GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
MARQUETTE DISTRICT OFFICE

DANIEL EICHINGER
ACTING DIRECTOR

SETTLEMENT CONFIDENTIAL
SUBJECT TO MRE 408

March 7, 2023

VIA EMAIL

City of Marquette
Attn: Mikael Kilpela
300 West Baraga Avenue
Marquette, Michigan 49855

Dear Mikael:

SUBJECT: Draft Permit for Countersignature
Submission Number: HP7-D88M-9J4GW
Project Name: Lakeshore Boulevard Phase 2

The Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD), has reviewed the above-referenced application for permit pursuant to Part 325, Great Lakes Submerged Lands, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The purpose of the project, as depicted in your application, is to improve deteriorated shoreline protection, decrease the threat of shoreline erosion, and to restore the shoreline and enable public access to the shoreline.

The WRD determined that the originally proposed project would have significant adverse effects on Lake Superior bottomlands, and that feasible and prudent alternatives existed that would minimize those impacts. Your permit application was denied on June 23, 2022, for those reasons. A contested case was subsequently filed, and negotiations ensued thereafter in an effort to find an agreeable compromise. The result of those negotiations is a tentative agreement for a modified project. The WRD has crafted a draft countersignature permit that memorializes this agreement. Enclosed is a draft permit for countersignature that authorizes construction of the living revetment.

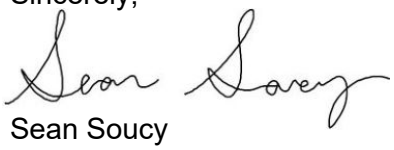
Carefully review and fully understand the draft permit and all of its associated terms and conditions. As the permittee, you are responsible for assuring that the project is completed as authorized and in compliance with permit requirements. If you agree to all of the terms and conditions, sign the draft permit in the space provided, initial each of the drawings, and return the entire document to our office within 30 days of the date of this letter.

This permit is not valid until signed by an official of the WRD. Upon return of the signed and initialed document from you, the WRD will issue the permit in a timely manner and return a signed copy to you. Construction activity is not authorized to begin until a valid permit is held at the project site. If you do not return the signed and initialed document by the required date, an application denial letter will be sent to you.

The activity authorized in the draft permit is an agreed settlement of the pending contested case concerning the initial application. By signing this document and returning it to EGLE for final execution, the applicant acknowledges this permit will require Petitioner to voluntarily dismiss the concurrent contested case, Docket No. 22-0300600.

If you have any questions regarding the specifics of this draft permit, please contact me at 906-250-0588; soucys@michigan.gov; or EGLE, WRD, Marquette District Office, 1504 West Washington Street, Marquette, Michigan 49855. Please include your submission number, HP7-D88M-9J4GW, in your response.

Sincerely,



Sean Soucy
Marquette District Office
Water Resources Division

SS:SLS
Attachment
cc: Richard Baron, City of Marquette Attorney
Carl Lindquist, Superior Watershed Partnership
Dennis Stachewicz, City of Marquette
Jared Dorvinen, Baird
Peter Truax, Baird
Kate Kasten, USACE
Ryan McCone, EGLE
Chris Antieau, EGLE
Chris Conn, EGLE
Steve Harrington, EGLE
Laura LaMore, MDAG
Echo Aloe, MDAG
Marquette CEA
City of Marquette Clerk

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
WATER RESOURCES DIVISION
PERMIT

Issued To:

City of Marquette
Attn: Mikael Kilpela
300 W. Baraga Ave.
Marquette, MI 49855

Permit No: **WRP036643 v.1**
Submission No.: **HP7-D88M-9J4GW**
Site Name: **52-Lakeshore Boulevard Relocation**
Issued: **DRAFT**
Expires: **X 5 YEARS**

This permit is being issued by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division, under the provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); specifically:

- ☐ **Part 301, Inland Lakes and Streams**
- ☐ **Part 303, Wetlands Protection**
- ☐ **Part 315, Dam Safety**
- ☐ **Part 323, Shorelands Protection and Management**
- ☒ **Part 325, Great Lakes Submerged Lands**
- ☐ **Part 353, Sand Dunes Protection and Management**
- ☐ **Part 31, Water Resources Protection (Floodplain Regulatory Authority)**

EGLE certifies that the activities authorized under this permit are in compliance with the State Coastal Zone Management Program and certifies without conditions under the Federal Clean Water Act, Section 401 that the discharge from the activities authorized under this permit will comply with Michigan's water quality requirements in Part 31, Water Resources Protection, of the NREPA and associated administrative rules, where applicable.

Permission is hereby granted, based on permittee assurance of adherence to State of Michigan requirements and permit conditions, to:

Authorized Activity:

Place 43,600 cubic yards of fill material below Lake Superior's Ordinary High Water Mark (OHWM) of 602.6 feet IGLD 1985 along 3,200 linear feet of shoreline. The width of fill varies with location, but the maximum width of fill will be 96.7 feet waterward of the OHWM. Most of the fill material is 4- to 8-inch-sized cobble stones placed on a 1-on-4 or 1-on-5 slope with sections of larger cobbles or boulders in strategically-placed locations as shown on the attached project plans. Dredge up to 160 cubic yards of bottomlands for site preparation. The projects' total footprint will impact 5.02 acres of Lake Superior bottomlands and permanently convert 2.8 acres of Lake Superior bottomlands to uplands.
All work shall be completed in accordance with the attached plans and the terms and conditions of this permit.
Authority granted by this permit does not waive any jurisdiction of the United States Army Corps of Engineers or the need for a federal permit.

Waterbody Affected: Lake Superior
Property Location: Marquette County, City of Marquette, T48N R25W Section 11

Authority granted by this permit is subject to the following limitations:

A. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit.
B. The permittee, in exercising the authority granted by this permit, shall not cause unlawful pollution as defined by Part 31 of the NREPA.
C. This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration.
D. All work shall be completed in accordance with the approved plans and specifications submitted with the application and/or plans and specifications attached to this permit.
E. No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved.
F. It is made a requirement of this permit that the permittee give notice to public utilities in accordance with 2013 PA 174 (Act 174) and comply with each of the requirements of Act 174.
G. This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits, or complying with other state statutes.
H. This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights.
I. This permit shall not be assigned or transferred without the written approval of EGLE.
J. Failure to comply with conditions of this permit may subject the permittee to revocation of permit and criminal and/or civil action as cited by the specific state act, federal act, and/or rule under which this permit is granted.
K. All dredged or excavated materials shall be disposed of in an upland site (outside of floodplains, unless exempt under Part 31 of the NREPA, and wetlands).
L. In issuing this permit, EGLE has relied on the information and data that the permittee has provided in connection with the submitted application for permit. If, subsequent to the issuance of a permit, such information and data prove to be false, incomplete, or inaccurate, EGLE may modify, revoke, or suspend the permit, in whole or in part, in accordance with the new information.
M. The permittee shall indemnify and hold harmless the State of Michigan and its departments, agencies, officials, employees, agents, and representatives for any and all claims or causes of action arising from acts or omissions of the permittee, or employees, agents, or representative of the permittee, undertaken in connection with this permit. The permittee's obligation to indemnify the State of Michigan applies only if the state: (1) provides the permittee or its designated representative written notice of the claim or cause of action within 30 days after it is received by the state, and (2) consents to the permittee's participation in the proceeding on the claim or cause of action. It does not apply to contested case proceedings under the Administrative Procedures Act, 1969 PA 306, as amended, challenging the permit. This permit shall not be construed as an indemnity by the State of Michigan for the benefit of the permittee or any other person.
N. Noncompliance with these terms and conditions and/or the initiation of other regulated activities not specifically authorized shall be cause for the modification, suspension, or revocation of this permit, in whole or in part. Further, EGLE may initiate criminal and/or civil proceedings as may be deemed necessary to correct project deficiencies, protect natural resource values, and secure compliance with statutes.
O. If any change or deviation from the permitted activity becomes necessary, the permittee shall request, in writing, a revision of the permitted activity from EGLE. Such revision request shall include complete documentation supporting the modification and revised plans detailing the proposed modification. Proposed modifications must be approved, in writing, by EGLE prior to being implemented.
P. This permit may be transferred to another person upon written approval of EGLE. The permittee must submit a written request to EGLE to transfer the permit to the new owner. The new owner must also submit a written request to EGLE to accept transfer. The new owner must agree, in writing, to accept all conditions of the permit. A single letter signed by both parties that includes all the above information may

be provided to EGLE. EGLE will review the request and, if approved, will provide written notification to the new owner.

Q. Prior to initiating permitted construction, the permittee is required to provide a copy of the permit to the contractor(s) for review. The property owner, contractor(s), and any agent involved in exercising the permit are held responsible to ensure that the project is constructed in accordance with all drawings and specifications. The contractor is required to provide a copy of the permit to all subcontractors doing work authorized by the permit.

R. Authority granted by this permit does not waive permit requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or the need to acquire applicable permits from the County Enforcing Agent (CEA).

S. The permittee is cautioned that grade changes resulting in increased runoff onto adjacent property is subject to civil damage litigation.

T. Unless specifically stated in this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed in a wetland or on bottomland of the water body are not authorized and shall not be constructed unless authorized by a separate permit or permit revision granted in accordance with the applicable law.

U. For projects with potential impacts to fish spawning or migration, no work shall occur within fish spawning or migration timelines (i.e., windows) unless otherwise approved in writing by the Michigan Department of Natural Resources, Fisheries Division.

V. Work to be done under authority of this permit is further subject to the following special instructions and specifications:

1. Authority granted by this permit does not waive permit or program requirements under Part 91 of the NREPA or the need to acquire applicable permits from the CEA. To locate the Soil Erosion Program Administrator for your county, visit https://www.michigan.gov/egle/about/organization/water-resources/soil-erosion/sesc-overview and select “Soil Erosion and Sedimentation Control Agencies”.
2. The authority to conduct the activity as authorized by this permit is granted solely under the provisions of the governing act as identified above. This permit does not convey, provide, or otherwise imply approval of any other governing act, ordinance, or regulation, nor does it waive the permittee's obligation to acquire any local, county, state, or federal approval or authorization necessary to conduct the activity.
3. No fill, excess soil, or other material shall be placed in any wetland, floodplain, or surface water area not specifically authorized by this permit, its plans, and specifications.
4. This permit does not authorize or sanction work that has been completed in violation of applicable federal, state, or local statutes.
5. The permit placard shall be kept posted at the work site in a prominent location at all times for the duration of the project or until permit expiration.
6. This permit is being issued for the maximum time allowed and no extensions of this permit will be granted. Initiation of the construction work authorized by this permit indicates the permittee's acceptance of this condition. The permit, when signed by EGLE, will be for a five-year period beginning on the date of issuance. If the project is not completed by the expiration date, a new permit must be sought.
7. Prior to the initiation of any permitted construction activities, a sedimentation barrier shall be constructed immediately down gradient of the construction site. Sedimentation barriers shall be specifically designed to handle the sediment type, load, water depth, and flow conditions of each construction site throughout the anticipated time of construction and unstable site conditions. The sedimentation barrier shall be maintained in good working order throughout the duration of the project. Upon project completion, the accumulated materials shall be removed and disposed of at an upland (non-wetland, non-floodplain) site and stabilized with seed and mulch. The sedimentation barrier shall then be removed in its entirety and the area restored to its original configuration and cover.
8. All raw areas in uplands resulting from the permitted construction activity shall be effectively stabilized with sod and/or seed and mulch (or other technology specified by this permit or project plans) in a sufficient quantity and manner to prevent erosion and any potential siltation to surface waters or wetlands. Temporary stabilization measures shall be installed before or upon commencement of the

permitted activity and shall be maintained until permanent measures are in place. Permanent measures shall be in place within five (5) days of achieving final grade.

9. All raw earth within 100 feet of a lake, stream, or wetland that is not brought to final stabilization by the end of the active growing season shall be temporarily stabilized with mulch blankets in accordance with the following dates: September 20th for the Upper Peninsula.
10. Prior to commencement of any dredging authorized by this permit, the entire dredged area shall be enclosed with a turbidity curtain to prevent off-site siltation. The turbidity curtain shall be installed to extend from the bed of the waterbody to a point above the existing water's surface. The turbidity curtain shall be maintained for the duration of the project and shall be left in place after completion of dredging until all disturbed sediments have settled.
11. All fill/backfill shall consist of clean inert material that will not cause siltation nor contain soluble chemicals, organic matter, pollutants, or contaminants. All fill shall be contained in such a manner so as not to erode into any surface water, floodplain, or wetland. All raw areas associated with the permitted activity shall be stabilized with sod and/or seed and mulch, riprap, or other technically effective methods as necessary to prevent erosion.
12. All fill shall consist of clean, washed rock or stone that is free of fines, other soil materials, any contaminants, or pollutants.
13. Prior to the start of construction, all adjacent non-work wetland areas shall be protected by properly trenched sedimentation barrier to prevent sediment from entering the wetland. Orange construction fencing shall be installed as needed to prohibit construction personnel and equipment from entering or performing work in these areas. Fence shall be maintained daily throughout the construction process. Upon project completion, the accumulated materials shall be removed and disposed of at an upland site. The sedimentation barrier shall then be removed in its entirety and the area restored to its original configuration and cover.
14. "As-Built" construction plans of the project shall be submitted to this office within 30 days of project completion. The "as-built" plans shall be sealed and signed by a licensed professional engineer and shall certify the project has been completed in accordance with this permit.
15. No excavation is allowed waterward of the ordinary high water mark within the identified contaminated groundwater plume area, as shown on the plans.
16. All existing monitoring wells associated with the Cliffs-Dow site will remain in place during construction to the greatest extent possible and will be replaced following construction if removal becomes necessary.
17. In the event there is a spill of a hazardous material during operations, or if a potentially hazardous substance is encountered in the sub-surface, or if container(s) (pipes, culverts, box troughs, etc.) with waste residues in them are encountered during earth-working activities, the project work shall be immediately suspended, and site conditions evaluated. Appropriate measures shall be promptly undertaken to prevent the potential release of hazardous materials or substances and/or abate any such release which may have occurred. The permittee is responsible for all liability associated with the occurrence of any unintended release, and is also ultimately responsible for the isolation, containment, restoration, final site cleanup, and proper disposal of any environmental media contaminated by the inadvertent fluid losses or the spread of hazardous or foreign materials. In the event of such occurrence(s), the permittee, agent, or contractor shall immediately notify EGLE via the PEAS hotline (800-292-4706) as well as through the National Response Center hotline (800-424-8802). The notification shall include:
    a. The time and magnitude of the spill or discovery of foreign materials.
    b. A description of the steps that are being taken to prevent, eliminate, or otherwise control the release and spread of hazardous fluids or foreign materials.
    c. A time for the next notification to EGLE with the time not to exceed eight (8) hours.
    d. The name and telephone number of the person reporting the incident or of the person overseeing the construction efforts to prevent, halt, or otherwise control the release and spread of hazardous fluids or foreign materials.
18. No foreign/non-native materials (slag, cinders, etc.) from upland areas of the site shall be allowed to be placed into the lake during earth-working activities.

19. Occasional maintenance may be performed on the revetment to re-establish the design profile and overall shoreline position, which includes replacing material that has migrated out of the project area or adding new material. Permittee shall contact EGLE WRD prior to start of maintenance work.
20. The permittee shall monitor the revetment for at least five (5) years following construction. A monitoring report, which compiles and summarizes all data collected during the monitoring period, shall be submitted annually by the permittee. Monitoring reports shall cover the period of January 1 through December 31 and be submitted to EGLE prior to January 31 of the following year.
21. The annual monitoring reports shall follow plans that are outlined in, "Appendix G: Monitoring and Maintenance Plan". The monitoring plans that are required by this permit shall be conducted and reported on annually, which include: cobble movement study, shoreline profile transects, and ecological monitoring for underwater plankton colonization. The dune restoration and trails/boardwalks maintenance plans and reporting will not be required by this permit.
22. The annual reports shall provide a written summary of data from previous monitoring periods and a discussion of changes or trends based on all monitoring results.
23. Monitoring and annual reporting to EGLE shall continue until at least 5 continuous years of proper project performance has been documented.
24. Should the revetment fail to maintain its design specifications throughout the initial 5-year monitoring period, and is determined by EGLE to be in non-compliance, the permittee shall:
    a. Assess the problem and its probable causes;
    b. Develop a reasonable corrective action plan, as a revision to original plans;
    c. Submit proposed corrective measures to EGLE for confirmation and approval within 60 days of identification of the problem;
    d. Upon EGLE approval, implement corrective measures; and
    e. If the proposed corrective action plan is not acceptable, EGLE will notify the City of this disapproval.
25. If the construction of the revetment has not been completed since the activities authorized by this permit have not been initiated, then the permittee shall provide a written status report by January 31 each year until the construction is complete. The written status report shall document the anticipated start date and completion date of the permitted activities. The status report shall not be considered in lieu of or as a substitution for any of the annual monitoring reports required by this permit.
26. Permittee shall provide the name, address, and telephone number of the person that EGLE can contact if necessary and who has the authority to stop work on the project, as part of the counter-signed permit:

    Name: Mikael Kilpela
    Print: Mikael Kilpela
    Sign: Mikael Kilpela
    Date: March 10, 2023
    Address: 1100 Wright Street
    Marquette, MI 49855
    Telephone Number: 906-225-8995
    Email: mkilpela@marquettemi.gov

27. The activity authorized in this draft permit is an agreed settlement of the pending contested case concerning the initial application. By signing this document and returning it to EGLE for final execution, the applicant acknowledges this permit will result in the Petitioner's voluntary dismissal of the pending contested case, Docket No. 22-0300600.
28. Upon signing by the permittee named herein, this permit must be returned to EGLE's Water Resources Division, Marquette District Office for final execution. This permit shall become effective on the date of EGLE representative's signature.

