

PLUM CREEK STREAM RESTORATION PROJECT Cecil County, MD 100% Design Plans

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Location Map

STANDARD RESPONSIBILITY NOTES

I (We) certify that:

1.
 - a. All development and construction will be done in accordance with this sediment and erosion control plan, and further, authorize the right of entry for periodic on-site evaluation by the Cecil Soil Conservation or their authorized agents.
 - b. Any responsible personnel involved in the construction project will have a certificate of attendance from the Maryland Department of the Environment's approved training program for the control of sediment and erosion before beginning the project.
Responsible personnel on site: _____
2. The developer is responsible for the acquisition of all easements, right, and/or rights-of-way that may be required for the sediment and erosion control practices, stormwater management practices and the discharge of stormwater onto or across adjacent or downstream properties included in the plan.
3. For initial soil disturbance or re-disturbance, permanent and/or temporary stabilization per the MDE Details and Specifications for Vegetative Establishment shall be completed within three calendar days for the surface of all controls, dikes, swales, ditches, perimeter slopes and all slopes greater than 3 horizontal to 1 vertical (3:1); and seven days for all other disturbed or graded areas on the project site.
4. The grading and sediment control approval on this plan extend only to those areas within the limits of disturbance.
5. The approval of this plan for sediment and erosion control does not relieve the developer/consultant from complying with Federal, State or County requirements pertaining to environmental issues.
6. The developer must request that the sediment and erosion control inspector approve work completed in accordance with the approved erosion and sediment control plan, the grading or building permit, and the ordinance.
7. All material shall be taken to a site with an approved sediment and erosion control plan.
8. Approval of the sediment and erosion control inspector shall be required upon completion of the installation of erosion and sediment controls prior to proceeding with any other earth disturbance or grading. This will require first phase inspection. Other building or grading inspection approvals may not be authorized until the initial approval by the sediment and erosion control inspector is given.
9. Approval shall be requested on final stabilization of all sites before removal of sediment and erosion controls.
10. Existing topography must be field verified by responsible personnel to the satisfaction of the sediment control inspector prior to commencing work.

Signature of Developer/Owner _____ Date _____

Print: Name: _____
 Title: _____
 Affiliation: _____
 Address: _____
 Telephone Number: _____
 Email Address: _____

Owner's/Developer's Certification

I/We hereby certify that all clearing, grading, construction and/or development will be done pursuant to this plan and that any responsible personnel involved in the construction project will have a certification of training at a Maryland Department of the Environment approved training program for the control of sediment and erosion before beginning the project. I hereby authorize the right of entry for periodic on-site evaluation by the Cecil Soil Conservation District or their representatives and the State of Maryland, Department of the Environment, Compliance Inspectors.

I hereby certify that development and/or construction will be done according to this plan of development and plan of erosion and sediment control.

Owner/Developer Signature _____ Date _____

Printed Name and Title _____

Design Certification

I hereby certify that all sediment and erosion control measures shown on these plans have been designed in accordance with the 2011 MD Standards and Specifications for Soil Erosion and Sediment Control or current revisions thereof.

Designer's Signature _____ Date _____

Printed name _____ MD Registration No. _____
 P.E., R.L.S., or R.L.A. (circle one)

Professional Certification

I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland.
 License # _____ Expiration Date _____



Professional Certification
 I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 20945, Expiration Date: 2015-08-23.

Site Information:

Total Area of Facility	2958 Acres	Total Cut	4925 Cubic Yards
Total Area of Project Site	1.59 Acres	Total Fill	835 Cubic Yards
Area Disturbed	1.59 Acres	Off-site Waste / Borrow Area Location	None
		Spoil (4090 cubic yards) to be stockpiled on-site	
		and spread on the existing facility gravel roads	
		Stream Impacts	480 Linear Feet

1 OF 21



Know what's below.
Call before you dig.

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 20 WEST BALTIMORE STREET, GREENCASTLE, PENNSYLVANIA 17225
 (301) 791-9650 (301) 416-7478 (717) 997-1007 FAX (301) 739-4956

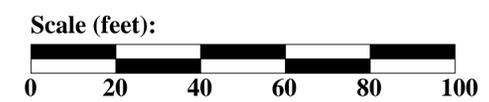
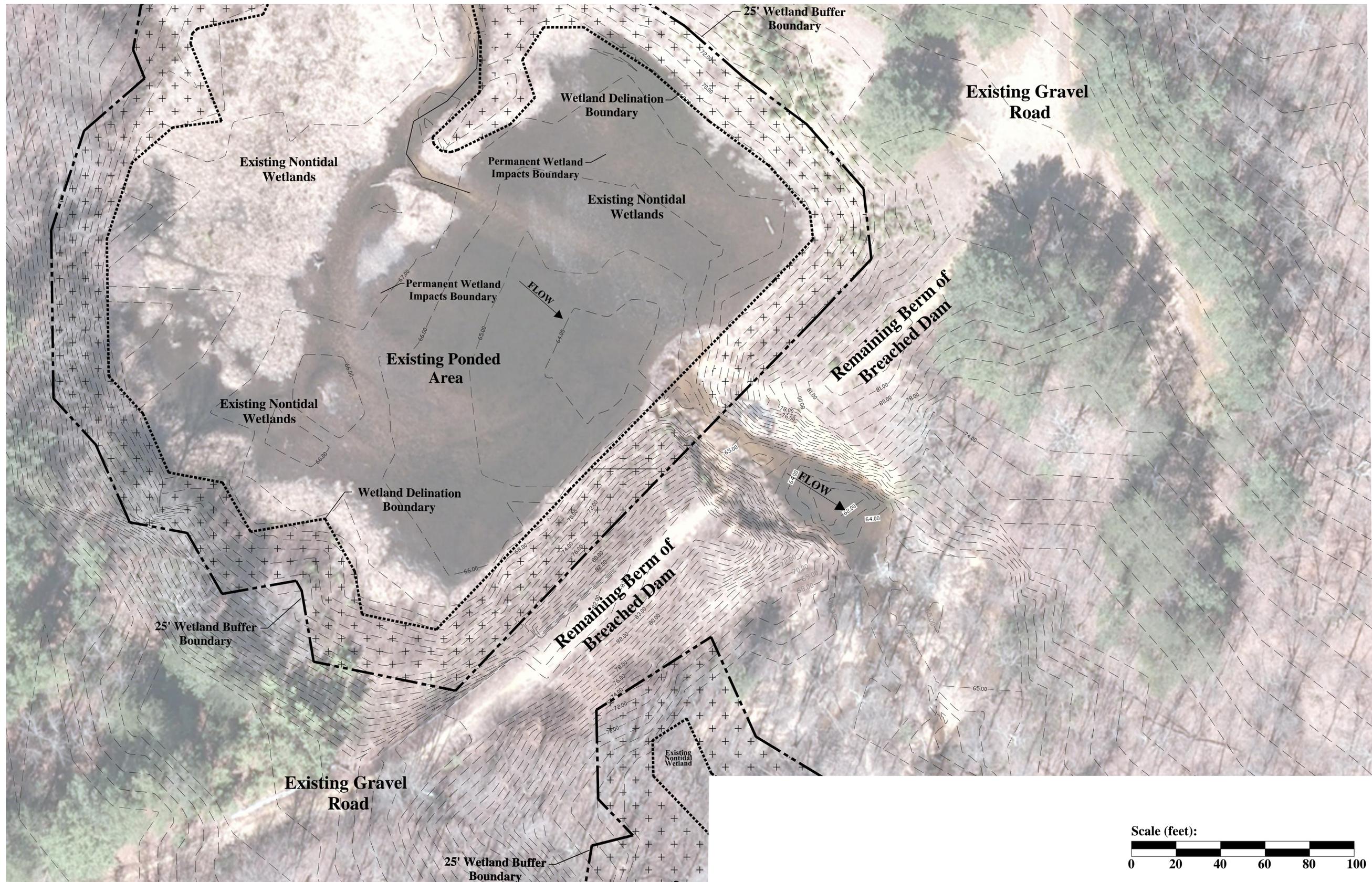
Prepared May 2015 as a Partnership Between:

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

FISH & WILDLIFE
SERVICE

Maryland Department of Natural Resources
 580 Taylor Ave.
 Annapolis, Maryland 21401
 Tel. 1-877-620-8367

U.S. Fish and Wildlife Service
 Chesapeake Bay Field Office
 Stream Habitat Assessment and Restoration Program
 177 Admiral Cochrane Drive
 Annapolis, MD 21401
 Tel. (410) 573-4518



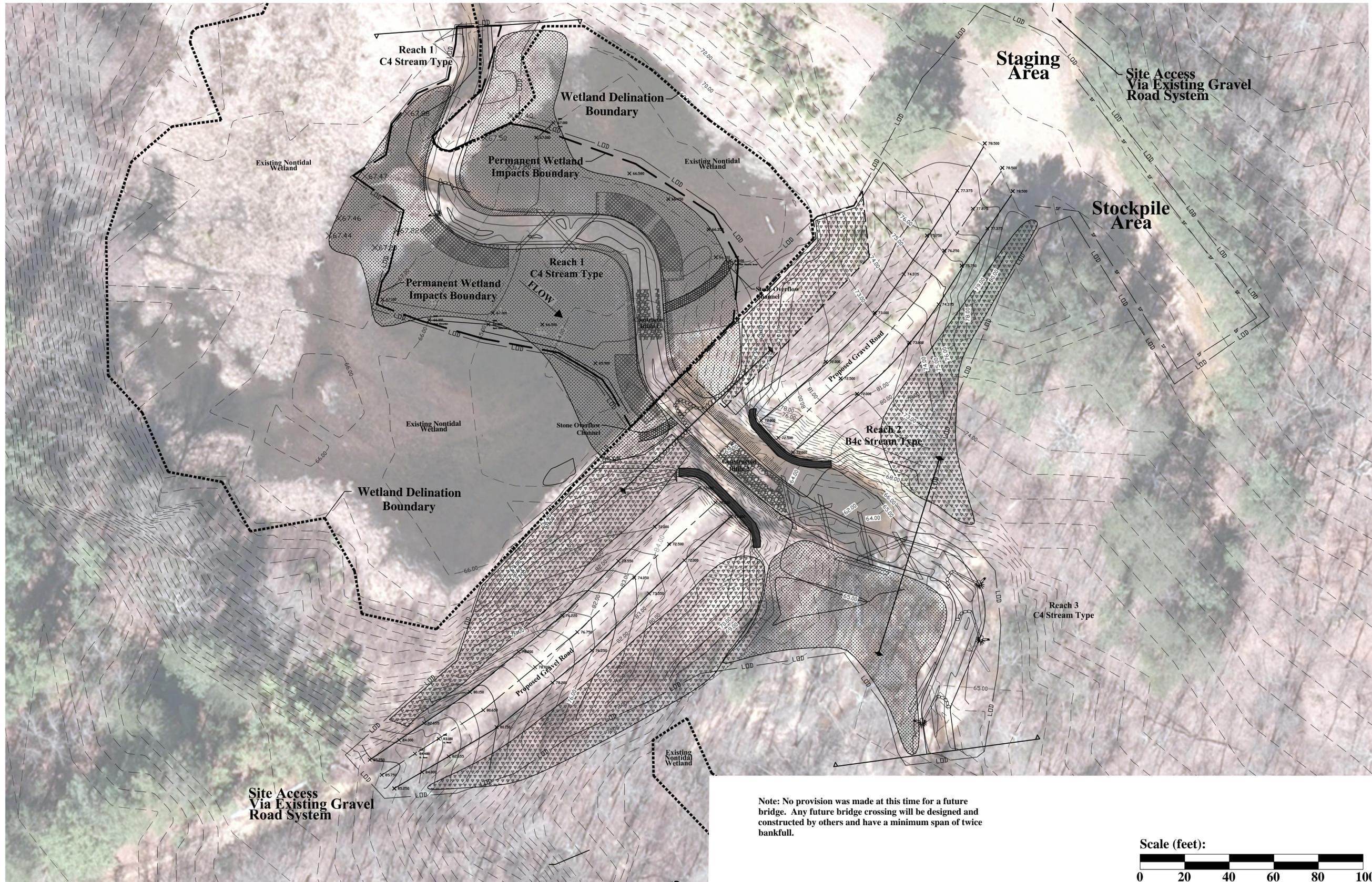
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 Expiration Date: 2015-08-23.



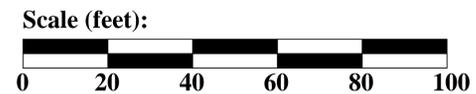
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 Chesapeake Bay Field Office
 Stream Habitat Assessment and Restoration Program
 177 Admiral Cochrane Drive
 Annapolis, Maryland 21401
 Tel. (410) 573-4581

REVISIONS		PLUM CREEK PROJECT CECIL COUNTY, MD	
DATE	BY	EXISTING CONDITIONS	
5/27/2015	MAS	PROJECT MANAGER: MAS	DRAFTING: MAS
		DESIGN: MAS	CHECKED BY: RRS
		DATE: 4/2/2014	SCALE: AS SHOWN

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EC-1



Note: No provision was made at this time for a future bridge. Any future bridge crossing will be designed and constructed by others and have a minimum span of twice bankfull.



Legend	
Proposed 1' Contour	—
Existing 1' Contour	- - -
Log Drop	
J-Hook	
Cross Vane	
Toe Wood	
Imbricated Rip-Rap Bridge Abutment	

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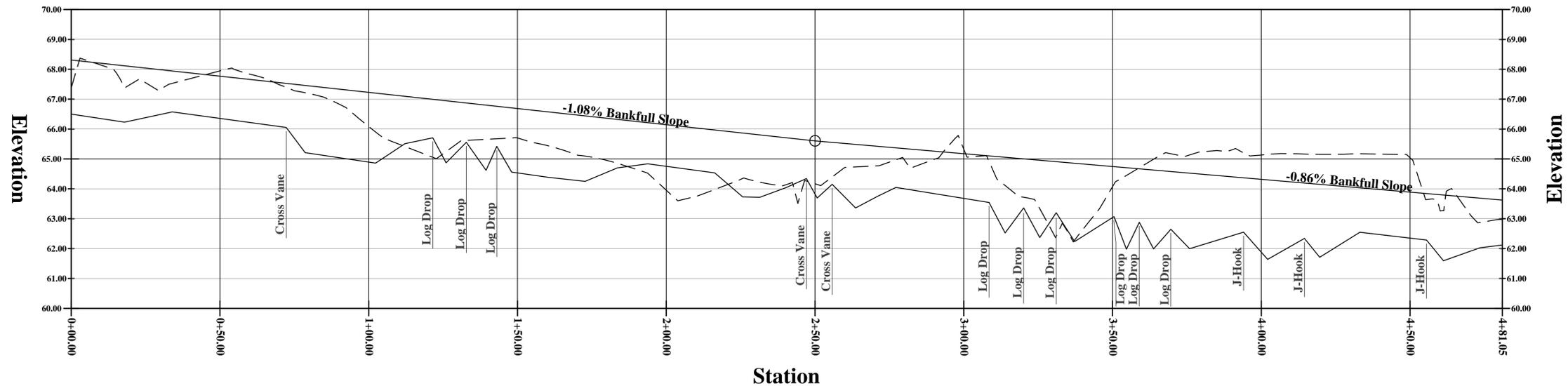


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Tel. (410) 573-4581

PLUM CREEK PROJECT CECIL COUNTY, MD			
PROPOSED CONDITIONS			
REVISIONS	DATE	BY	
	5/27/2015	MAS	
			PROJECT MANAGER: MAS
			DRAFTING: MAS
			DESIGN: MAS
			CHECKED BY: RRS
			DATE: 4/2/2014
			SCALE: AS SHOWN

