

PROJECT NARRATIVE

Fish Creek, Half Mile Dam

Town of Gibraltar

Project Contacts

Contacts	Name	Address	Phone Number
Landowner	Town of Gibraltar	4097 Highway 42 Fish Creek, WI 54212	(920) 868-1714
Consultant	Miller Engineers & Scientists	5308 S. 12th Street Sheboygan, WI 53081	(920) 458-6164

Project Summary

The Town of Gibraltar is mitigating fish passage obstructions at two locations on Fish Creek in Door County, Wisconsin. The obstructions include the State Highway 42 culvert located within the unincorporated community of Fish Creek and Half Mile Dam, located approximately ½ mile upstream of Highway 42. Removal of these obstructions will allow the movement of fish and other aquatic organisms from the Bay of Green Bay upstream to the headwaters of Fish Creek. These headwaters and associated wetlands provide critical habitat for spawning and young-of-the-year fish. Facilitating migration beyond these barriers will allow for fish passage to historic spawning grounds and nursery areas, making them once again available to migrating fish and other associated biota.

Obstructions at the Highway 42 culvert include a 1½ feet high lip at the downstream edge of the apron that provides a barrier to upstream fish movement, particularly during periods of low flow. Additionally, concrete width restrictions on the interior of the culvert concentrate flow, causing excessive flow velocities in this section of the stream. Remediation of these obstructions will include the construction of terraced fish “steps” within the non-structural portion of the apron and the addition of flow restrictors along both edges of the culvert interior to break flow velocities and provide loafing areas for fish during their upstream passage through the culvert. Construction details of the culvert modifications are shown on the attached plans.

Half Mile Dam consists of a 3 feet high spillway that forms a shallow pool of about 2 acres with a maximum depth of about 6 feet. A dissipation pan approximately 7 feet long spans the width of the dam spillway on the downstream edge of the dam. This dam prevents the movement of fish upstream into the headwaters of the creek. Proposed remediation at this location consists of removal of a section of the dam down to the dissipation pan elevation. This will allow for free passage of fish through the section of removed dam into the historic stream channel and the upstream headwaters and associated wetlands. Details of the dam modification are shown on the attached plan.

Upon completion of construction, the area of the former Claflin (Redmann) Pond will be restored with a seeding of native wetland vegetation. The restoration specification for this area is attached.

Construction Sequencing

Half Mile Dam

1. Equipment is expected to enter and exit the site. A Tracking Pad will be utilized for track-out control in accordance with WDNR Conservation Practice Standard 1057.
2. Establish Erosion Control and Sediment Control BMPs.
3. Remove existing concrete from dam. Material shall be disposed of offsite.
4. Follow Vegetation/Restoration plan for permanent seeding (following spring).

List of Appendices:

Appendix A: Hydrologic and Hydraulic Study

Appendix B: Restoration Specification

Appendix C: Construction Plans

Appendix A: Hydrologic and Hydraulic Study

HYDROLOGIC AND HYDRAULIC (H&H) EVALUATION REPORT

Town of Gibraltar

Fish Passage Project – Half Mile Dam

Project Contacts

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H & H Evaluation

This report summarizes results of the hydrologic and hydraulic (H&H) analyses that we performed for the Half-Mile Dam on Fish Creek. The Town of Gibraltar is planning on modifying the dam by cutting out much of its concrete spill way wall (see attached plans) in order to functionally eliminate this fish passage barrier. This evaluation is required for the Wisconsin Department Natural Resources (WDNR) Chapter 30 Stream Realignment Permit application, as well as the Door County Floodplain Zoning Ordinance. The Chapter 30 Stream Realignment Permit application requires an analysis of the 2-year flow event while the Door county Flood Plain Zoning Ordinance requires an analysis to confirm that the proposed modifications will not raise the water surface elevation (WSEL) during the 100-year flow events.

Project Description

The primary objective of the Town of Gibraltar is to restore fish access to spawn habitat along Fish Creek, which flows into Green Bay. The first obstacle to fish passage is the approximate two foot rise from the stony bed of the creek up to the downstream pan of the Hwy 42 Bridge box culvert, through which the creek flows. This obstacle's modifications and analysis is addressed in a separate report. The next obstacle is Half-Mile Dam. The plan is to modify the dam as analyzed in this report.

The existing dam spillway is approximately 3' tall and 20' wide. There is a 7' long dissipation pan immediately downstream of the dam. The dam currently makes fish passage impossible. In order to allow fish passage, much of the spillway wall will be removed, lowering the spillway invert by approximately 3' down to the existing dissipation pan (see attached plans for more details).

The dam is located within the Zone AE flood plain limit (per the pertinent FEMA FIRM) as is shown in Figure 1. In order to computationally verify that the proposed dam modification will not raise the WSEL for the 2- and 100-year flow events, we performed detailed hydrologic and hydraulic analyses, which are described as follows.

Door County Flood Insurance Study

Door County's Flood Insurance Study (FIS) dated March 2, 2009, includes hydrologic and hydraulic analyses of Fish Creek. Through Wisconsin Department of Natural Resources' Surface Water Data Viewer, we were able to obtain the Input Data for this FIS of Fish Creek. This data includes calculated estimated peak flows for the 10-, 50-, 100-, and 500-year events (see Table 1). We have utilized the 100-year peak flow (Q_{100}) from the FIS as part of our analysis.

Table 1: Summary of Door County FIS flood flow values at Half Mile Dam

FIS Input Data at Half Mile Dam		
Event	Flow (cfs)	Water Surface Elevation Over Existing Spillway of 592.4 ft (NAVD 88)
10-Year Event	355	595.35
50-Year Event	600	595.84
100-Year Event	710	596.03
500-Year Event	1010	597.29

Hydrologic Analysis

For the purposes of this project, the evaluations of both the 2-year and 100-year events are required. Because the Door County FIS did not include the 2 year event, our evaluation included hydrologic analysis for it. The hydrological analysis for flood studies in Wisconsin must be done in accordance with the NR116.07(3)(a) list of approved techniques. When analyzing the 100-year event, Door County FIS values were used. However, the IP Stream Realignment Chapter 30 Permit's 2-year event analysis does not specify a method for analysis. Therefore, we used the **USGS Flood-Frequency Regression Equation to establish the 2-year event peak flow estimate (Q_2)**. This calculation employs the best-fit multi-variable regression equations developed and tabulated in "Flood-Frequency Characteristics of Wisconsin Streams", by J. F. Walker and W.R. Krug in 2003 (Equation 1).

Equation 1: Best-fit regression equation (equation 4-1) for the Q_2 flow; A – contributing drainage area in square miles, ST – storage, in percent of basin area plus 1.0, S – main-channel slope in feet per mile, SP – soil permeability of the least-permeable soil horizon in inches per hour, SN – mean annual snowfall for 1961-1990 in inches.

$$Q_2 = 2.69 A^{0.864} \cdot ST^{-0.296} \cdot S^{0.279} \cdot SP^{-0.250} \cdot SN^{0.490}$$

Figure 2 illustrates the watershed area draining into the flood study project area. Values used for our calculations are summarized in Table 2.

