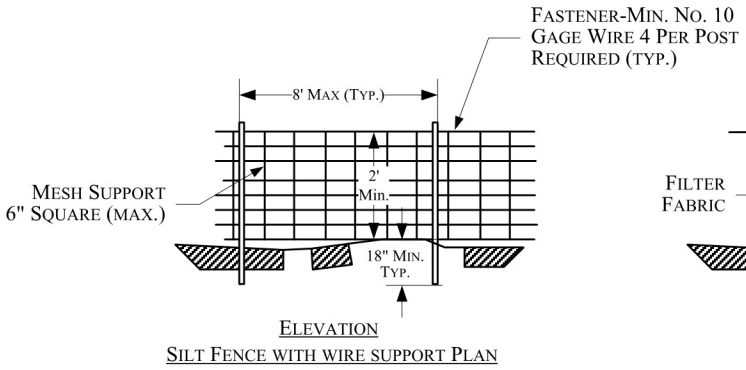
Figure 8

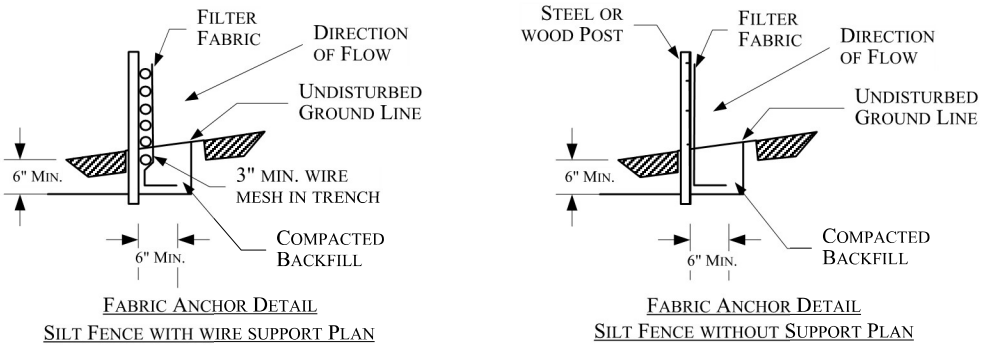
Typical For Remediation

Typical Biolog Installation

Scale: NTS
Date: 11/3/2016
Revised: 3/21/2017
Location: M:\Clients\D-F\EEL\BadRiver\Documents\

SILT FENCE PLAN (NTS)

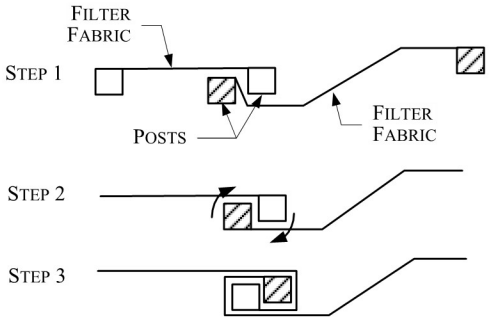




NOTES:

1. WIRES OF MESH SUPPORT SHALL BE MIN. GAGE NO. 12.
2. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF THE SPECIFICATION WITH EQUIVALENT OPENING SIZE OF AT LEAST 30 FOR NONWOVEN AND 50 FOR WOVEN. (SIEVE NO.)
3. THE POSTS USED TO SUPPORT THE SILT FENCE SHOULD BE HARDWOOD MATERIAL WITH A MINIMUM CROSS SECTIONAL AREA OF 4 INCHES SQUARE AND 4 FEET LONG. METAL POSTS SHOULD BE USED IN AREAS THAT POND WATER.

ATTACHING TWO SILT FENCES



NOTES:

1. PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE.
2. ROTATE BOTH POSTS AT LEAST 180 DEGREES IN A CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL.
3. DRIVE BOTH POSTS A MINIMUM OF 18 INCHES IN THE GROUND AND BURY THE FLAP.

