

APPENDIX A

EXAMPLE DRAFT EROSION AND SEDIMENTATION CONTROL PLAN

**MCCLURE PENSTOCK PROJECT
EXAMPLE DRAFT SEDIMENTATION AND
EROSION CONTROL PLAN**

MARCH 2009

REVISION 0

EXAMPLE DRAFT EROSION AND SEDIMENTATION CONTROL PLAN MCCLURE PENSTOCK REPAIR PROJECT

The Erosion and Sedimentation Control Program (ESCP) will be prepared to address proper control of stormwater runoff from earth disturbance activities associated with the proposed option of repairing/restoring the Penstock supplying the McClure Powerhouse.

The purpose of this ESCP will be to ensure the design, implementation, management, and maintenance of Best Management Practices (BMPs) to reduce the amount of sediment and other pollutants in storm water discharges associated with the land disturbance activities, comply with the Michigan Water Quality Standards, and ensure compliance with the terms and conditions of the General Permit for Land Disturbance.

The ESCP will be revised under any of the following conditions:

- Design, operation, or maintenance of the BMPs is changed;
- Design of the construction Project is changed that could significantly affect the quality of the stormwater discharges;
- Inspections indicate deficiencies in the ESCP or any BMP;
- This ESCP is determined to be ineffective in significantly minimizing or controlling erosion and sedimentation; or
- The Michigan Department of Environmental Quality (MDEQ) determines violations of Water Quality Standards may occur or have occurred.

Surface water bodies at the Project site include: McClure Reservoir, the 6.1 mile Dead River Bypassed Reach, nine unnamed streams identified in the vicinity of the Penstock route, and the Forestville Reservoir.

Drainage patterns are such that there is potential for stormwater migration to the Dead River, and storage reservoirs below the Penstock corridor route between McClure Dam and McClure

Powerhouse. Outfalls that may receive waters from the Project Site will be identified as required in the NPDES Permit for Stormwater Discharges Associated with Construction Activities.

The area in the immediate vicinity of the “Project area” is the primary area where impacts may occur. This is within a 400 corridor along the current Penstock route. It is estimated that approximately 15.0 acres may require clearing and grubbing, 10.3 acres is needed for possible lay down area, and 2.0 acres for potential borrow excavation. Based on the preliminary power line relocation alignment, an additional 4.6 acres may require clearing and grubbing. Total estimated project impact area is 39.2 acres. Some of the area to be cleared and grubbed includes areas occupied by some new access roadways that will be constructed. Some of this roadway will become permanently maintained roadway after the construction and repair of the Penstock are completed. There are some limited wetlands along the Penstock route. An estimated 10,150 square feet of regulated wetlands will be permanently disturbed. Some non-regulated wetland areas are artificially sustained through Penstock leaks, which will decline and resume the habitat of the natural environment once the Penstock repairs are completed. BMPs will be implemented in accordance with applicable State and County guidance to prevent erosion and sedimentation before, during, and after construction. E & S drawing notes and typical details for E & S engineering controls that will be implemented during construction are provided on *Figures ES-1 and ES-2* in the back of this E & S Plan. Perimeter and entrance BMPs will be installed before any earth disturbance activities are initiated. Oversight, inspection, and maintenance of stormwater BMPs and controls will be performed by a State-Certified Stormwater Operator throughout construction to prevent erosion and sedimentation to surface waters in the Project vicinity.

Temporary BMPs that will be used to control erosion and sedimentation during construction may include one or more of the following:

- Sedimentation Pond;
- Silt fence;
- Compost filter sock;
- Rock fill sedimentation control barriers;
- Hay bales;
- Erosion control matting;
- Temporary and permanent revegetation;
- Mulching;

- Contouring;
- Controlled sequencing of excavation, transport, placement, and compaction of earthen materials;
- Stabilized access road surfaces using rock and geofabric;
- Water spray;
- Water diversion and use of Cofferdams;
- Proper construction, control, protection, and maintenance of stockpiles; and
- Good housekeeping.

Functionally equivalent BMPs may be substituted if field conditions warrant. Related specifications will be provided in the Project's specifications.