Table 2: Summary of USGS regression equation input variable values; input parameters used in our analysis were sampled by watershed from geospatially referenced (GIS) data freely available at the county, state, and federal levels.

Location	Watershed Area (mi ²)	Watershed Storage (%)	Slope of Main Channel (feet/mile)	Soil Permeability (inches/hour)	Average Annual Snowfall (inches)	"2-Yr" Estimated Peak Flow (Q ₂ , cfs)
Project Site	10.87	24	12.15	0.177	52	177

Hydraulic Analysis

The hydraulic analysis was conducted using a Q₂ of 177 cfs based on the USGS regression equation and a Q₁₀₀ of 710 cfs from the Door County FIS.

HEC-RAS was used to model the hydraulic component of the analysis. The edition of HEC-RAS in wide-release, contemporaneous to this study and accepted by Wisconsin DNR, is version 5.0.7. This version exceeds the requirements of NR116.07(4)(c), which requires the use of HEC-2, the predecessor to HEC-RAS.

Cross-sectional data was established using a combination of data obtained from site topographic survey and county level contour topography data. The station and elevation data for the existing conditions reflect sampled points overlain onto county topography. The channel topography consists of field cross-section surveys conducted by Miller Engineers & Scientists. The proposed condition elevation data comes from the same topography with modifications to include the proposed alterations to the dam. The locations of these cross sections are shown in Figure 3.

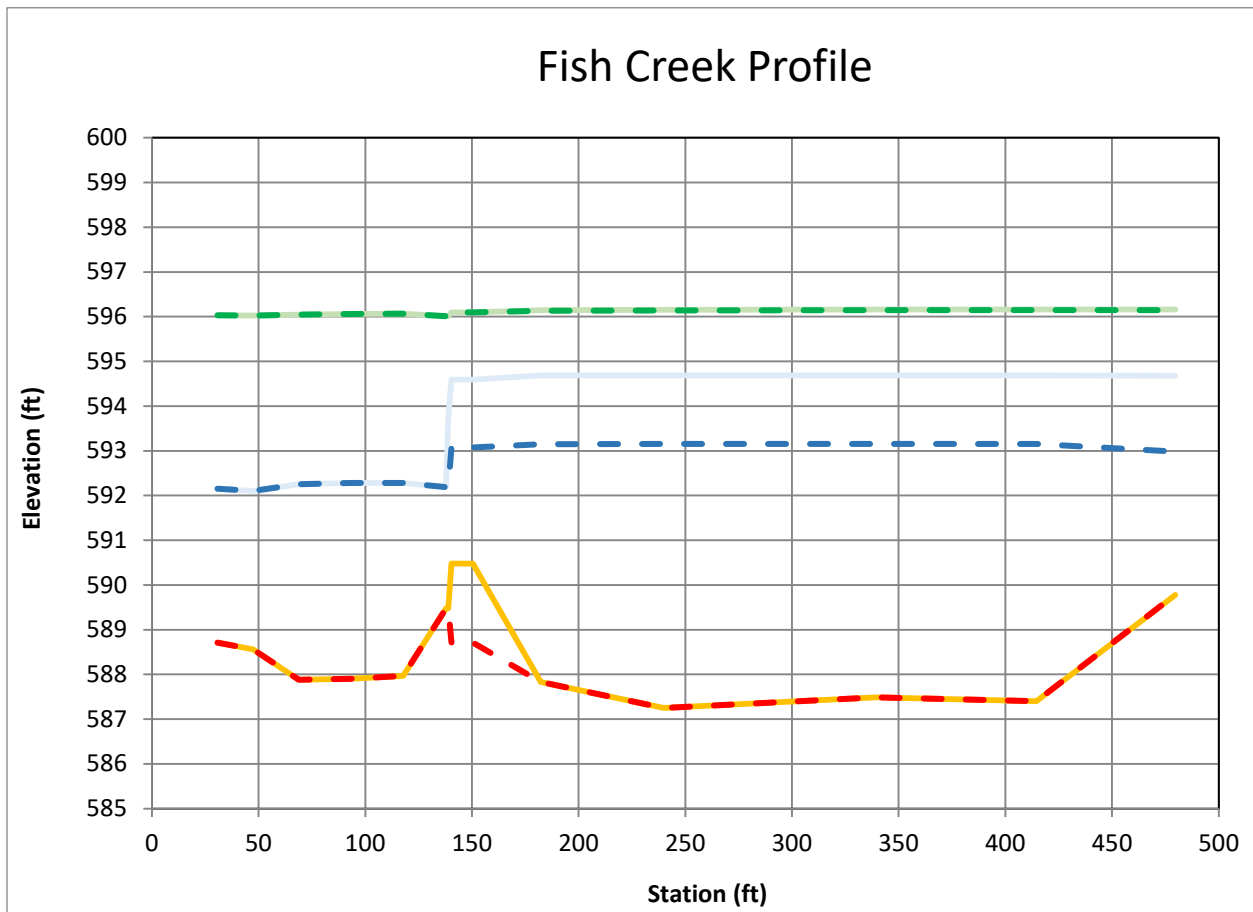
Manning's "n" values were chosen appropriate for the local vegetated land cover conditions. Much of the area in the expected floodplain is covered in riparian forest, shrubbery, or grasses. The Manning's "n" values represent an average channel with few obstructions and banks and some vegetation creating an impediment for flow. These values are shown in Table 3. The model was sensitivity-tested by increasing and decreasing the Manning's "n" values simultaneously for all geometries: existing and proposed while empty and full. No appreciable effect was noted for adjustments made within ±0.005 of the initially selected values.

Table 3: HEC-RAS model input values for Manning's "n" roughness at all cross section geometries

Manning's "n"			
Channel Downstream of Dam	Channel Upstream of Dam	Weedy Areas on Creek Bank	Upland Wooded Areas on Creek Bank
0.044	.033	0.05	0.12

The results of the finalized model parameters for the analyzed flow are shown in Exhibit 1 and Tables 4 and 5. **These results verify that the proposed project will not increase the Q₂ and Q₁₀₀ WSEL's at any locations evaluated and will lower the WSEL around the spillway location by approximately 1.5'.** Figure 4 compares the existing and proposed Q₂ and Q₁₀₀ WSEL's for dam modifications.

