

	Site ID	Date Photo Taken
No Photo Available as of 11/05/10	161	
No Photo Available as of 11/05/10	261	
	62	09/27/10

Site ID Date Photo Taken



63

09/27/10



164

10/27/10



64

09/27/10

	Site ID	Date Photo Taken
	165	10/27/10
<p data-bbox="634 699 1045 730">No Photo Available as of 11/05/10</p>	65	
	66	09/25/10

	Site ID	Date Photo Taken
	67	09/25/10
	68	09/25/10
<p data-bbox="634 1266 1045 1297">No Photo Available as of 11/05/10</p>	69	

	Site ID	Date Photo Taken
<p data-bbox="634 205 1045 233">No Photo Available as of 11/05/10</p>	<p data-bbox="1195 384 1230 411">70</p>	
	<p data-bbox="1195 911 1230 938">71</p>	<p data-bbox="1302 911 1419 938">09/25/10</p>

APPENDIX B

Photos – Example Erosion Areas

EXAMPLE LEVEL 5 SITES



EXAMPLE LEVEL 4 SITES



Site 39, MP 9.15



Site 34, MP 8.25

EXAMPLE LEVEL 3 SITES



EXAMPLE LEVEL 2 SITE



APPENDIX C

Stabilization Design Plans

ENBRIDGE LINE 6B INCIDENT KALAMAZOO RIVER BANK STABILIZATION DESIGN PRIORITY AREAS

OCTOBER 26, 2010

FIGURE #	SITE ID	APPROXIMATE MILE POST
1.....	24.....	6.0
2.....	32.....	7.4
3.....	42.....	9.4
4.....	45 & 46.....	10.0
5.....	47.....	10.3
6.....	56.....	11.7
7.....	68.....	25.4
8.....	160.....	12.4
9.....	261.....	12.7

DETAIL ID	DESCRIPTION
A.....	COIR LOGS
B.....	BIOENGINEERED SOIL LIFTS
C.....	RESLOPE BANK
D.....	TOPSOIL, SEED, & EROSION FABRIC
E.....	BRUSH WATTLES
F.....	BANK RECLAMATION
G.....	LOG DEFLECTORS
H.....	STONE TOE
I.....	LUNKER STRUCTURE

ALL APPLICABLE STATE / LOCAL PERMITS, AND LAND OWNER PERMISSION MUST BE OBTAINED PRIOR TO COMMENCING WORK

REVISION

Figure 8 - adjusted location of tree move, added stump move

DATE

10/28/10





ASH TREE
W/ EXPOSED ROOT MASS

HONEYSUCKLE
BUSH

SITE #24
75' +/- OF BANK EROSION
INSTALL BRUSH WATTLES AND/OR LOG DEFLECTORS
(SEE DETAILS E AND G)

6.00



0 25 50 Feet

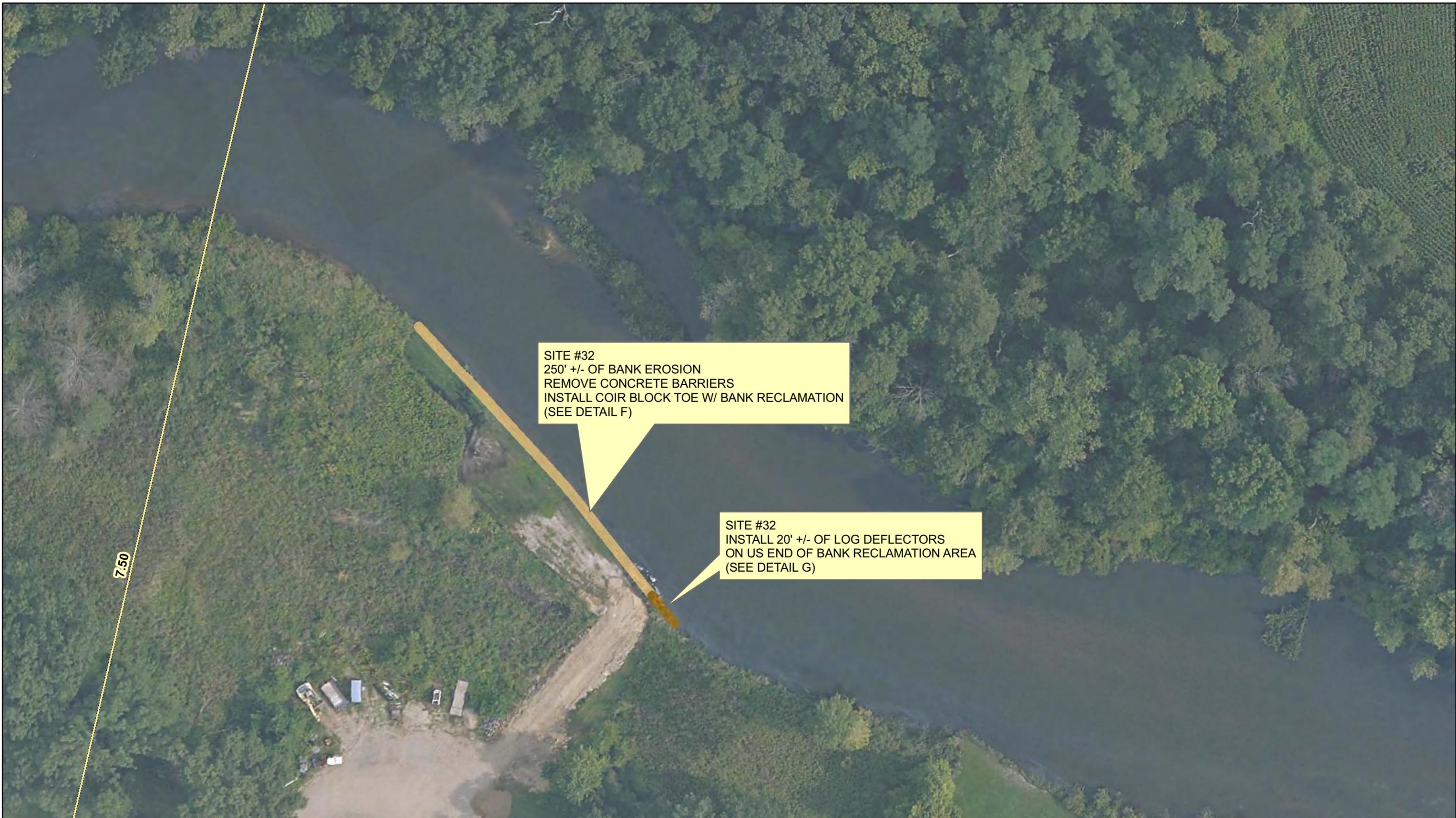
ALL APPLICABLE STATE / LOCAL PERMITS, AND LAND OWNER PERMISSION MUST BE OBTAINED PRIOR TO COMMENCING WORK