In order to minimize the potential for introducing invasive species into the area, construction equipment will be cleaned prior to entering the job site

Excavation, backfilling, placement, and compaction of earthen materials will be performed in accordance with the Project's specifications. Excavations and demolition will be performed in a safe manner, and all excavated materials will be placed on-site, stockpiled, or disposed of off-site immediately upon excavation. Any open excavation will be properly braced, supported, and protected.

A number of stockpiles may be required during the completion of the Project. Stockpile areas will be seeded as the stockpile is completed and/or when stockpiling areas are inactive in accordance with regulations. Erosion control matting or similar BMP controls will be used on the steep-sloped portions of the stockpile to prevent erosion during establishment of vegetation. Steep slopes are considered to be slopes at 3 horizontal to 1 vertical (3H:1V) or steeper, and/or slopes greater than 8 feet in height.

Onsite borrow pits would be aesthetically contoured to stabilize the side walls. Topsoil would be placed as necessary so that suitable and stable vegetation could be established. Restoration at any offsite borrow locations, would be managed and implemented per the Owner's specific permit requirements.

Only areas necessary for construction will be disturbed, cleared, or graded. Areas not to be disturbed will be flagged or otherwise delineated. To preserve natural vegetation, vehicles and

other construction equipment will be excluded from these areas. All graded or disturbed areas including slopes shall be protected during clearing and construction in accordance with this ESCP until they are permanently stabilized.

All sediment control measures shall be constructed in accordance with the Contract Drawings and Specifications for the appropriate erosion control practices. Areas to be filled shall be cleared and grubbed to remove trees, vegetation, roots, and other objectionable material.

All fills shall be compacted to reduce erosion, slippage, settlement, subsidence, and other related problems. Fill intended to support buildings, structures, and conduits will be compacted in accordance with the Specifications, local codes, and requirements.

Seeding and mulching shall be performed in accordance with the project's Contract Drawings and Specifications. To the extent practical, native grass would be used for restoration.

Permanent BMPs that will be used to control erosion and sedimentation during construction include one or more of the following:

- Permanent revegetation;
- Armoring with riprap;
- Jersey barriers on extended areas;
- Impervious surface construction (e.g., concrete);
- Sheet flow runoff conveyance structures (i.e., channels, ditches, swales); and
- Culverts.

Following construction, storm water will flow naturally to existing stream channels and into the subsurface recharging groundwater.

Pollution control measures and systems will be maintained in good order during construction. This will be verified through inspections by a State Certified Stormwater Operator of all storm water and erosion and sedimentation control facilities. Inspections will be conducted, at minimum, weekly, as well as within 24 hours after every rainfall equal to or greater than 0.5 inches, to identify potential or actual disturbance or destruction of controls or incorrect management methods. Inspections and maintenance will be performed by the Contractor, with review inspections conducted by the Construction Manager. Inspections conducted by both the Contractor and the Construction Manager will include:

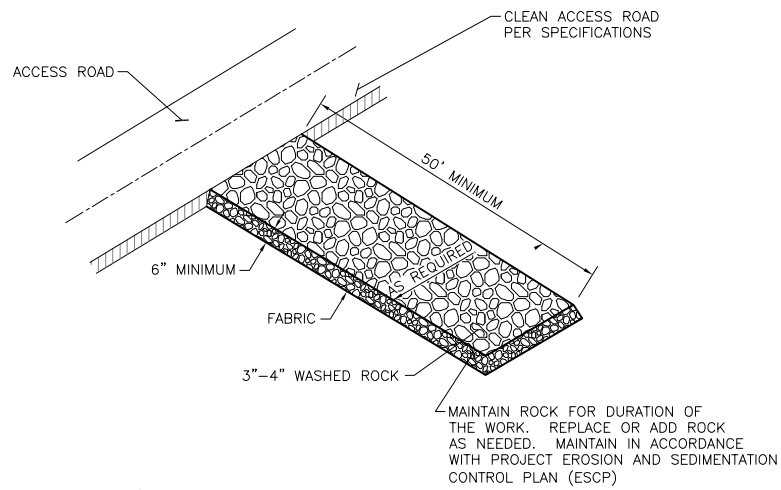
- Evaluate the effectiveness of existing control measures and determine whether additional measures are necessary;
- Observe structural measures, sedimentation controls, and other storm water BMPs to ensure proper installation, operation, and maintenance; and
- Review locations where storm water leaves the site for evidence of erosion or sediment deposition.