SHEET
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PC-1

Profile View of Proposed Alignment



Plum Creek Longitudinal Profile Summary Data							
Station	Feature	Bed Elevation	Thalweg Offset		Bankfull Elevation	Bankfull Width Offset	
			Left	Right		Left	Right
0+00.0	Existing Pool	66.50	0.00	0.00	68.31	-6.50	6.50
0+18.0	Pool	66.23	0.00	0.00	68.12	-6.50	6.50
0+34.0	TR	66.57	0.00	0.00	67.94	-6.50	6.50
0+45.0	BR	66.42	0.00	0.00	67.83	-6.50	6.50
0+72.0	JH Log Structure	66.05	0.00	0.00	67.53	-6.50	6.50
0+78.7	Max D Pool	65.21	0.00	0.00	67.46	-7.00	6.50
0+90.0	Pool	65.04	0.00	0.00	67.34	-7.50	6.50
1+02.3	Max D Pool	64.86	0.00	0.00	67.21	-6.50	6.50
1+12.2	TR	65.51	0.00	0.00	67.10	-6.50	6.50
1+21.5	Log Drop Structure	65.70	0.00	0.00	67.00	-6.50	6.50
1+26.0	Max D Pool	64.87	0.00	0.00	66.95	-6.50	6.50
1+32.8	Log Drop Structure	65.55	0.00	0.00	66.88	-6.50	6.50
1+39.5	Max D Pool	64.62	0.00	0.00	66.80	-6.50	6.50
1+43.1	Log Drop Structure	65.42	0.00	0.00	66.77	-6.50	6.50
1+48.1	Pool	64.56	0.00	0.00	66.71	-6.50	6.50
1+60.5	Pool	64.38	0.00	0.00	66.58	-6.50	6.50
1+72.8	Max D Pool	64.25	0.00	0.00	66.45	-6.50	7.50
1+83.6	Btm Glide	64.70	0.00	0.00	66.31	-6.50	6.50
1+93.8	TR	64.84	0.00	0.00	66.22	-6.50	6.50
2+16.3	BR	64.53	0.00	0.00	65.97	-6.50	6.50
2+25.7	Max D Pool	63.73	0.00	0.00	65.87	-6.50	6.50
2+31.4	Pool	63.72	0.00	0.00	65.81	-6.50	6.50
2+40.1	Btm Pool	64.21	0.00	0.00	65.72	-6.50	6.50
2+47.1	Rock Cross Vane	64.34	0.00	0.00	65.64	-6.50	6.50
2+50.8	Plunge Pool	63.69	0.00	0.00	65.60	-6.50	6.50
2+55.8	Step	64.15	0.00	0.00	65.52	-6.50	6.50
2+63.6	Max D Pool	63.36	0.00	0.00	65.49	-6.50	6.50
2+77.2	TR	64.08	0.00	0.00	65.46	-6.50	6.50
3+08.5	Log Drop Structure	63.54	0.00	0.00	65.10	-6.50	6.50
3+13.9	Max D Pool	62.52	0.00	0.00	65.05	-6.50	6.50
3+20.1	Log Drop Structure	63.36	0.00	0.00	65.00	-6.50	6.50
3+25.6	Max D Pool	62.37	0.00	0.00	64.95	-6.50	6.50
3+31.1	Log Drop Structure	63.20	0.00	0.00	64.91	-6.50	6.50
3+37.3	Max D Pool	62.24	0.00	0.00	64.85	-6.50	6.50
3+50.5	Log Drop Structure	63.07	0.00	0.00	64.74	-6.50	6.50
3+54.7	Max D Pool	61.98	0.00	0.00	64.70	-6.50	6.50
3+59.0	Log Drop Structure	62.88	0.00	0.00	64.67	-6.50	6.50
3+63.8	Max D Pool	61.99	0.00	0.00	64.62	-6.50	6.50
3+69.6	Log Drop Structure	62.65	0.00	0.00	64.57	-6.50	6.50
3+75.9	Max D Pool	62.00	0.00	0.00	64.52	-6.50	6.50
3+85.0	Pool	62.29	0.00	0.00	64.44	-6.50	6.50
3+94.0	JH Log Structure	62.55	0.00	0.00	64.36	-6.50	6.50
4+02.1	Max D Pool	61.64	0.00	0.00	64.29	-6.50	6.50
4+14.5	JH Log Structure	62.34	0.00	0.00	64.19	-6.50	6.50
4+19.7	Max D Pool	61.71	0.00	0.00	64.14	-6.50	6.50
4+33.2	TR	62.55	0.00	0.00	64.03	-6.50	6.50
4+55.5	CV Log Structure	62.29	0.00	0.00	63.84	-6.50	6.50
4+61.2	Max D Pool	61.59	0.00	0.00	63.79	-6.50	6.50
4+73.5	Btm Pool	62.03	0.00	0.00	63.68	-6.50	6.50
4+81.1	Existing TR	62.12	0.00	0.00	63.63	-6.50	6.50

Scale:
 Horz: 1"=20'
 Vert: 1"=2'
 Proposed ———
 Existing - - - - -

SEQUENCE OF CONSTRUCTION

- CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BEGIN UNTIL ALL REQUIRED PERMITS ARE OBTAINED AND PRECONSTRUCTION MEETING IS HELD ON SITE.
- NOTIFY MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) AT (410) 537-3510 TWO WEEKS PRIOR TO CONSTRUCTION TO REQUEST A PRE-CONSTRUCTION MEETING.
- NOTIFY THE PROJECT INSPECTOR (P.I.) MARK SECRIST AT (410) 573-4551 AT LEAST FIVE DAYS
- STAKE OUT ACCESS ROADS, STOCKPILE AND STAGING AREAS, AND LIMITS OF GRADING
- STAKE OUT PROPOSED STREAM CENTERLINE AND IN-STREAM STRUCTURE LOCATIONS
- P.I. WILL IDENTIFY INDIVIDUAL TREES AND/OR VEGETATION AREAS FOR PRESERVATION. CONTRACTOR SHALL PLACE ORANGE SAFETY FENCE AROUND THE PRESERVATION AREAS. NO REMOVAL OF VEGETATION WITHIN THE PRESERVATION AREAS SHALL TAKE PLACE
- INSTALL STABILIZED CONSTRUCTION ENTRANCE. LOAD PROTECTION MATS SHALL BE USED TO PROTECT EXISTING DRIVEWAYS AS NEEDED. ANY DAMAGE SHALL BE REPAIRED
- CONTRACTOR SHALL MAINTAIN A RECORD OF DATES WHEN MAJOR GRADING ACTIVITIES OCCUR, WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE, AND WHEN STABILIZATION MEASURES ARE INITIATED.
- INSTALL EROSION AND SEDIMENT CONTROL MEASURES AND GET INSPECTOR'S APPROVAL
- WITH THE APPROVAL OF THE P.I., CLEAR AND GRUB THE WORK AREAS AND BEGIN CONSTRUCTION. CLEARING AND GRUBBING SHALL BE LIMITED TO THE MINIMUM REQUIRED TO PROVIDE CONSTRUCTION ACCESS AND TO ACCOMPLISH GRADING. VEGETATION THAT IS SCARRED, NICKED, OR OTHERWISE DAMAGED SHALL BE PRUNED OR REPLACED
- CONTRACTOR SHALL BE PREPARED TO QUICKLY REMOVE CONSTRUCTION AND PUMP AROUND EQUIPMENT AND TO SECURE WORK AREA IN THE EVENT OF RAINFALL. FOLLOWING FLOW EVENT, CONTRACTOR, SHALL REESTABLISH PUMP AROUND AND DEWATER WORK AREA BEFORE RECOMMENCING WORK.
- THE CONTRACTOR SHALL PROVIDE A SET OF PLANS TO THE P.I. CLEARLY SHOWING
- REFER TO THE PROJECT SPECIFICATIONS FOR CONSTRUCTION DETAILS AND PAYMENT

PHASE 1:

- INSTALL EROSION AND SEDIMENT CONTROL MEASURES AND GET INSPECTOR'S APPROVAL PRIOR TO WORK.
- CLEAR AND GRUB THE NORTHEAST (DOWNSTREAM LEFT) SIDE OF BERM OF THE BREACHED DAM.
- CLEARING AND GRUBBING SHALL BE LIMITED TO THE MINIMUM REQUIRED TO PROVIDE CONSTRUCTION ACCESS AND TO ACCOMPLISH GRADING. VEGETATION THAT IS SCARRED, NICKED, OR OTHERWISE DAMAGED SHALL BE PRUNED OR REPLACED.
- CUT THE NORTHEAST SIDE OF THE BERM TO PROPOSED ELEVATION.
- INSTALL PUMP AROUND PRACTICE UPSTREAM OF THE BERM. AREA. INSTALL DIKE DOWNSTREAM END THE BERM AND INSTALL CLEAN WATER PUMPS. DISCHARGE CLEAN WATER INTO THE STREAM, DOWNSTREAM OF THE DIKE AND ONTO A STABLE VELOCITY DISSIPATOR MADE OF RIPRAP OR SANDBAGS.
- PUMP WATER FROM THE WORK AREA TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN OR SEDIMENT BAG. THE MEASURE SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM DIKE.
- INSTALL TEMPORARY ACCESS CULVERT (DETAIL ON SHEET 14) IN PLUM CREEK TO GAIN ACCESS TO THE SOUTHWEST SIDE OF THE PROJECT AREA.
- CLEAR AND GRUB THE SOUTHWEST (DOWNSTREAM RIGHT) SIDE OF BERM OF THE BREACHED DAM.
- CUT THE SOUTHWEST SIDE OF THE BERM TO PROPOSED ELEVATION.
- ALL GRADING MUST BE STABILIZED AT THE END OF EACH WORK DAY WITH SEED AND MULCH OR SEED AND MATTING AS SPECIFIED ON THE PLANS.
- STOCKPILE EXCESS MATERIAL FROM BERM IN STOCKPILE AREA AT THE NORTHEAST CORNER OF THE PROJECT AREA. MD DNR FORESTRY WILL USE THE EXCESS MATERIAL FOR ROAD MAINTENANCE AND MAY TAILGATE SOME OF THE MATERIAL DURING CONSTRUCTION ON EXISTING ROADS IN THE STATE FOREST.

Phase 2-4 shown on Sheet 5

Professional Certification
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 License No. 20945.
 Expiration Date: 2015-08-23.



U.S. Fish & Wildlife Service
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 177 Admiral Cochrane Drive
 Annapolis, Maryland 21401
 Tel. (410) 573-4581

REVISIONS		DATE		BY	

PLUM CREEK PROJECT CECIL COUNTY, MD			
PROPOSED PROFILE			
PROJECT MANAGER: MAS	DRAFTING: MAS	DESIGN: MAS	CHECKED BY: BRS
DATE: 4/2/2014	SCALE: AS SHOWN		

SHEET
4 OF 21
PR-1

Plum Creek Cross Vane Structure Table																															
Structure	Vane Data						A - Cross Over						B - Plunge Pool		C - Crest Second Crossover			D - Second Crossover Tie-in						E - Max. Pool and Vane Tie-in							
	Left Vane			Right Vane			Centerline			AL - Left End Cross Over		AR - Right End Cross Over		Centerline		Centerline			DL - Second Crossover Tie-in			DR - Second Crossover Tie-in			Max. Pool Centerline			Left Bank Tie-in		Right Bank Tie-in	
	Length VL	Pitch	Angle from Bank	Length VR	Pitch	Angle from Bank	Station	Offset	Elevation	Offset	Elevation	Offset	Elevation	Station	Elevation	Station	Offset	Elevation	Station	Offset	Elevation	Station	Offset	Elevation	Station	Offset	Elevation	Offset	Elevation	Offset	Elevation
Cross Vane 1	24.00	4.6%	25.00	24.00	4.6%	25.00	2+47.0	0.00	64.34	-2.00	64.34	2.00	64.34	2+50.75	63.70	2+53.00	0.00	64.15	2+67.00	-3.00	64.18	2+53.00	3.00	64.18	2+63.65	0.00	63.12	-6.50	64.99	6.50	64.99

Plum Creek J-Hook Structure Table																												
Structure	Vane Data				A - J-Hook Invert			AL - Left End Cross Over			AR - Right End Cross Over			C - Plunge Pool		E - End Crossover						Maximum Pool		End Vane Bank Tie-in				
	Side	Pitch	Length	Angle From Bank	Station	Offset	Elevation	Station	Offset	Elevation	Station	Offset	Elevation	Station	Elevation	Centerline		EL - Left Station		ER - Right Station		Centerline		Station	Offset	Elevation		
																	Station	Elevation	Station	Offset	Elevation	Station	Offset	Elevation	Station	Offset	Elevation	
J-Hook 1	Left	4.6%	24.00	25.00	0+72.0	0.00	66.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0+76.5	-0+06.5	66.45	n/a	n/a	n/a	0+78.7	65.21	0+84.8	6.50	66.70
J-Hook 2	Left	4.6%	24.00	25.00	3+94.0	0.00	62.55	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3+99.0	6.50	62.95	4+02.1	61.64	4+05.0	-6.50	63.20
J-Hook 3	Left	4.6%	24.00	25.00	4+14.5	0.00	62.34	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4+20.0	0+06.5	62.74	4+19.7	61.71	4+25.3	-6.50	62.99
J-Hook 4	Left	4.6%	24.00	25.00	4+55.0	0.00	62.29	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4+59.7	-0+06.5	62.69	n/a	n/a	n/a	4+19.7	61.71	4+69.0	6.50	62.94

Plum Creek Log Drop Structure Table										
Structure	Structure Data				A - Start Log Bank Tie-in			B - End Log Bank Tie-in		
	High Side	Pitch	Log Length	Angle From Bank	Station	Offset	Elevation	Station	Offset	Elevation
	Log Drop 1									
Log 1	Left	2.0%	24.00	45	1+20.5	6.50	65.70	1+33.3	-6.50	66.07
Log 2	Right	2.0%	24.00	45	1+30.6	-6.50	65.55	1+41.5	6.50	65.92
Log 3	Left	2.0%	24.00	45	1+40.5	6.50	65.42	1+53.6	-6.50	65.79
Log Drop 2										
Log 1	Right	2.0%	24.00	45	3+07.8	-6.50	63.54	3+21.3	6.50	63.91
Log 2	Left	2.0%	24.00	45	3+17.6	6.50	63.49	3+30.6	-6.50	63.86
Log 3	Right	2.0%	24.00	45	3+28.5	-6.50	63.33	3+39.8	6.50	63.70
Log Drop 3										
Log 1	Left	2.0%	24.00	45	3+49.8	-6.50	63.07	3+58.2	6.50	63.44
Log 2	Right	2.0%	24.00	45	3+55.9	6.50	62.88	3+70.3	-6.50	63.25
Log 3	Left	2.0%	24.00	45	3+67.3	-6.50	62.65	3+80.4	6.50	63.02

Plum Creek Toe Wood Structure Table								
Structure	Structure Data							
	Station / Start	Station / End	Side	Length	Top Elevation	Bottom Elevation	Offset / Front	Offset / Back
Structure 1	0+90.00	1+15.00	Right	25.00	66.7	64.25	5.5	15.50
Structure 2	1+53.00	1+91.00	Left	38.00	65.7	64.00	-5.5	-15.50
Structure 3	2+22.00	2+46.00	Right	24.00	65.1	63.75	5.5	15.50

Plum Creek Soil Lift Table				
Structure	Structure Data			
	Station / Start	Station / End	Side	Length
Structure 1	0+29.00	0+75.00	Right	46.00
Structure 2	0+69.00	1+27.00	Left	58.00
Structure 3	1+46.00	2+22.00	Right	76.00
Structure 4	1+91.00	3+03.00	Left	112.00
Structure 5	2+62.00	3+14.00	Left	52.00

PHASE 2: 3+45 - 4+81

- INSTALL EROSION AND SEDIMENT CONTROL MEASURES AND GET INSPECTOR'S APPROVAL PRIOR TO WORK.
- INSTALL PUMP AROUND PRACTICE AT THE UPSTREAM LIMIT OF THE PHASE 2 WORK AREA. INSTALL DIKE AT DOWNSTREAM END OF THE PHASE 2 WORK AREA. INSTALL CLEAN WATER PUMPS. DISCHARGE CLEAN WATER INTO THE STREAM, DOWNSTREAM OF THE DIKE AND ONTO A STABLE VELOCITY DISSIPATOR MADE OF RIPRAP OR SANDBAGS.
- PUMP WATER FROM THE WORK AREA TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN OR SEDIMENT BAG. THE MEASURE SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM DIKE.
- CLEAR AND GRUB PHASE 2.
- CLEARING AND GRUBBING SHALL BE LIMITED TO THE MINIMUM REQUIRED TO PROVIDE CONSTRUCTION ACCESS AND TO ACCOMPLISH GRADING. VEGETATION THAT IS SCARRED, NICKED, OR OTHERWISE DAMAGED SHALL BE PRUNED OR REPLACED.
- START AT THE DOWNSTREAM END AND PROGRESS UPSTREAM PERFORMING GRADING AND INSTALLATION OF IN-STREAM STRUCTURES AS SHOWN ON THE PLANS AND DETAILS.
- ALL GRADING MUST BE STABILIZED AT THE END OF EACH WORK DAY WITH SEED AND MULCH OR SEED AND MATTING AS SPECIFIED ON THE PLANS.
- AFTER THE PHASE IS COMPLETED AND STABILIZED, REMOVE THE CLEAN WATER DIKE.