FIGURE 1
SITE #24
BANK EROSION STABILIZATION DESIGN



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10/18/10

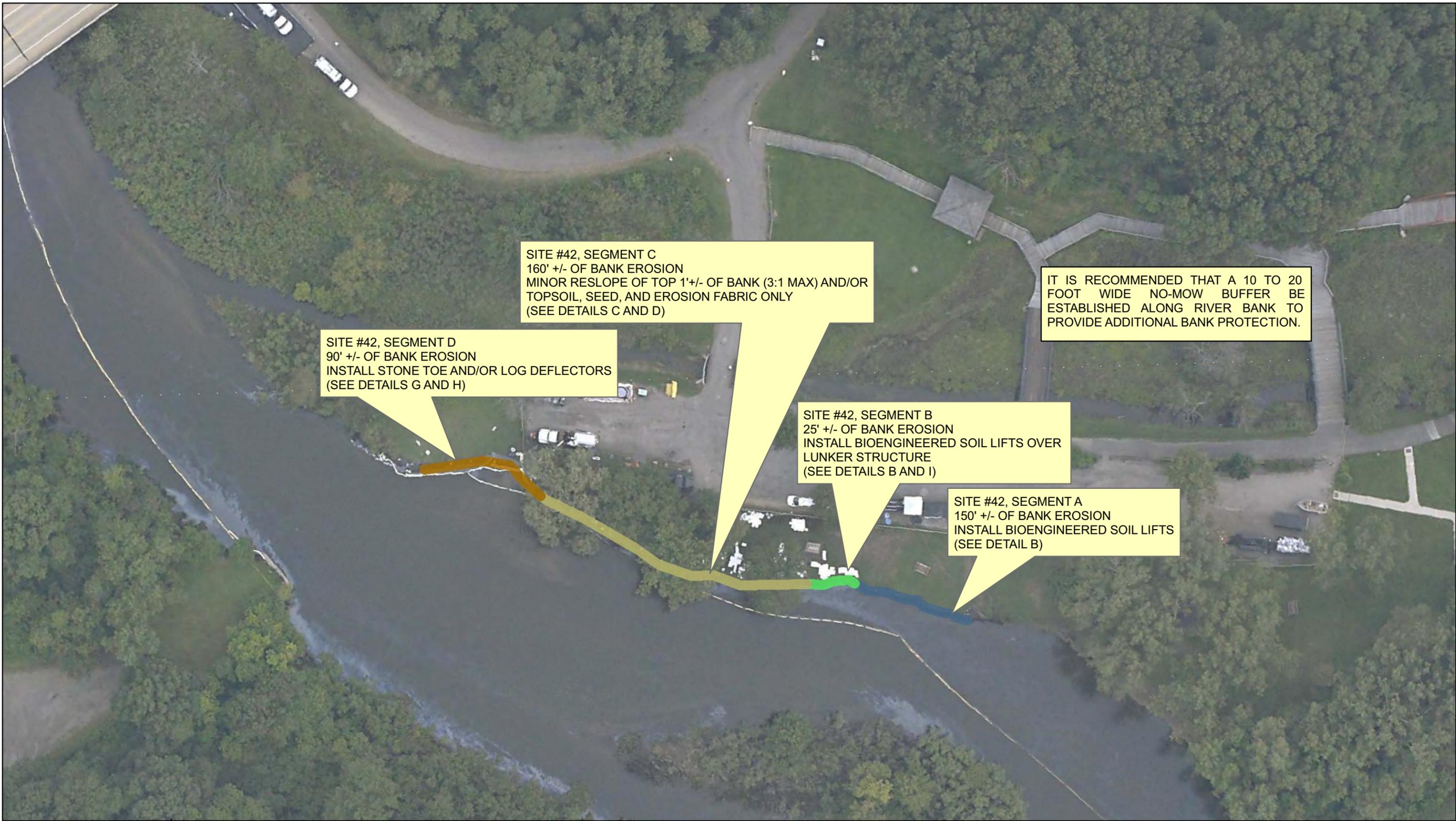


0 25 50 Feet

ALL APPLICABLE STATE / LOCAL PERMITS, AND LAND OWNER PERMISSION MUST BE OBTAINED PRIOR TO COMMENCING WORK

FIGURE 2
SITE #32
BANK EROSION STABILIZATION DESIGN





SITE #42, SEGMENT C
 160' +/- OF BANK EROSION
 MINOR RESLOPE OF TOP 1'+/- OF BANK (3:1 MAX) AND/OR
 TOPSOIL, SEED, AND EROSION FABRIC ONLY
 (SEE DETAILS C AND D)

SITE #42, SEGMENT D
 90' +/- OF BANK EROSION
 INSTALL STONE TOE AND/OR LOG DEFLECTORS
 (SEE DETAILS G AND H)

IT IS RECOMMENDED THAT A 10 TO 20
 FOOT WIDE NO-MOW BUFFER BE
 ESTABLISHED ALONG RIVER BANK TO
 PROVIDE ADDITIONAL BANK PROTECTION.