Any deficiencies will be noted in a weekly report of the inspection(s) and corrected within seven calendar days of the Inspection Report. The permittee will promptly notify the site contractors responsible for operation and maintenance of BMPs of deficiencies.

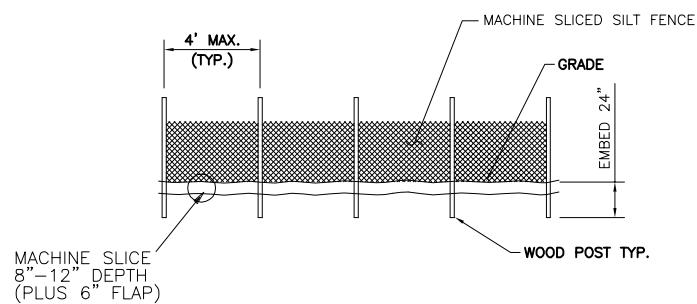
The Contractor shall be responsible for the management, recycling, and/or disposal of all waste materials including, but not limited to:

- Excavated earthen materials that will be reused on-site;
- Excess earthen materials;
- Building demolition materials;
- Excess building materials;
- Temporary erosion and sedimentation control devices (e.g., compost filter sock, silt fence);
- Sanitary waste;
- Rubbish, litter and garbage;
- Material packaging;
- Concrete wash water; and
- All other waste waters that could adversely impact water quality.

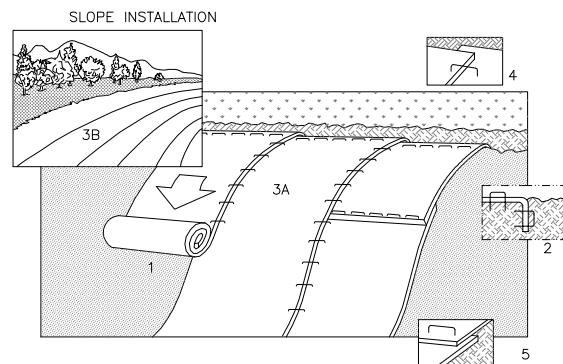
Wherever possible, recycling of excess materials is preferred. The Contractor will be responsible for planning and implementing effective material management, litter control, and good housekeeping practices.



1 **DETAIL: ROCK CONSTRUCTION ENTRANCE**
NOT TO SCALE

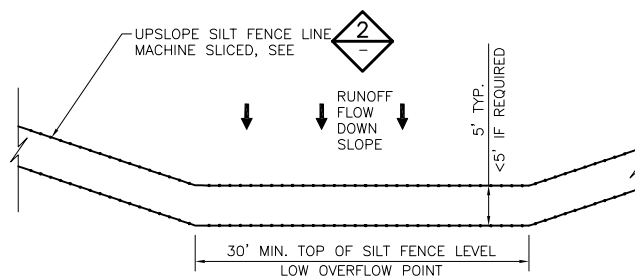


2 **DETAIL: SILT FENCE - MACHINE SLICED**
NOT TO SCALE

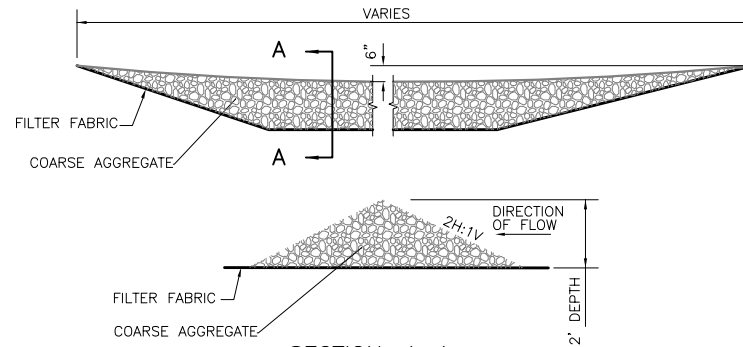


- NOTE: REFER TO GENERAL STAPLE PATTERN GUIDE FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-0-SEED DO NOT SEED PREPARED AREA. CELL-0-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
 2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
 3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE.
 4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 6" OVERLAP, WITH THE UPHILL BLANKET ON TOP.
 5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.