Permittee hereby accepts and agrees to comply with the terms and conditions of this permit.

x Mikael Kilpela March 10, 2023

Permittee Date

X Mikael Kilpela, City Engineer - City of Marquette

Printed Name and Title of Permittee

Issued By:

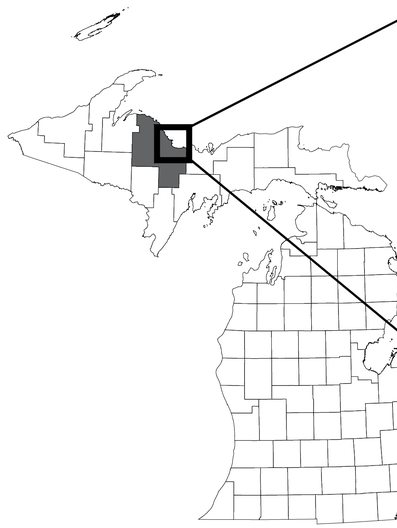
Sean Soucy
Marquette District Office
Water Resources Division
906-250-0588

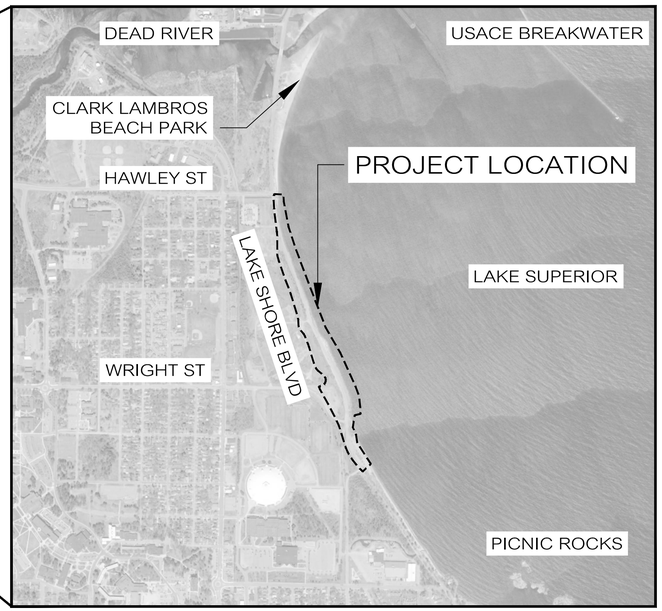
cc: Dennis Stachewicz, City of Marquette
Richard Baron, City of Marquette Attorney
Carl Lindquist, Superior Watershed Partnership
Peter Truax, Baird
Jared Dorvinen, Baird
Kate Kasten, USACE
Laura LaMore, MDAG
Echo Aloe, MDAG
Chris Conn, EGLE
Chris Antieau, EGLE
Ryan McCone, EGLE
Steve Harrington, EGLE
Marquette County Drain Commissioner
Marquette CEA
City of Marquette Clerk

MARQUETTE, MI
LAKE SUPERIOR SHORELINE RESTORATION

PERMIT DRAWINGS

N.T.S.





SHEET LIST	
SHEET NO.	SHEET TITLE
G-001	TITLE SHEET
01 - 05	PLAN DRAWINGS
XS01 - XS24	SECTION DRAWINGS

PREPARED BY:

Baird.
W.F. BAIRD & ASSOCIATES LTD.
2924 MARKETPLACE DR
SUITE 200
MADISON, WI 53719

IN ASSOCIATION WITH:

res
RESOURCE ENVIRONMENTAL SOLUTIONS, INC.
17921 W SMITH ROAD
BRODHEAD, WI 53520

Foth
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
2121 INNOVATION COURT
P.O. BOX 5095
DE PERE, WI 54115-5095

PREPARED FOR:

CITY OF MARQUETTE, MI
300 W BARAGA AVE
MARQUETTE, MI 49855

SUPERIOR WATERSHED PARTNERSHIP
2 PETER WHITE DRIVE
MARQUETTE, MI 49855

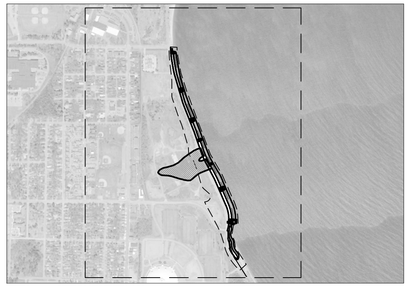
PERMIT DOCUMENTS
NOT FOR CONSTRUCTION

ISSUE NUMBER: 02

ISSUE DATE: 2023-02-10

MHK 3-10-23

KEY MAP



COORDINATE TABLE/NOTES

1. HORIZONTAL DATUM IS IN FEET RELATIVE TO THE MARQUETTE CITY DATUM.
2. VERTICAL DATUM IS IN FEET RELATIVE TO THE INTERNATIONAL GREAT LAKES DATUM OF 1985 (IGLD85). IGLD85 ELEVATIONS CONVERSION TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) IS ELEVATION IGLD85 + 0.002 FEET = ELEVATION NAVD88. CONVERSION SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) ONLINE VERTICAL DATUM TRANSFORMATION TOOL.

QUANTITIES

	UNIT	QUANTITY
MATERIAL PLACED LAKEWARD OF OHWM, BELOW 602.6'	CY	26,500
MATERIAL PLACED LAKEWARD OF OHWM, ABOVE 602.6'	CY	17,100
MATERIAL PLACED LAKEWARD OF OHWM, TOTAL	CY	43,600
MATERIAL EXCAVATED LAKEWARD OF OHWM IN PLUME FOOTPRINT	CY	0
MATERIAL EXCAVATED LAKEWARD OF OHWM, ALL OTHER AREAS	CY	160

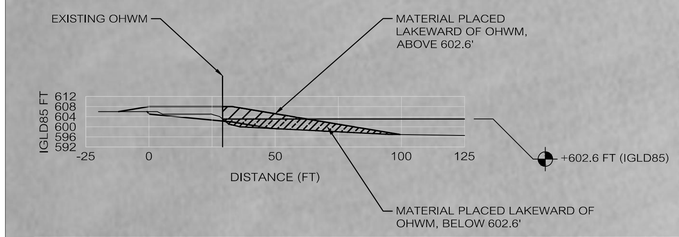


DIAGRAM OF QUANTITIES

N.T.S

LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- GROUNDWATER PLUME
- ORDINARY HIGH WATER MARK (OHWM)
- PROPOSED ORDINARY HIGH WATER MARK

0 200 400 FEET

SCALE = 1:200

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT			(D) TENDER		(E) CONSTRUCTION		(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2021-06-18								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

BOTTOMLANDS CONVEYANCE FIGURE
REVISED ALTERNATIVE

ISSUE NUMBER: 02
ISSUE DATE: 2023-02-10
SHEET NUMBER: 01
PROJECT NUMBER: 13290.101

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE PLANS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

MHK 3/10/23

KEY MAP

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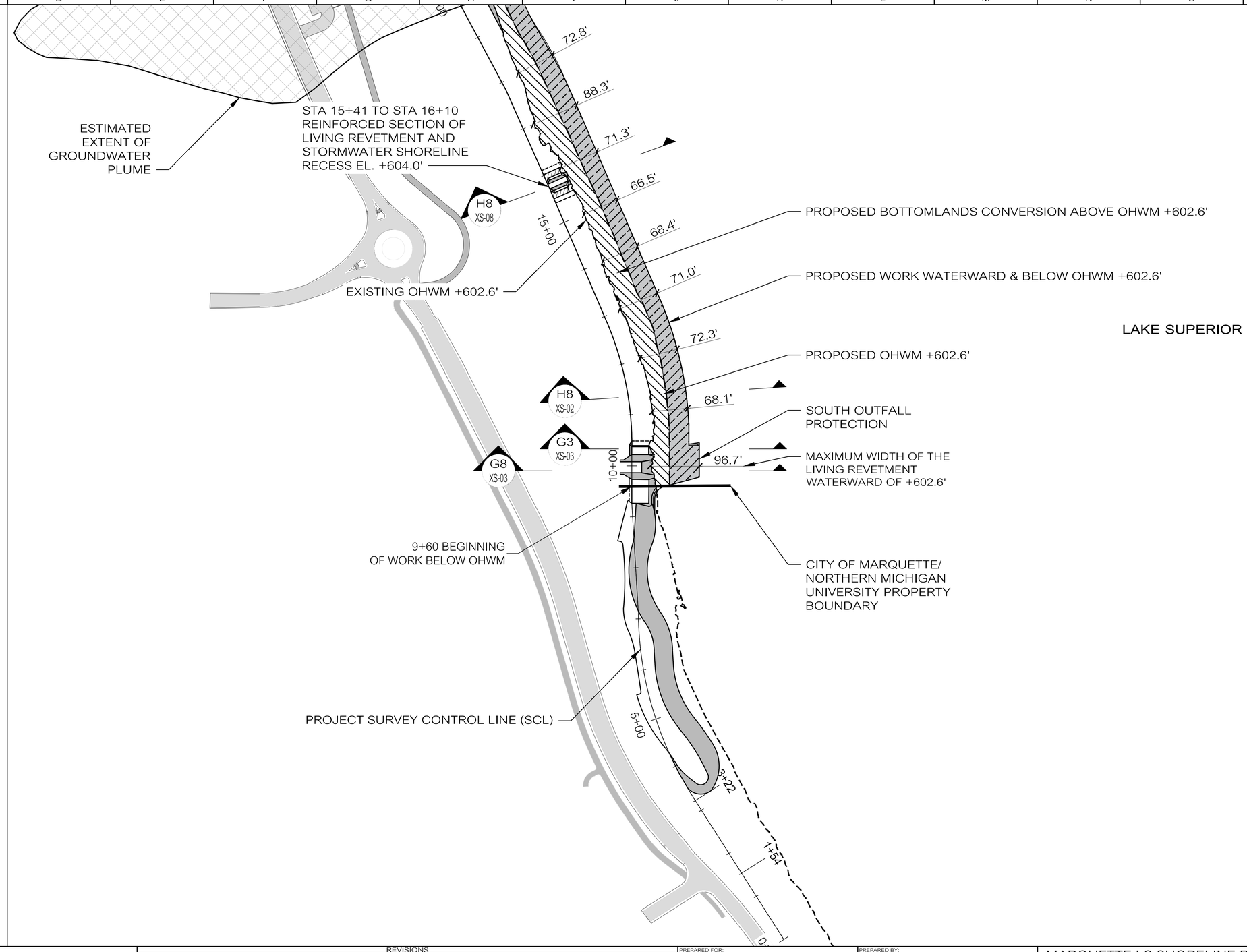
LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- GROUNDWATER PLUME
- ORDINARY HIGH WATER MARK (OHWM)



0 100 200 FEET
SCALE = 1:100

N

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2021-06-18
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

ORDINARY HIGH WATER MARK PROPOSED WORK FIGURE - SOUTH

ISSUE NUMBER: 04
ISSUE DATE: 2023-02-10
SHEET NUMBER: 02
PROJECT NUMBER: 13290.101

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE PLANS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

MHK 3/10/23

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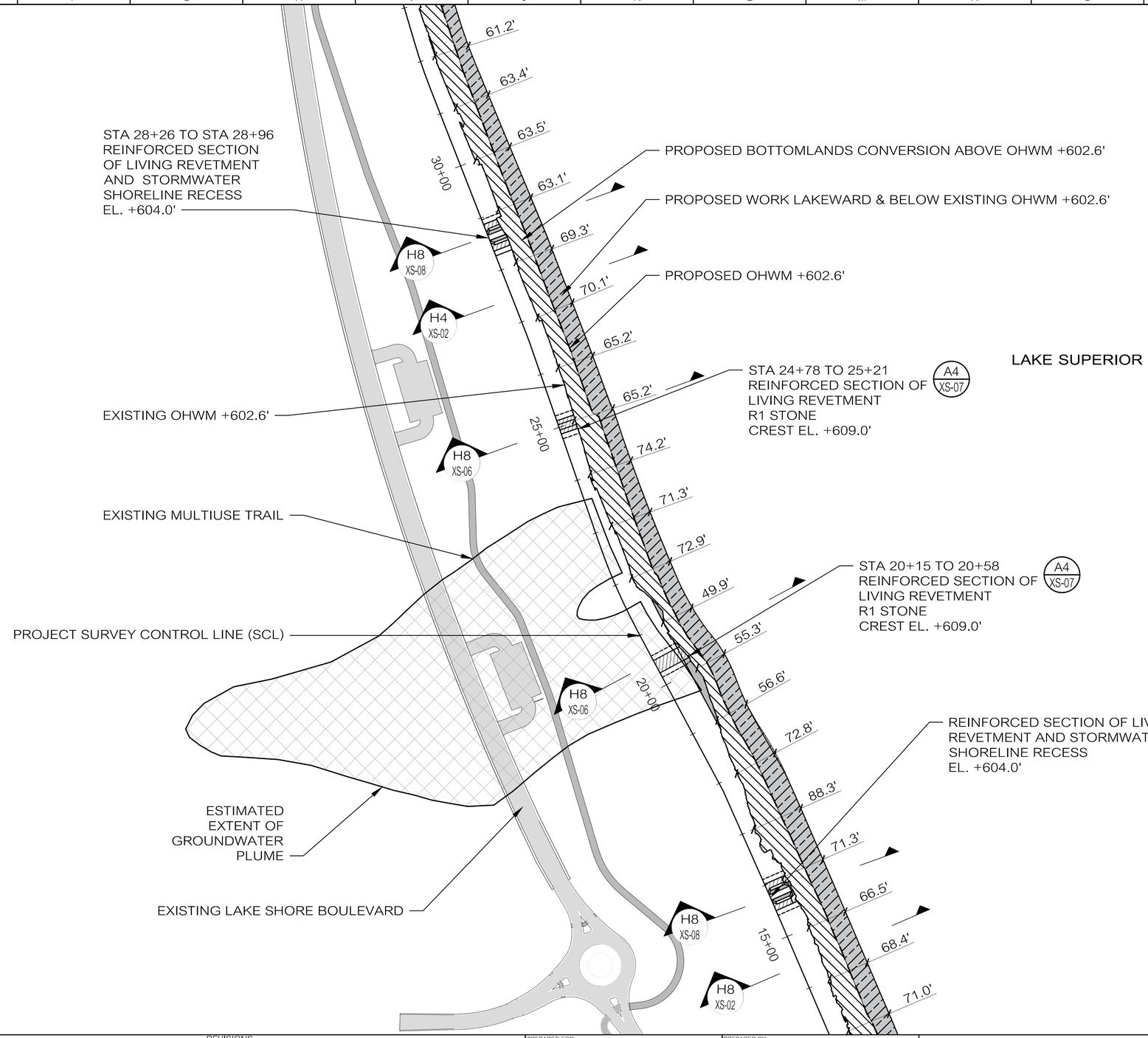
LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- GROUNDWATER PLUME
- ORDINARY HIGH WATER MARK (OHWM)



0 100 200 FEET
SCALE = 1:100

N

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2021-06-18								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								

PREPARED FOR:

PREPARED BY:
Baird.
IN ASSOCIATION WITH:
res
Foth

MARQUETTE LS SHORELINE RESTORATION

ORDINARY HIGH WATER MARK PROPOSED WORK FIGURE - CENTER

ISSUE NUMBER: 04
ISSUE DATE: 2023-02-10
SHEET NUMBER: 03
PROJECT NUMBER: 13290.101

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE PLANS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

MHK
3/10/23

KEY MAP

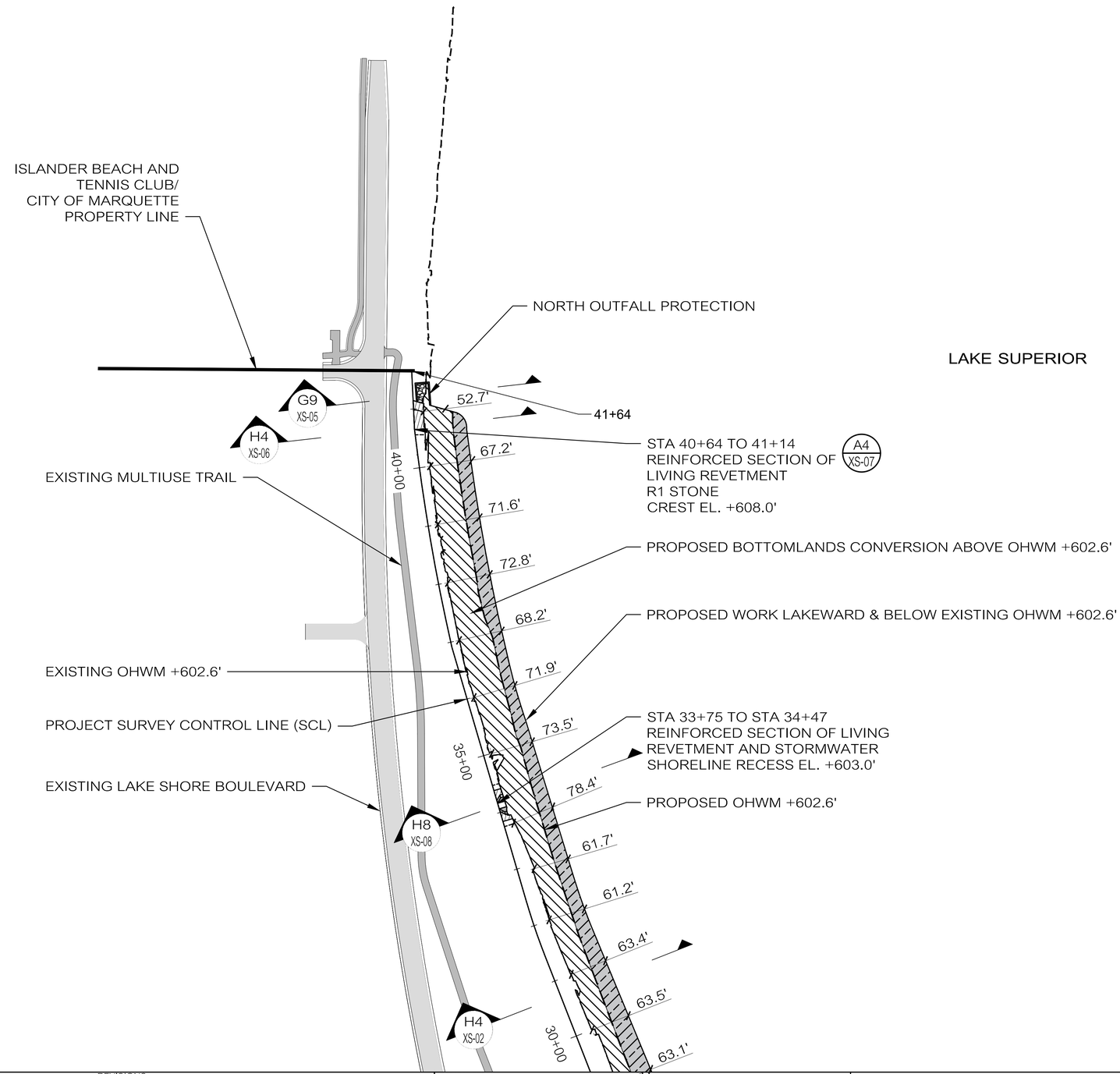
COORDINATE TABLE/NOTES

1. HORIZONTAL DATUM IS IN FEET RELATIVE TO THE MARQUETTE CITY DATUM.

2. VERTICAL DATUM IS IN FEET RELATIVE TO THE INTERNATIONAL GREAT LAKES DATUM OF 1985 (IGLD85). IGLD85 ELEVATIONS CONVERSION TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) IS ELEVATION IGLD85 + 0.002 FEET = ELEVATION NAVD88. CONVERSION SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) ONLINE VERTICAL DATUM TRANSFORMATION TOOL.

LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- ORDINARY HIGH WATER MARK (OHWM)



0 100 200 FEET

SCALE = 1:100

N

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD			
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2021-06-18								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: CITY OF MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

ORDINARY HIGH WATER MARK PROPOSED WORK FIGURE - NORTH

ISSUE NUMBER:	ISSUE DATE:	SHEET NUMBER:
02	2023-02-10	04

PROJECT NUMBER: 13290.101

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE PLANS_REVISED.DWG

MHK 3/10/23

KEY MAP

COORDINATE TABLE/NOTES

1. HORIZONTAL DATUM IS IN FEET RELATIVE TO THE MARQUETTE CITY DATUM.
2. VERTICAL DATUM IS IN FEET RELATIVE TO THE INTERNATIONAL GREAT LAKES DATUM OF 1985 (IGLD85). IGLD85 ELEVATIONS CONVERSION TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) IS ELEVATION IGLD85 + 0.002 FEET = ELEVATION NAVD88. CONVERSION SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) ONLINE VERTICAL DATUM TRANSFORMATION TOOL.
3. AERIAL IMAGE COMPILED BY ORTHOMOSAIC FROM UNMANNED AERIAL VEHICLE (UAV) SURVEY CONDUCTED BY GEI ASSOCIATES, INC., NOVEMBER 19, 2020. AERIAL IMAGE FOR REFERENCE PURPOSES ONLY.

LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- GROUNDWATER PLUME
- ORDINARY HIGH WATER MARK (OHWM)
- EXISTING GROUNDWATER MONITORING WELL

PROPOSED WORK LAKEWARD & BELOW EXISTING OHWM +602.6'

PROPOSED OHWM +602.6'

LAKE SUPERIOR

EXISTING OHWM +602.6'

EXTENT OF 6.0' DEPTH OF EXCAVATION (TO BE FILLED BY LIVING REVETMENT)

AT STA 20+00 PLACE LIVING REVETMENT 10.0' LAKEWARD OF SCL TO ELIMINATE IN-WATER EXCAVATION

19+00

19+69

20+00

21+00

23+62

PROJECT SURVEY CONTROL LINE (SCL)

ESTIMATED EXTENT OF GROUNDWATER PLUME

EXISTING GROUNDWATER MONITORING WELLS WITHIN LIVING REVETMENT FOOTPRINT TO BE PROTECTED DURING CONSTRUCTION AND EXTENDED/REPLACED BY OTHERS

0 20 40 FEET

SCALE = 1:100

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2021-06-18
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

ENLARGEMENT - GROUNDWATER PLUME AREA ON AERIAL IMAGE

ISSUE NUMBER: 02
ISSUE DATE: 2023-02-10
SHEET NUMBER: 05
PROJECT NUMBER: 13290.101

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE PLANS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

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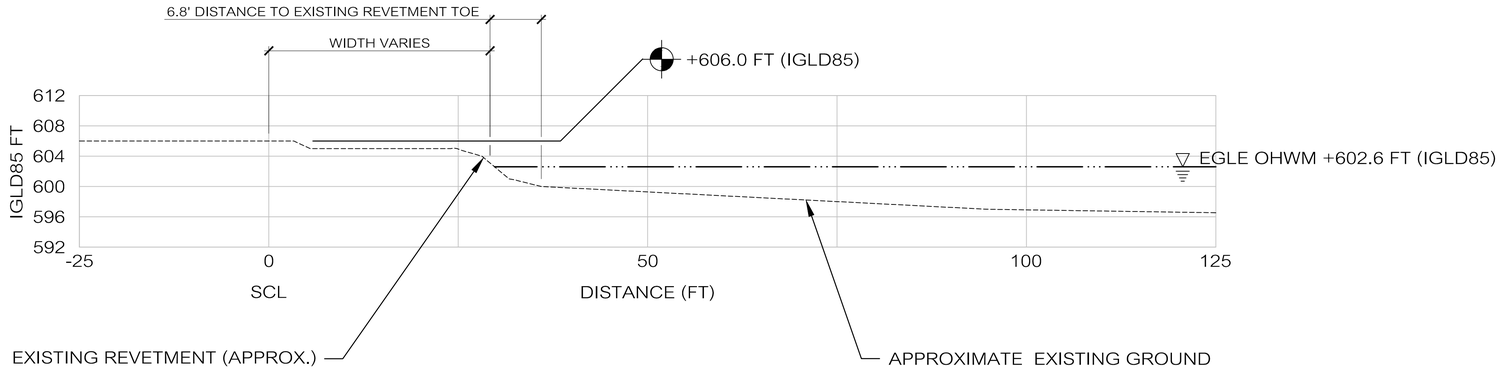
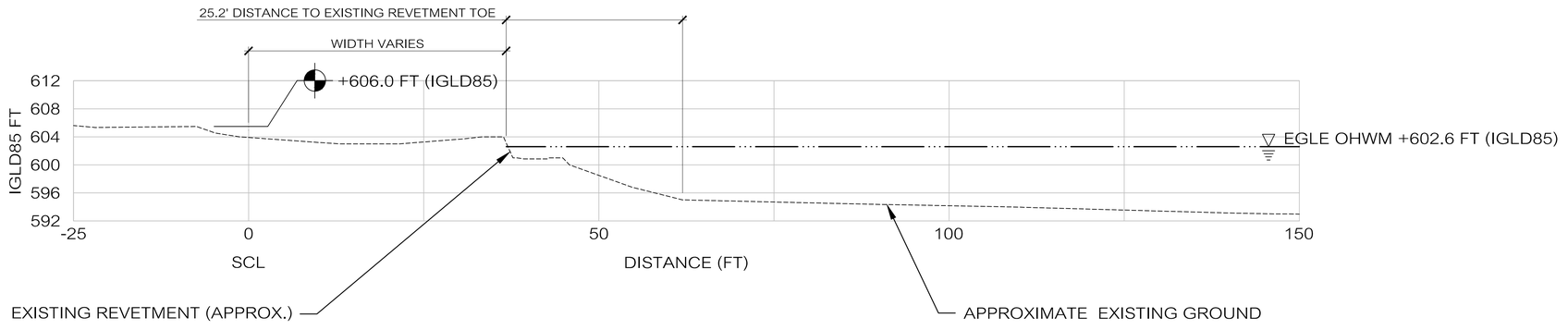


H4 / XS-01 EXISTING CONDITIONS - NORTH (TYP.)



H8 / XS-01 EXISTING CONDITIONS - SOUTH (TYP.)

LEGEND

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT	(D) TENDER		(E) CONSTRUCTION			(F) RECORD
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - EXISTING CONDITION

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
SHEET NUMBER: XS-01
PROJECT NUMBER: 13290.101

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

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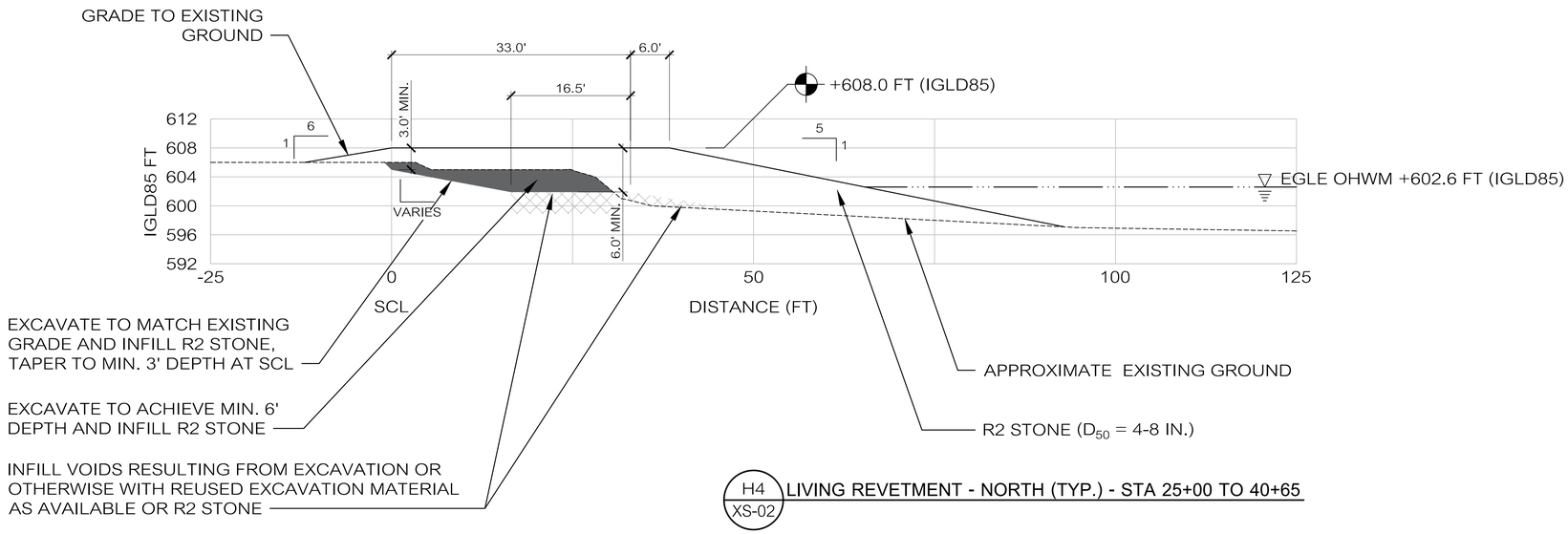
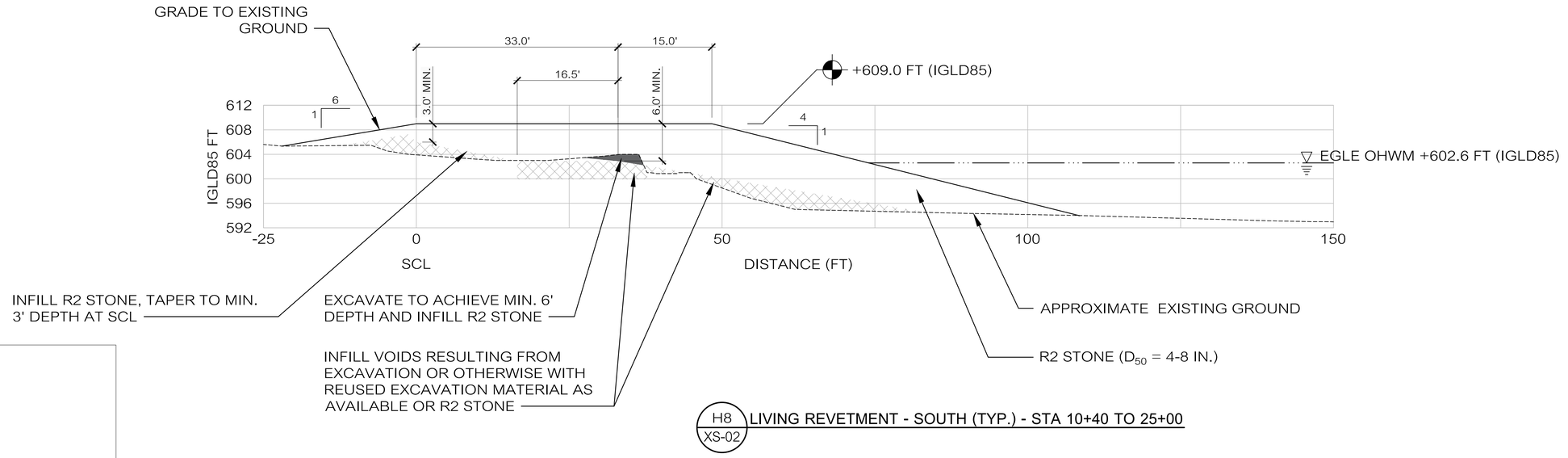


H4 / XS-02 LIVING REVETMENT - NORTH (TYP.) - STA 25+00 TO 40+65



H8 / XS-02 LIVING REVETMENT - SOUTH (TYP.) - STA 10+40 TO 25+00

LEGEND

- INFILL VOIDS
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - PROPOSED LIVING REVETMENT

ISSUE NUMBER: 03 | ISSUE DATE: 2023-02-10 | SHEET NUMBER: XS-02

PROJECT NUMBER: 13290.101

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

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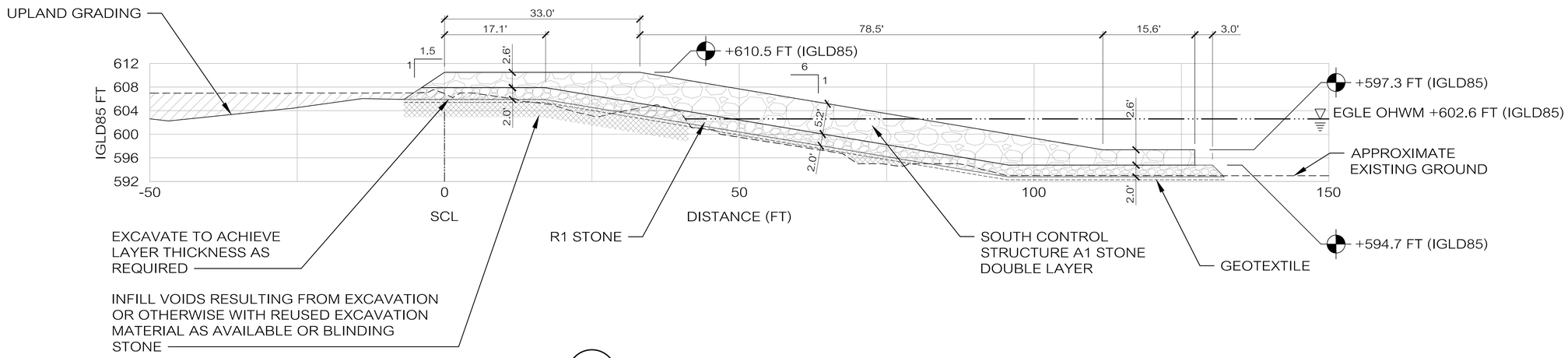
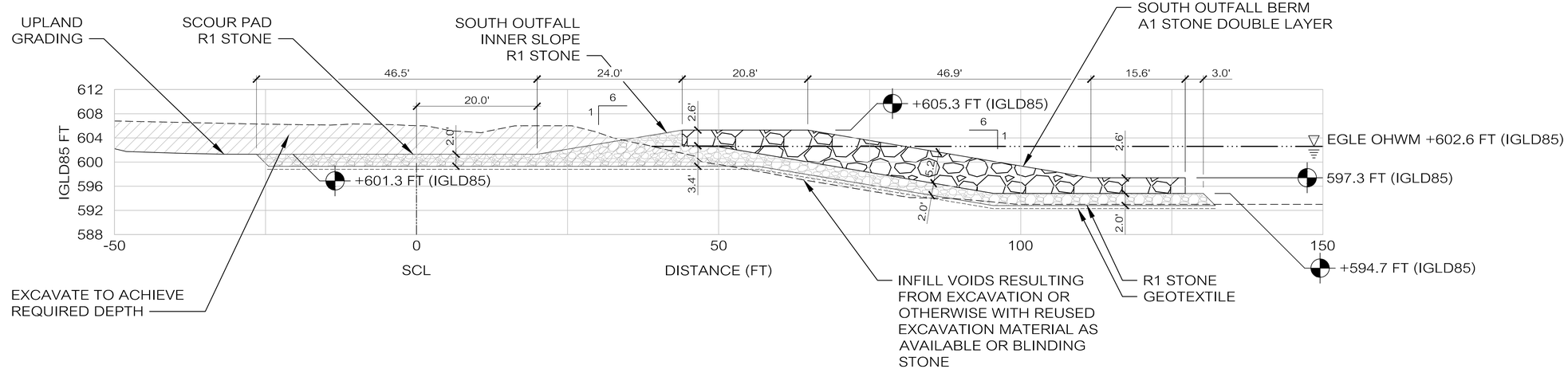
3/10/23



G3 / XS-03 SOUTH CONTROL STRUCTURE SECTION - STA 10+22 TO 10+38



G8 / XS-03 SOUTH OUTFALL BERM SECTION - STA 9+86 TO 10+08

LEGEND

- INFILL VOIDS
- EXCAVATION
- ARMOR STONE
- BEDDING STONE

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - PROPOSED SOUTH OUTFALL

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-03

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

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REMOVED FROM REVISED DESIGN

I4 / XS-04 POCKET BEACH CONTROL STRUCTURE CROSS-SECTION

REMOVED FROM REVISED DESIGN

LEGEND

- EXCAVATION
- BEDDING STONE
- FILTER STONE
- ARMOR STONE

REMOVED FROM REVISED DESIGN

I9 / XS-04 POCKET BEACH AND SILL CROSS-SECTION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - POCKET BEACH CONTROL STRUCTURES

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
SHEET NUMBER: XS-04
PROJECT NUMBER: 13290.101

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

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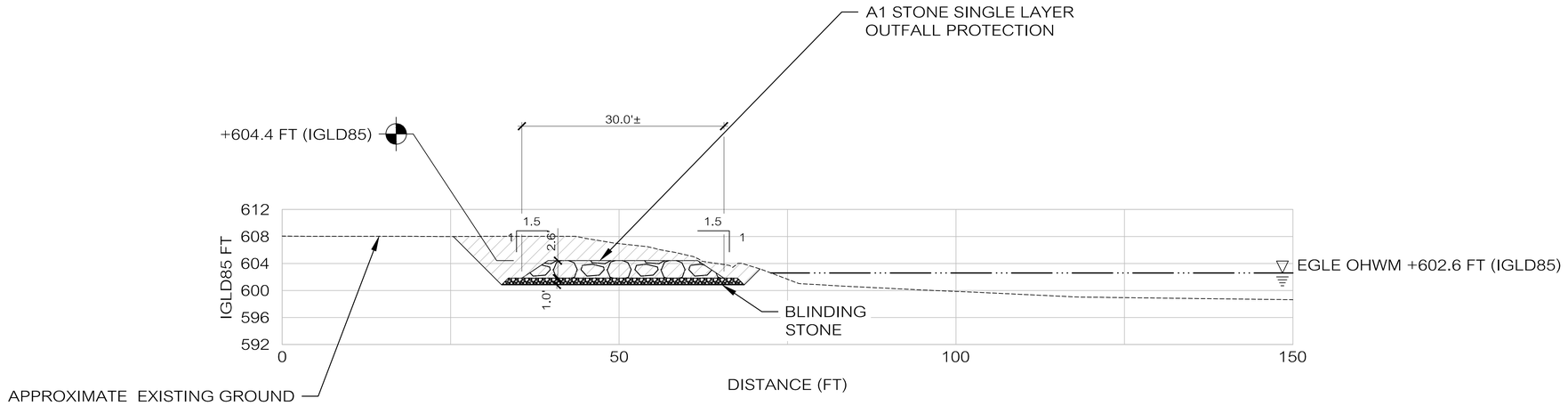
LEGEND

- EXCAVATION
- BEDDING STONE
- FILTER STONE
- ARMOR STONE



G9 / XS-05 NORTH OUTFALL PROTECTION (TYP.)