SITE #42, SEGMENT B
 25' +/- OF BANK EROSION
 INSTALL BIOENGINEERED SOIL LIFTS OVER
 LUNKER STRUCTURE
 (SEE DETAILS B AND I)

SITE #42, SEGMENT A
 150' +/- OF BANK EROSION
 INSTALL BIOENGINEERED SOIL LIFTS
 (SEE DETAIL B)

ALL APPLICABLE STATE / LOCAL
 PERMITS, AND LAND OWNER
 PERMISSION MUST BE OBTAINED
 PRIOR TO COMMENCING WORK

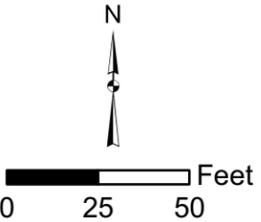


FIGURE 3
SITE #42
 BANK EROSION STABILIZATION DESIGN





0 25 50 Feet

ALL APPLICABLE STATE / LOCAL PERMITS, AND LAND OWNER PERMISSION MUST BE OBTAINED PRIOR TO COMMENCING WORK

FIGURE 4
SITES #45 & 46
BANK EROSION STABILIZATION DESIGN





0 25 50 Feet

ALL APPLICABLE STATE / LOCAL PERMITS, AND LAND OWNER PERMISSION MUST BE OBTAINED PRIOR TO COMMENCING WORK

FIGURE 5
SITE #47
BANK EROSION STABILIZATION DESIGN





SITE #56
115 +/- OF BANK EROSION
INSTALL COIR LOG
(SEE DETAIL A)

1175



0 25 50 Feet

ALL APPLICABLE STATE / LOCAL PERMITS, AND LAND OWNER PERMISSION MUST BE OBTAINED PRIOR TO COMMENCING WORK

FIGURE 6
SITE #56
BANK EROSION STABILIZATION DESIGN



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SITE 68
120'+/- OF BANK EROSION
INSTALL:
BRUSH WATTLES (SEE DETAIL E) AND/OR
LOG DEFLECTORS (SEE DETAIL G)

25:25



0 25 50 Feet

ALL APPLICABLE STATE / LOCAL PERMITS, AND LAND OWNER PERMISSION MUST BE OBTAINED PRIOR TO COMMENCING WORK

FIGURE 7
SITE #68

BANK EROSION STABILIZATION DESIGN





DOWN TREE NEAR LDB PUTTING STRESS ON LDB.
MOVE DOWNED TO RDB
LOCATION APPROXIMATE - ACTUAL LOCATION TO BE DETERMINED IN FIELD AT TIME OF CONSTRUCTION.

STUMP PUTTING STRESS ON RDB
RELOCATE STUMP UP AGAINST BANK.
ANCHOR AS NECESSARY TO SECURE.
LOCATION APPROXIMATE - ACTUAL LOCATION TO BE DETERMINED IN FIELD AT TIME OF CONSTRUCTION.

12.5



0 25 50 Feet

ALL APPLICABLE STATE / LOCAL PERMITS, AND LAND OWNER PERMISSION MUST BE OBTAINED PRIOR TO COMMENCING WORK

FIGURE 8
SITE #160
BANK EROSION STABILIZATION DESIGN



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10/28/10

SITE #261
150' +/- OF BANK EROSION
INSTALL BRUSH WATTLES AND/OR LOG DEFLECTORS
(SEE DETAILS E AND G)