3 **DETAIL: TEMPORARY EROSION CONTROL BLANKET**
NOT TO SCALE

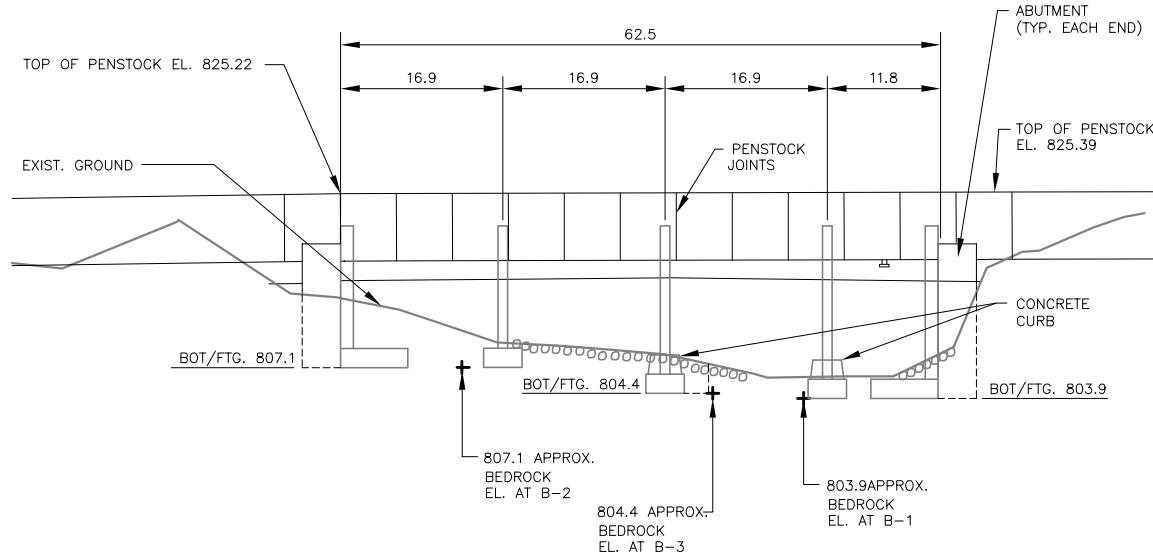


4 **DETAIL: DOUBLE ROW SILT FENCE**
NOT TO SCALE



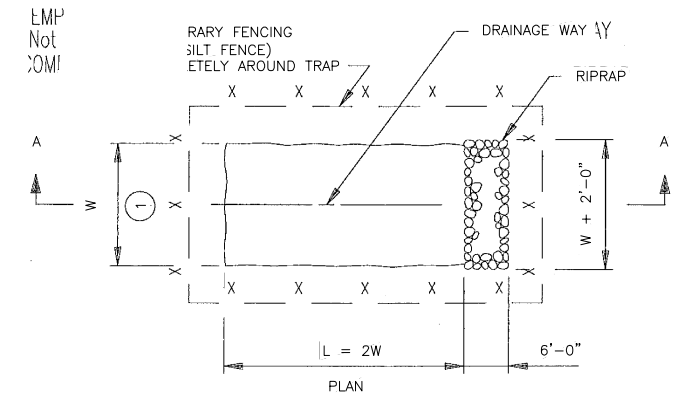
- NOTE:
ROCK CHECK DAMS SHOULD CONSIST OF WELL-GRADED STONE CONSISTING OF A MIXTURE OF ROCK SIZES WITH THE FOLLOWING GRADATION:
100% LESS THAN 24 INCHES
75% LESS THAN 15 INCHES
50% LESS THAN 12 INCHES
10% LESS THAN 4 INCHES