PHASE 3: 0+00 - 2+50

- INSTALL EROSION AND SEDIMENT CONTROL MEASURES AND GET INSPECTOR'S APPROVAL PRIOR TO WORK.
- INSTALL PUMP AROUND PRACTICE AT THE UPSTREAM LIMIT OF PHASE 3 WORK AREA. INSTALL DIKE AT DOWNSTREAM END OF THE PHASE 3 WORK AREA. INSTALL CLEAN WATER PUMPS. DISCHARGE CLEAN WATER INTO THE STREAM, DOWNSTREAM OF THE DIKE AND ONTO A STABLE VELOCITY DISSIPATOR MADE OF RIPRAP OR SANDBAGS.
- PUMP WATER FROM THE WORK AREA TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN OR SEDIMENT BAG. THE MEASURE SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM DIKE.
- PROGRESS UPSTREAM FROM 2+50 STRIPPING THE TOP 6-8" OF ORGANIC MATERIAL ON THE EXISTING POND BOTTOM IN THE AREA THAT WILL BE FILLED AS PART OF THE PROPOSED GRADING. DO NOT DISTURB EXISTING POND BOTTOM OUTSIDE OF PROPOSED GRADING AREAS.
- ROUGH GRADE THE BANKFULL BENCH/FLOODPLAIN ON BOTH SIDES OF THE CHANNEL TO AN ELEVATION 6" BELOW FINAL GRADE USING MATERIAL REMOVED FROM THE BERMS. THIS AREA WILL BE BROUGHT UPTO FINAL GRADE USING THE ORGANIC MATTER REMOVED FROM THE EXISTING POND BOTTOM.
- START AT THE UPSTREAM END (0+00) AND PROGRESS DOWNSTREAM PERFORMING GRADING AND INSTALLATION OF IN-STREAM STRUCTURES AS SHOWN ON THE PLANS AND DETAILS.
- ALL GRADING MUST BE STABILIZED AT THE END OF EACH WORK DAY WITH SEED AND MULCH OR SEED AND MATTING AS SPECIFIED ON THE PLANS.
- AFTER THE PHASE IS COMPLETED AND STABILIZED, REMOVE THE CLEAN WATER DIKE.

PHASE 4: 2+50 - 3+45

- INSTALL EROSION AND SEDIMENT CONTROL MEASURES AND GET INSPECTOR'S APPROVAL PRIOR TO WORK.
- INSTALL PUMP AROUND PRACTICE AT THE UPSTREAM LIMIT OF THE PHASE 4. INSTALL DIKE AT DOWNSTREAM END OF THE PHASE 4 WORK AREA. INSTALL CLEAN WATER PUMPS. DISCHARGE CLEAN WATER INTO THE STREAM, DOWNSTREAM OF THE DIKE AND ONTO A STABLE VELOCITY DISSIPATOR MADE OF RIPRAP OR SANDBAGS.
- PUMP WATER FROM THE WORK AREA TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN OR SEDIMENT BAG. THE MEASURE SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM DIKE.
- FINISH GRADE THE BERM ON THE SOUTHWEST SIDE OF PLUM CREEK.
- INSTALL ROCK WALL ABUTMENT ON SOUTHWEST SIDE OF PLUM CREEK.
- START AT THE DOWNSTREAM END AND PROGRESS UPSTREAM PERFORMING GRADING AND INSTALLATION OF IN-STREAM STRUCTURES AS SHOWN ON THE PLANS AND DETAILS.
- INSTALL ROCK WALL ABUTMENT ON NORTHEAST SIDE OF PLUM CREEK.
- FINISH GRADE THE BERM ON THE NORTHEAST SIDE OF PLUM CREEK.

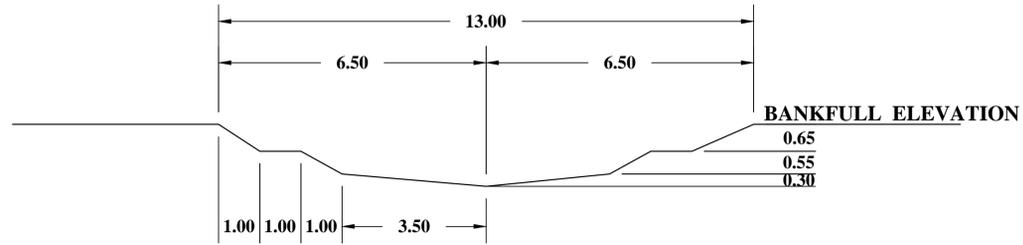
DEMobilization

- AFTER PERMANENT STABILIZATION, COMPLETE FINAL SITE GRADING. REPAIR ANY AREAS DAMAGED DURING CONSTRUCTION ACTIVITIES.
- UPON PERMANENT STABILIZATION OF PROJECT AREAS AND WITH PERMISSION FROM INSPECTIONS AND PERMITS, REMOVE SEDIMENT AND EROSION CONTROL MEASURES.

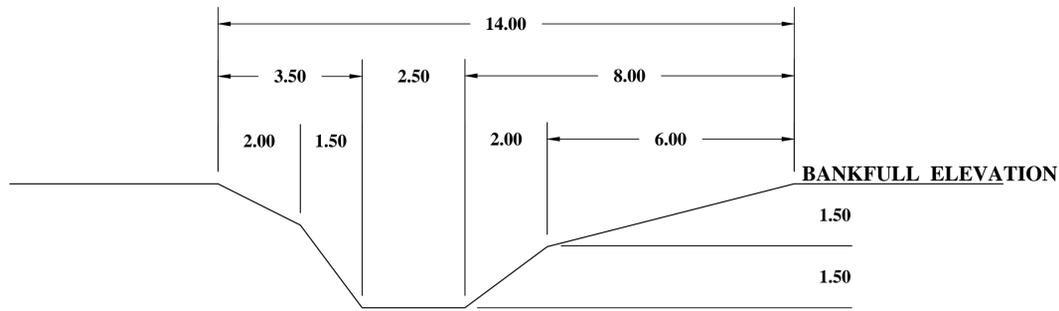
CONSTRUCTION SCHEDULE (WEEKS 1 - 3)												
TASK	WEEK 1	WEEK 2	WEEK 3									
MOBILIZATION AND SITE PREPARATIONS	X	X	X									
ESC AND DIVERSION INSTALLATION		X	X									
CLEARING / GRUBBING			X	X	X	X	X	X	X	X	X	X
EXCAVATION OF BERM				X	X	X	X	X	X	X	X	X
CHANNEL GRADING								X	X	X	X	X
STRUCTURE INSTALLATION									X	X	X	X

CONSTRUCTION SCHEDULE (WEEKS 4 - 6)												
TASK	WEEK 4	WEEK 5	WEEK 6									
CHANNEL GRADING		X	X	X	X	X	X	X	X	X	X	X
STRUCTURE INSTALLATION		X	X	X	X	X	X	X	X	X	X	X
FINAL GRADING AND SITE CLEAN-UP									X	X	X	X
DEMobilization										X	X	X
PLANT RIPARIAN TREES AND SHRUBS (TBD)										X	X	X
FINAL INSPECTION											X	X

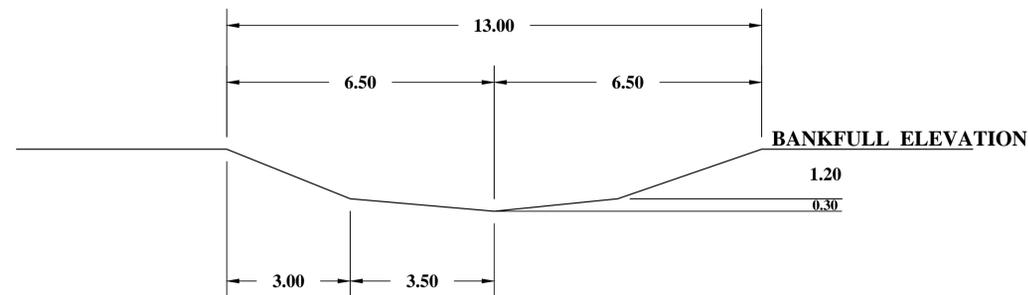
Professional Certification I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 20945 Expiration Date: 2015-08-23.			U.S. Fish & Wildlife Service Chesapeake Bay Field Office Stream Habitat Assessment and Restoration Program 177 Admiral Cochrane Drive Annapolis, Maryland 21401 Tel. (410) 573-4581	PLUM CREEK PROJECT CECIL COUNTY, MD		SHEET 5 OF 21 SD-1
				STANDARD DETAILS		
				REVISIONS DATE BY	PROJECT MANAGER: MAS DRAFTING: MAS DESIGN: MAS CHECKED BY: RRS DATE: 4/2/2014 SCALE: AS SHOWN	



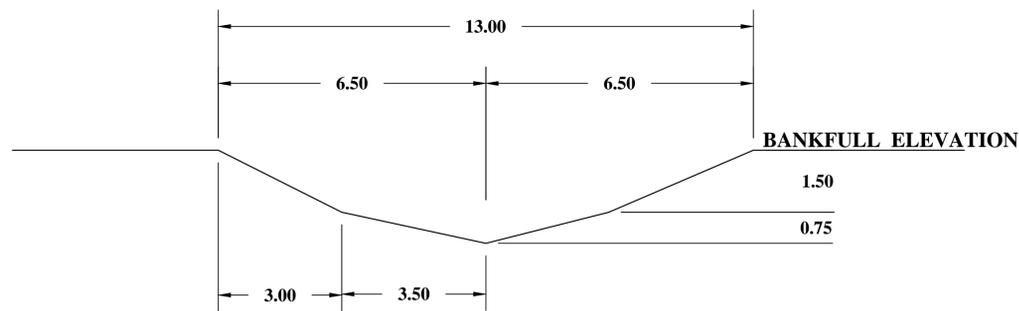
C4 TYPICAL RIFFLE X/S
 Reach 1 0+00 - 2+50
 Reach 3 3+75 - 4+81
 Bankfull Area = 12.75 sq. ft.



C4 TYPICAL POOL X/S
 Reach 1 0+00 - 2+50
 Reach 3 3+75 - 4+81
 Bankfull Area = 18.50 sq. ft.



B4c TYPICAL RIFFLE X/S
 Reach 2 2+50 - 3+75
 Bankfull Area = 12.75 sq. ft.



B4c TYPICAL POOL X/S
 Reach 2 2+50 - 3+75
 Bankfull Area = 26.75 sq. ft.

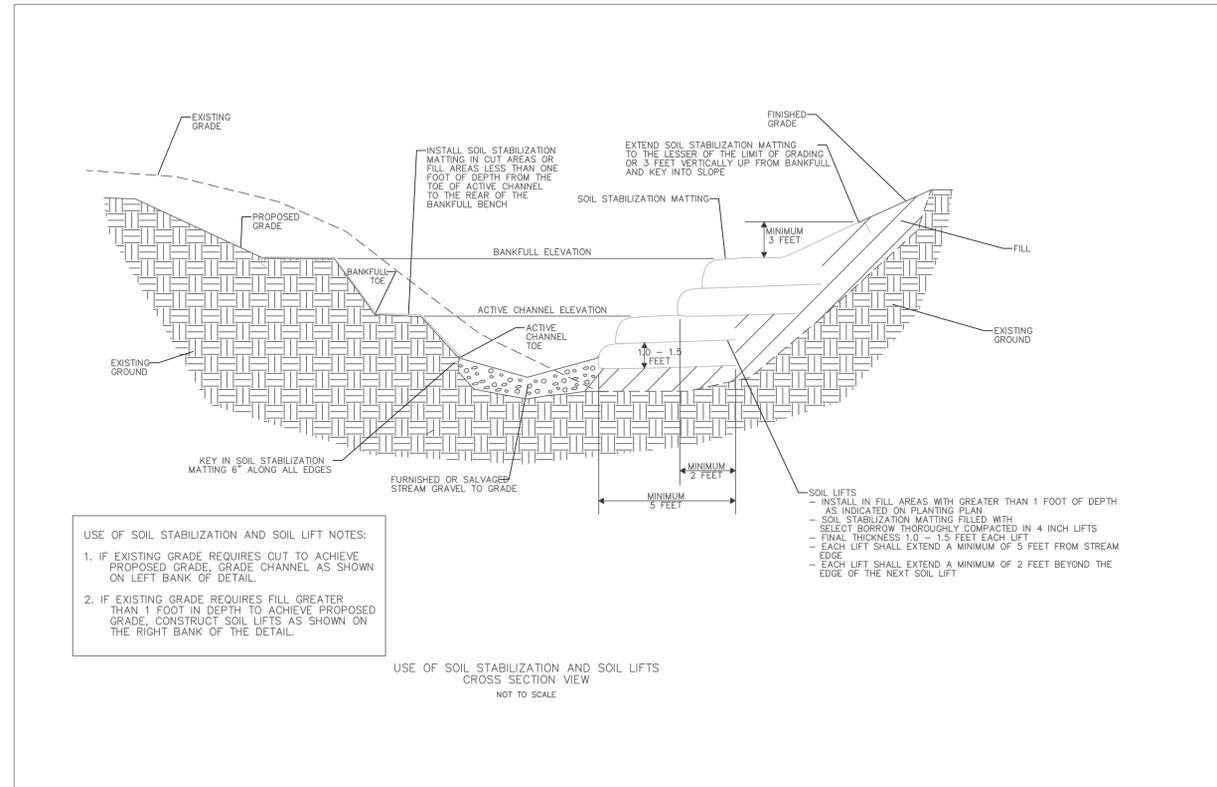


Table 1: Design Criteria for C and B stream types

Parameter	Common Design Ratios			
	MIN	MAX	MIN	MAX
Stream Type (Rosgen)	C4		B4c	
Bankfull Mean Velocity, Vb _{kf} (ft/s)	3.5	5.0	4.0	6.0
Width to Depth Ratio, W/D (ft/ft)	10.0	15.0	12.0	18.0
Riffle Max Depth Ratio, D _{max} /D _{b_{kf}}	1.2	1.5	1.2	1.4
Bank Height Ratio, D _{tob} /D _{max} (ft/ft)	1.0	1.1	1.0	1.1
Meander Length Ratio, L _m /W _{b_{kf}}	7.0	14.0	N/a	N/a
R _c Ratio, R _c /W _{b_{kf}}	2.0	3.0	N/a	N/a
Meander Width Ratio, W _{b_{lt}} /W _{b_{kf}}	3.5	8.0	N/a	N/a
Sinuosity, K	1.20	1.40	1.1	1.3
Valley Slope, S _{val} (ft/ft)	0.0050	0.0150	0.005	0.015
Riffle Slope Ratio, S _{r_{if}} /S _{chan}	1.2	1.5	1.1	1.8
Run Slope Ratio, S _{r_{un}} /S _{r_{if}}	0.50	0.80	N/a	N/a
Glide Slope Ratio, S _{g_{lide}} /S _{chan}	0.30	0.50	0.3	0.5
Pool Slope Ratio, S _{p_{ool}} /S _{chan}	0.00	0.20	0.0	0.4
Pool Max Depth Ratio, D _{max_{pool}} /D _{b_{kf}}	1.5	3.5	2.0	3.5
Pool Width Ratio, W _{p_{ool}} /W _{b_{kf}}	1.2	1.7	1.1	1.5
Pool-Pool Spacing Ratio, L _{p_s} /W _{b_{kf}}	3.5	7.0	1.5	6.0