12.75



0 25 50 Feet

ALL APPLICABLE STATE / LOCAL
PERMITS, AND LAND OWNER
PERMISSION MUST BE OBTAINED
PRIOR TO COMMENCING WORK

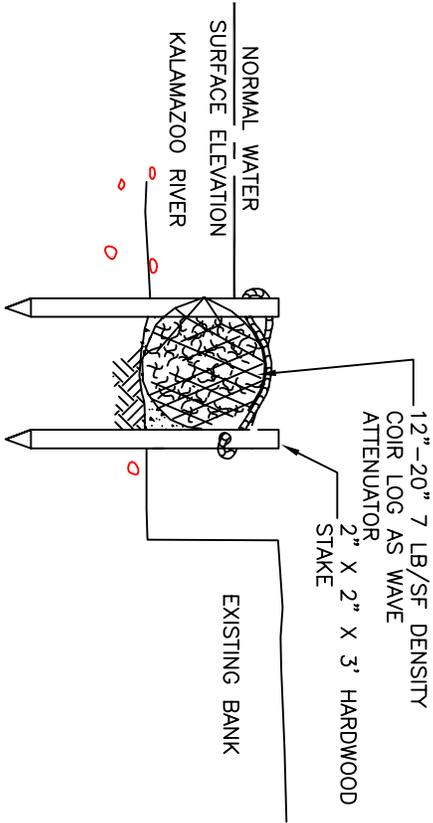
FIGURE 9
SITE #261

BANK EROSION STABILIZATION DESIGN

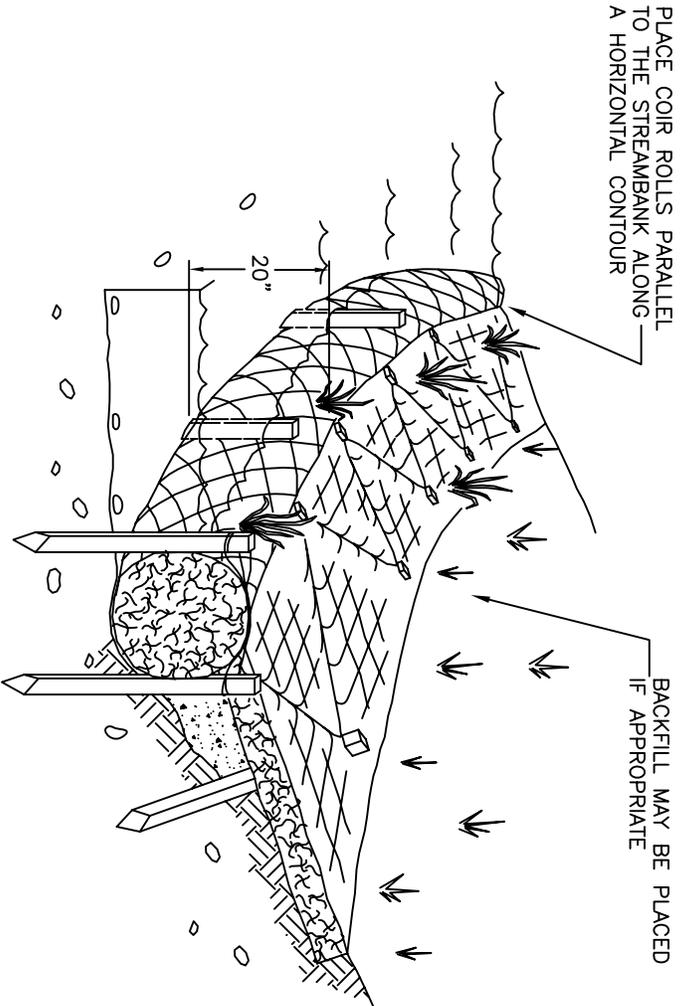


60162778

10/26/10

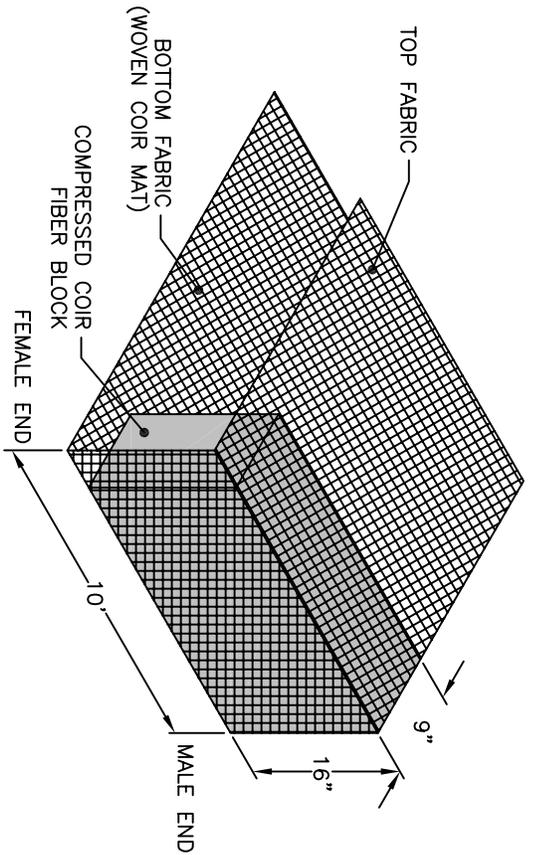
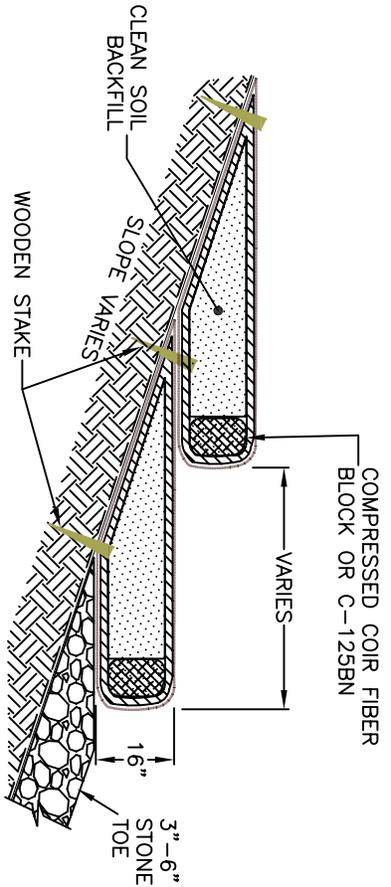


COIR LOG WAVE ATTENUATOR
NOT TO SCALE



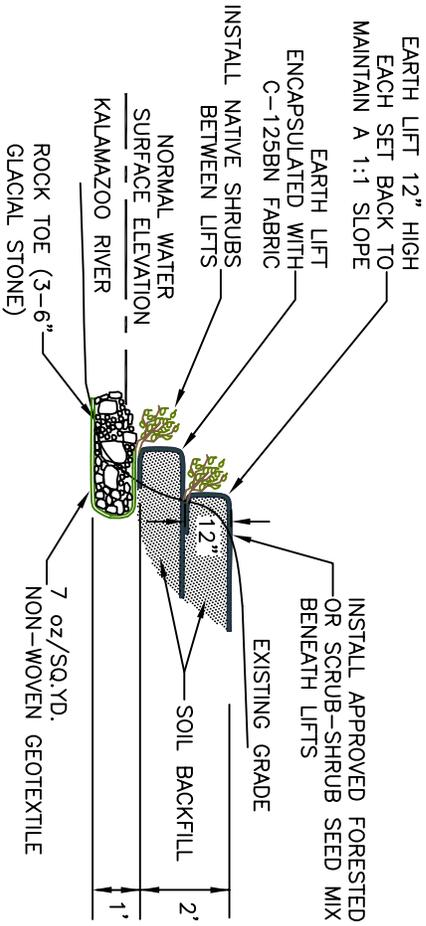
TYPICAL COIR LOG SYSTEM
NOT TO SCALE

Detail A - Coir Logs
Enbridge Line 6B Incident
Kalamazoo River Proposed Typical Restoration Techniques
Calhoun County, Michigan
JFNew 1008114.00 - Oct 18, 2010