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD			
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - PROPOSED NORTH OUTFALL

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
SHEET NUMBER: XS-05
PROJECT NUMBER: 13290.101

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

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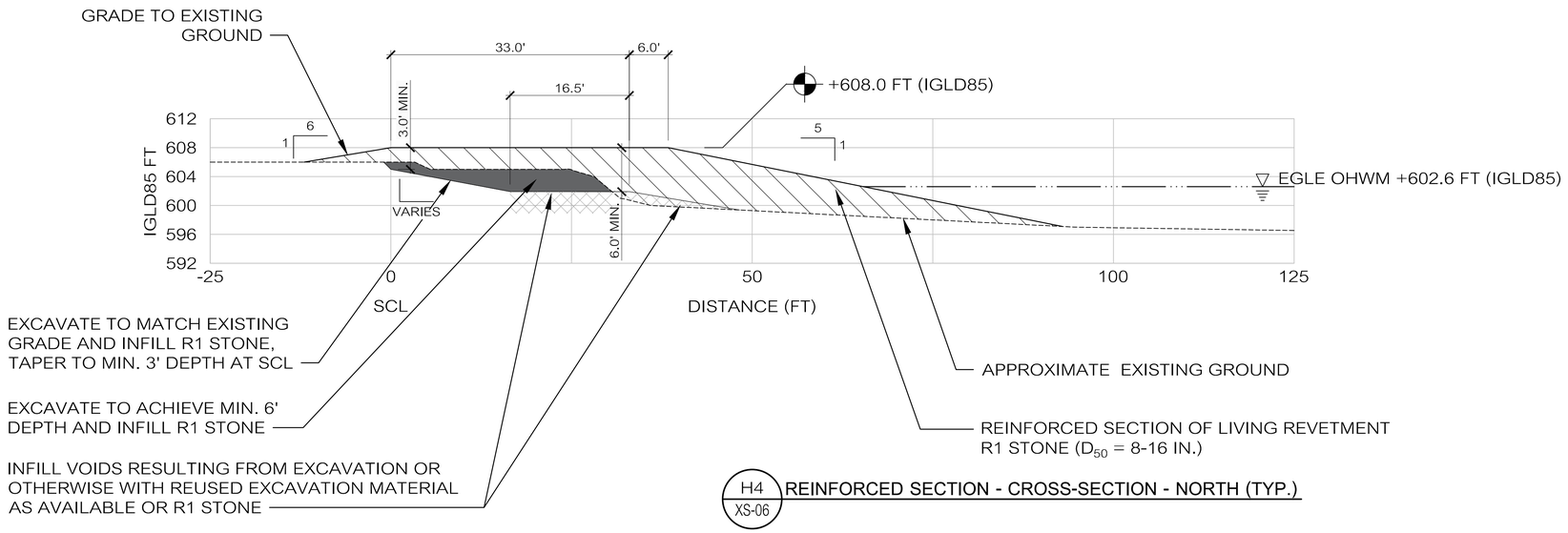
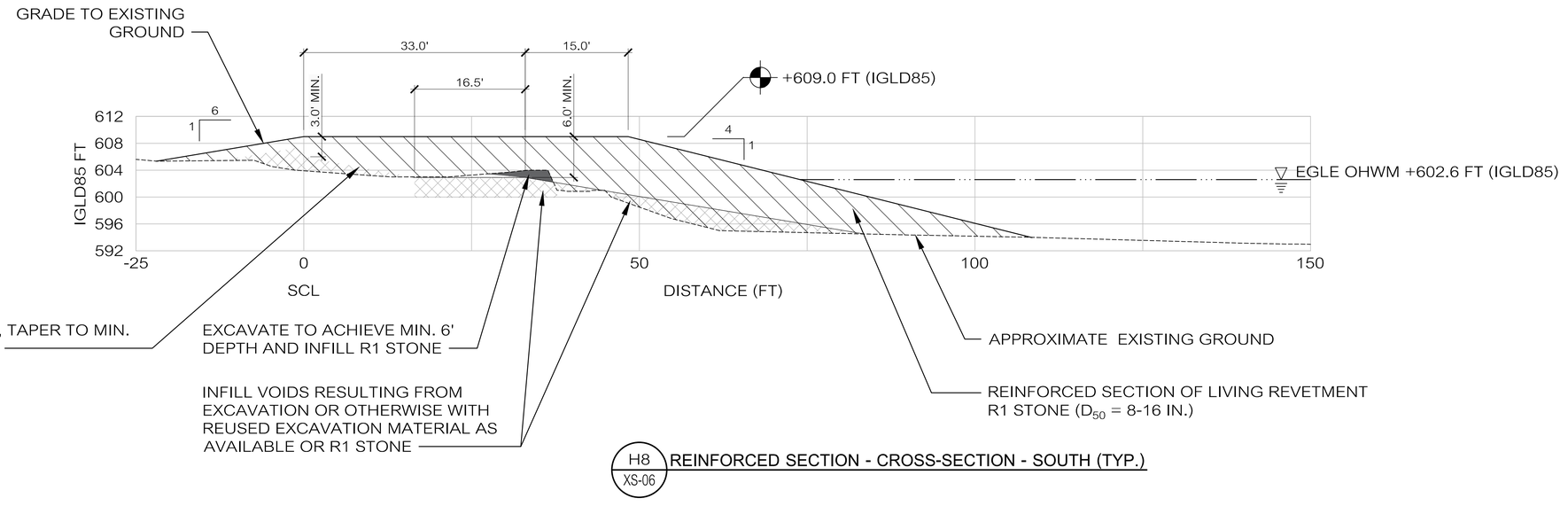


H4 / XS-06 **REINFORCED SECTION - CROSS-SECTION - NORTH (TYP.)**



H8 / XS-06 **REINFORCED SECTION - CROSS-SECTION - SOUTH (TYP.)**

LEGEND

- INFILL VOIDS
- EXCAVATION
- REINFORCED SECTION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - REINFORCED SECTION (SHEET 1)

ISSUE NUMBER: 03 | ISSUE DATE: 2023-02-10 | SHEET NUMBER: XS-06

PROJECT NUMBER: 13290.101

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

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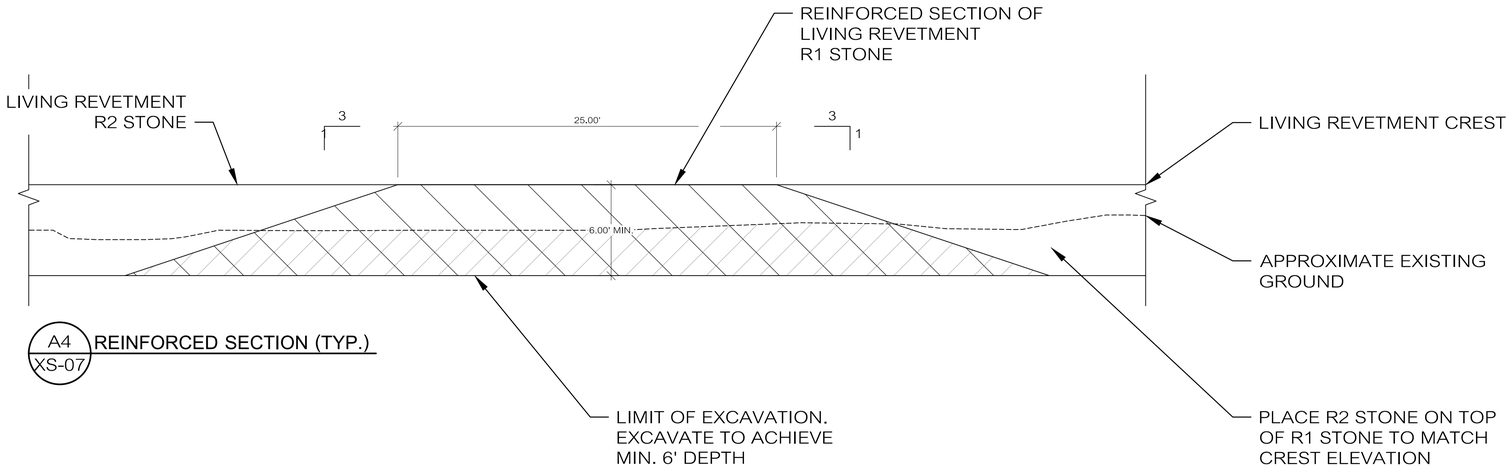

A4
XS-07
REINFORCED SECTION (TYP.)

LEGEND

EXCAVATION

REINFORCED SECTION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - REINFORCED SECTION (SHEET 2)

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
SHEET NUMBER: XS-07
PROJECT NUMBER: 13290.101

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PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

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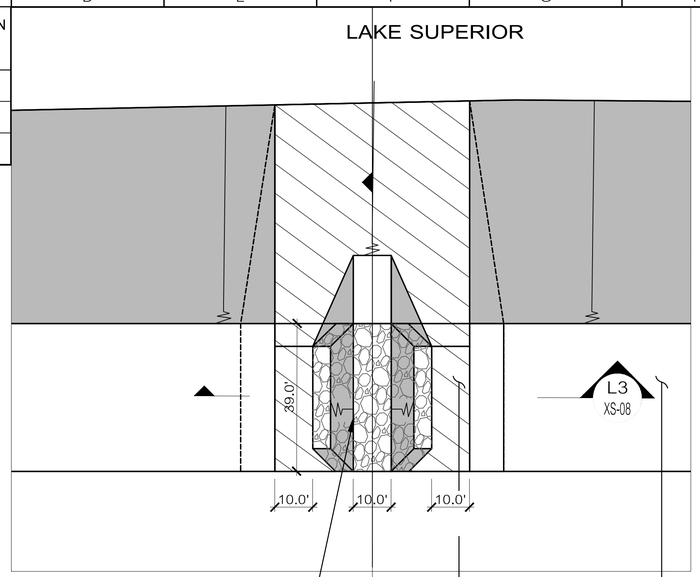
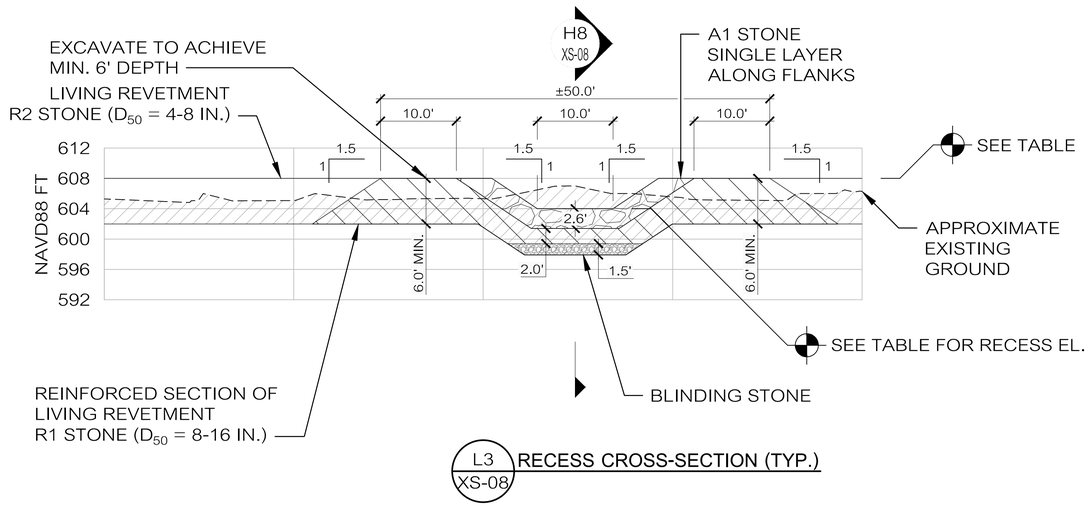
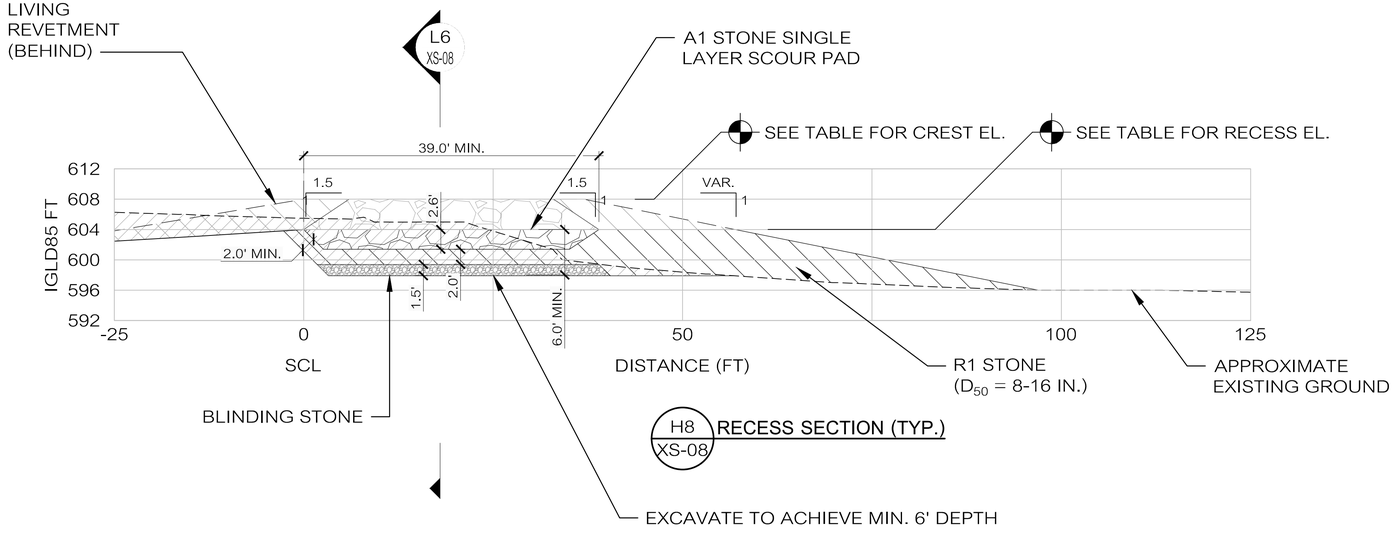
LOCATION (STATION)	CREST ELEVATION (ft, IGLD85)	RECESS ELEVATION (ft, IGLD85)
15+41 to 16+10	+609.0	+604.0
28+26 to 28+96	+608.0	+604.0
33+75 to 34+47	+608.0	+603.0





L3 / XS-08 RECESS CROSS-SECTION (TYP.)



H8 / XS-08 RECESS SECTION (TYP.)

LEGEND

- EXCAVATION
- BEDDING STONE
- FILTER STONE
- ARMOR STONE

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND ORGANIZATION

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - STORMWATER SHORELINE RECESS

ISSUE NUMBER: 03 | ISSUE DATE: 2023-02-10 | SHEET NUMBER: XS-08

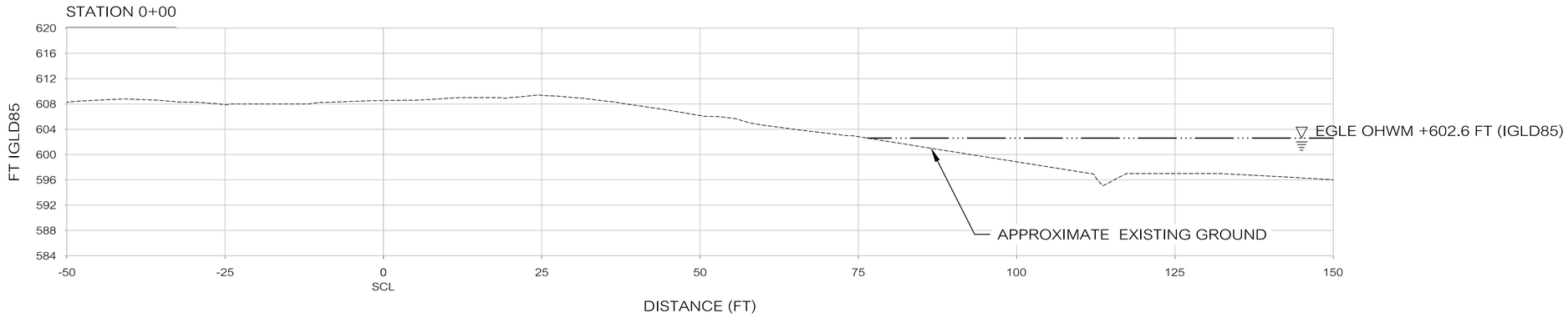
PROJECT NUMBER: 13290.101

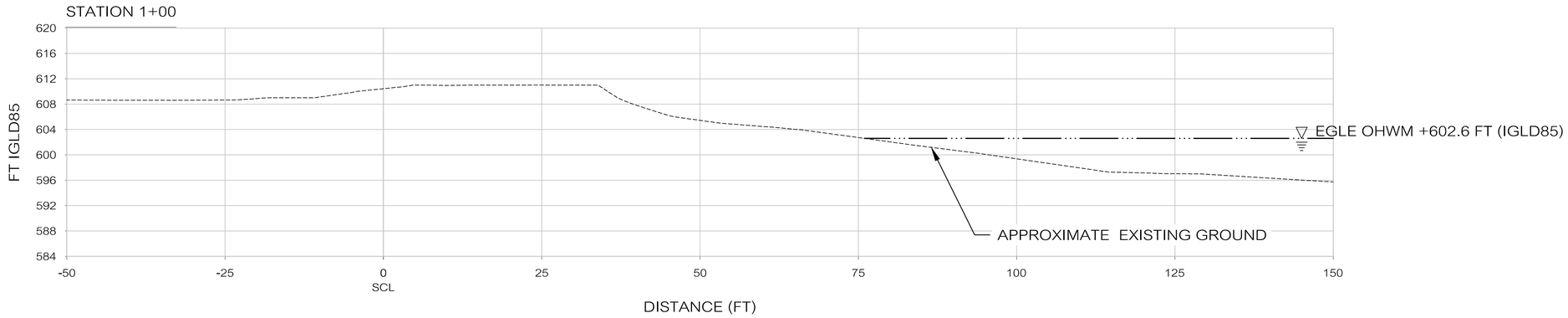
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

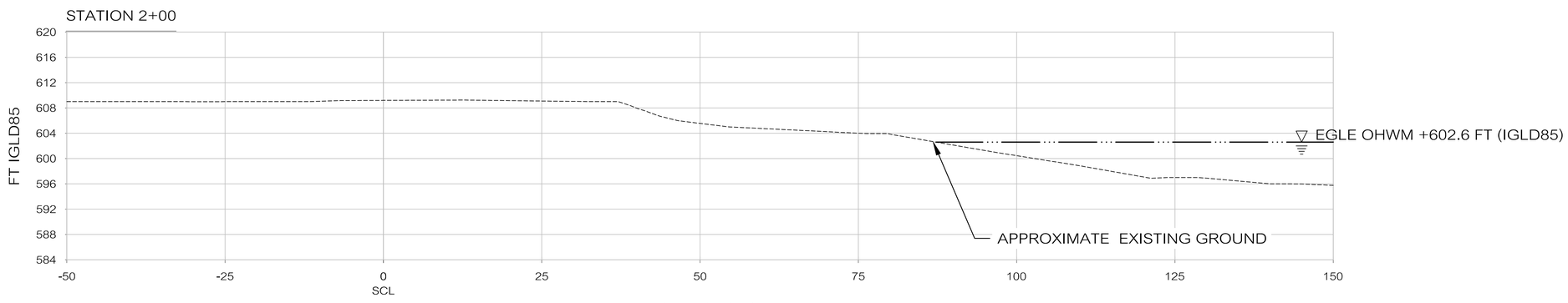
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