Exhibit 1: Q_2 and Q_{100} WSEL's Profile through analyzed reach of Fish Creek



- Existing Creek Elevation
- - Proposed Bed Elevation
- Existing WSEL 2-Yr Event
- - Proposed WSEL 2-Yr Event
- Existing WSEL 100-Yr Event
- - Proposed WSEL 100-Yr Event

Table 4: WSE's for Analyzed Q_2 Flow calculated in HEC-RAS;

Geometry		Analyzed Q_2 Flow			
River Station	Stream Thalweg Elevation	Q_2	Existing Q_2 WSEL	Proposed Q_2 WSEL	Maximum Change of WSEL
(ft.)	(ft.)	(cfs.)	(ft.)	(ft.)	(ft.)
0+30.74	588.71	177	592.15	592.15	0.00
0+47.44	588.56	177	592.10	592.10	0.00
0+68.83	587.88	177	592.26	592.26	0.00
0+93.01	587.90	177	592.28	592.28	0.00
1+17.79	587.97	177	592.28	592.28	0.00
1+37.88	589.48	177	592.19	592.19	0.00
Half-Mile Dam					
1+50.47	588.74	177	594.60	593.08	-1.52
1+82.30	587.83	177	594.69	593.15	-1.54
2+39.80	587.25	177	594.69	593.15	-1.54
3+39.42	587.49	177	594.69	593.15	-1.54
4+14.62	587.40	177	594.69	593.15	-1.54
4+79.59	589.78	177	594.68	592.98	-1.70

Table 5: WSE's for Analyzed Q_{100} Flow calculated in HEC-RAS.

Geometry		Analyzed Q_{100} Flow			
River Station	Main Channel Elevation	Q_{100}	Existing Q_{100} WSEL	Proposed Q_{100} WSEL	Maximum Change of WSEL
(ft.)	(ft.)	(cfs.)	(ft.)	(ft.)	(ft.)
0+30.74	588.71	710	596.03	596.03	0.00
0+47.44	588.56	710	596.03	596.03	0.00
0+68.83	587.88	710	596.05	596.05	0.00
0+93.01	587.90	710	596.06	596.06	0.00
1+17.79	587.97	710	596.07	596.07	0.00
1+37.88	589.48	710	596.01	596.01	0.00
Half-Mile Dam					
1+50.47	588.74	710	596.09	596.09	0.00
1+82.30	587.83	710	596.15	596.13	-0.02
2+39.80	587.25	710	596.15	596.14	-0.01
3+39.42	587.49	710	596.16	596.15	-0.01
4+14.62	587.40	710	596.16	596.15	-0.01
4+79.59	589.78	710	596.16	596.15	-0.01

Conclusions

This evaluation concludes that **the WSEL for the 2- and 100-year flow events will not be raised by performing the proposed modifications to the dam** described as detailed on the attached plan. As expected, the proposed modifications to the dam do not reduce the creek's flow capacity, but actually lower the WSEL for both the 2 and 100 year peak flows.

Sincerely,

MILLER ENGINEERS & SCIENTISTS

Brian Wells
9/17/19

Brian Wells, P.E.
Project Engineer



Roger G. Miller

Roger G. Miller, P.E.
President

Enclosures: Appendix

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APPENDIX

Cross Section 1+50.47 with Dam Overlay

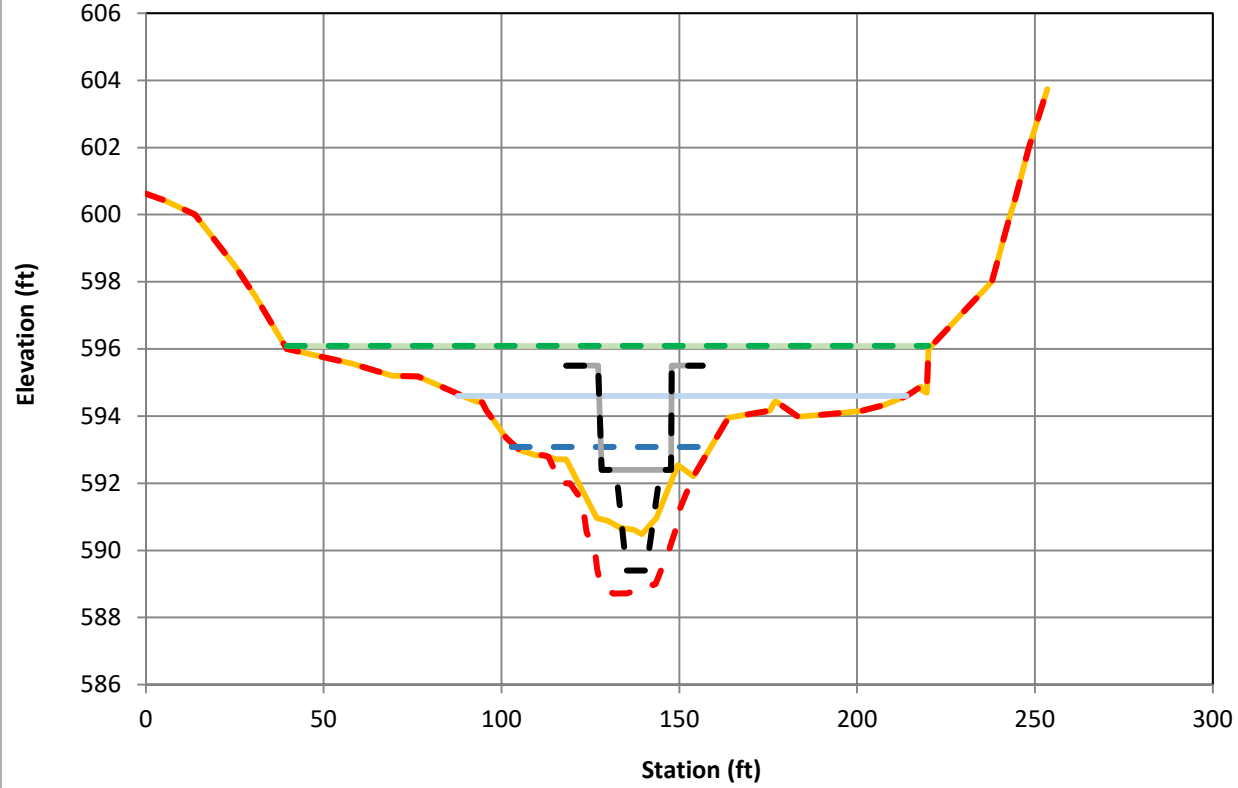


Figure 4: Cross Section 1+50.47 with Dam Overlay

- Existing Ground
 - Existing WSEL 2-Yr Event
 - Existing WSEL 100-Yr Event
 - Existing Dam
- - Proposed Ground
 - - Proposed WSEL 2-Yr Event
 - - Proposed WSEL 100-Yr Event
 - - Proposed Dam






FIGURE 1: FEMA FLOODPLAIN MAP

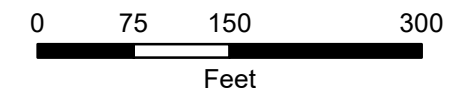
Fish Creek Dam
Town of Gibraltar, Wisconsin