ROLANKA 16-400 COIR BLOCK LIFT SYSTEM

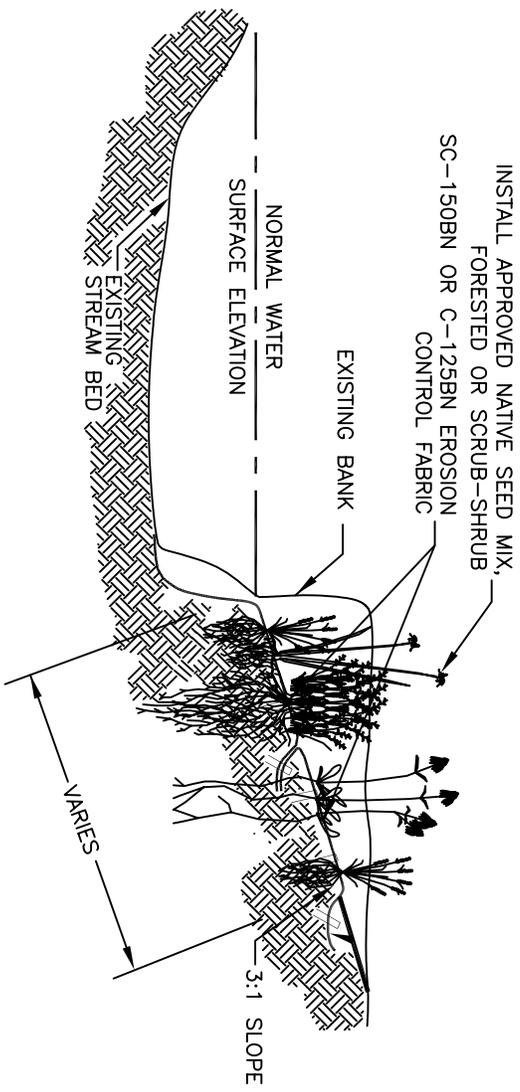
NOT TO SCALE



TYPICAL ENCAPSULATED LIFT/ROCK TOE

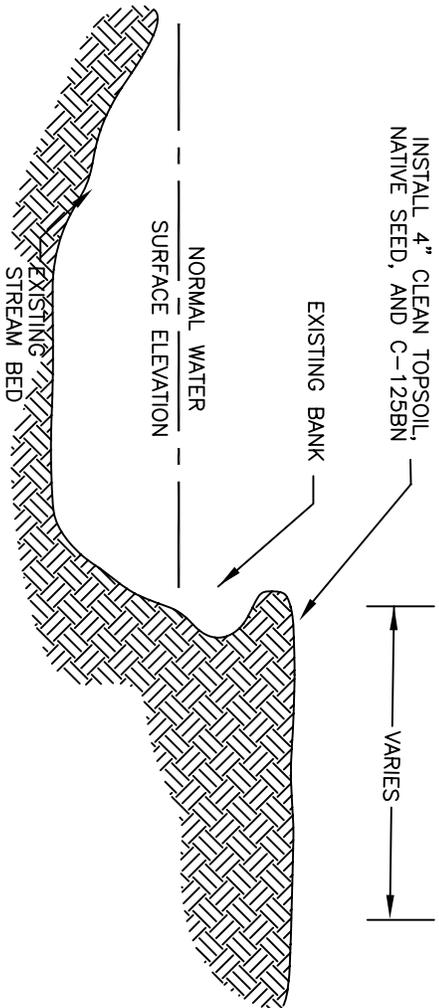
NOT TO SCALE

Detail B - Bioengineered Lifts
Enbridge Line 6B Incident
Kalamazoo River Proposed Typical Restoration Techniques
 Calhoun County, Michigan
 JFN_{ew} 1008114.00 - Oct 18, 2010



TYPICAL SLOPE RE-GRADING
NOT TO SCALE

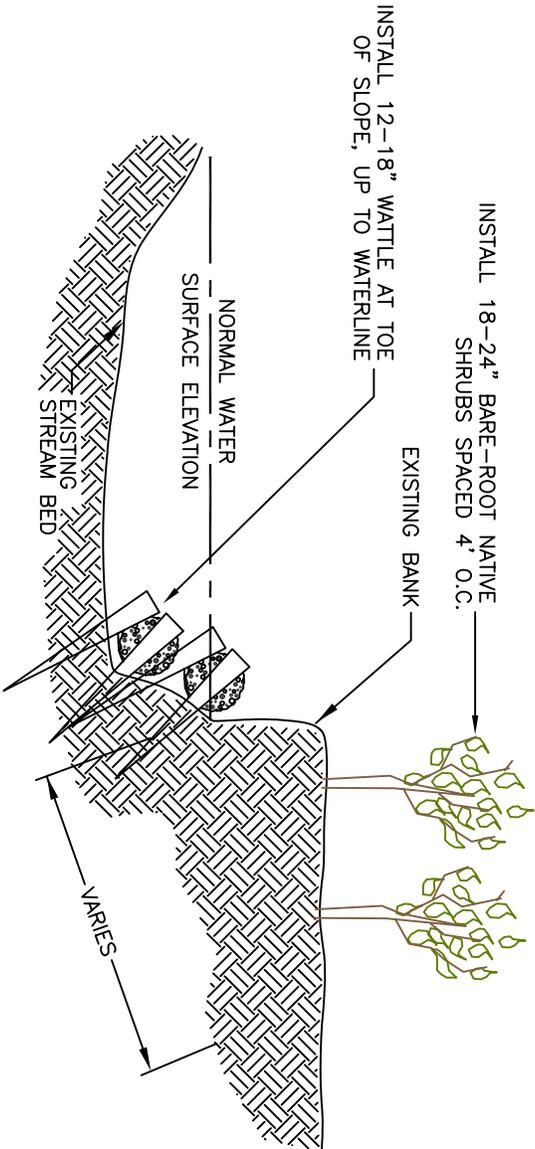
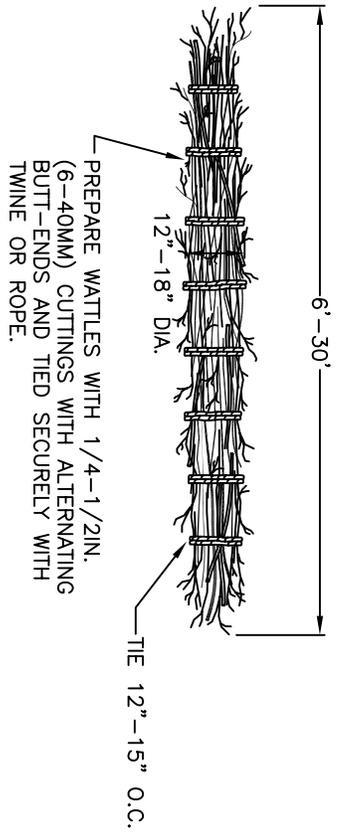
Detail C - Re-slope
Enbridge Line 6B Incident
Kalamazoo River Proposed Typical Restoration Techniques
Calhoun County, Michigan
JFNew 1008114.00 - Oct 18, 2010