MHK 3/10/23

NOTE 1:
NO WORK LAKEWARD OF OHWM THIS SHEET







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = ####

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER	(E) CONSTRUCTION		(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 0+00 TO 2+00

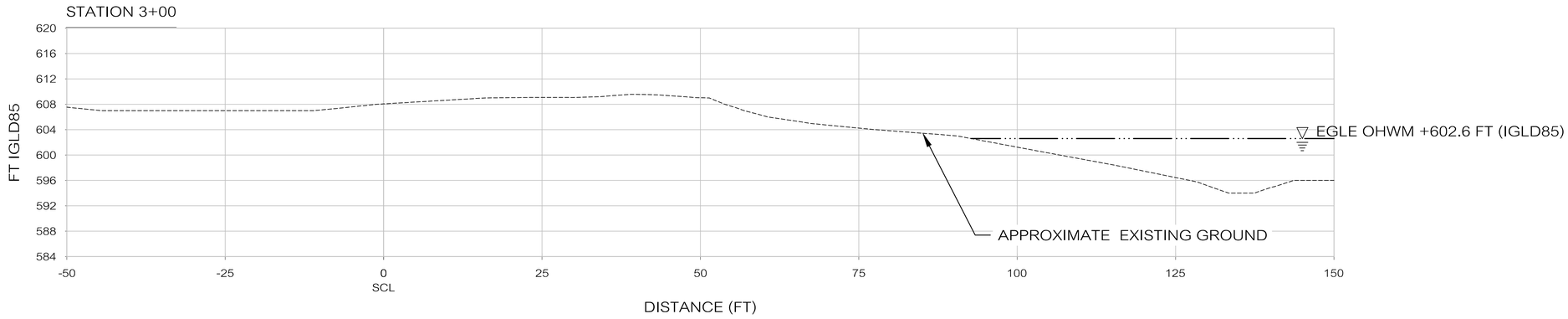
ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-10

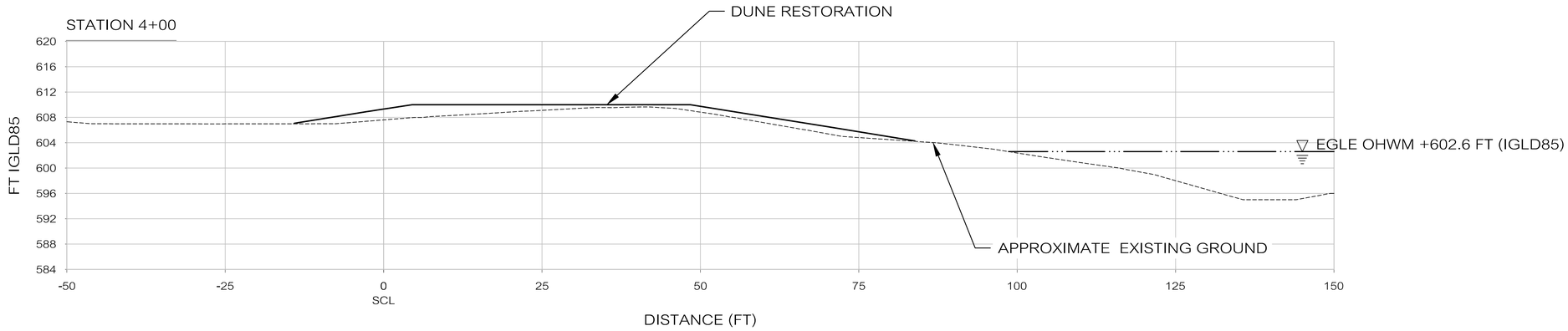
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

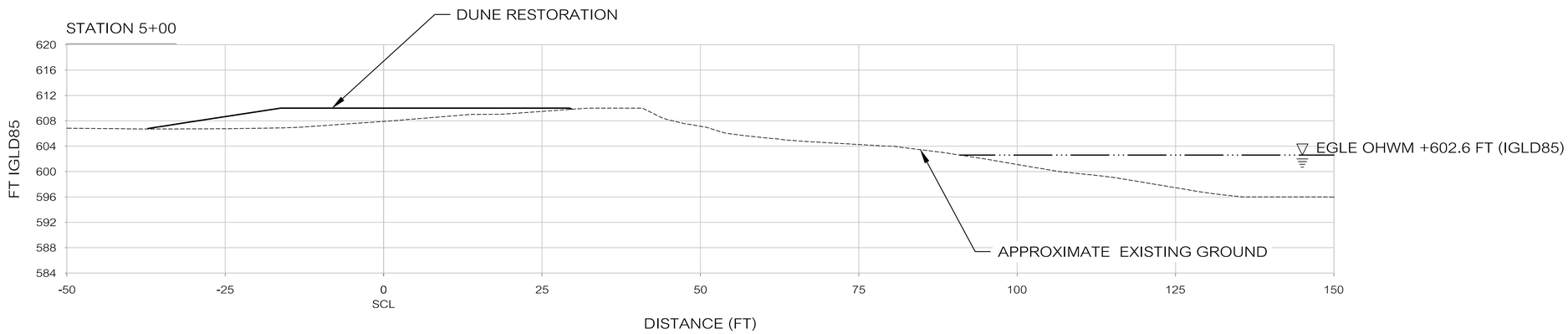
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

MHK 3/10/23

NOTE 1:
NO WORK LAKEWARD OF OHWM THIS SHEET







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = ####

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 3+00 TO 5+00

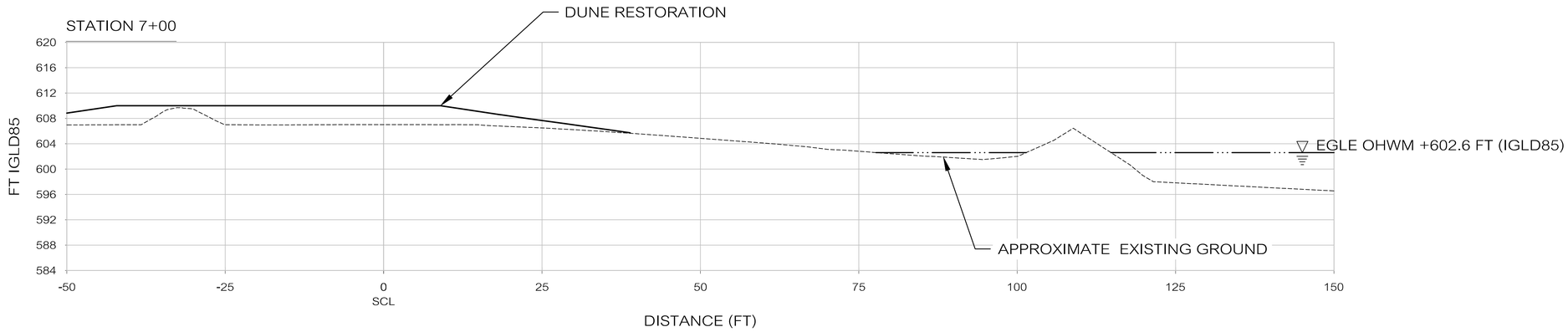
ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-11

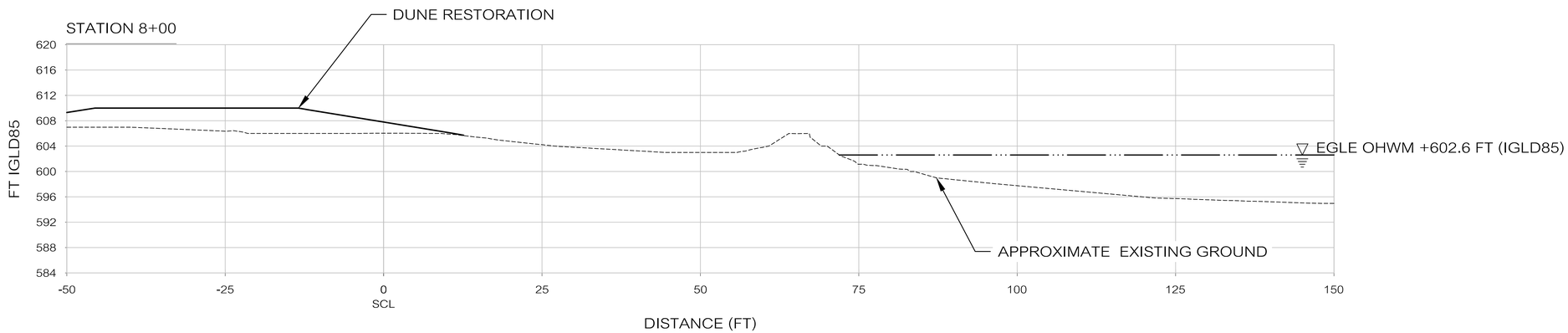
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

MHK 3/10/23

NOTE 1:
NO WORK LAKEWARD OF OHWM THIS SHEET





LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 6+00 TO 8+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-12

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

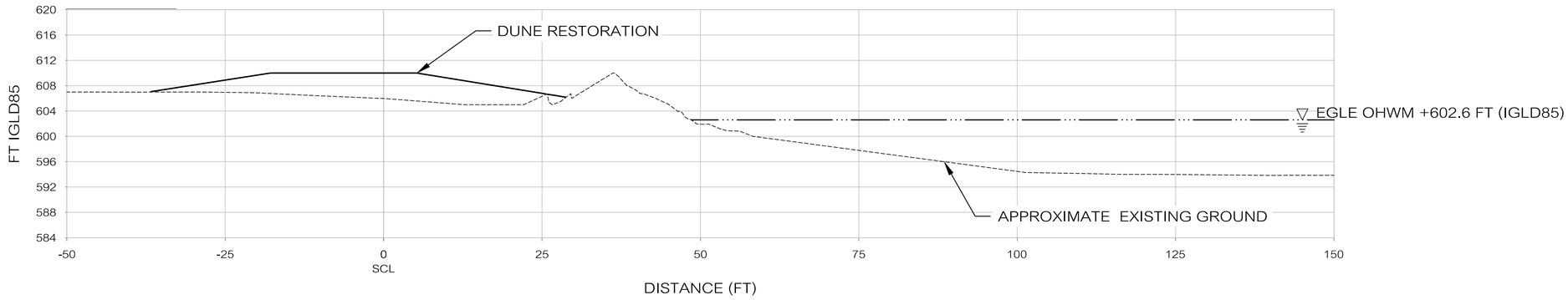
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

3/10/23

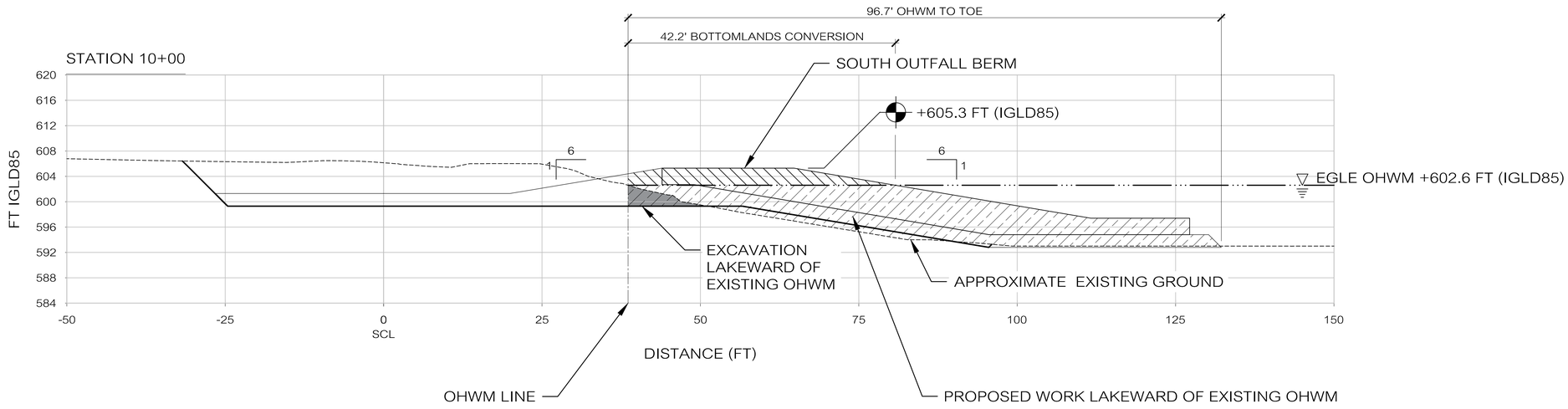
QUANTITIES (THIS SHEET)

SECTION	LAKEWARD WORK (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 9+00	0	0	0
STA 10+00	700	200	40
STA 10+30	1000	300	40

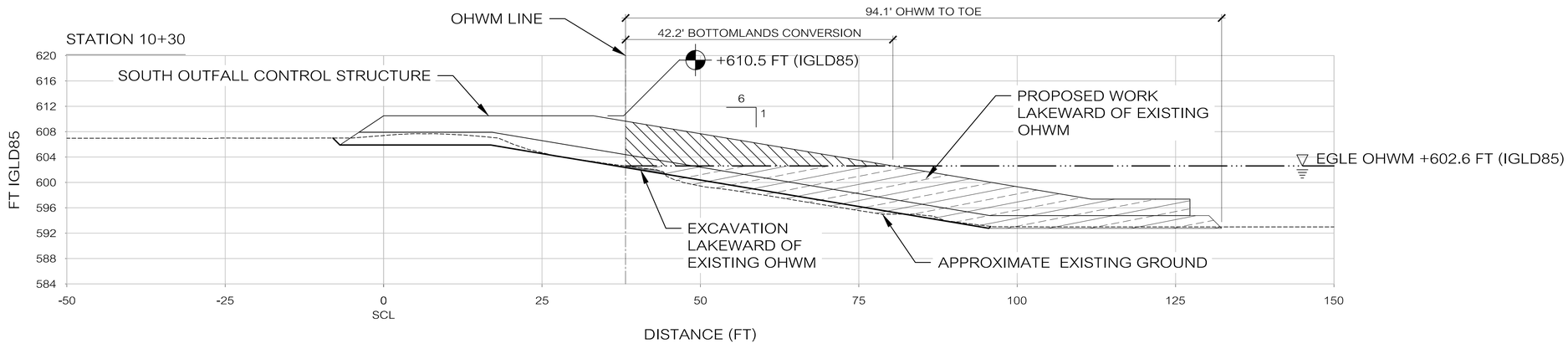
STATION 9+00



STATION 10+00



STATION 10+30



LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 9+00 TO 10+30

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-13

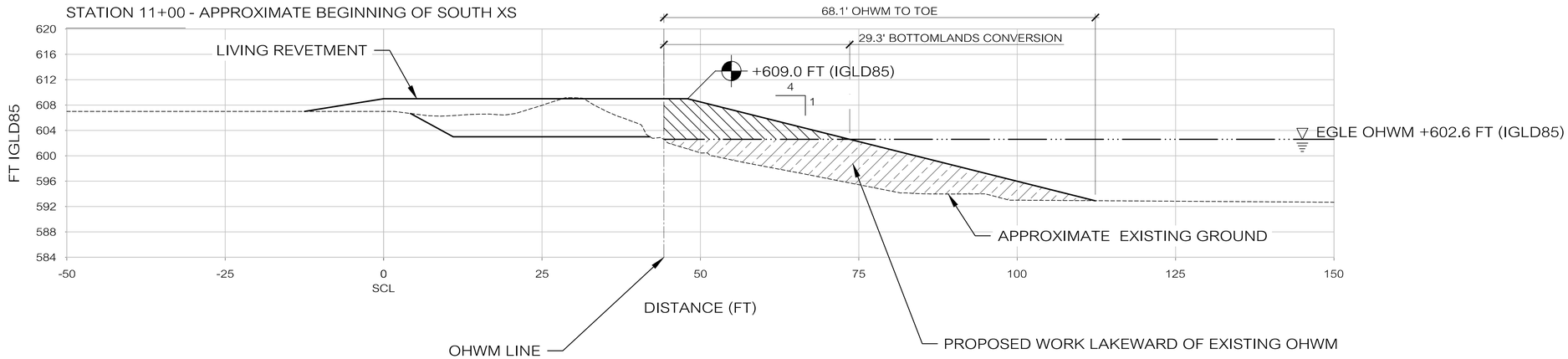
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

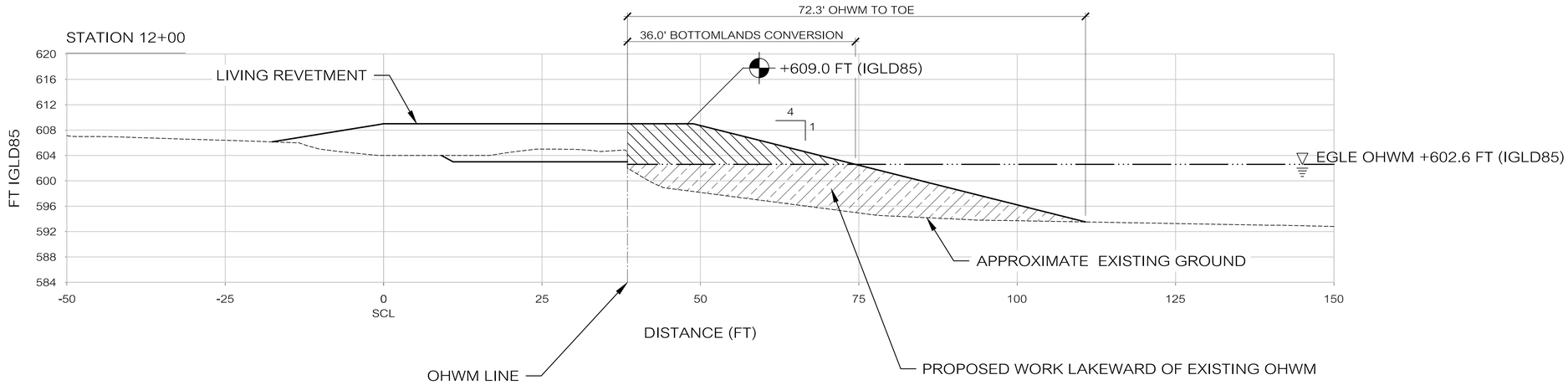
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