MILLER ENGINEERS SCIENTISTS

5308 S. 12th Street
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Legend

-  Fish Creek
-  FEMA Zone AE
-  Miller Studied
2-Year Event WSEL
-  Miller Studied
100-Year Event WSEL
-  Approximate Project Area



DATE: 9/5/2019

PROJECT: 20435-001

BY: SMM

CHK: BRW



FIGURE 2: WATERSHED MAP




Fish Creek Dam
Town of Gibraltar, Wisconsin

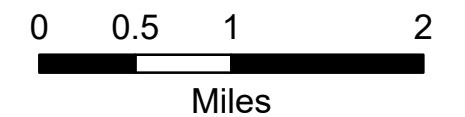
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Legend

-  Fish Creek
-  Project Watershed
-  Approximate Project Area



DATE: 9/5/2019

PROJECT: 20435-001

BY: SMM

CHK: BRW

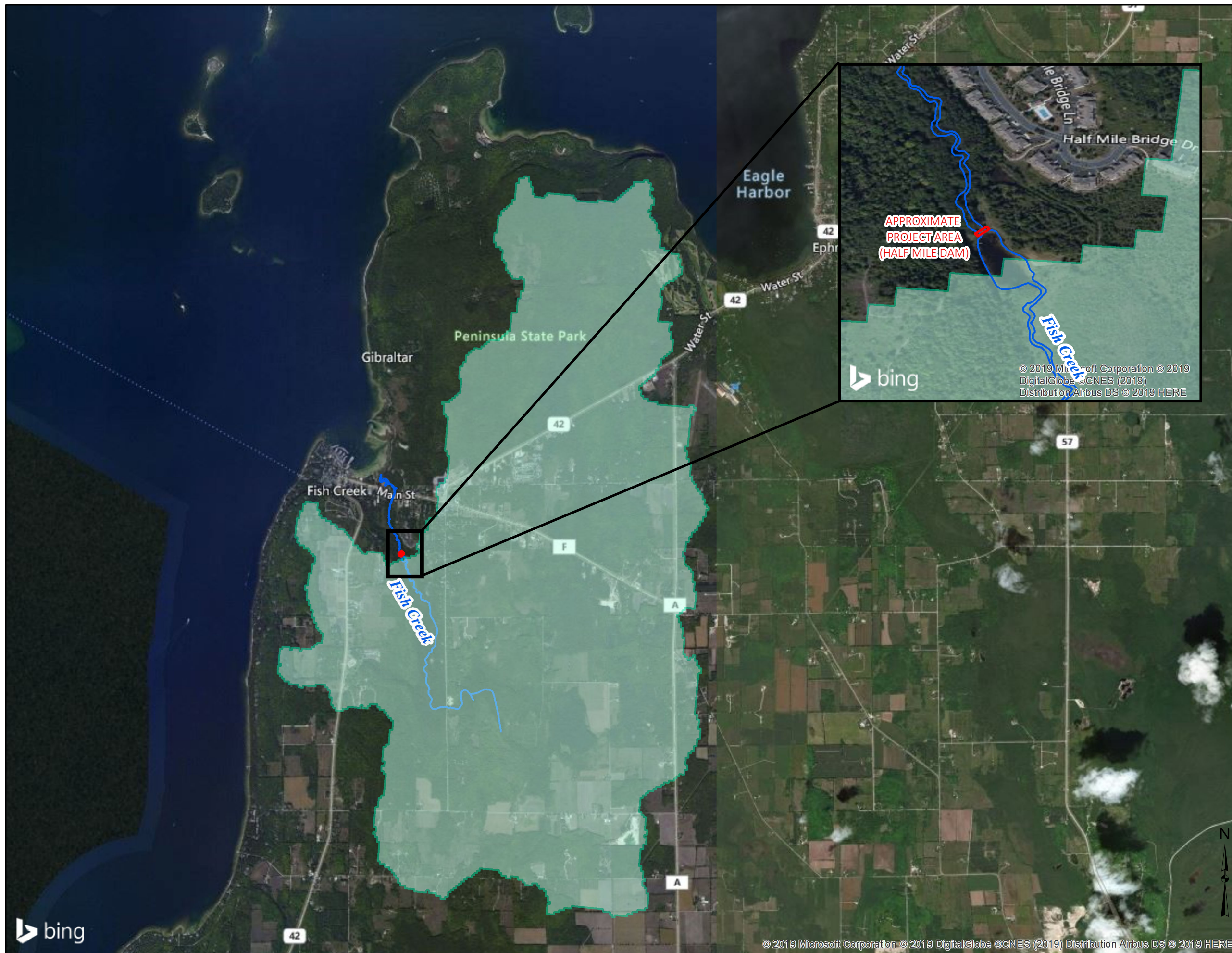




FIGURE 3: CROSS SECTION LOCATIONS

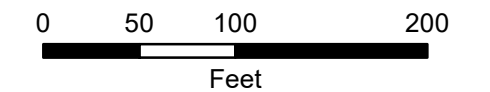
Fish Creek Dam
Town of Gibraltar, Wisconsin

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Legend

- Fish Creek
- Cross Sections
- Miller Studied
2-Year Event WSEL
- Miller Studied
100-Year Event WSEL
- Approximate Project Area



DATE: 9/5/2019

PROJECT: 20435-001

BY: SMM

CHK: BRW

Appendix B: Restoration Specification

RESTORATION SPECIFICATION
Town of Gibraltar
Fish Passage Project – Half Mile Dam

Project Contacts

Contacts	Name	Address	Phone Number
Landowner	Town of Gibraltar	4097 Highway 42 Fish Creek, WI 54212	(920) 868-1714
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Restoration Specifications

1. Permanent seeding shall be done only between April 15 through June 1, or between August 1 through August 21. Otherwise, temporary seeding with common oats and/or annual rye shall be done. Permanent seeding shall be done during the next suitable period following temporary seeding.
2. Seed mix shall be placed along the exposed side-slopes (post drawdown) of Redman Pond, between standing water and undisturbed vegetation.
3. Seed mix shall be applied at rates determined by local nursery.
4. Native seed and cover crop shall be applied directly to soil surface and raked in
5. Erosion control mat shall be placed following seeding and kept in place until vegetation has established.