TYPICAL TOPSOIL/SEEDING

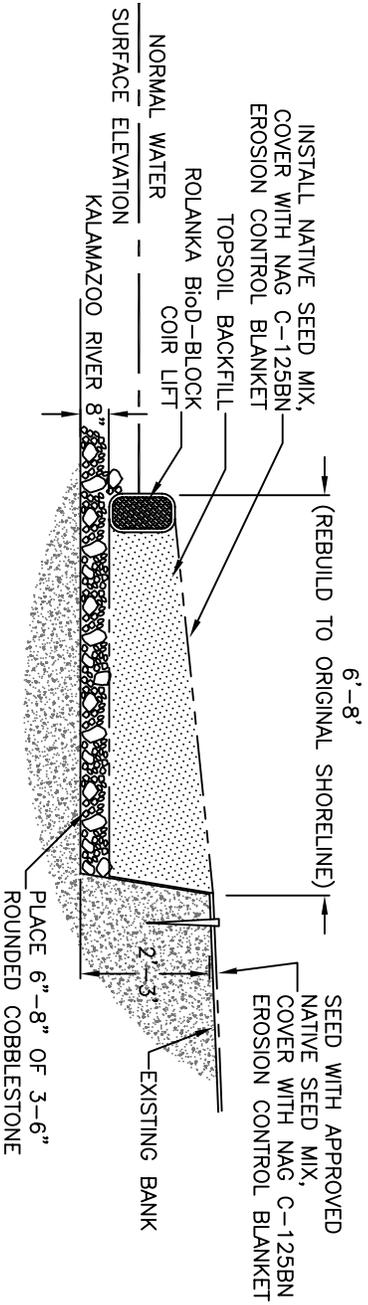
NOT TO SCALE

Treatment D - Topsoil, seed, and erosion fabric
Enbridge Line 6B Incident
Kalamazoo River Proposed Typical Restoration Techniques
Calhoun County, Michigan
JFNew 1008114.00 - Oct 18, 2010



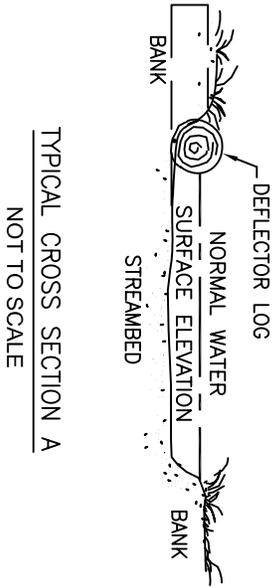
TYPICAL BRUSH WATTLES
NOT TO SCALE

Detail E - Brush Wattles
Enbridge Line 6B Incident
Kalamazoo River Proposed Typical Restoration Techniques
Calhoun County, Michigan
JFNew 1008114.00 - Oct 18, 2010

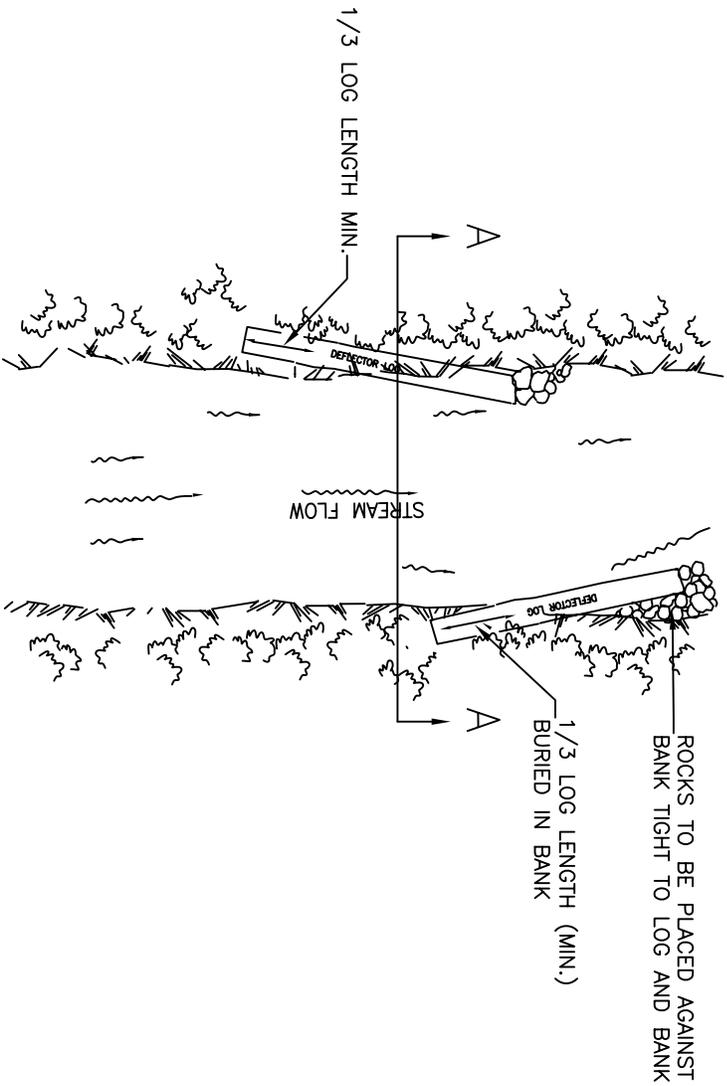


TYPICAL BANK RECLAMATION
NOT TO SCALE

Detail F - Bank Reclamation
Enbridge Line 6B Incident
Kalamazoo River Proposed Typical Restoration Techniques
Calhoun County, Michigan
JFNew 1008114.00 - Oct 18, 2010