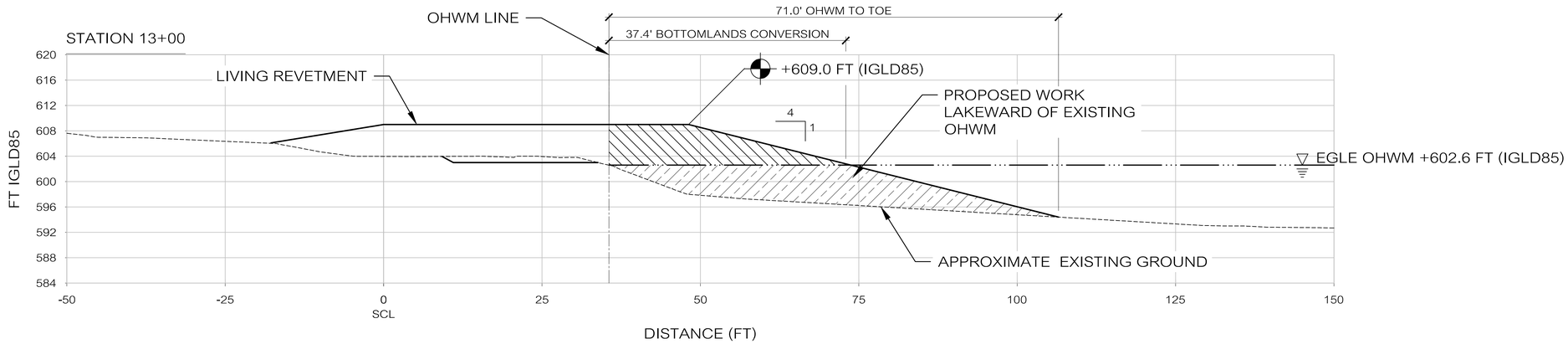
MHK 3/10/23

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 11+00	1000	300	0
STA 12+00	1100	500	0
STA 13+00	1100	600	0







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:	(A) PRELIMINARY	(B) DESIGN	(C) PERMIT	(D) TENDER	(E) CONSTRUCTION	(F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 11+00 TO 13+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-14

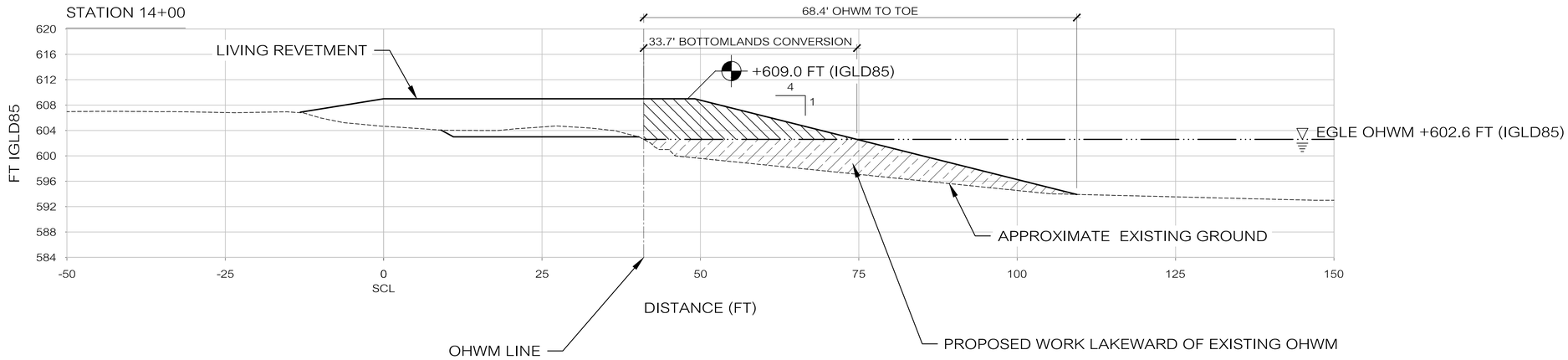
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

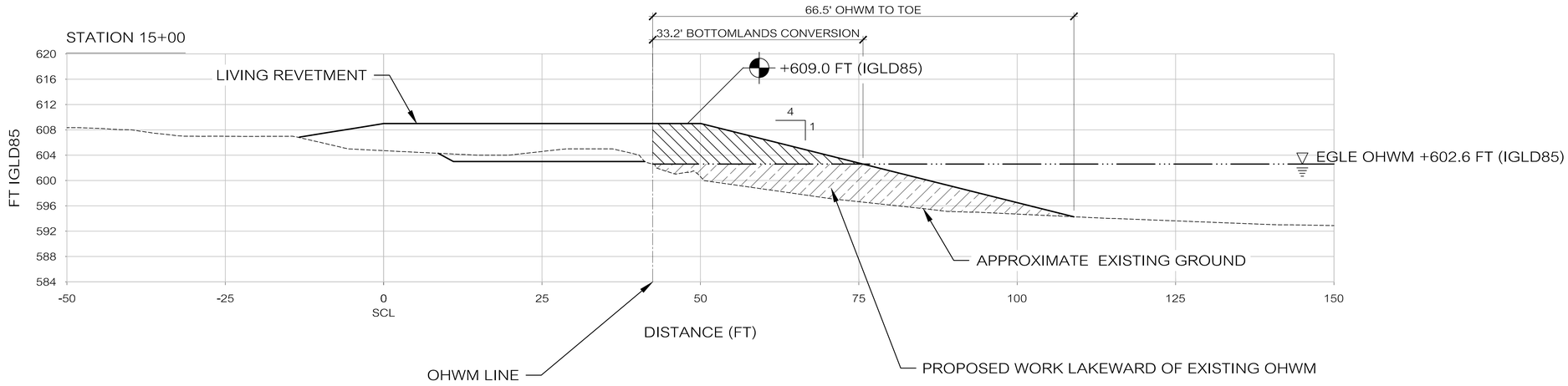
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

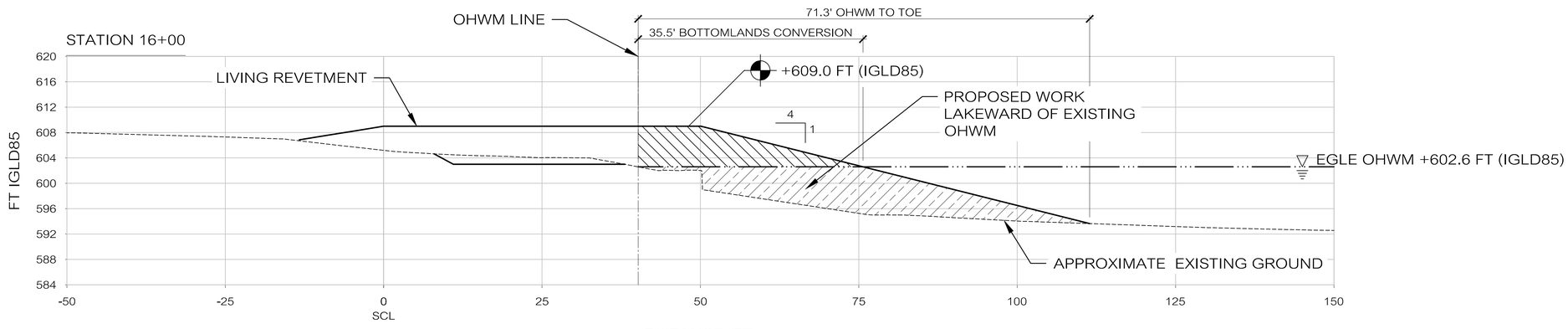
MHK 3/10/23

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 14+00	900	600	0
STA 15+00	800	500	0
STA 16+00	800	500	0







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 14+00 TO 16+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-15

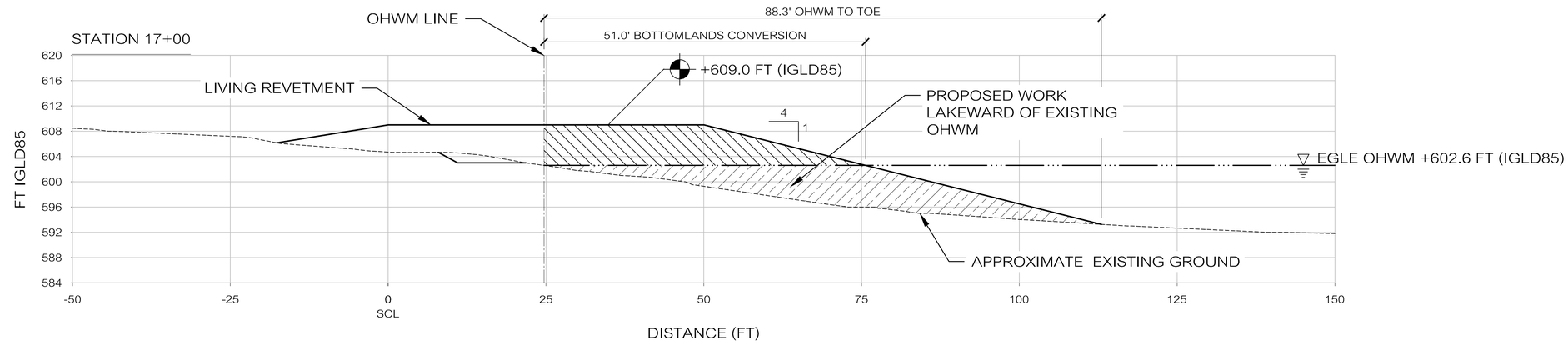
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

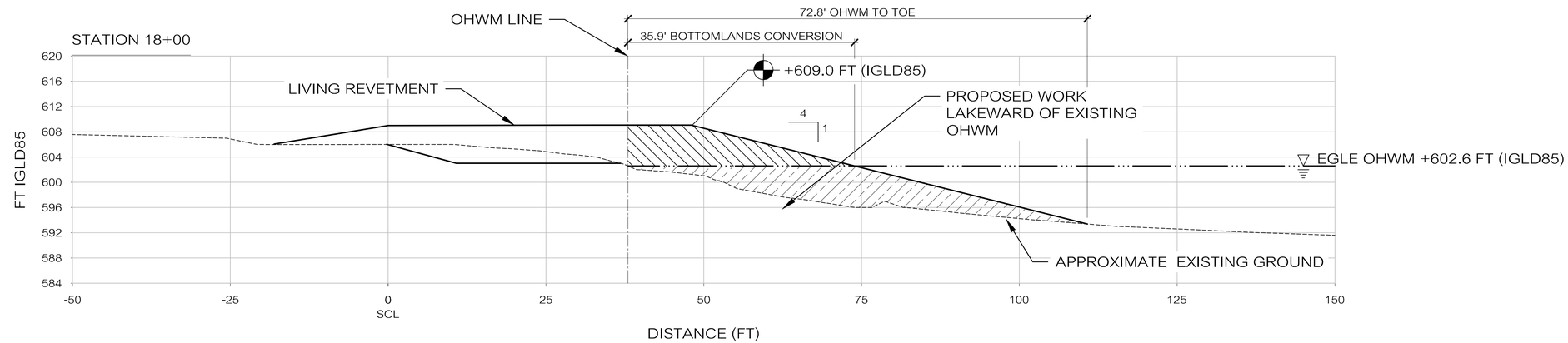
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

MHK 3/10/23

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 17+00	1100	700	0
STA 18+00	1000	700	0





LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 16+75 TO 18+00

ISSUE NUMBER: 03 | ISSUE DATE: 2023-02-10 | SHEET NUMBER: XS-16

PROJECT NUMBER: 13290.101

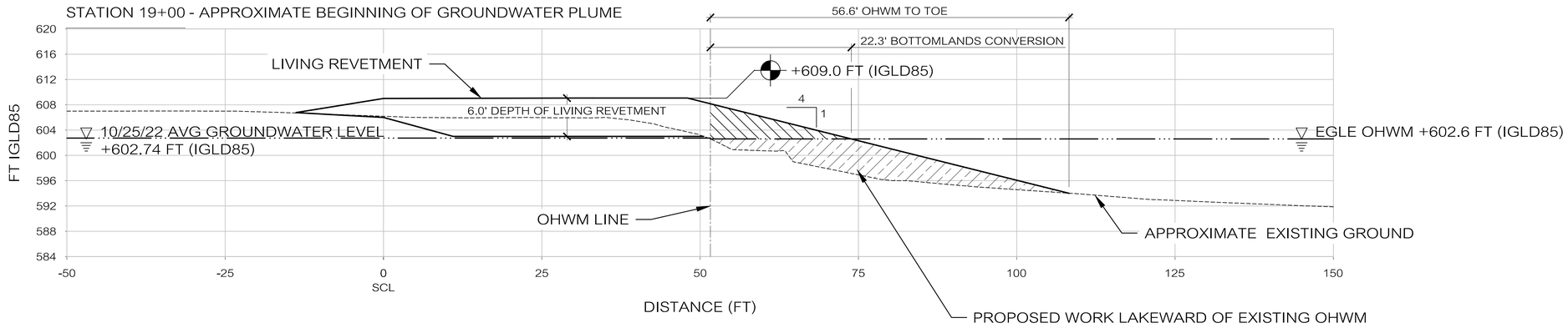
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

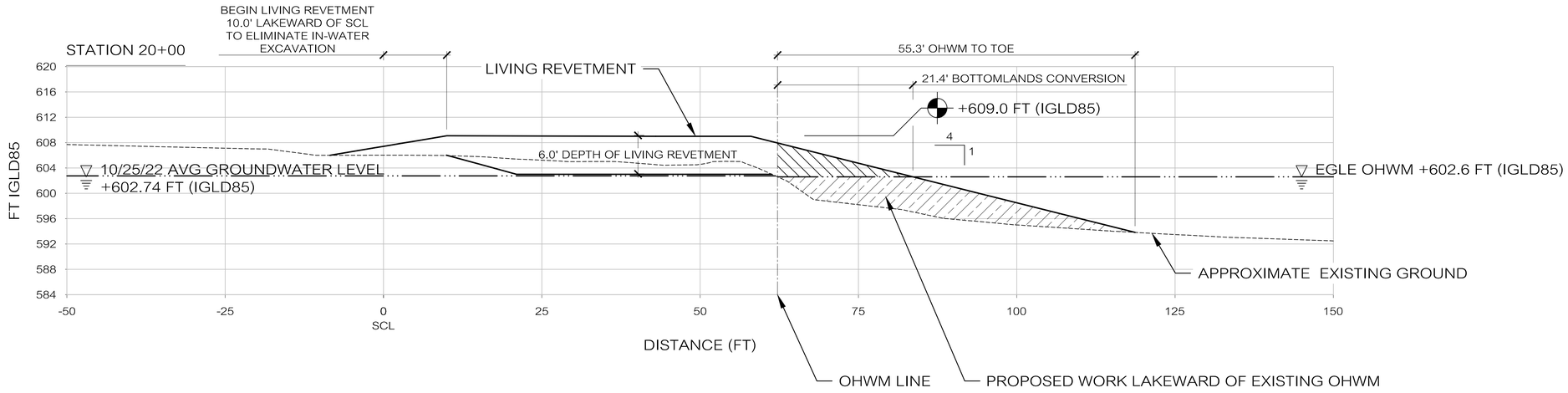
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

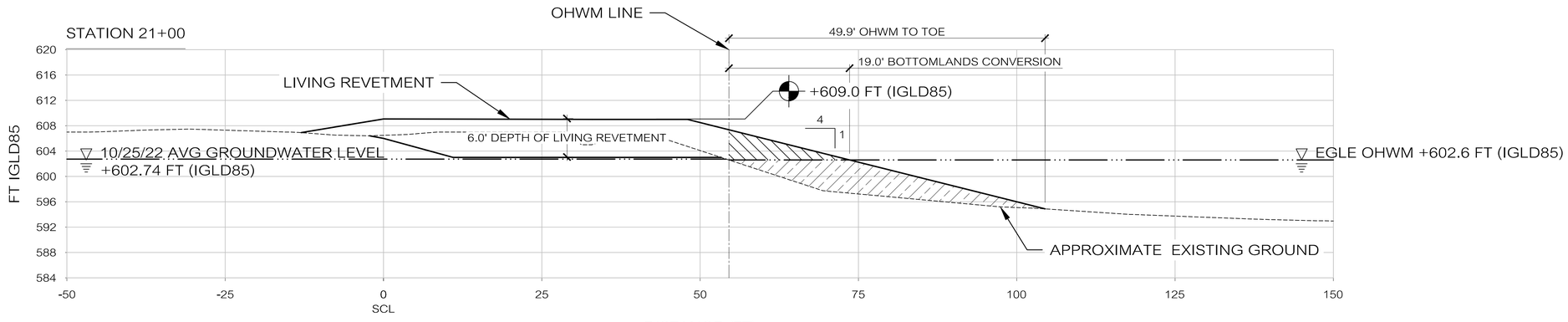
3/10/23

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 19+00	700	400	0
STA 20+00	600	100	0
STA 21+00	600	100	0







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD	
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 19+00 TO 21+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-17

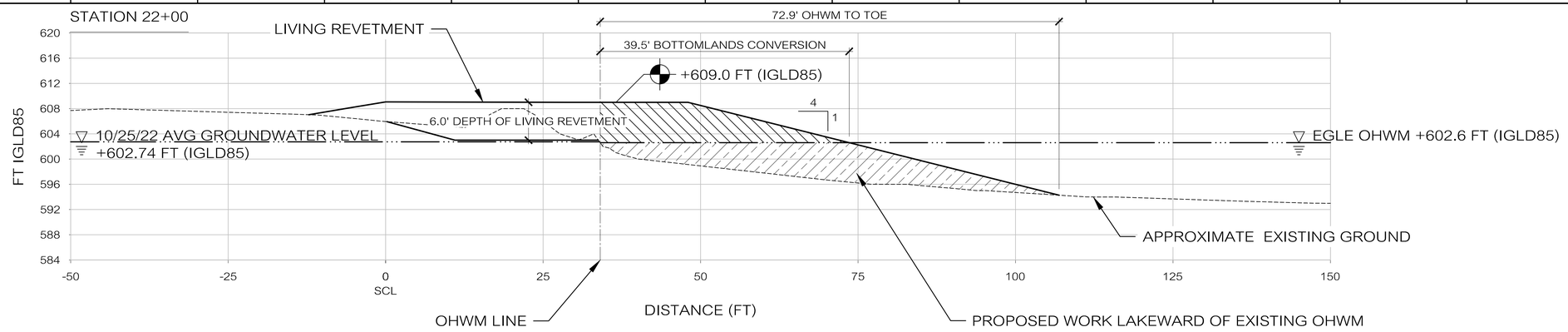
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