**Recommended species list for restoration of exposed soils post-dam-removal.
Specific seeding rates to be determined by local nursery, based on availability.**

**FISH CREEK DAM REMOVAL - SHORELINE RESTORATION PLANT LIST
(Partial Sun, Muck, Mostly Saturated)**

Common Name	Species Name	Mature Plant Height	Flower Color	Bloom Time
Forbs				
Wild Columbine	<i>Aquilegia canadensis</i>	1-3'	Red/Yellow	May-July
Swamp Milkweed	<i>Asclepias incarnata</i>	3'-5'	Pink	Jun-Sept
Side-Flowering Aster	<i>Aster lateriflorus</i>	1-3'	White/Yellow	Jul-Aug
New England Aster	<i>Aster novae-angliae</i>	3'-6'	Violet/Yellow	Jul-Sept
Common Boneset	<i>Eupatorium perfoliatum</i>	3'-5'	White	July-Oct
Sneezeweed	<i>Helenium autumnale</i>	3'-5'	Yellow	July-Nov
Blue Flag	<i>Iris virginicus</i>	2-3'	Purple	May-July
Cardinal Flower	<i>Lobelia cardinalis</i>	2-4'	Red	Jul-Sept
Great Blue Lobelia	<i>Lobelia siphilitica</i>	1-4'	Blue	Jul-Sept
Monkey Flower	<i>Mimulus ringens</i>	2'-4'	Purple	Jun-Sept
Common Arrowhead	<i>Sagittaria latifolia</i>	1'-4'	White	June-Sept
Grasses				
Bluejoint Grass	<i>Calamagrostis canadensis</i>	2'-4'	Brown	June-Aug
Bebb's Oval Sedge	<i>Carex bebbii</i>	2-3'	Green	June
Crested Oval Sedge	<i>Carex cristatella</i>	2-3'	Green	May-June
Porcupine Sedge	<i>Carex hystericina</i>	2'-3'	Green	May-June
Common Lake Sedge	<i>Carex lacustris</i>	2-4'	Green	May-June
Tussock Sedge	<i>Carex stricta</i>	2'-3'	Green	Apr-June
Fox Sedge	<i>Carex vulpinoidea</i>	2'-3'	Green	May-Jun
Blunt Spike Rush	<i>Eleocharis ovata</i>	6"-1'	Green	May-Sept
Fowl Manna Grass	<i>Glyceria striata</i>	1'-5'	Green	May-June
Common Rush	<i>Juncus effusus</i>	1-4'	Brown	June
Hard-Stemmed Bulrush	<i>Schoenoplectus acutus</i>	4'-8'	Brown	May-Aug
Great Bulrush	<i>Schoenoplectus tabernaemontani</i>	4'-8'	Brown	May-Aug
Cover Crop				
Common Oat	<i>Avena sativa</i>			
Annual Rye	<i>Lolium multiflorum</i>			

Appendix C: Construction Plans

HALF MILE DAM STRUCTURE MODIFICATION

HWY 42, FISH CREEK, DOOR COUNTY, WISCONSIN

ORIGINAL PLANS

PREPARED BY

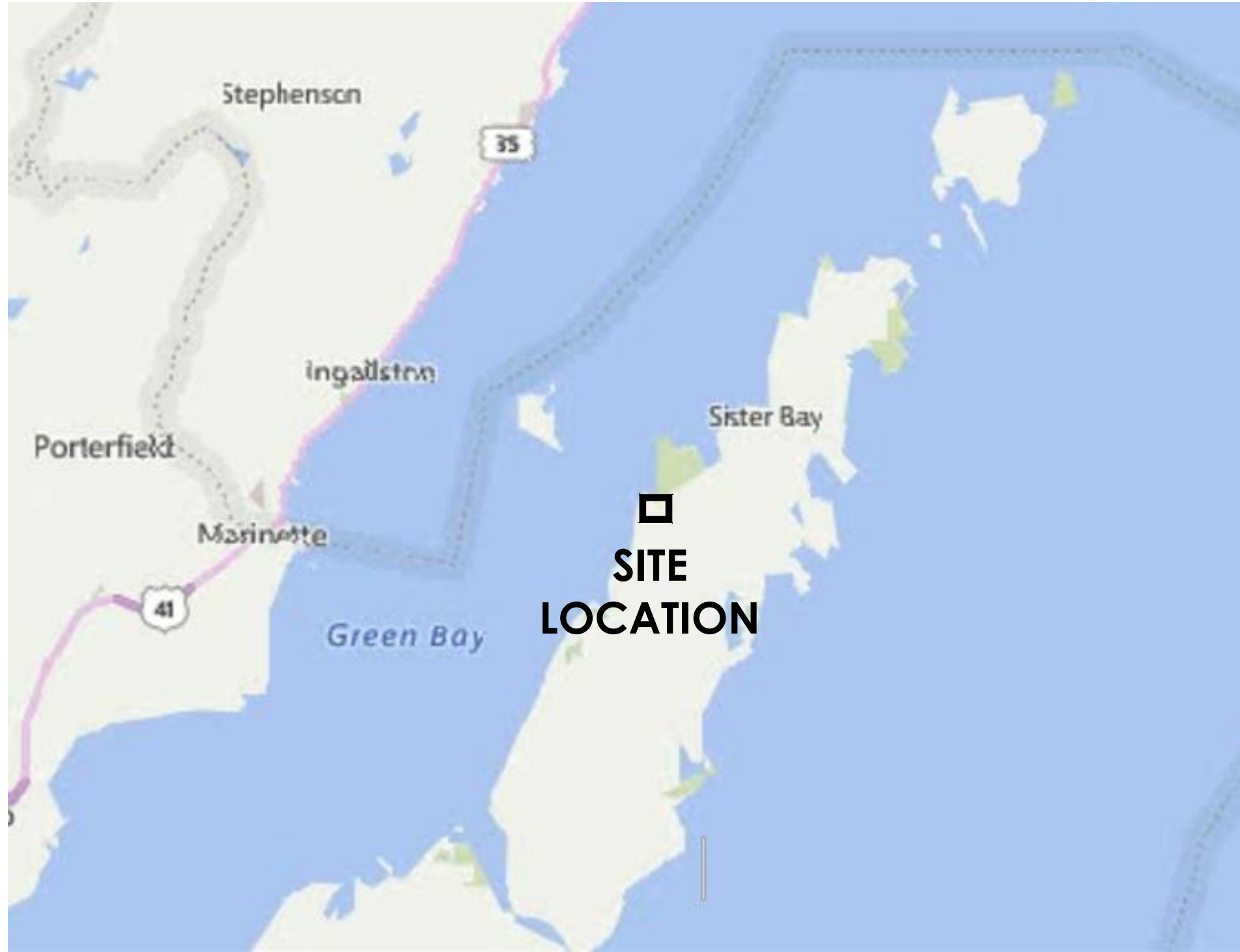
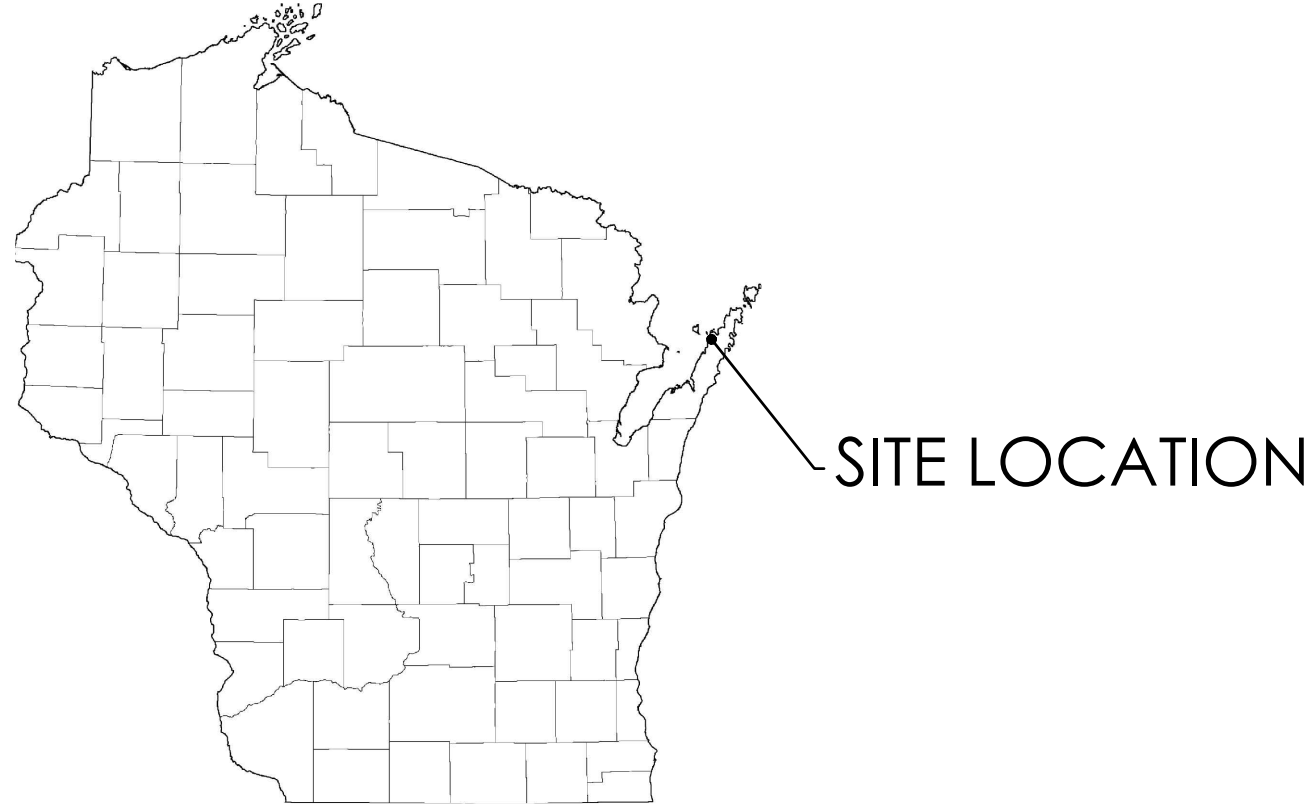
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PREPARED FOR