TYPICAL CROSS SECTION A
NOT TO SCALE

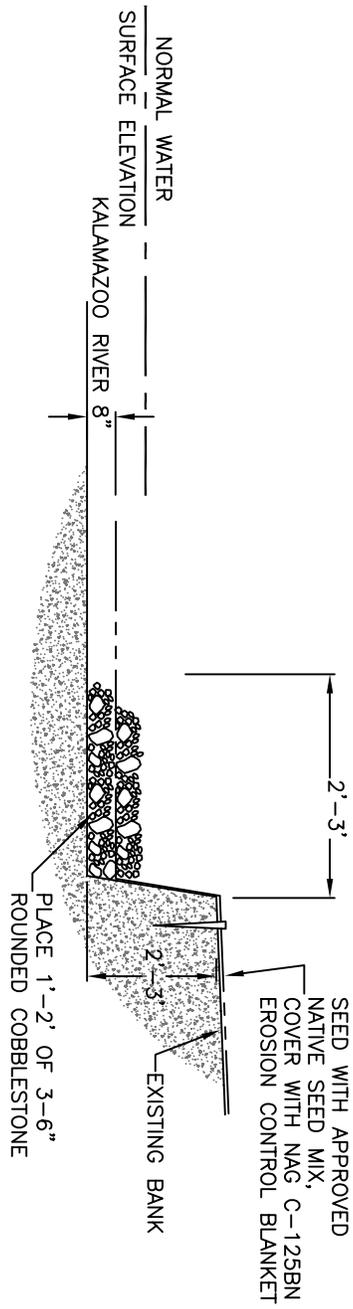


TYPICAL LOG DEFLECTORS

NOT TO SCALE

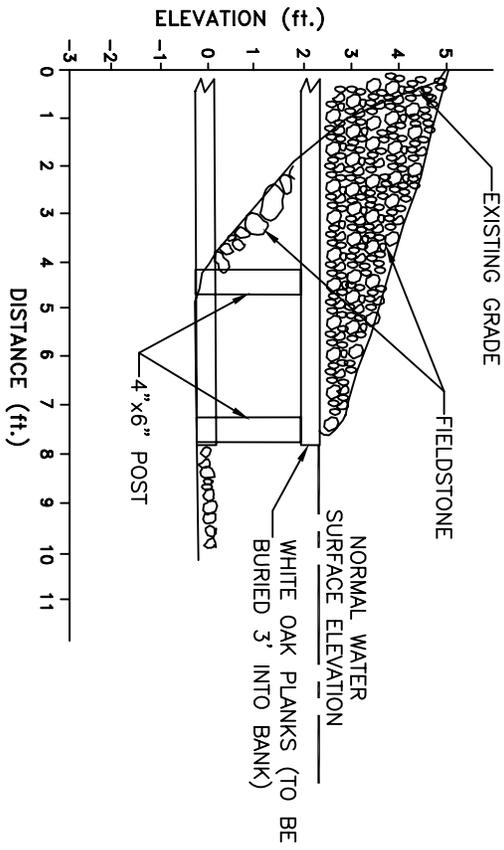
NOTE: LOGS USED IN GROUPS OR PAIRS SHALL BE OF SIMILAR DIAMETER.

Detail G - Log Deflectors
Enbridge Line 6B Incident
Kalamazoo River Proposed Typical Restoration Techniques
Calhoun County, Michigan
JFNew 1008114.00 - Oct 18, 2010



TYPICAL STONE TOE

Detail H - Stone Toe
Enbridge Line 6B Incident
Kalamazoo River Proposed Typical Restoration Techniques
Calhoun County, Michigan
JFNew 1008114.00 - Oct 18, 2010



TYPICAL LUNKER STRUCTURE
NOT TO SCALE

Detail I - Luncker Structure
Enbridge Line 6B Incident
Kalamazoo River Proposed Typical Restoration Techniques
Calhoun County, Michigan
JFNew 1008114.00 - Oct 18, 2010