5 **DETAIL: SEDIMENT CONTROL CHECK DAM**
NOT TO SCALE

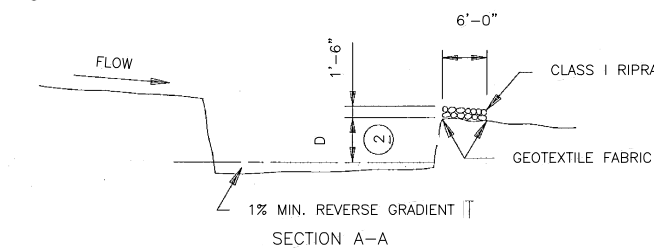


6 **DETAIL: TYPICAL EXISTING STREAM CROSSING**
NOT TO SCALE

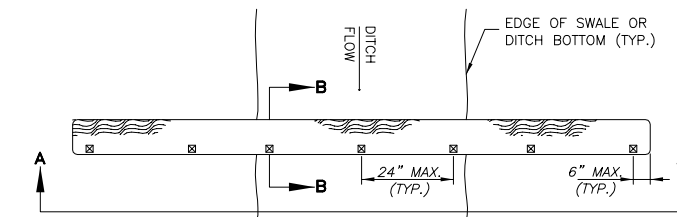
- NOTES:
1. DETAILS SHOWN ARE APPROXIMATE AND ARE BASED ON A 50% ENGINEERING DESIGN LEVEL. FINAL CONSTRUCTION PLANS ARE BEING DEVELOPED AND WILL BE SUBMITTED AS PART OF OBTAINING ANY NECESSARY PERMITS FOR CONSTRUCTION AS NEEDED.



- NOTES:
① W = 10 FT. MIN., 20 FT. MAX
② D = 3 FT. MIN., 6 FT. MAX



7 **DETAIL: TEMPORARY SEDIMENT TRAP**
NOT TO SCALE



- NOTE: MIN. LENGTH OF SEDIMENT LOG SHALL BE 10' WITH MIN. OF 7 WOOD STAKES
- A-A** WOOD STAKES: MIN. 1 1/2" X 1 1/2" MIN. LENGTH = LOG DIAMETER PLUS 28". INSTALL STAKE TO PENETRATE NETTING, BUT NOT WOOD FIBER MATERIAL.
- B-B** INSTALL LOG IN 2"-DEEP TRENCH IF EROSION CONTROL BLANKET IS NOT SPECIFIED

8 **DETAIL: SEDIMENT LOG DITCH CHECK**
NOT TO SCALE

CADD USER: Mark Kretschmer FILE: M:\CAD\2525088\30527_2.DWG PLOT SCALE: 1:2 PLOT DATE: 3/4/2009 12:55 PM
Xrefs in Drawing - M:\Cad\2525088\30447_1.DWG M:\Cad\2525088\30462_1.DWG
Images in Drawing - M:\Cad\2525088\30527_2.DWG
M:\Cad\2525088\30527_2.DWG Plot on: 1 02/06/2009 08:26:56

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	MRM	MAK2	WJF	10OCT2008	ISSUED FOR PERMITTING - NOT FOR CONSTRUCTION
B	MRM	MAK2	WJF	20NOV2008	REVISED ENVIRONMENTAL PLAN SUBMITTAL
C	MJJ	MAK2	WJF	10DEC2008	COMMENTS FROM RIZZO/INTERGRYS
D	MJJ	MAK2	WJF	23DEC2008	REVISED ALIGNMENT
E	MJJ	MAK2	WJF	06FEB2009	FERC SUBMITTAL
F	MJJ	MAK2	WJF	26FEB2009	REVISIONS/INTERGRYS

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MICHIGAN.

SIGNATURE: _____
PRINTED NAME: WILLIAM J. FORSMARK
DATE: _____ REG. NO.: 39572

CLIENT	10/10	11/20	12/10	12/23	02/08	02/28
FERC						
CONSTRUCTION						03/04

Project Office:
BARR ENGINEERING CO.
4700 WEST 77TH STREET
MINNEAPOLIS, MN.
55435-4803

Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

Scale	AS SHOWN
Date	10OCT2008
Drawn	RLG/MRM
Checked	MAK2/WJF
Designed	WJF
Approved	

UPPER PENINSULA POWER CO.
MARQUETTE COUNTY, MI

MCCLURE PENSTOCK REPLACEMENT
MARQUETTE COUNTY, MI

TYPICAL SEDIMENTATION AND EROSION CONTROL DETAILS

BARR PROJECT No.	22/52-088
CLIENT PROJECT No.	
DWG. No.	FIGURE ES-1
REV. No.	0