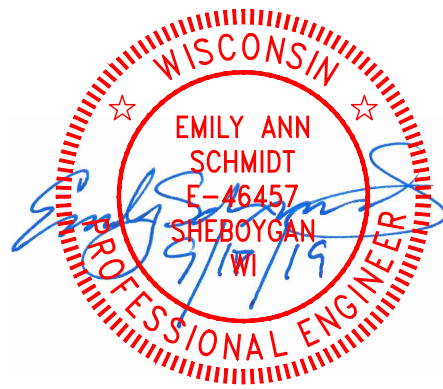


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PO BOX 850
FISH CREEK, WI 54212-0850
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FAX: (920) 868-9425



INDEX TO DRAWINGS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET, INDEX, AND LOCATION MAP
2	DETAILS AND SPECIFICATIONS



I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF WISCONSIN.

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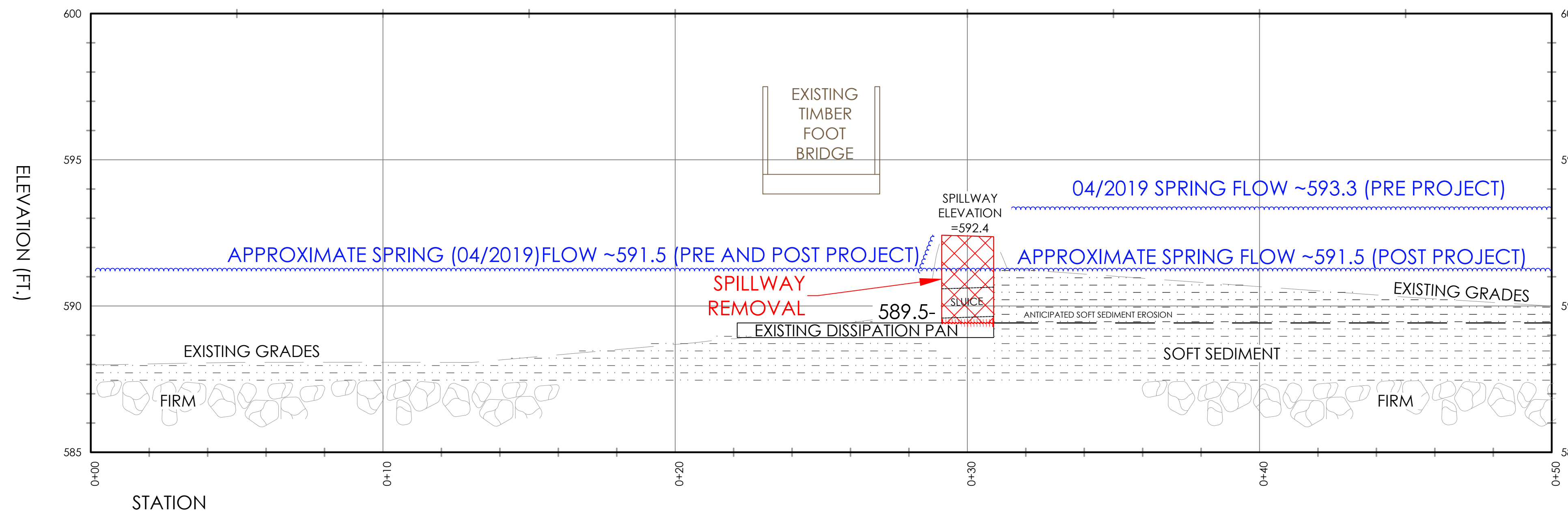
NO.	DATE	DESCRIPTION	BY