APPENDIX D

Photos – Example Erosion Areas Stabilized as of 11/18/10

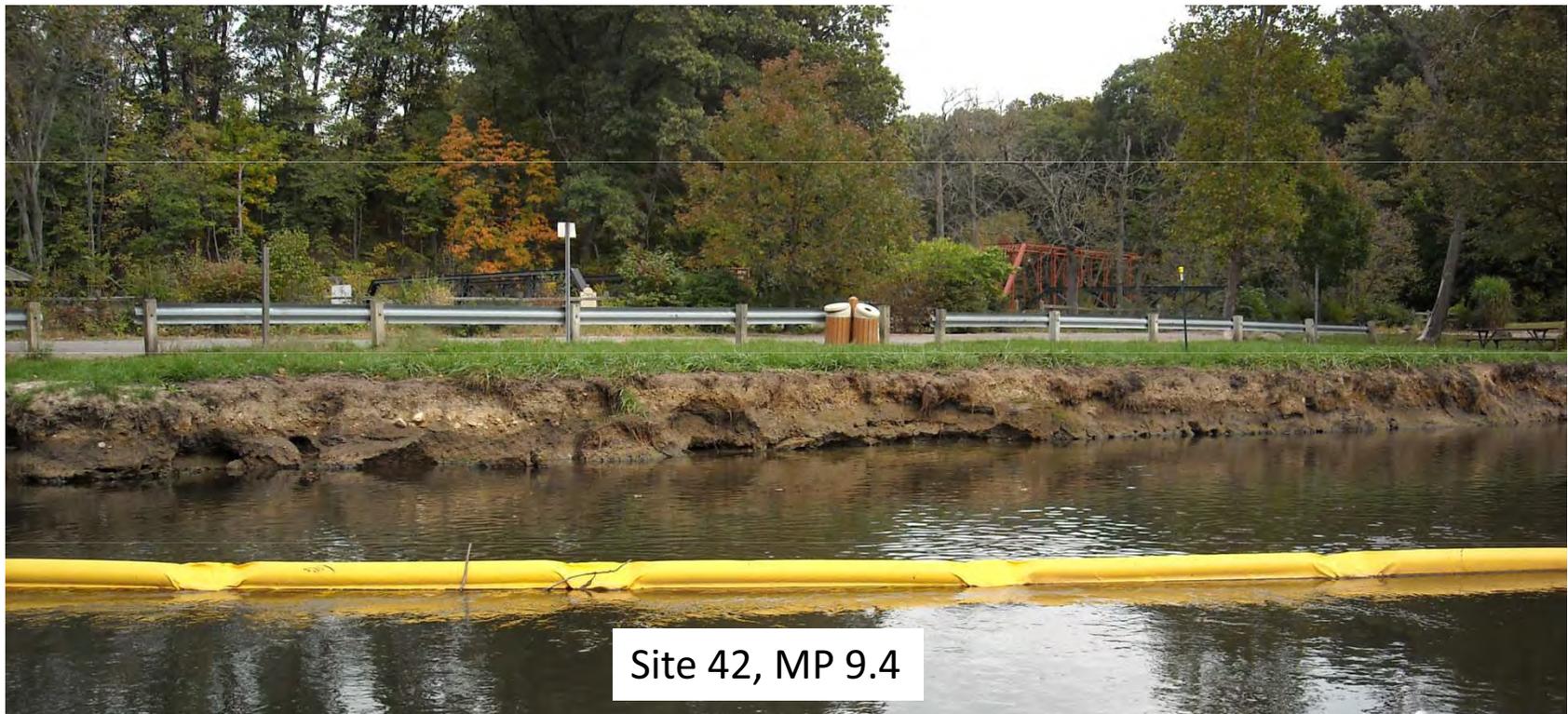
- Before Construction



- After Construction



- Before Construction



Site 42, MP 9.4

- After Construction



Site 42, MP 9.4

- Before Construction



Site 45, MP 10.0

- After Construction



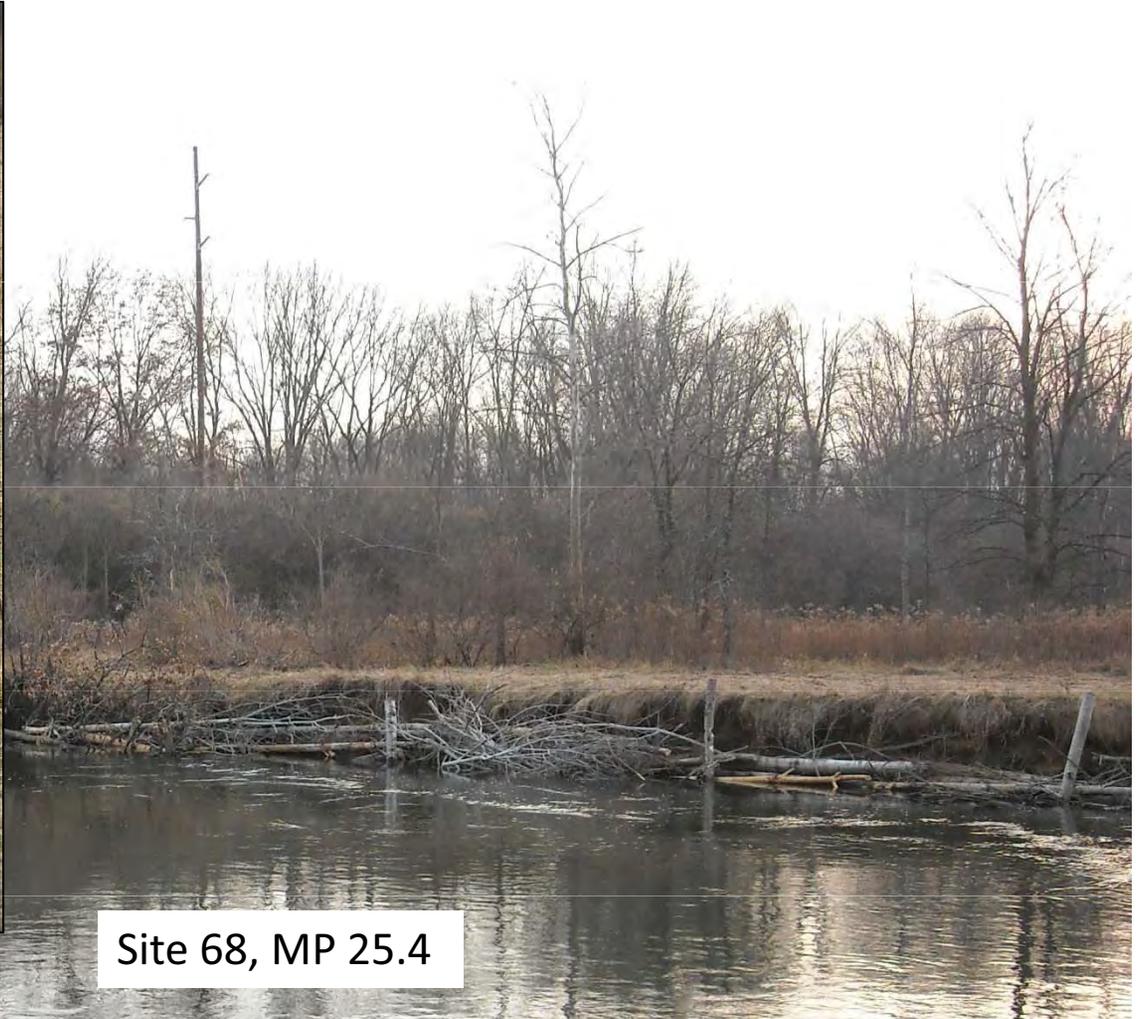
Site 45, MP 10.0

- Before Construction



Site 68, MP 25.4

- After Construction



Site 68, MP 25.4

Other Restoration Actions



Before