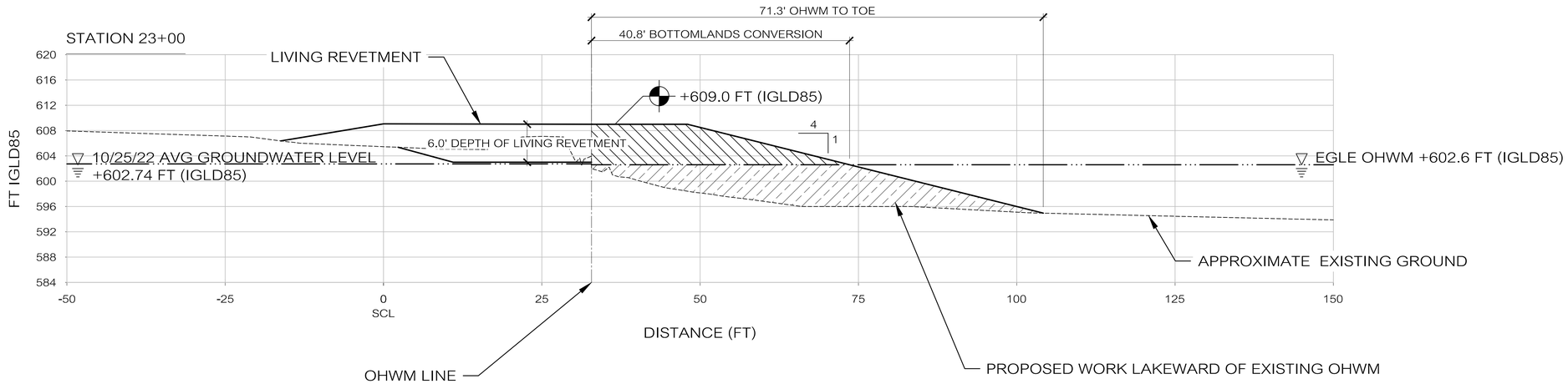
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

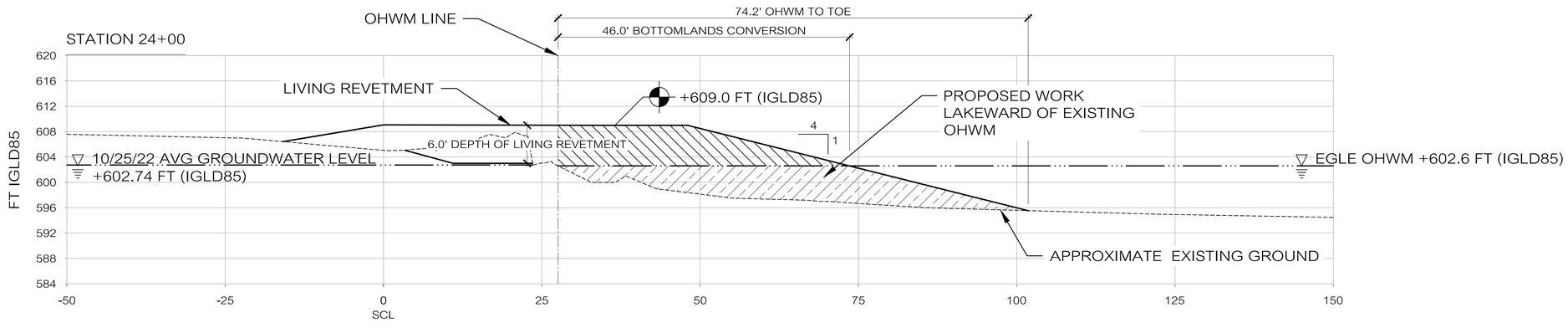
MHK 3/10/23

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 22+00	700	400	0
STA 23+00	1000	700	0
STA 24+00	1000	700	0







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 22+00 TO 24+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-18

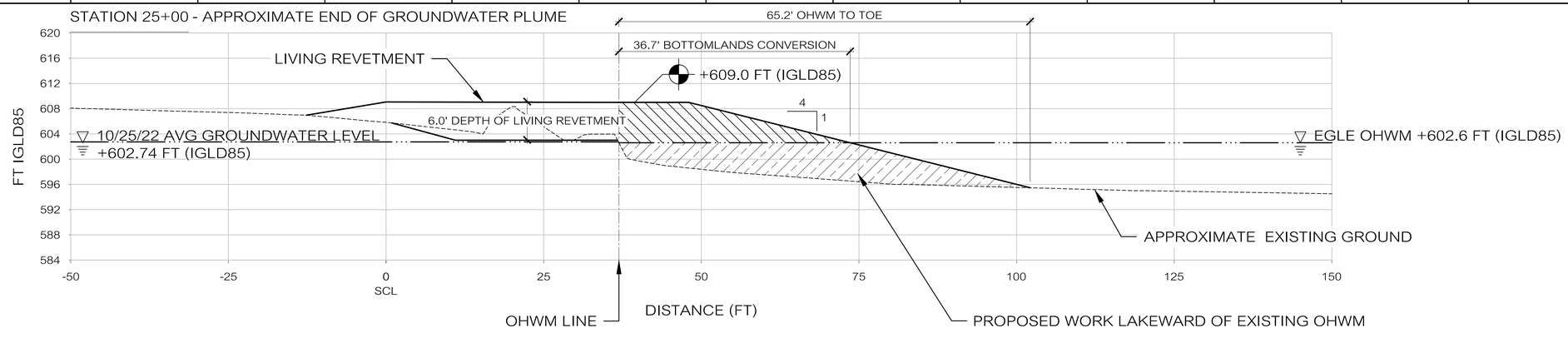
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

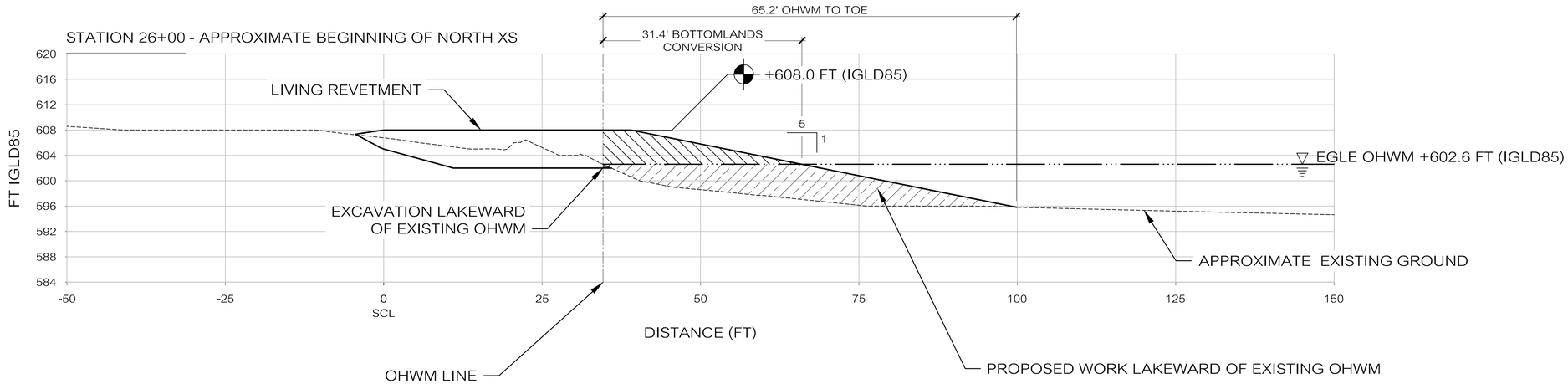
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

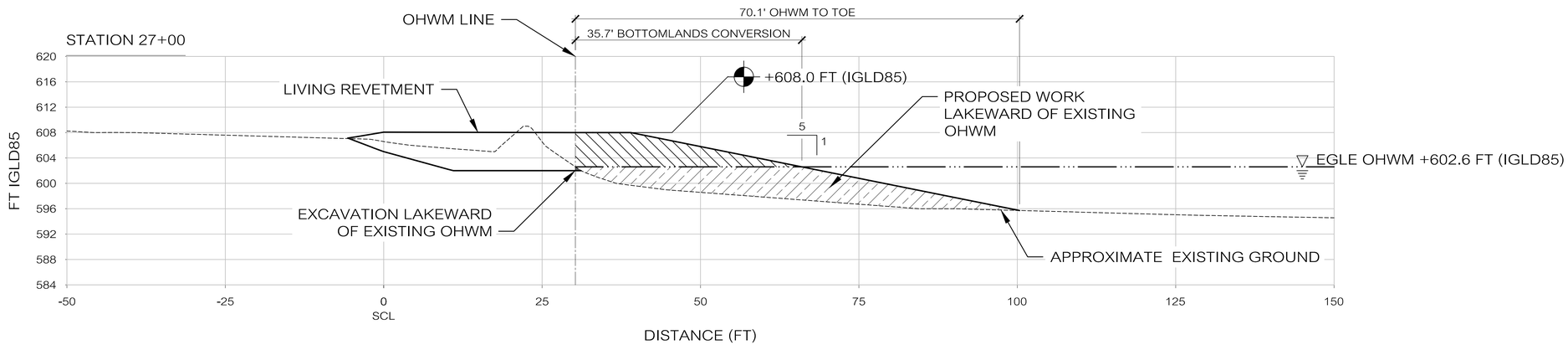
MHK 3/10/23

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 25+00	1000	700	0
STA 26+00	900	500	10
STA 27+00	800	400	10







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: City of Marquette, Michigan

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 25+00 TO 27+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-19

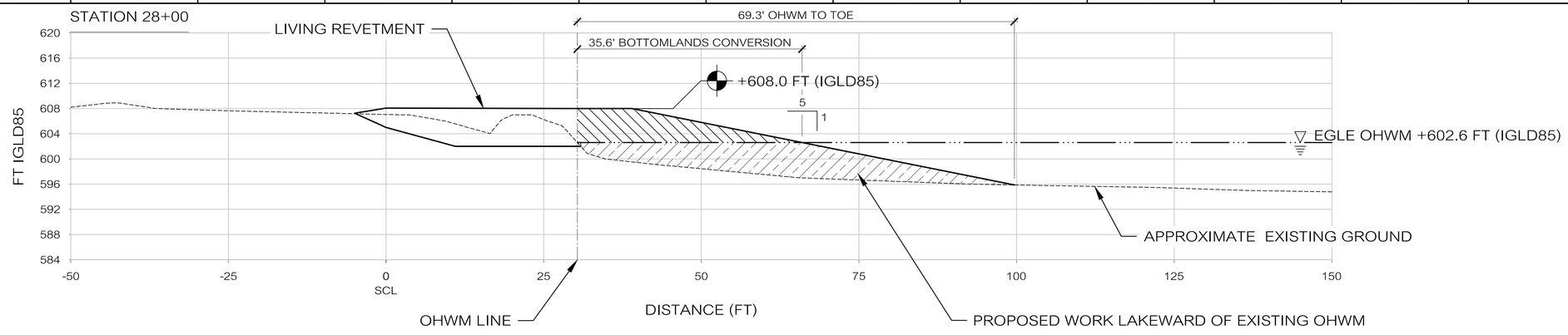
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

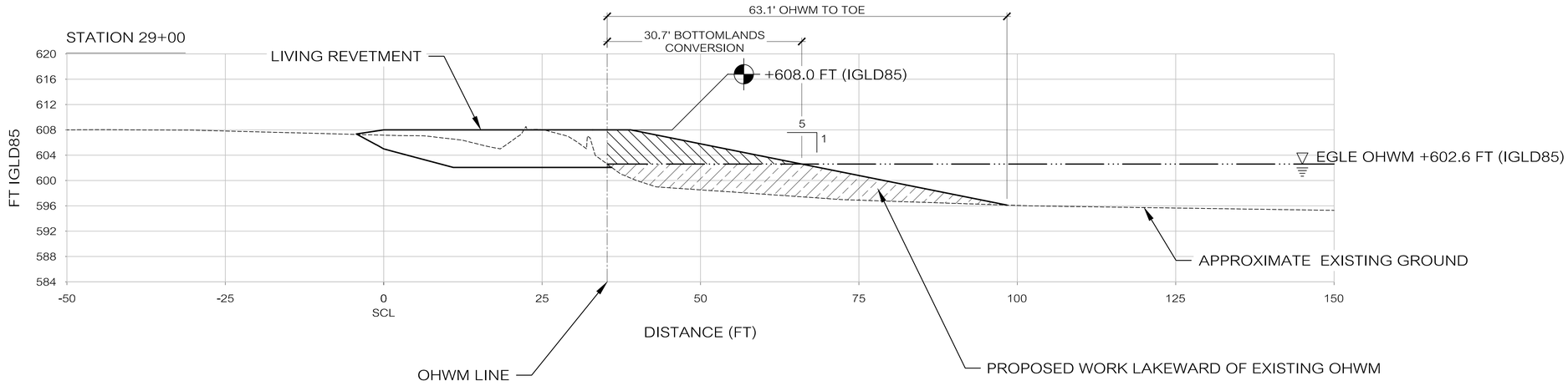
3/10/23

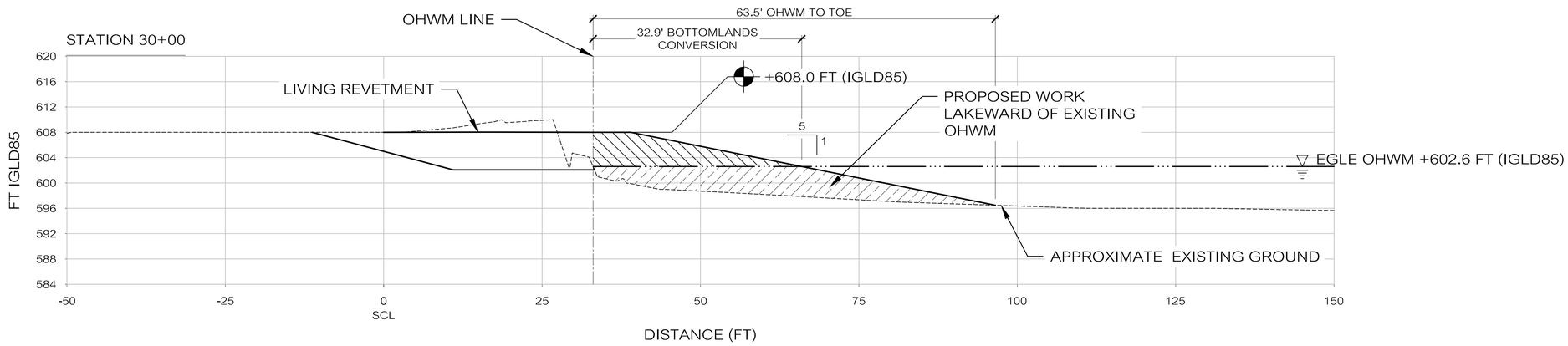
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 28+00	900	400	0
STA 29+00	800	400	0
STA 30+00	700	400	0







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 28+00 TO 30+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-20

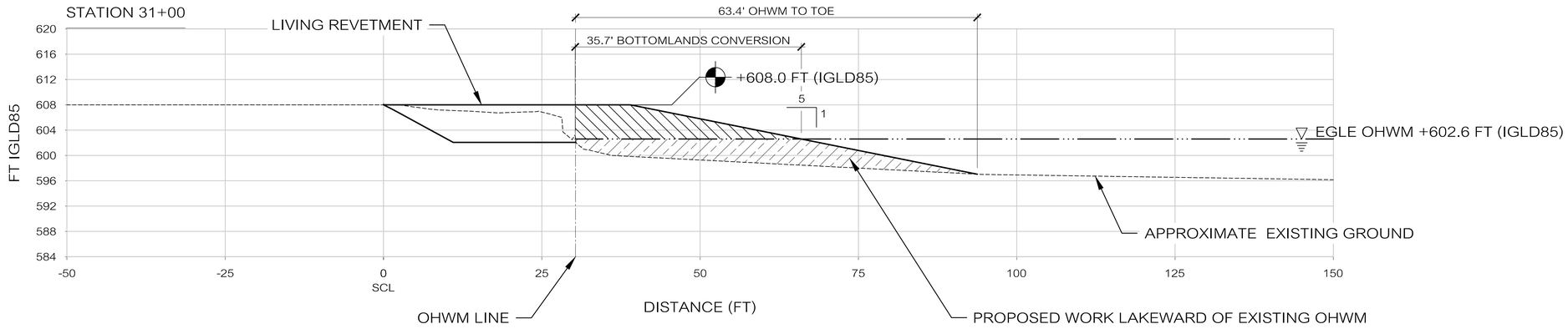
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

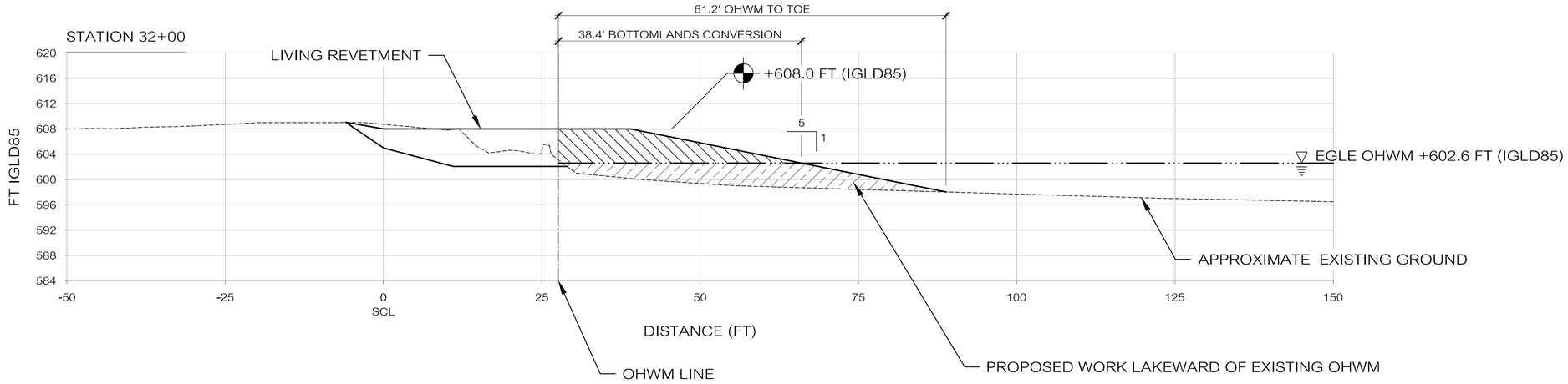
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

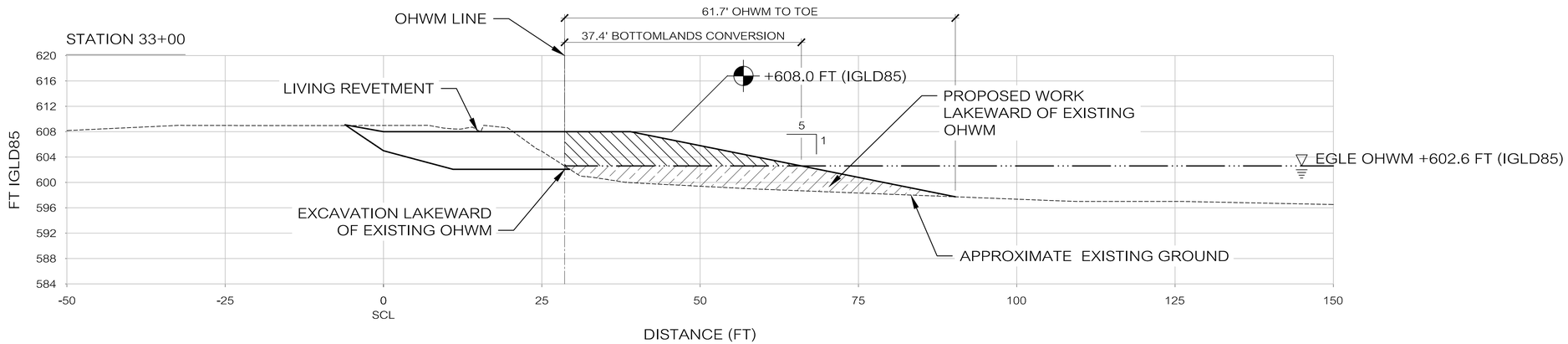
MHK 3/10/23

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 31+00	700	400	0
STA 32+00	600	500	0
STA 33+00	600	500	10