HALF MILE DAM STRUCTURE MODIFICATIONS
TOWN OF GIBRALTAR
HWY 42, FISH CREEK
DOOR COUNTY, WISCONSIN

SCALE	HOR. NA
VER.	NA
DATE	09/10/2019
JOB	20435-C
BY	EAS
CK	RGM
SHEET	1
OF	2

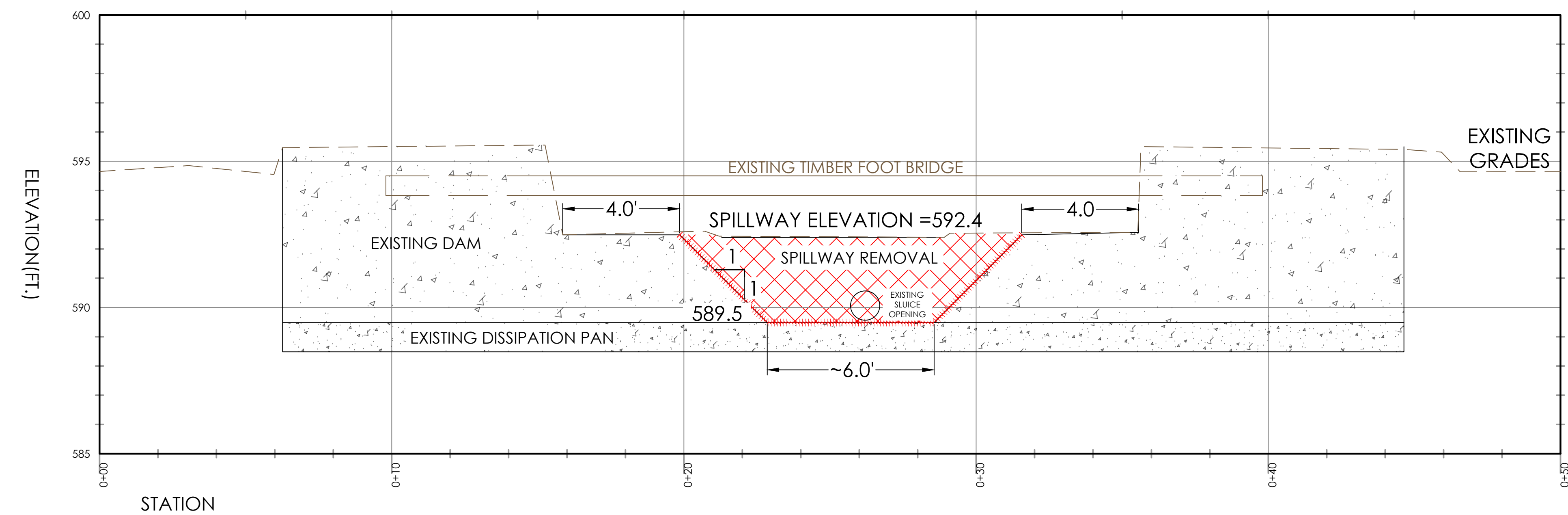
STREAM PROFILE A-A' (LOOKING NORTHEAST)

1"=3'

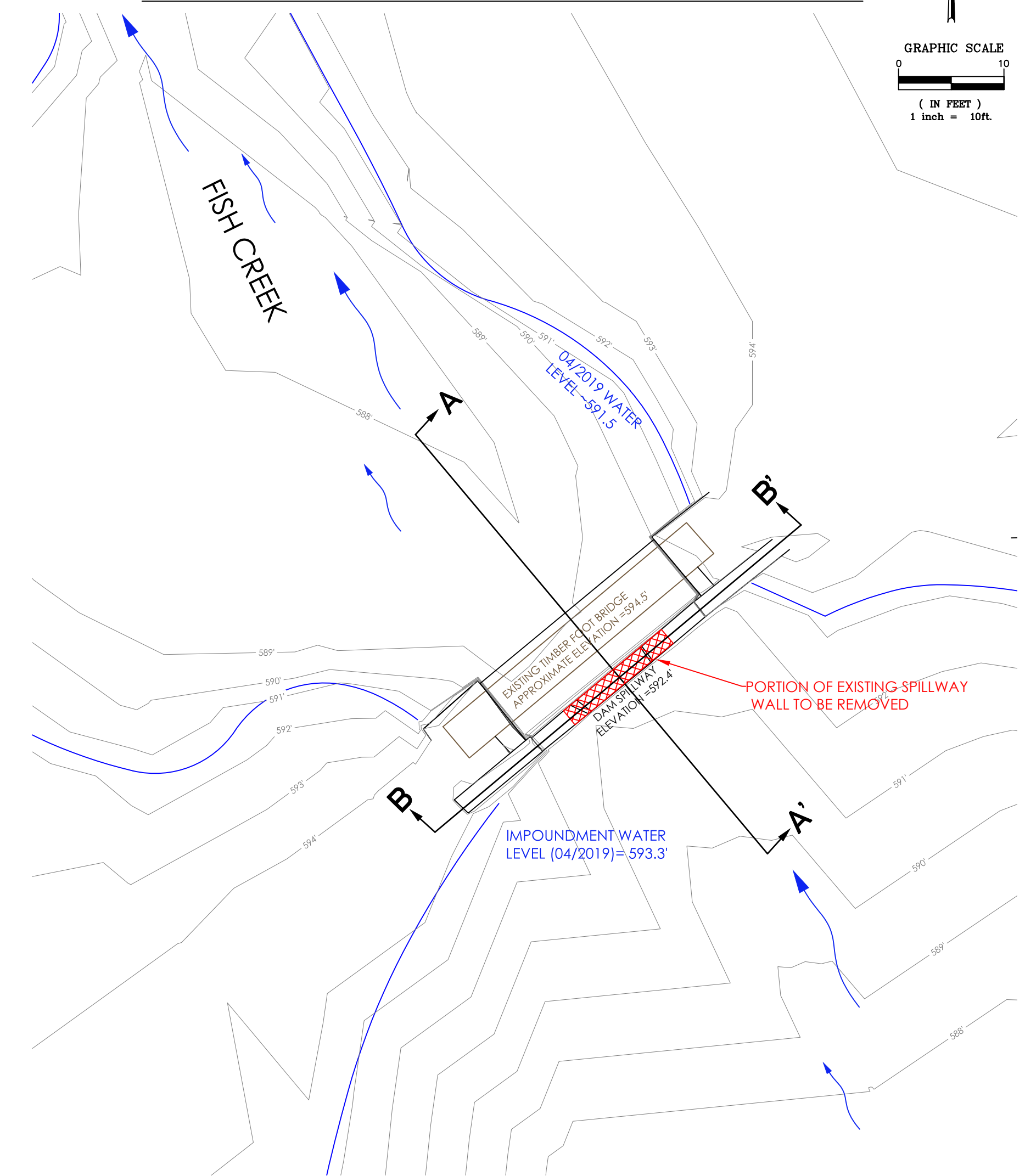


DAM SPILLWAY CROSS SECTION B-B' (LOOKING UP-STREAM)

1"=3'