Source: Combination of Rosgen, Harman, and USFWS-CBFO data

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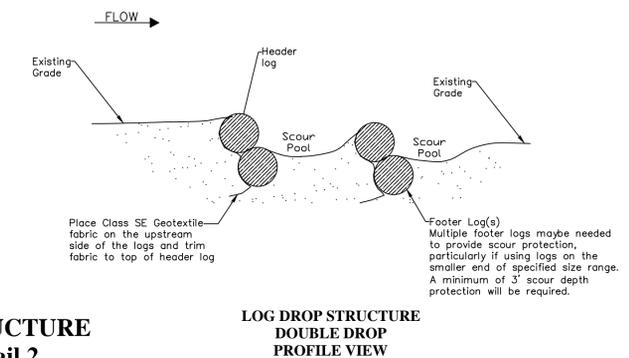
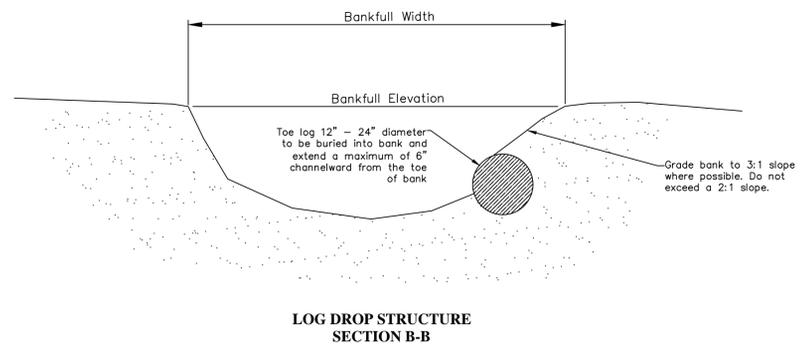
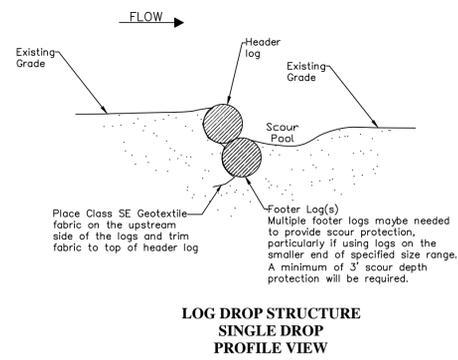
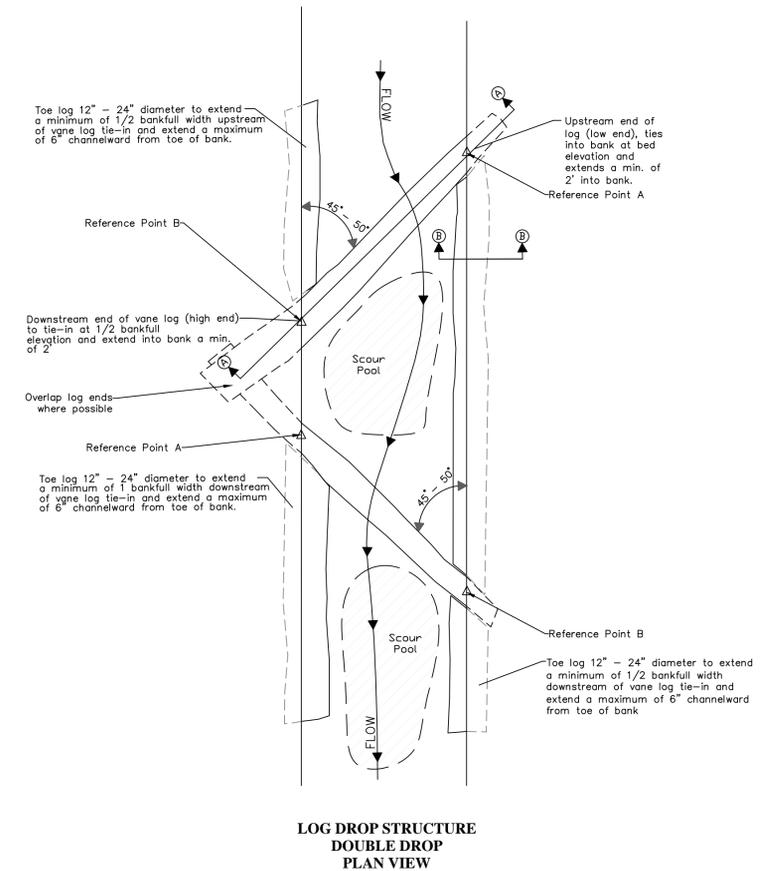
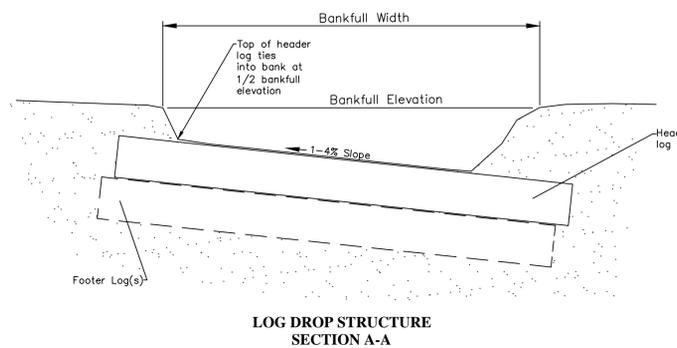
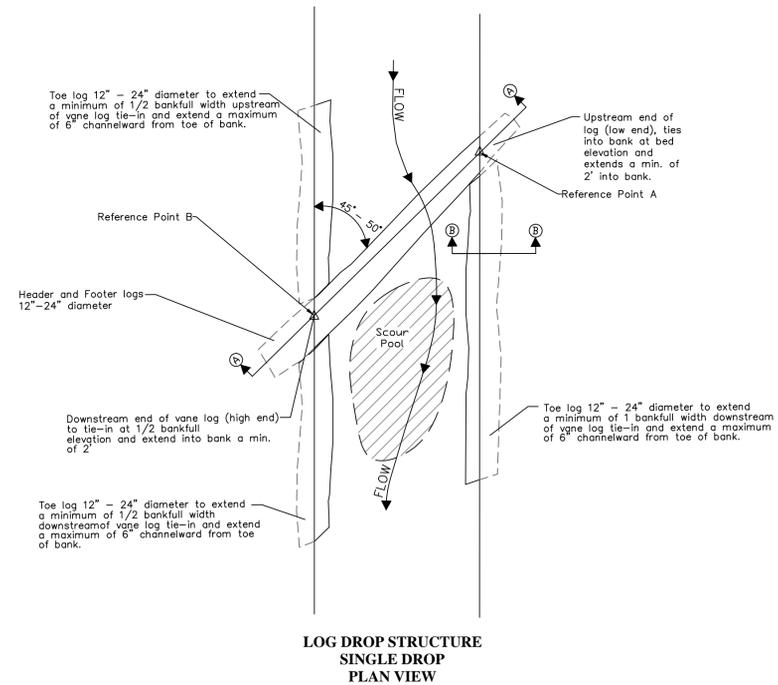
U.S. Fish & Wildlife Service
 Chesapeake Bay Field Office
 Stream Habitat Assessment and
 Restoration Program
 177 Admiral Cochrane Drive
 Annapolis, Maryland 21401
 Tel. (410) 573-4581

REVISIONS		DATE		BY	

**PLUM CREEK PROJECT
 CECIL COUNTY, MD**

**PROPOSED
 DESIGN RATIOS**

PROJECT MANAGER: MAS	DRAFTING: MAS
DESIGN: MAS	CHECKED BY: RRS
DATE: 4/2/2014	SCALE: AS SHOWN



**LOG DROP STRUCTURE
Standard Detail 1
Not to Scale**

**LOG DROP STRUCTURE
Standard Detail 2
Not to Scale**

**LOG DROP STRUCTURE
DOUBLE DROP
PROFILE VIEW**

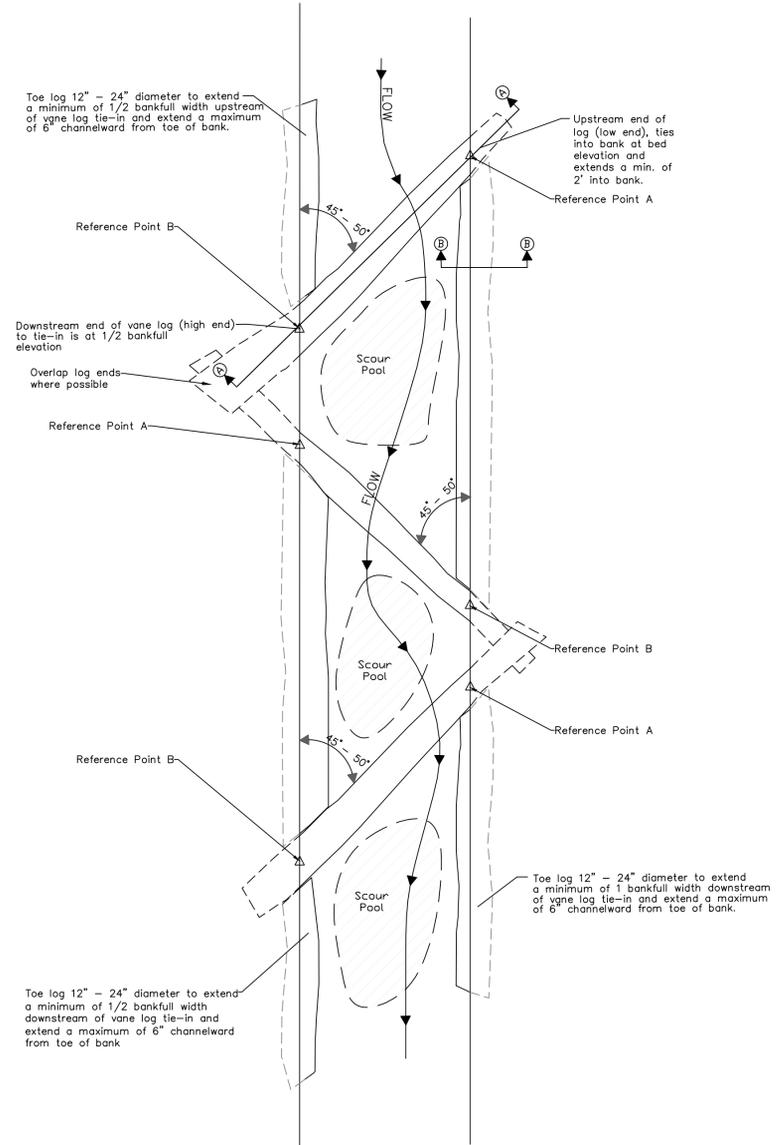
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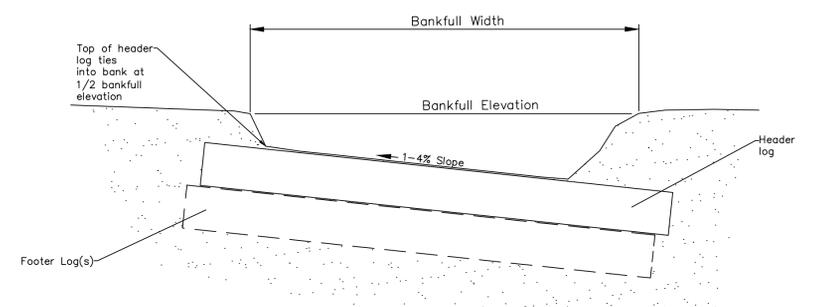
REVISIONS		DATE		BY	

PROJECT MANAGER: MAS	DRAFTING: MAS
DESIGN: MAS	CHECKED BY: RRS
DATE: 4/2/2014	SCALE: AS SHOWN

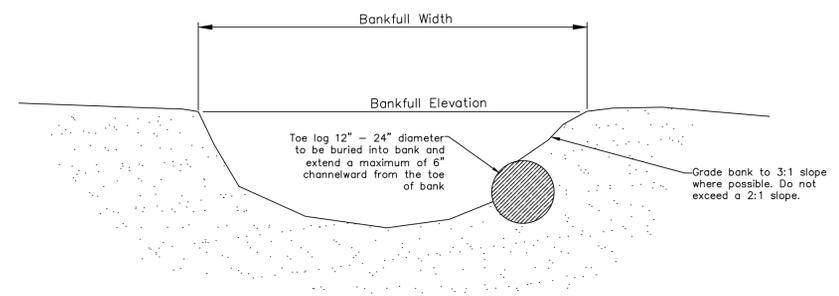


**LOG DROP STRUCTURE
TRIPLE DROP
PLAN VIEW**

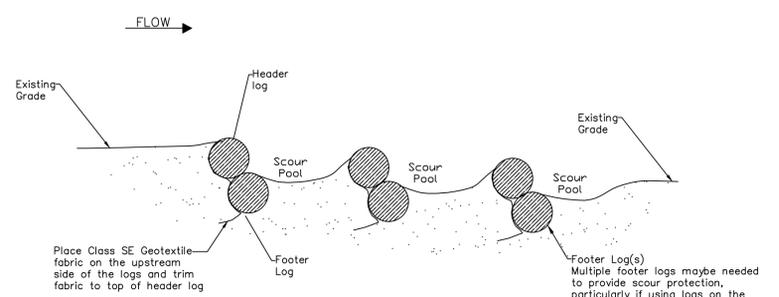
**LOG DROP STRUCTURE
Standard Detail 3
Not to Scale**