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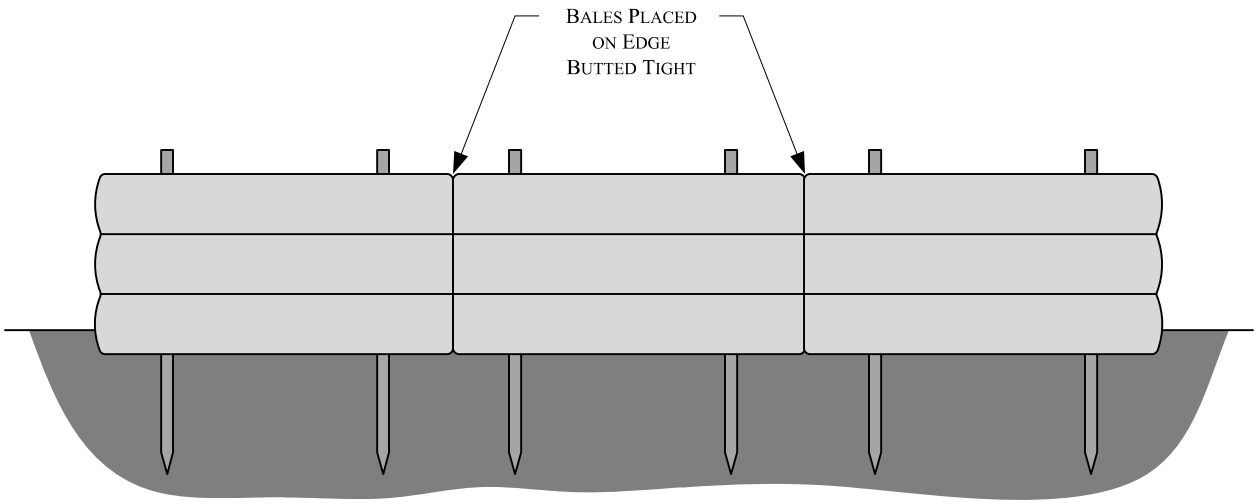
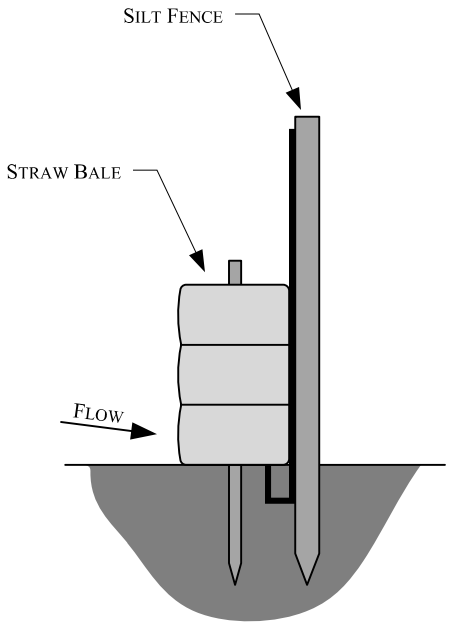
Figure 9

Typical For Remediation

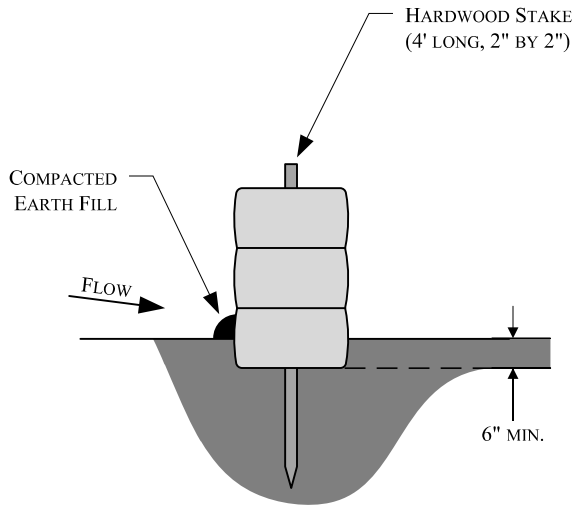
Typical Silt Fence Installation

Scale: NTS
Date: 5/25/2001
Revised: 3/21/2017
Location: M:\Department Tasks\EPP Figures wBorders\





STRAW BALES AND SILT FENCE



STRAW BALES ONLY

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Figure 10

Typical For Remediation

Typical Straw Bale Installation

Scale: NTS
Date: 10/28/2016
Revised: 3/21/2017
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