HALF MILE DAM PLAN VIEW



GENERAL NOTES

- DIMENSIONS, WHEN SHOWN, TAKE PRECEDENCE OVER SCALE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD.
- THE CONTRACTOR SHALL CALL DIGGERS HOTLINE SERVICE FOR THE LOCATION AND STAKING OF EXISTING UNDERGROUND UTILITIES AT 1-800-242-8511, 3 WORKING DAYS PRIOR TO DIGGING. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING ALL OF THE UTILITIES PRIOR TO THE INSTALLATION OF ANY UNDERGROUND IMPROVEMENTS.
- ALL CONSTRUCTION SIGNING TO BE IN ACCORDANCE WITH THE TOWN OF GIBRALTAR AND WISCONSIN DEPARTMENT OF TRANSPORTATION REQUIREMENTS.
- THE PROPOSED IMPROVEMENTS SHALL BE CONSTRUCTED ACCORDING TO THE ORDINANCES AND REQUIREMENTS OF THE TOWN OF GIBRALTAR AND THE STATE OF WISCONSIN DOT, DSPS, AND DNR REQUIREMENTS AND PER THE STATE OF WISCONSIN STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION, CURRENT EDITION.
- THE PROPOSED IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH PLANS APPROVED BY THE TOWN OF GIBRALTAR, FOLLOWING PROPER CONSTRUCTION TECHNIQUES.
- THE CONTRACTOR IS RESPONSIBLE FOR EXAMINING ALL EXISTING SITE CONDITIONS PRIOR TO BEGINNING CONSTRUCTION AND IS TO COMPARE THE SITE CONDITIONS TO THOSE SHOWN ON THE ENGINEERING PLANS. ANY DISCREPANCIES ARE TO BE IDENTIFIED AND RESOLVED PRIOR TO THE START OF CONSTRUCTION.
- IF ANY ERRORS, DISCREPANCIES OR OMISSIONS ON THE PLANS BECAME APPARENT DURING CONSTRUCTION, PROVIDE IMMEDIATE NOTIFICATION TO ENGINEER.
- THE CONTRACTOR SHALL VERIFY THE GRADE AND LOCATION OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. RELATED WORK SHALL NOT COMMENCE UNTIL ANY DISCREPANCY IS RESOLVED.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER WITH AS-BUILT INFORMATION OF THE IMPROVEMENTS.
- THE CONTRACTOR SHALL INSTALL A PEDESTRIAN FENCE AROUND ALL EXCAVATIONS TO BE LEFT OPEN OVERNIGHT. THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY DURING CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- THE RESTORATION OF EXISTING IMPROVEMENTS WHICH ARE DAMAGED DURING CONSTRUCTION, IS CONSIDERED INCIDENTAL AND SHALL BE DONE PER THE REQUIREMENTS OF THE MUNICIPALITY AND SHOULD INCLUDE PAVEMENT, CURB & GUTTER, SIDEWALK, TOPSOIL, FERTILIZER, SEEDING AND MULCHING.
- THE PRIME CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE WORK OF ALL OTHER CONTRACTORS INVOLVED WITH CONSTRUCTION OF THE PROPOSED IMPROVEMENTS AND FOR REPORTING ANY DISCREPANCIES BETWEEN THESE PLANS AND PLANS PREPARED BY OTHERS FOR THE PROJECT.
- THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY DURING CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS, PERMIT COSTS, TAP FEES, METER DEPOSITS, BONDS, AND ALL OTHER FEES REQUIRED FOR THE PROPOSED WORK TO BE DONE AND IS RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
- ANY EXISTING SANITARY SEWER, SANITARY SEWER LATERALS, WATER MAIN, WATER SERVICES, STORM SEWER, STORM SEWER LATERALS OR OTHER EXISTING UTILITIES WHICH ARE DAMAGED DURING CONSTRUCTION, SHALL BE REPAIRED TO THE UTILITY OWNER'S SATISFACTION AND AT THE CONTRACTOR'S EXPENSE.

CONSTRUCTION NOTES:

- CONTRACTOR SHALL OBTAIN ANY REQUIRED PERMITS FROM WDNR, COUNTY AND LOCAL MUNICIPALITIES PRIOR TO COMMENCING CONSTRUCTION AND MEET ALL CONDITIONS OF PERMIT.
- CONSTRUCTION ACCESS AND STAGING SHALL BE LOCATED IN UPLAND AREAS, AVOIDING WETLANDS AND SHALL BE COORDINATED WITH THE TOWN OF GIBRALTAR.
- DAM BREACH SHOULD BE PERFORMED IN WINTER WHEN FLOW IS AT A MINIMUM AND THERE IS LITTLE CHANCE OF FLOODING.
- WORK SCHEDULE SHALL CONFORM TO REQUIREMENTS OF THE TOWN OF GIBRALTAR.
- CONCRETE REMOVAL SHALL BE PERFORMED AT LEAST TO THE LIMITS SHOWN ON THE PLAN.
- ALL EXPOSED REINFORCING STEEL SHALL BE CUT OFF FLUSH WITH FINAL CONCRETE SURFACE.
- ALL CONCRETE AND DEMOLITION MATERIALS SHALL BE PROPERLY DISPOSED OF, OFF SITE.
- SOFT SEDIMENT REMOVED FROM UPSTREAM OF SPILLWAY MAY BE SPREAD ON AGRICULTURAL LAND AT DIRECTION OF LAND OWNER AND FARMER.
- ANY DAMAGE TO PAVEMENTS, LANDSCAPING OR EXISTING IMPROVEMENTS SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.

DETAILS AND SPECIFICATIONS



CALL 811 OR 1-800-242-8511

TDD (FOR HEARING IMPAIRED) 1-800-542-2289

WIS. STATUTE (REGS) 19.46

REQUIRES MIN. OF 3 WORK DAYS

NOTICE BEFORE YOU EXCAVATE

ALL UNDERGROUND UTILITY LOCATIONS SHOWN HEREON ARE BASED UPON: FIELD SURVEY OF VISIBLE ABOVE GROUND STRUCTURES, RECORD MAPS OR DIGGERS HOTLINE MARKINGS. THE SURVEYOR HAS NOT LOCATED THE ACTUAL UNDERGROUND UTILITY. THE EXACT LOCATION OF ALL UTILITIES MUST BE FIELD LOCATED AND MARKED PRIOR TO BEGINNING ANY CONSTRUCTION.

5308 S. 12th Street
Sheboygan, WI 53081-8099
Phone: (920) 458-8144
Fax: (920) 458-0369
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MILLER
ENGINEERS
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Designing in Harmony with the Environment

NO.	DATE	DESCRIPTION	BY

HALF MILE DAM STRUCTURE MODIFICATIONS
TOWN OF GIBRALTAR
HWY 42, FISH CREEK
DOOR COUNTY, WISCONSIN

SCALE
HOR. 1"=10'
VER. 1"=10'

DATE
09/10/2019

JOB
20435-C

BY
EAS

CK
RGM

SHEET
2 OF 2