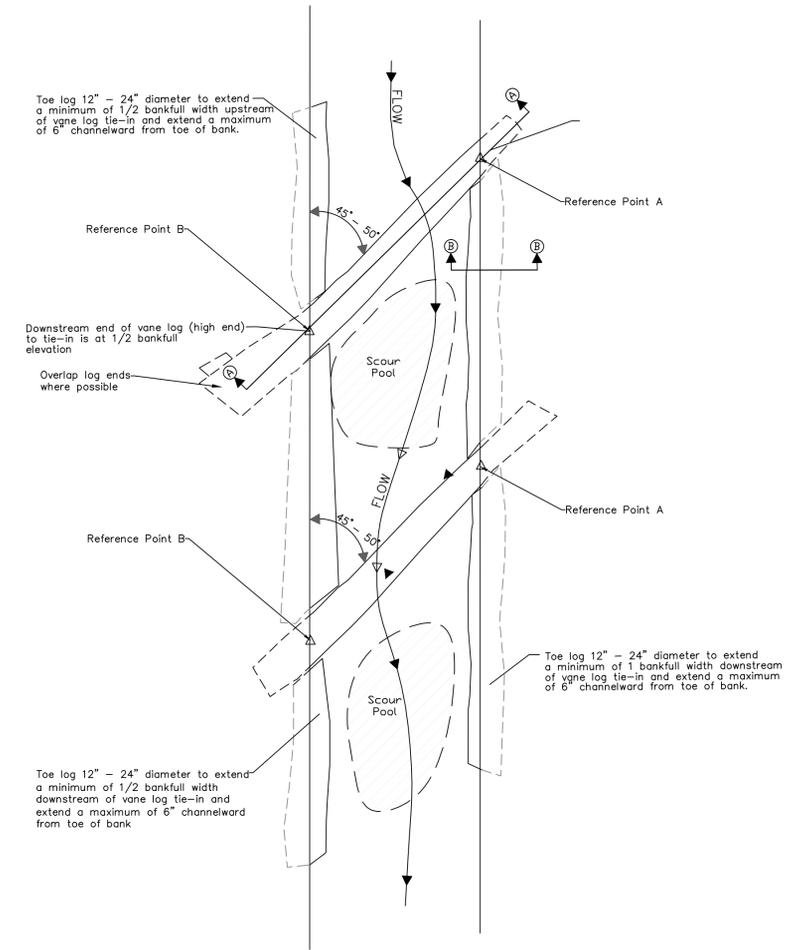
**LOG DROP STRUCTURE
SECTION A-A**



**LOG DROP STRUCTURE
SECTION B-B**



**LOG DROP STRUCTURE
TRIPLE DROP
PROFILE VIEW**



**LOG DROP STRUCTURE
WITH PARALLEL STRUCTURES
PLAN VIEW**

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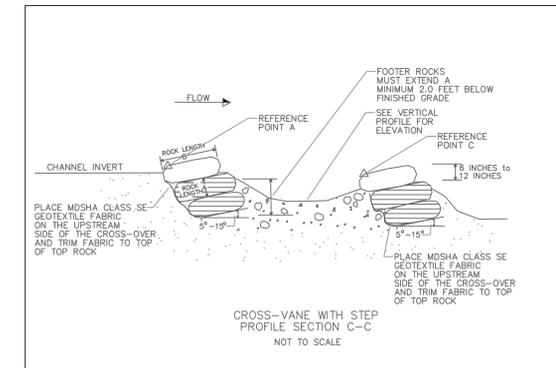
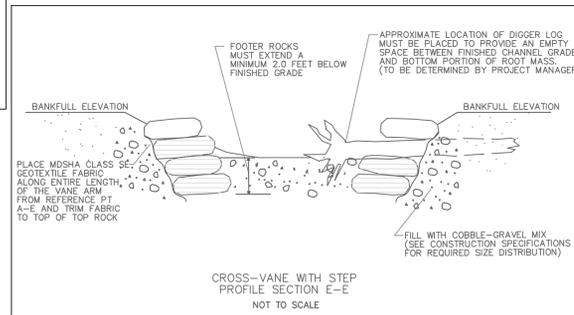
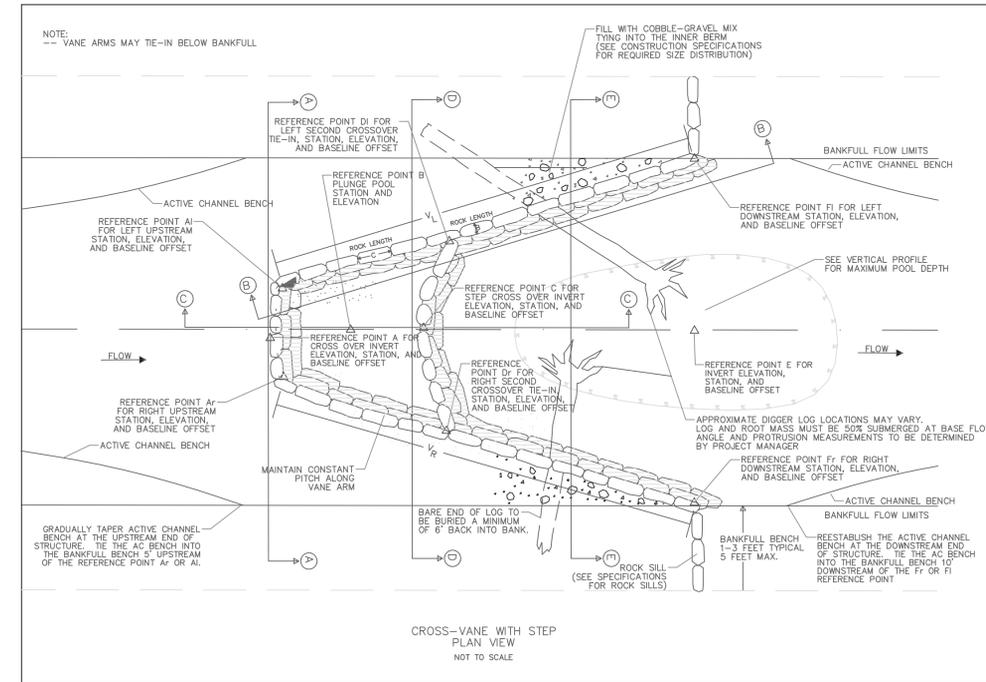
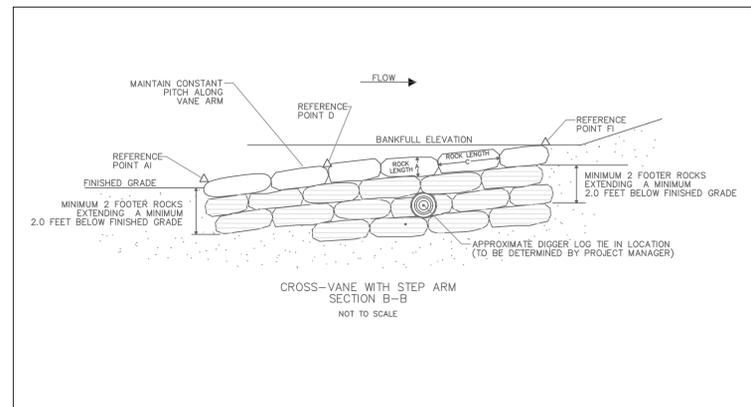
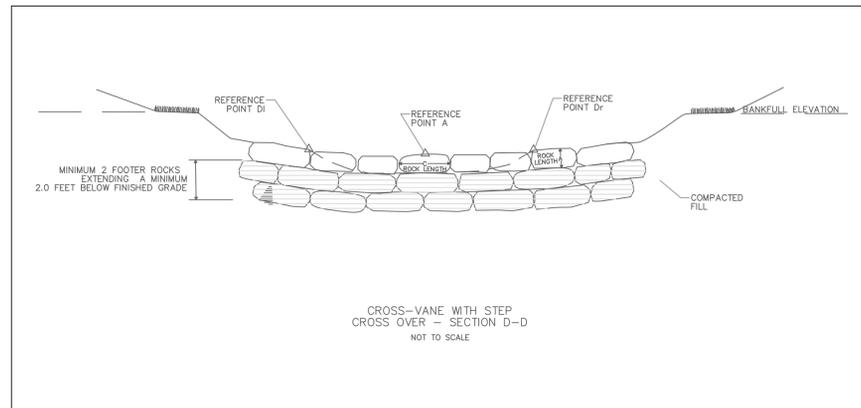
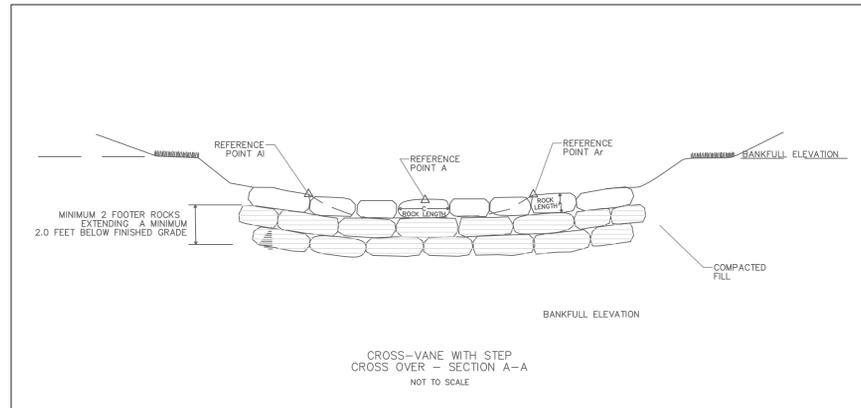


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PLUM CREEK PROJECT CECIL COUNTY, MD	
STANDARD DETAILS	
PROJECT MANAGER: MAS	DRAFTING: MAS
DESIGN: MAS	CHECKED BY: RRS
DATE: 4/2/2014	SCALE: AS SHOWN

**SHEET
8 OF 21
SD-4**



- CROSS VANE WITH STEP NOTES:
1. MDSHA CLASS SE GEOTEXTILE FABRIC WILL BE PLACED ON THE UPSTREAM SIDE OF THE VANE ARMS AND CROSS OVERS.
 2. ALL ROCKS (EXCEPT BOTTOM LAYER OF FOOTER ROCKS) SHALL BE SUPPORTED BY A FOOTER ROCK AND SHINGLED UPSTREAM OR INTO STREAM BANK. ALL ROCKS SHALL BE INTERLOCKED AND SHALL NOT ROCK OR ROTATE IN PLACE.
 3. ALL ROCKS SHALL BE PLACED WITH THE PARALLEL FACES ORIENTED UP AND DOWN WITH THE TOP FACE TILTING UP FROM THE BED AT 5 TO 15 DEGREES IN THE DIRECTION OF FLOW ON THE CROSSOVER AND VANE ARMS.
 4. ALL ROCKS (EXCEPT TOP LAYER OF CROSSOVER) SHALL BE PLACED TO FIRMLY ADJACENT ROCKS LEAVING NO GAPS BETWEEN ROCKS.
 5. STRUCTURE SHALL BE CONSTRUCTED SUCH THAT ROCKS FORM A CONTINUOUS, UNIFORM SLOPE WITH A MINIMUM OF STEEP, HIGH, OR LOW SPOTS ALONG THE TOP FINISHED SURFACE. SEE ROCK CROSS VANE WITH STEP SPECIFICATIONS FOR ALLOWABLE TOLERANCES.
 6. CHANNEL STATION AND ELEVATION REFERENCE MAY NOT ALWAYS FALL ON BASELINE OF CONSTRUCTION, THALWEG, OR CHANNEL INVERT.
 7. STREAM BOTTOM AROUND STRUCTURE SHALL BE BACKFILLED WITH FINISHED OR SALVAGED STREAMBED MATERIAL TO MEET FINISHED GRADE AS DIRECTED IN SPECIFICATIONS.
 8. SEE ROCK CROSS VANE WITH STEP STRUCTURE TABLE, PROFILE, AND GEOMETRY SHEET FOR ALL DIMENSIONS AND ELEVATIONS.

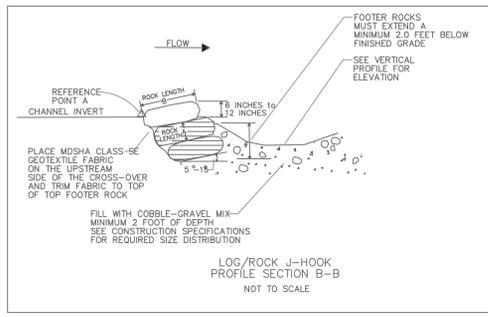
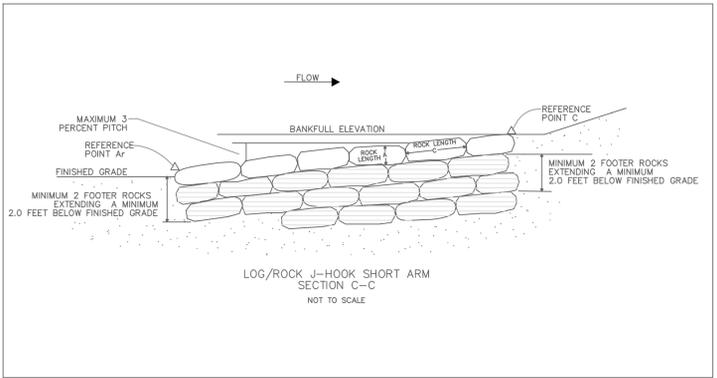
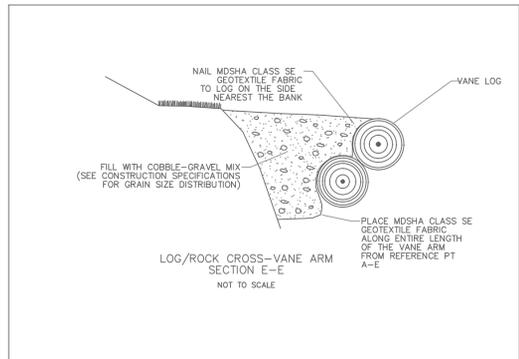
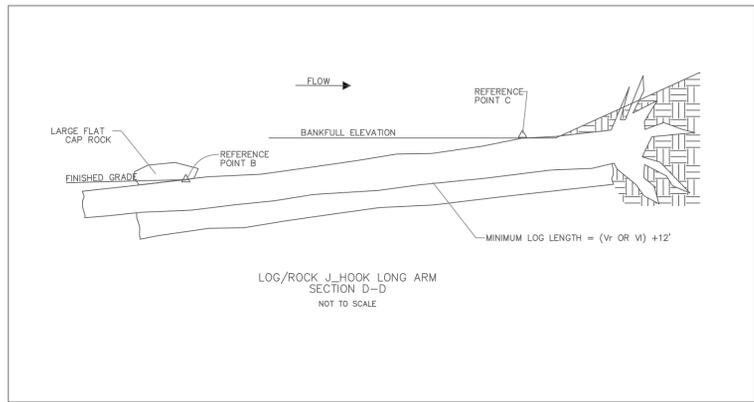
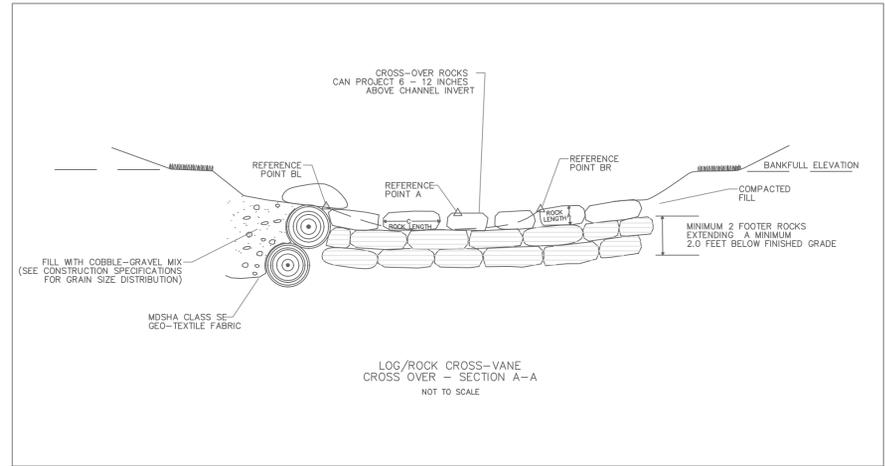
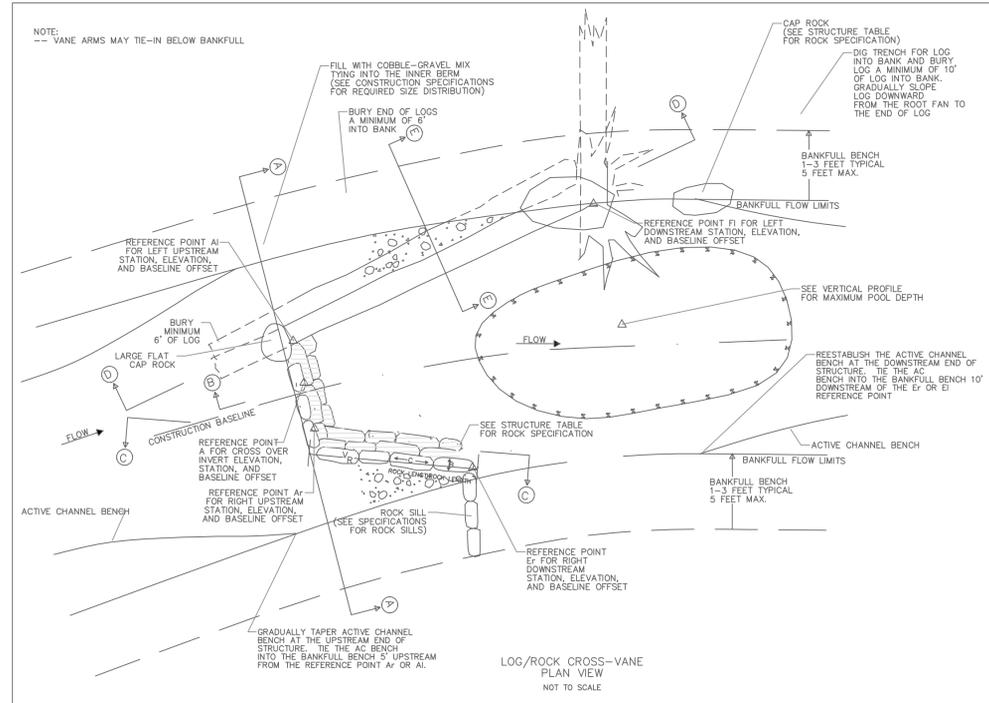
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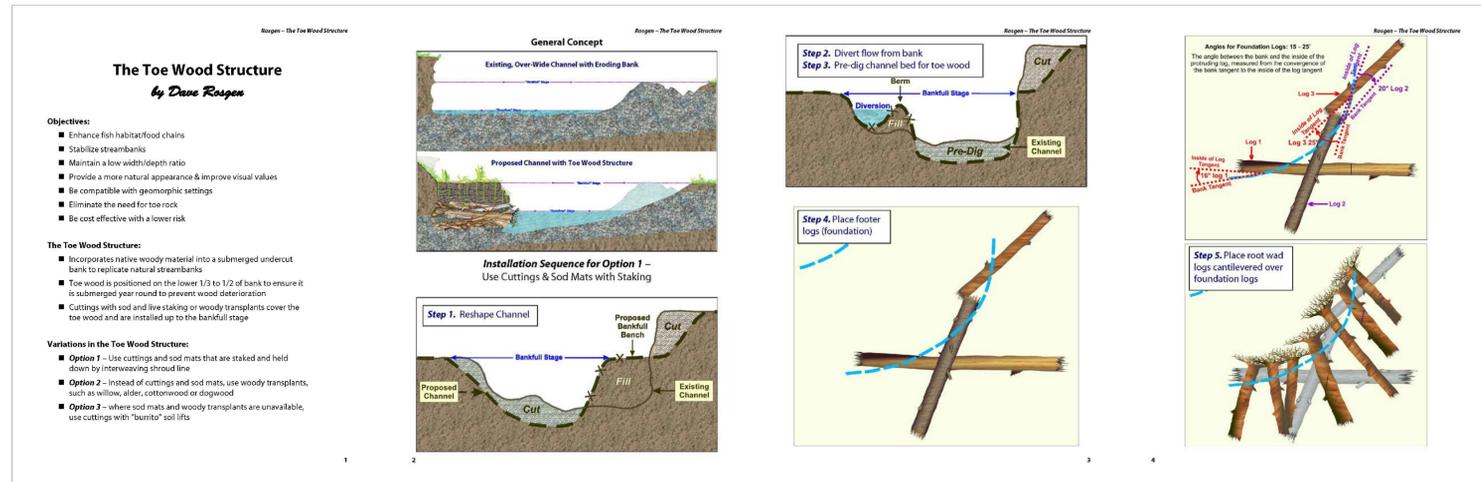
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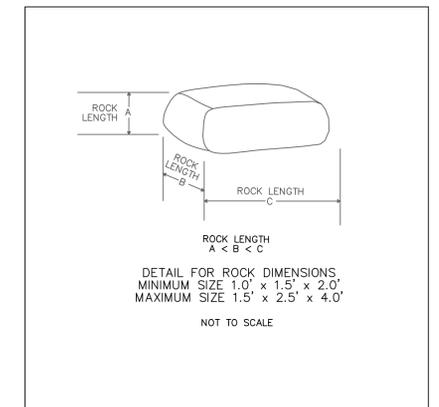
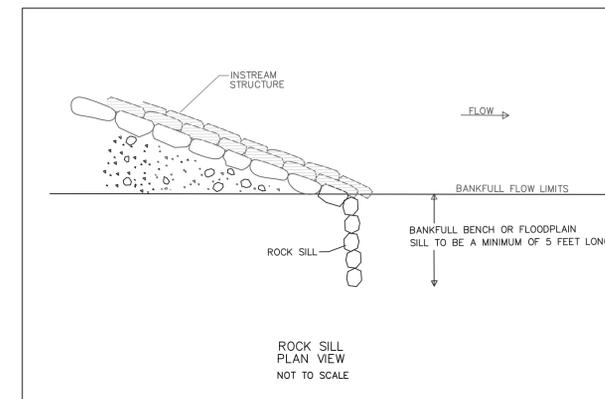
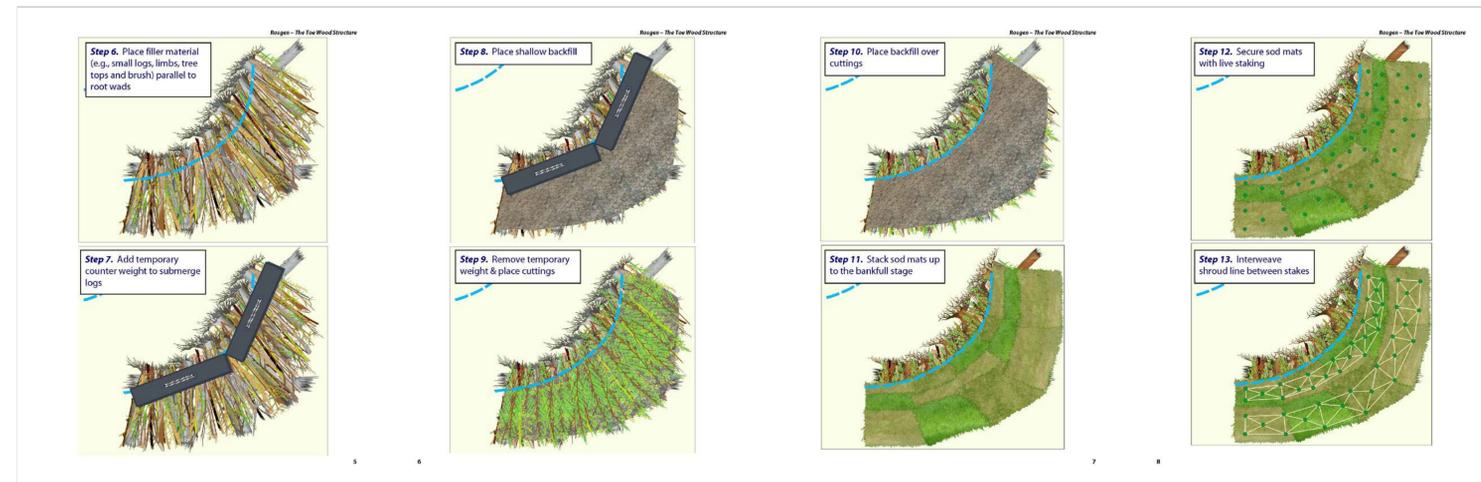
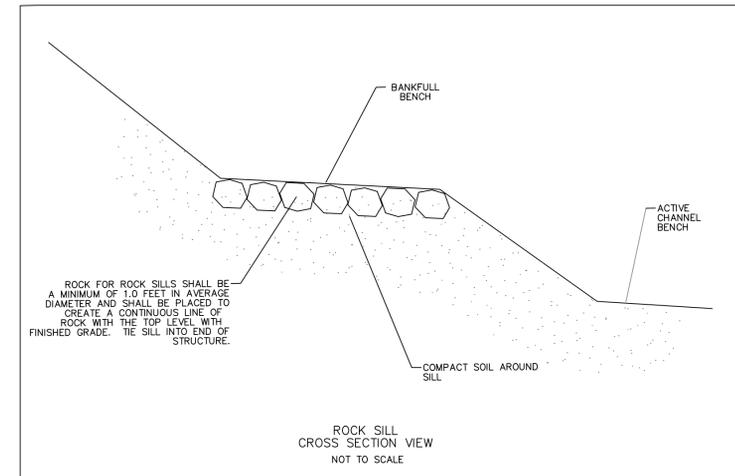
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				STANDARD DETAILS		
				REVISIONS DATE BY	PROJECT MANAGER: MAS DRAFTING: MAS	
				DESIGN: MAS DATE: 4/2/2014	CHECKED BY: RRS SCALE: AS SHOWN	

Toe Wood Details and Specifications



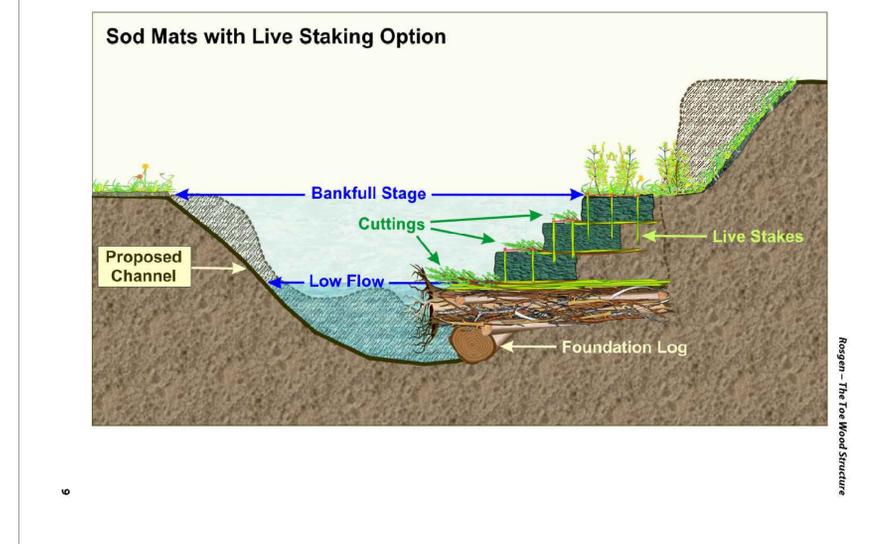
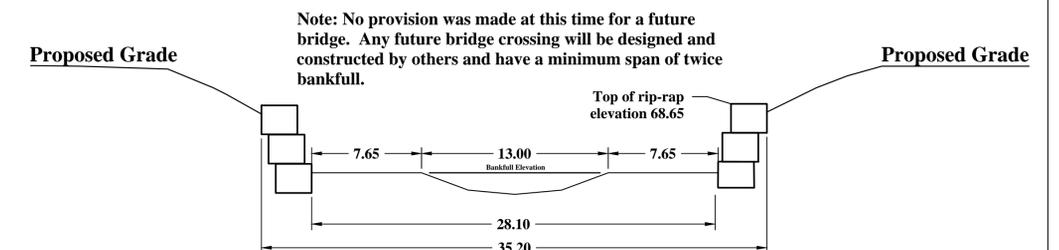
Rock Sill Detail for Structures



Constructed Riffle Specifications

Riffle 1 1+94 - 2+16	
Approximate Diameter	Percent by Total Weight
6 inches	0
5 inches	10
4 inches	40
3 inches	40
2 inches	10 Max

Riffle 2 2+77 - 3+15			
Class of Rip Rap	Size in Weight	Approximate Diameter	Percent by Total Weight
I	Heavier than 150 lb	12 inches	0
	Heavier than 40 lb	8 inches	50
	Less than 2 lb	3 inches	10 Max



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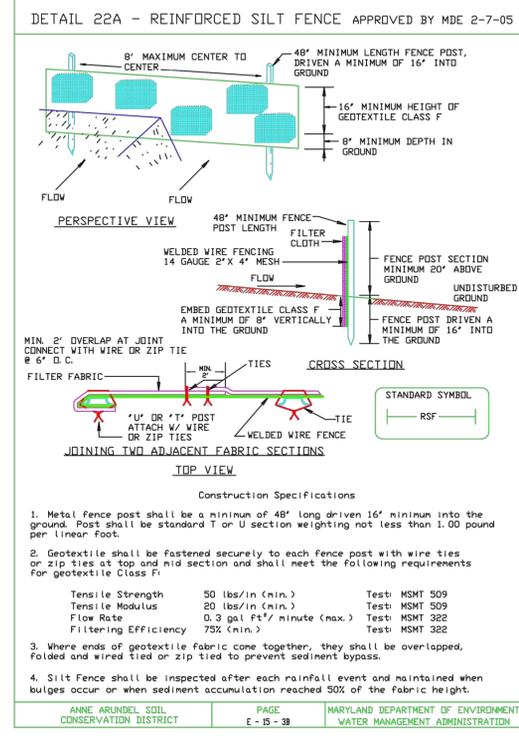
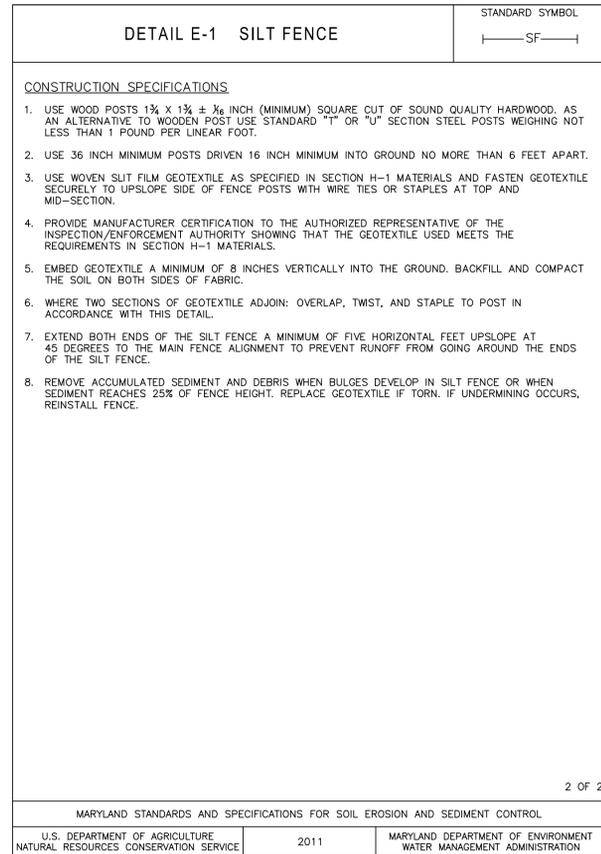
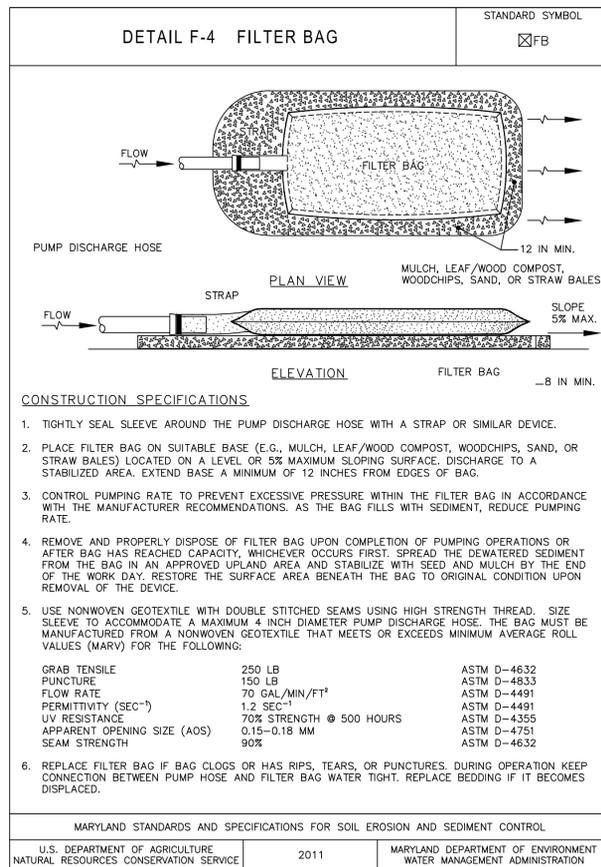
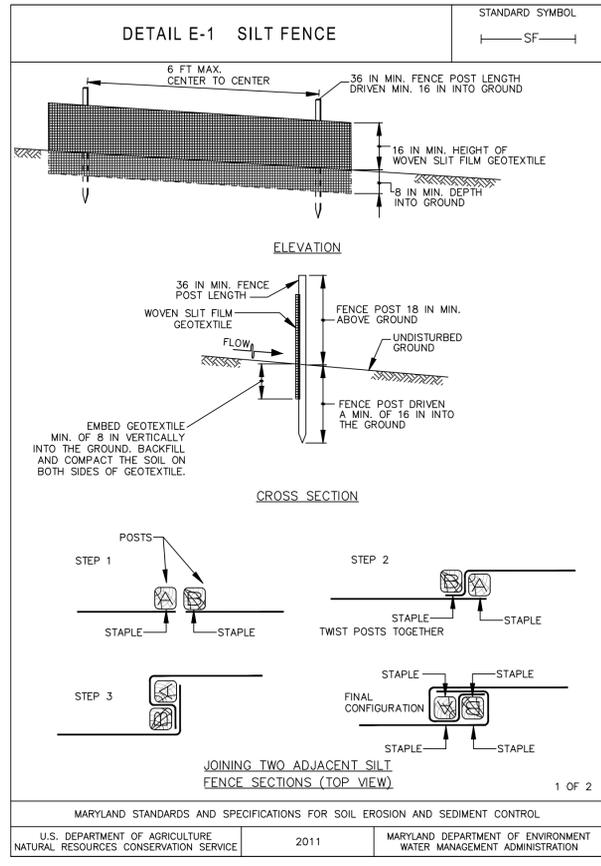
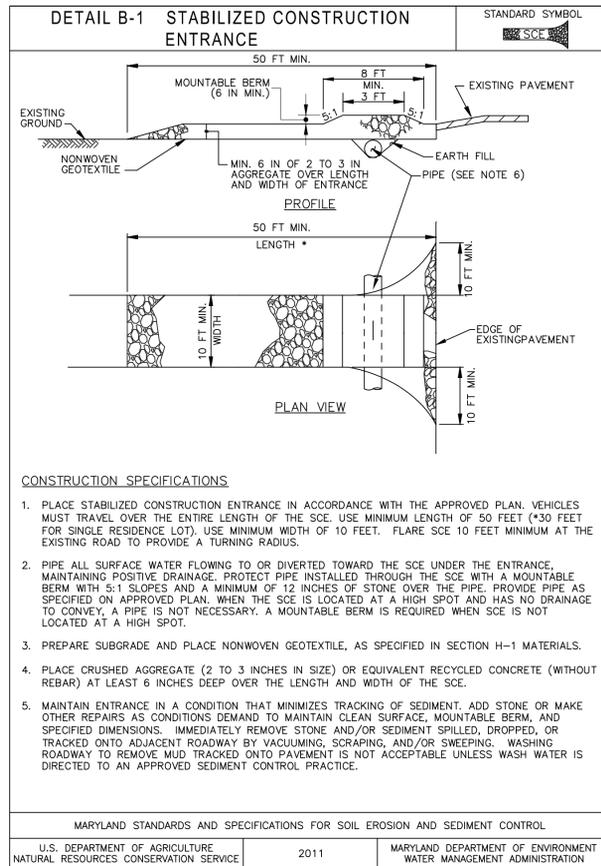
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REVISIONS		DATE		BY	

**PLUM CREEK PROJECT
CECIL COUNTY, MD
STANDARD
DETAILS**

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SHEET
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SD-8



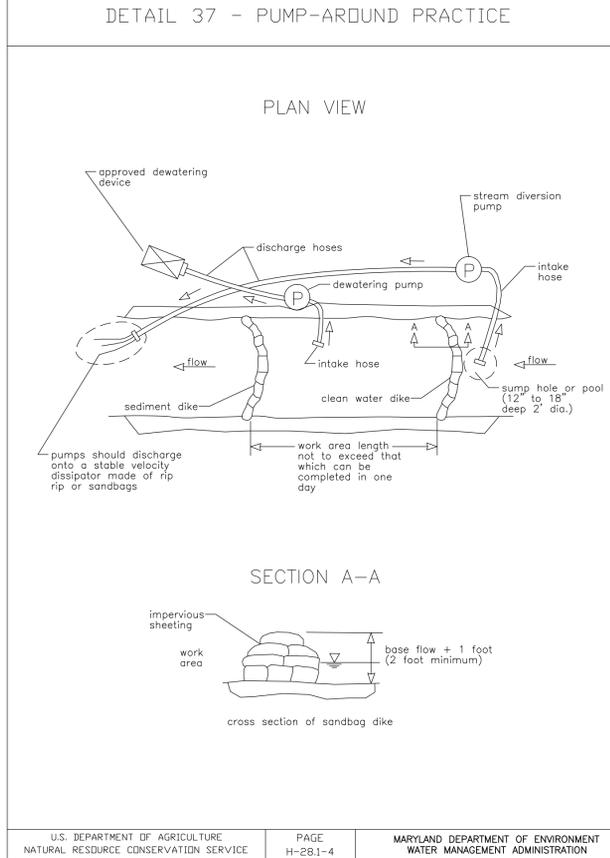
SILT FENCE

Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



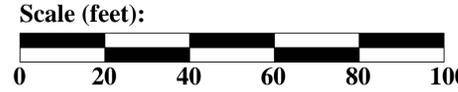
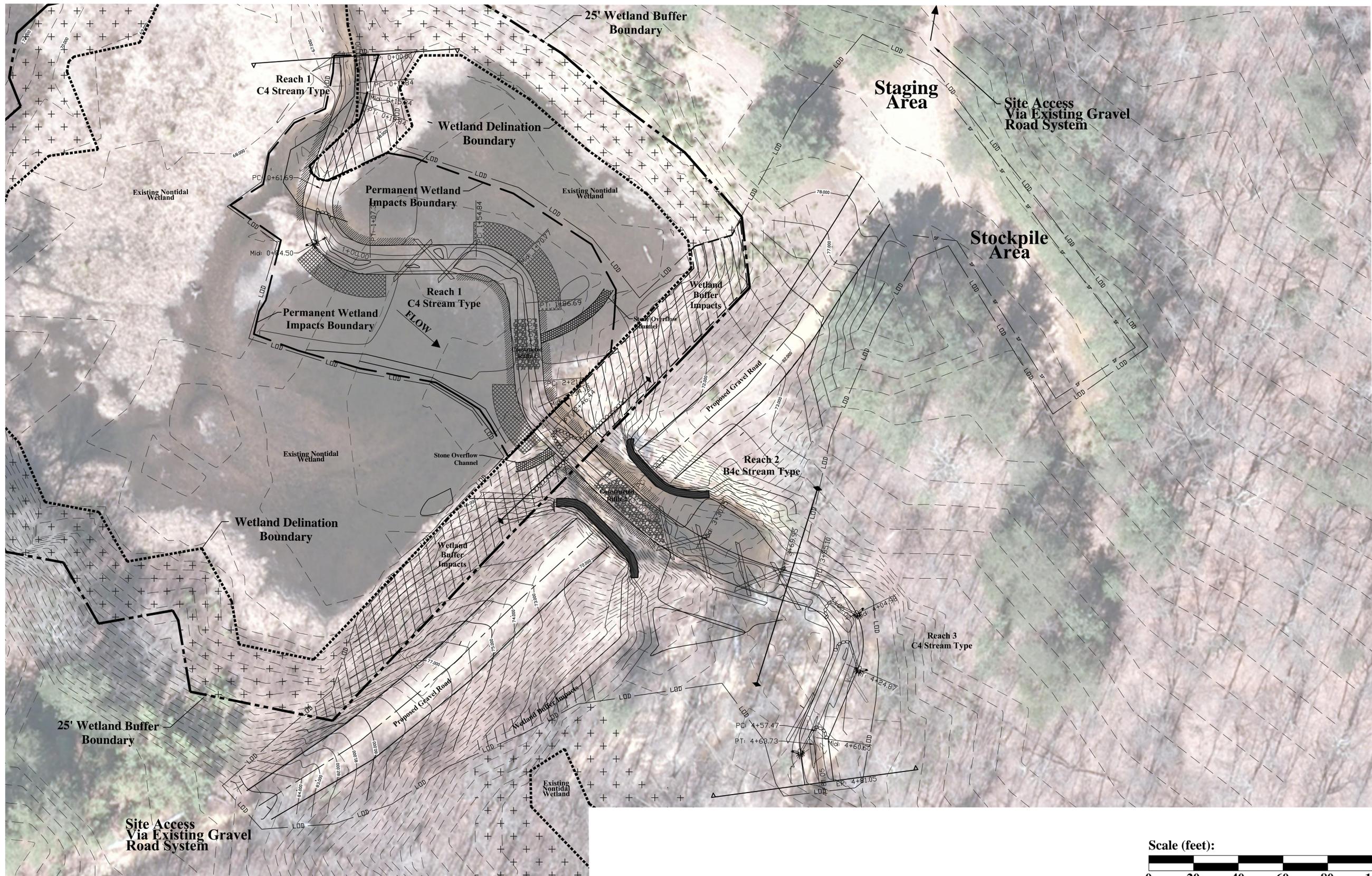
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 177 Admiral Cochrane Drive
 Annapolis, Maryland 21401
 Tel. (410) 573-4581

**PLUM CREEK PROJECT
 CECIL COUNTY, MD
 EROSION AND SEDIMENT CONTROL DETAILS**

REVISIONS	DATE	BY
PROJECT MANAGER: MAS	DRAFTING: MAS	
DESIGN: MAS	CHECKED BY: RRS	
DATE: 4/2/2014	SCALE: AS SHOWN	

**SHEET
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 ES-2**



Site Information:

Length of Stream Impacts	345 Linear Feet	Length of Stream Restored	480 Linear Feet
Area of Stream Impacts	4,985 Square Feet	Area of Stream Restored	6,240 Square Feet
Permanent Impacts to Nontidal Wetlands	14,985 Square Feet	Nontidal Wetlands Restored	11,865 Square Feet
Impacts to Nontidal Wetlands Buffer	7,200 Square Feet	Nontidal Wetlands Buffer Restored	7,200 Square Feet
Temporary Impacts to Nontidal Wetlands	0 Square Feet	Net Loss of Nontidal Wetlands	3,120 Square Feet

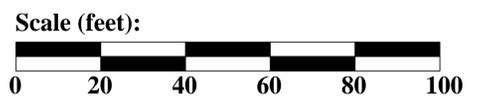
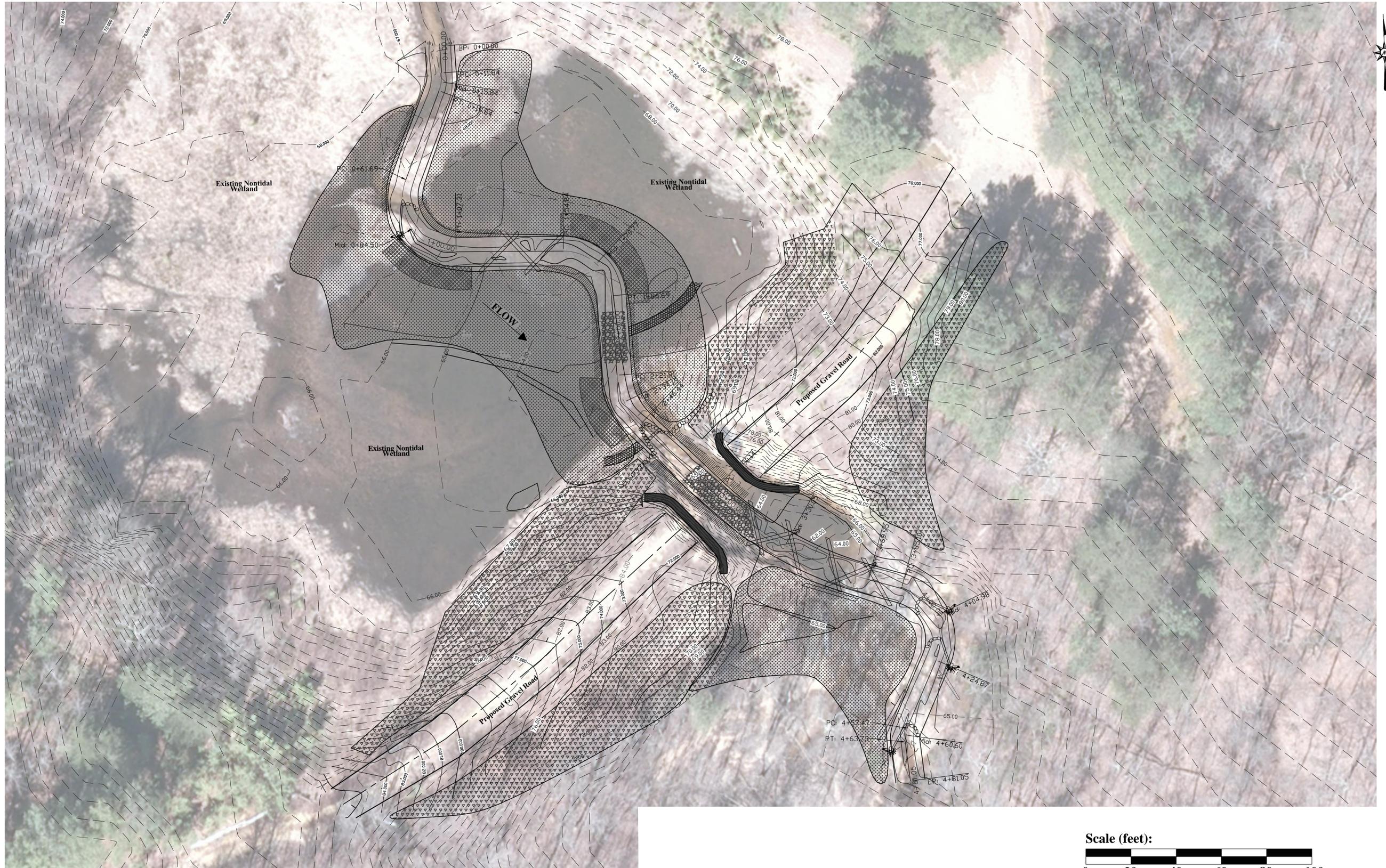
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PLUM CREEK PROJECT CECIL COUNTY, MD			
REVISIONS		EROSION AND SEDIMENT CONTROL AND WETLAND IMPACTS	
DATE	BY	PROJECT MANAGER/MAS	DRAFTING: MAS
5/27/2015	MAS	DESIGN: MAS	CHECKED BY: RRS
DATE: 4/2/2014		SCALE: AS SHOWN	

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ES-3



Legend

- Upland Planting Area
- Riparian Planting Area

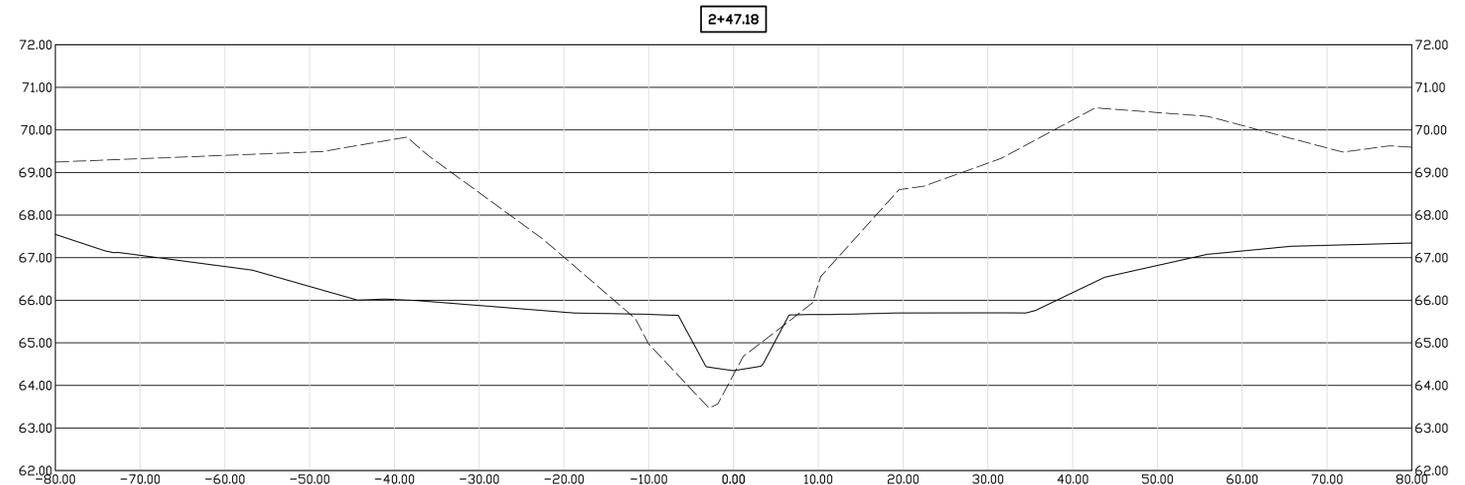
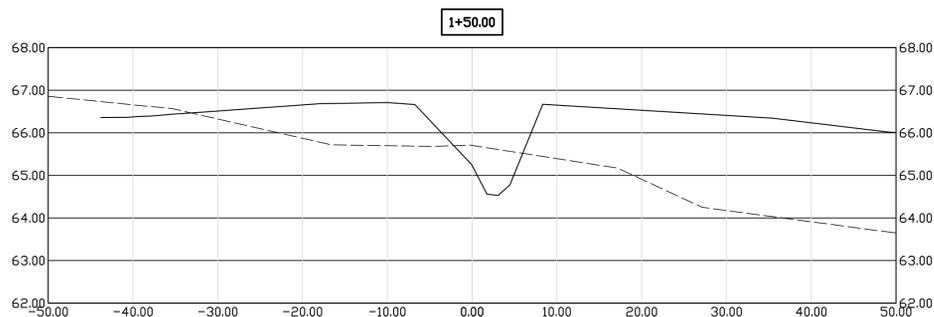
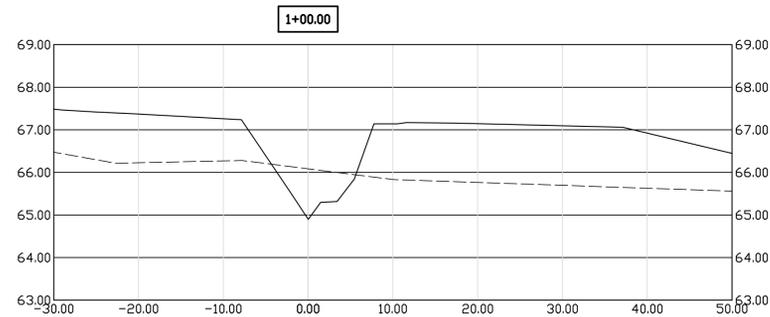
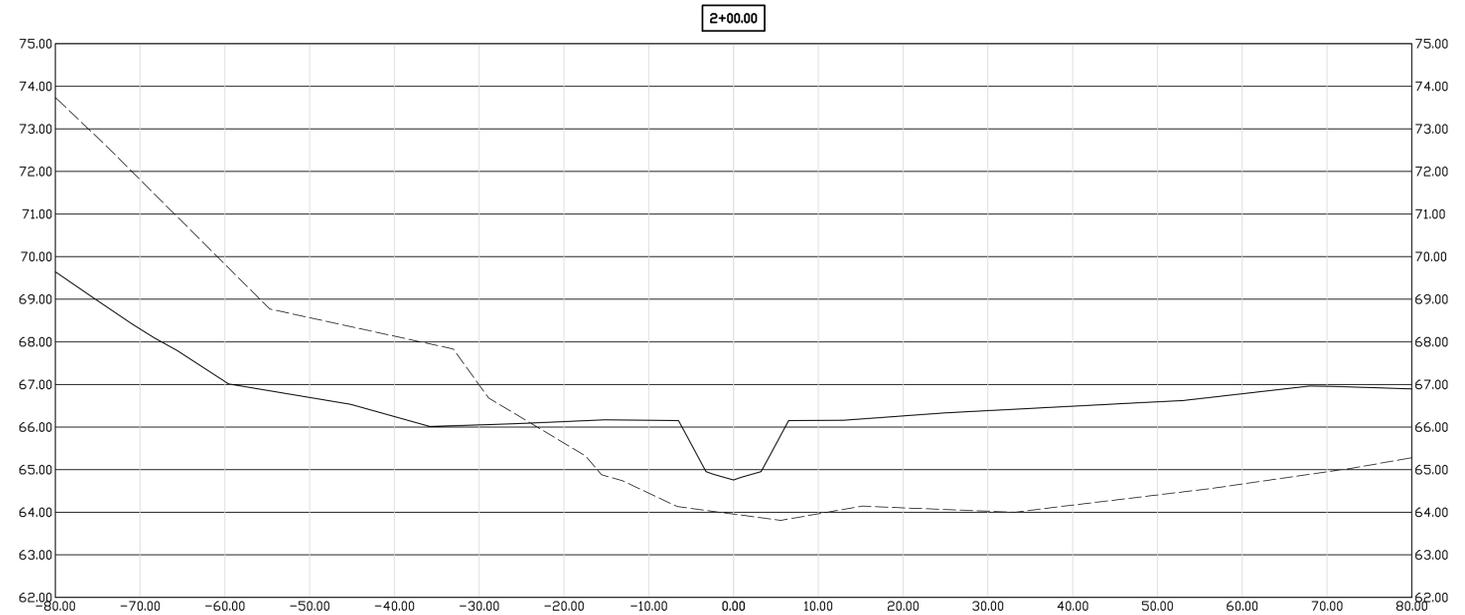
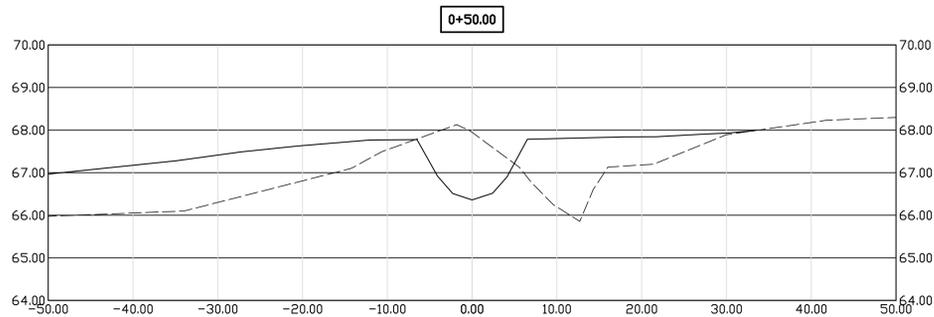
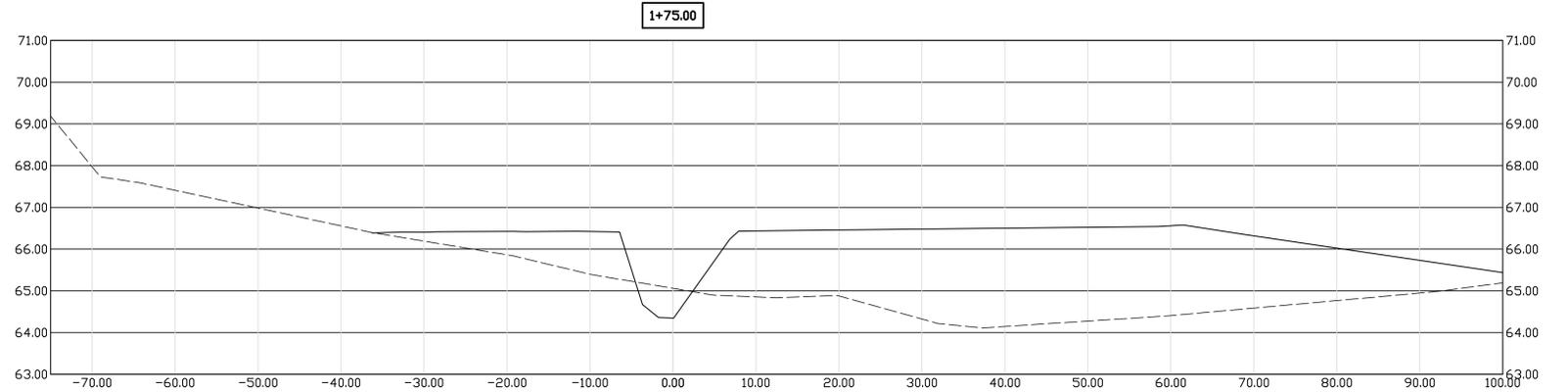
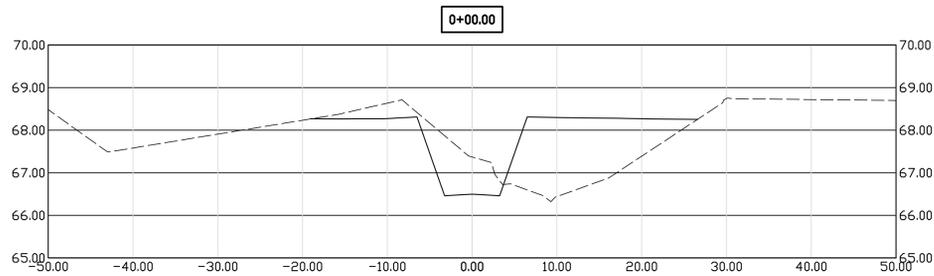
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REVISIONS		PLUM CREEK PROJECT CECIL COUNTY, MD	
DATE	BY	PLANTING PLAN STANDARD DETAILS	
		PROJECT MANAGER: MAS	DRAFTING: MAS
		DESIGN: MAS	CHECKED BY: RRS
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SHEET
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 PP-1



Legend
 Proposed ————
 Existing - - - - -

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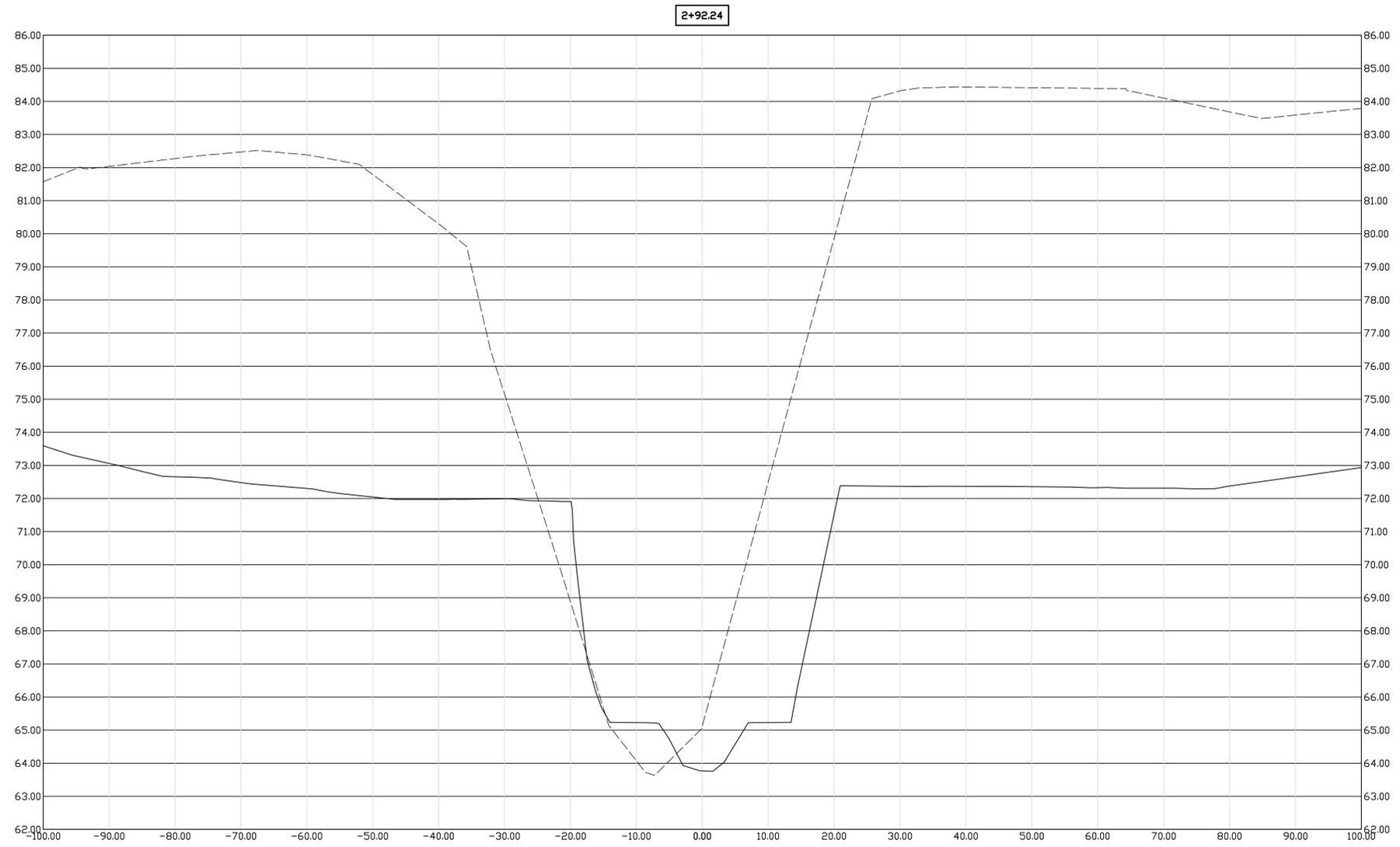


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DESIGN: MAS		CHECKED BY: RRS	
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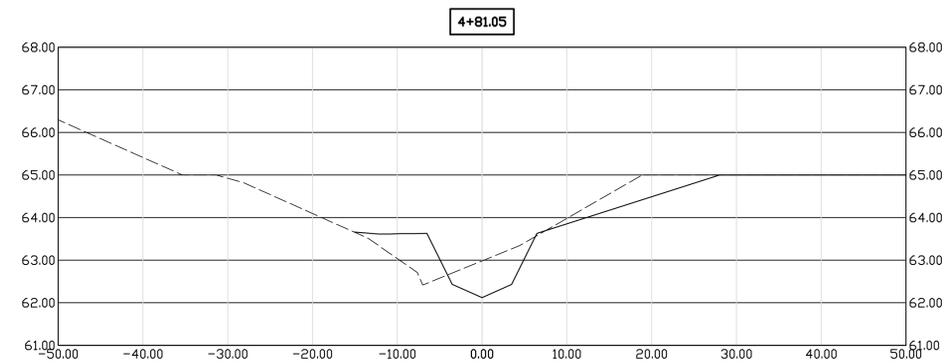
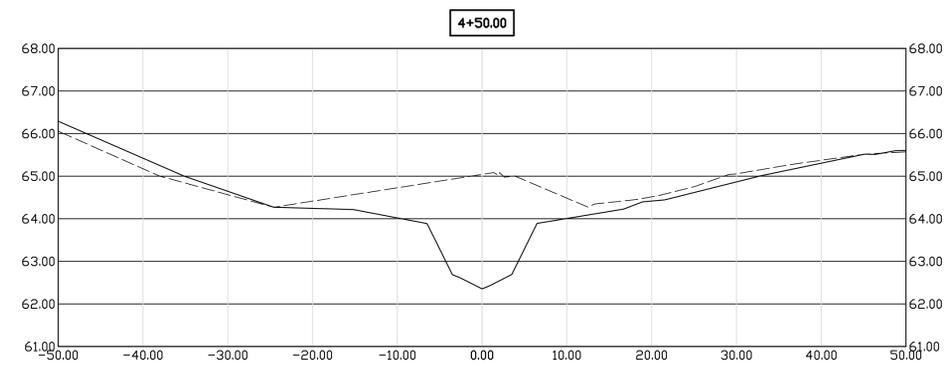
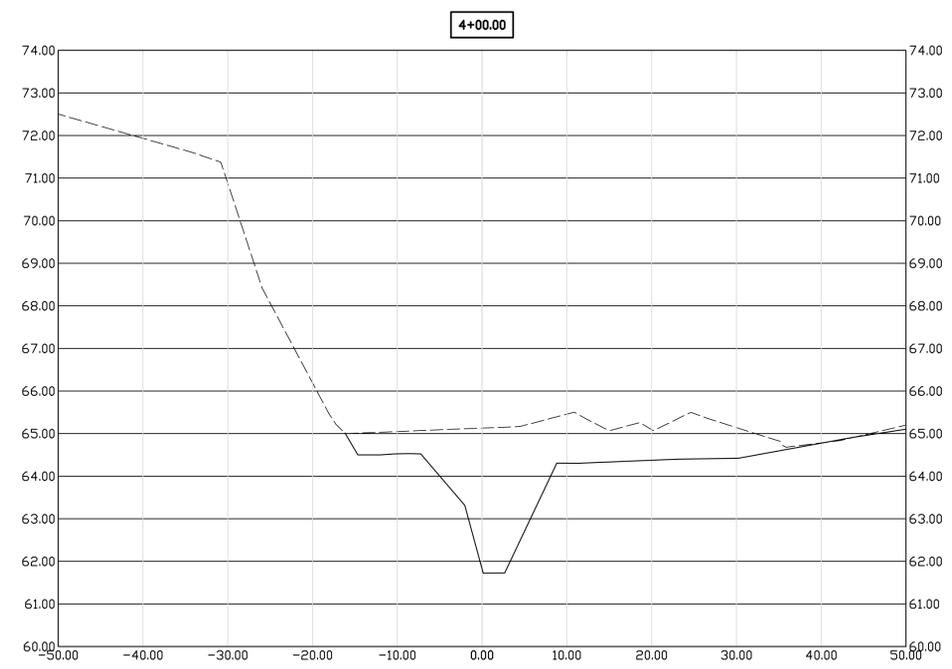
Legend
 Proposed —————
 Existing - - - - -

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PLUM CREEK PROJECT		DESIGN CROSS SECTIONS	SHEET 19 OF 21
CECIL COUNTY, MD			
REVISIONS		PROJECT MANAGER: MAS	DRAFTING: MAS
DATE	BY		
DESIGN: MAS		CHECKED BY: RRS	
DATE: 4/2/2014		SCALE: AS SHOWN	
XS-2			



Legend
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 Existing - - - - -

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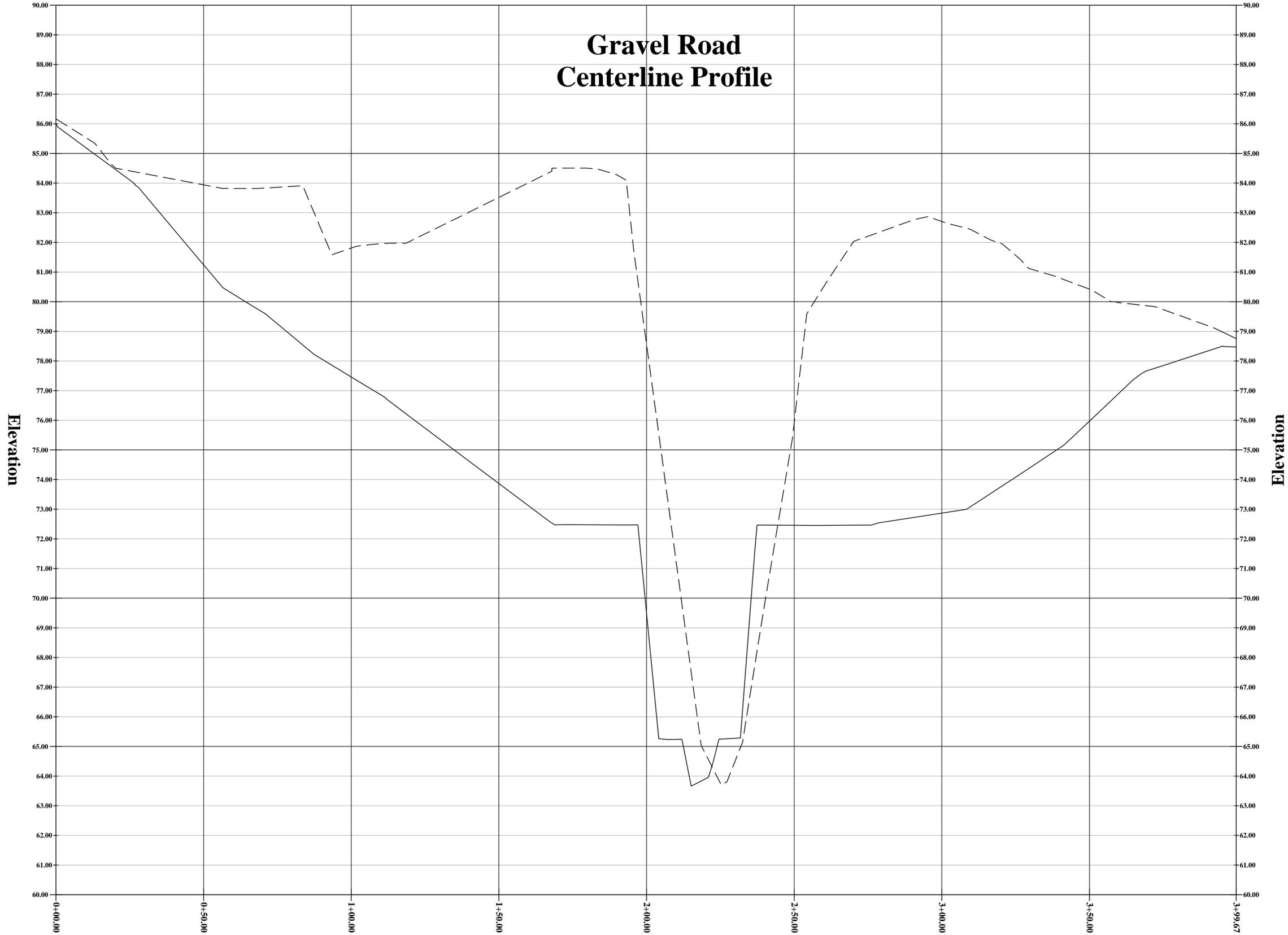


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SHEET
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XS-3

Gravel Road Centerline Profile



Legend
 Proposed ———
 Existing - - - - -

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SHEET
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XS-4