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 31+00 TO 33+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-21

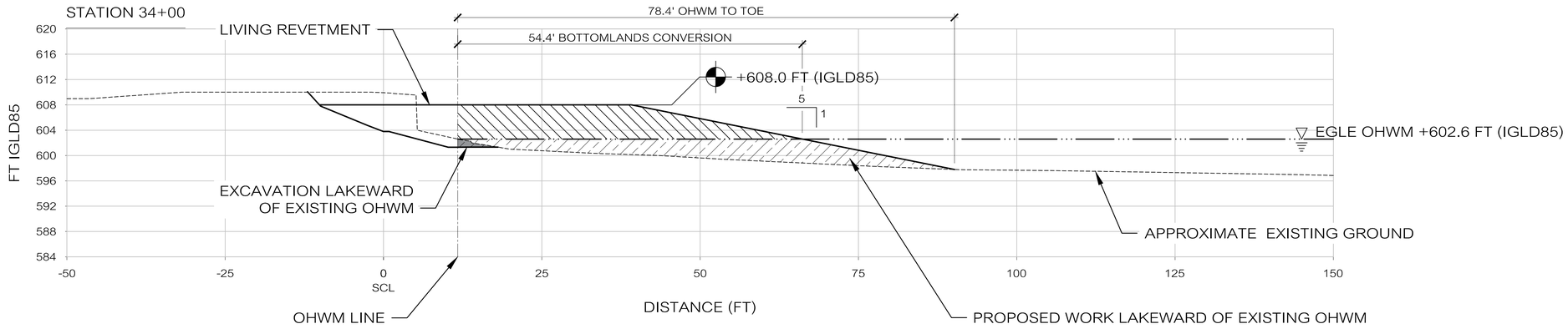
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

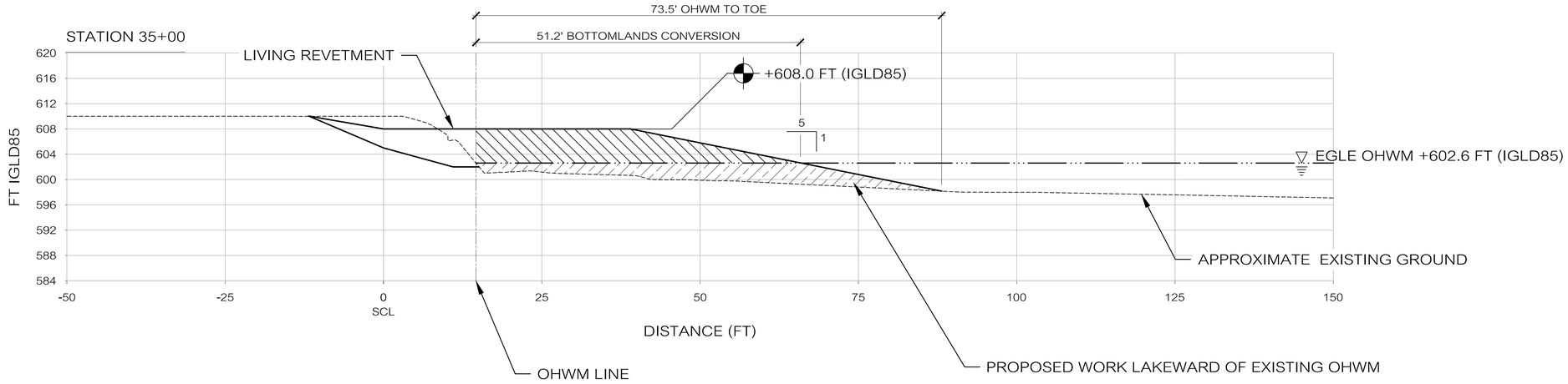
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

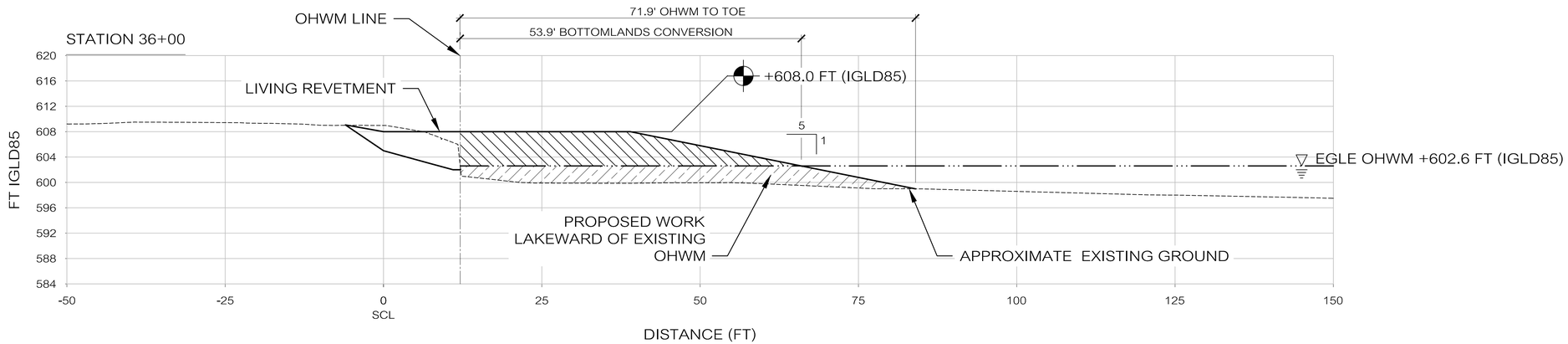
MHK 3/10/23

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 34+00	600	600	10
STA 35+00	600	800	0
STA 36+00	600	800	0







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER	(E) CONSTRUCTION		(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 34+00 TO 36+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-22

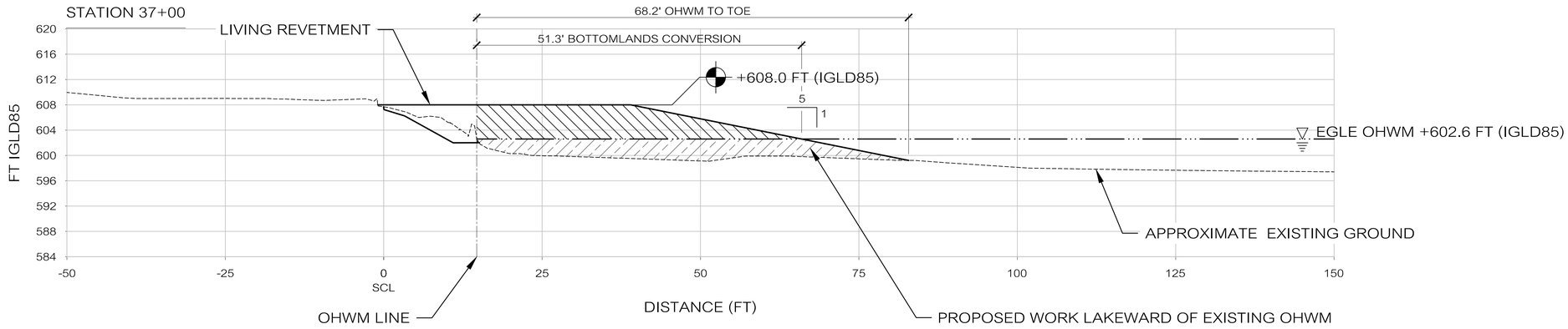
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

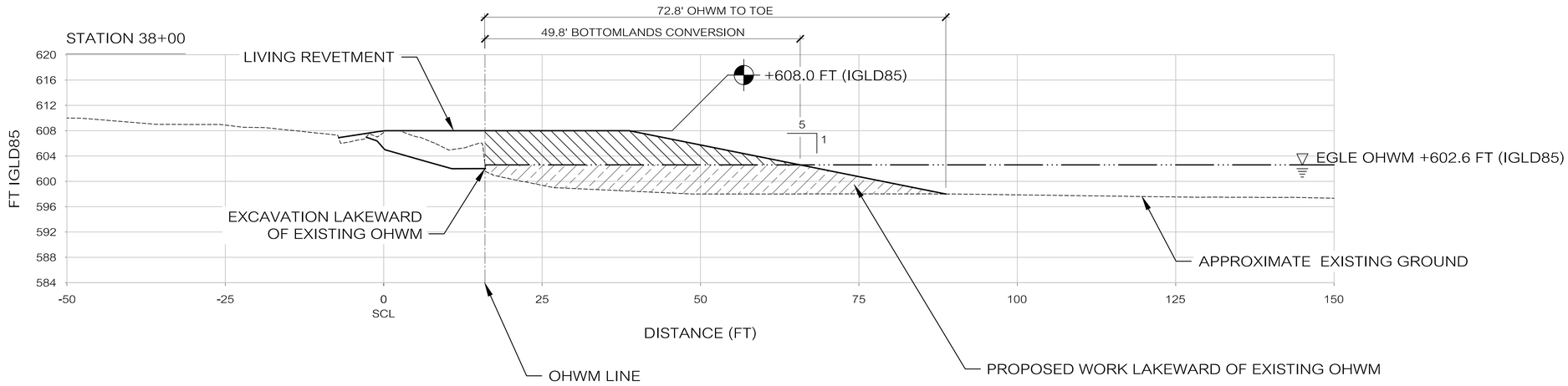
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

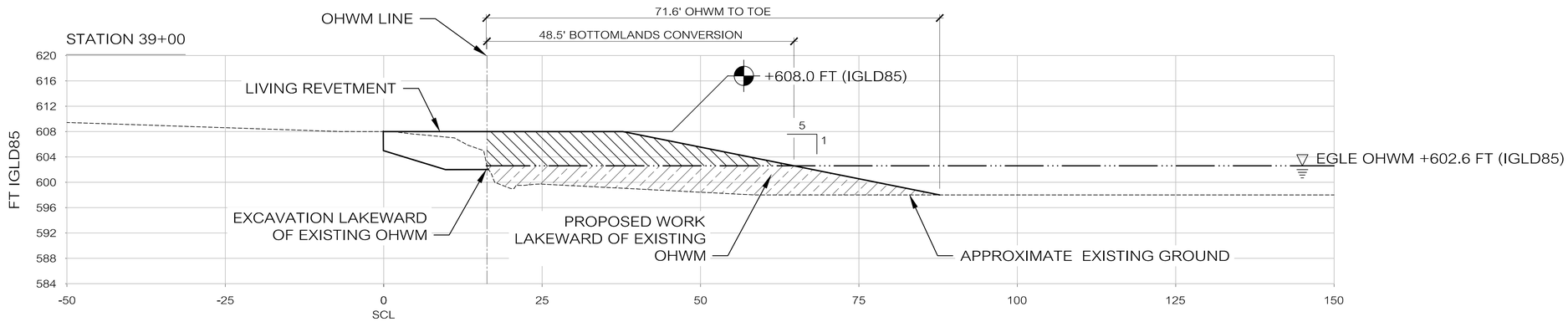
MHK 3/10/23

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 37+00	600	800	0
STA 38+00	800	700	10
STA 39+00	900	700	10







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD	
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 37+00 TO 39+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-23

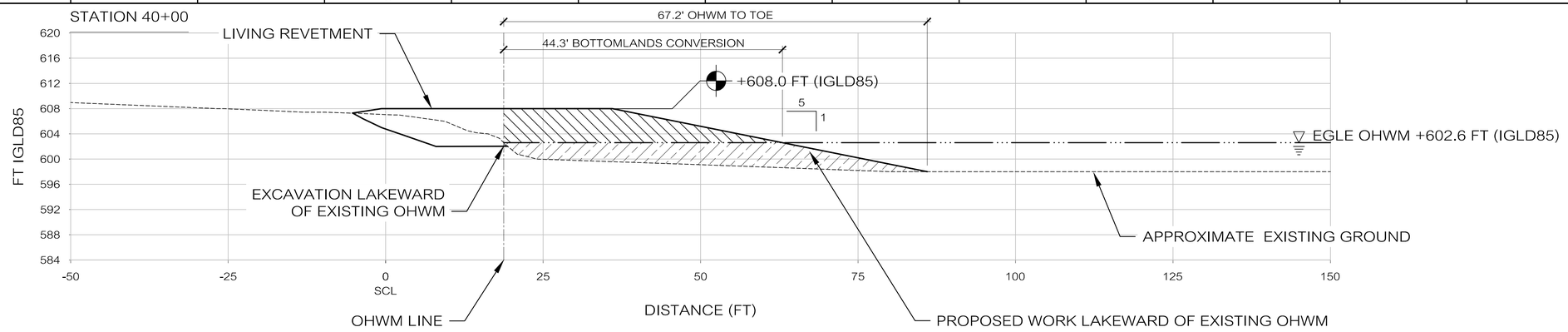
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

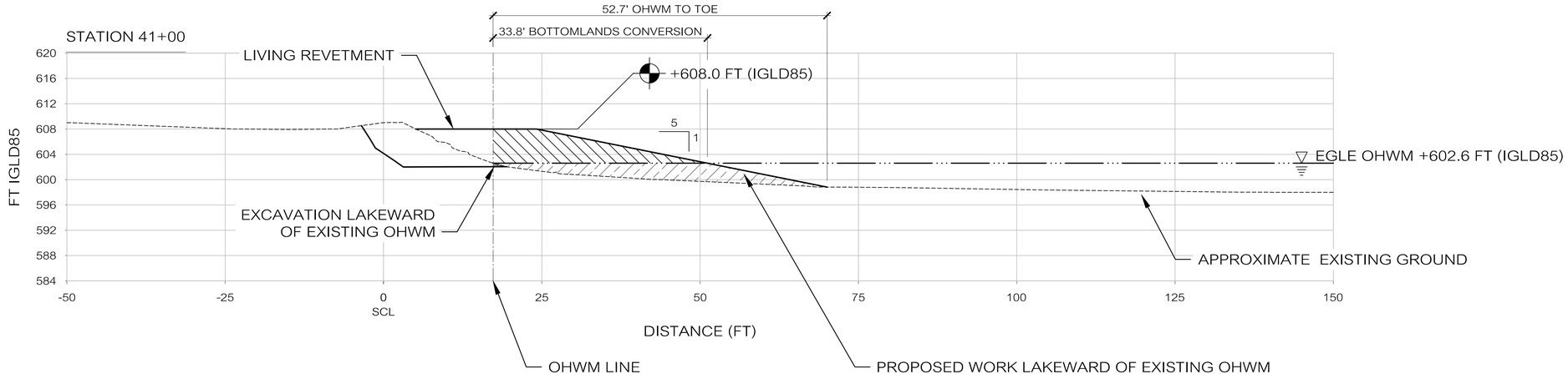
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

MHK 3/10/23

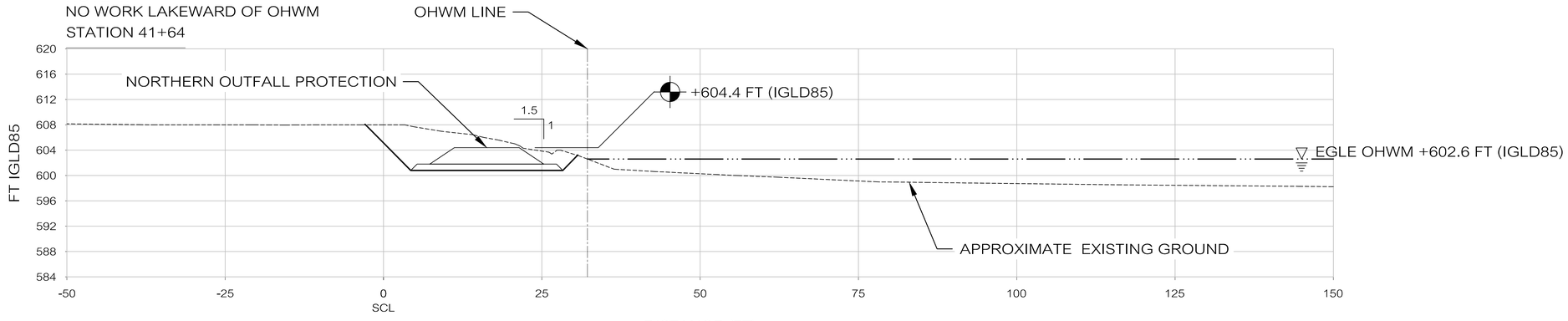
QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 40+00	800	700	10
STA 41+00	500	500	10
STA 41+64	0	0	0





NOTE 1:
NO WORK LAKEWARD OF OHWM
STATION 41+64



LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER	(E) CONSTRUCTION		(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 40+00 TO 41+64

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-24

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\EGLE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

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Appendix G

Monitoring and Maintenance Plan

Working Note

Baird.
Innovation Engineered.

Project/Proposal Number :	13290.103	**Date**	30 June 2021
Staff Member :	Peter Truax		
Title :	LS Shoreline Restoration Monitoring and Maintenance Plan		
Summary / Description :	--		
File Reference :	13290.103.W.PST.Rev0_Marquette Monitoring and Maintenance Plan		

Summary

Implementation of the ~4,000-ft shoreline protection project will result in an improved level of erosion protection and flood risk reduction. As the improvements will be comprised of new construction and upgrades to existing natural features, it is important to establish a record of performance. Therefore, it is recommended that regular monitoring and maintenance is performed, as follows:

Monitoring

Monitoring Adjacent Properties

Benchmark locations will be surveyed and 6-ft benchmark rods with protective concrete-filled collars will be installed in the ground at 400-800' spacing along the back of the living revetment and 1000' north and south of the project area (to monitor impact on adjacent properties), parallel to the shoreline. Shoreline profiles will be developed along transects from these benchmarks running perpendicular to the shoreline and will record the elevation at a minimum of 20' intervals at least to the ordinary high water mark or the waterline, whichever is lower. Additionally, aerial orthoimagery will be collected by unmanned aerial vehicle (UAV) and topographic data will be compiled from this using photogrammetry or other survey techniques (e.g., lidar). Surveys will be undertaken along the entire project area as well as NMU shoreline every three months for the first year of the post-construction period.

At the end of each survey, data from all available surveys, including the post-construction as-built survey, should be compared to determine trends and understand overall performance of the shoreline protection, as well as to determine littoral drift of living revetment material. Additional surveys will be collected at 5- and 10-years post-construction in the same season each year.

Monitoring Cobble Movement

At the time of construction, a select group of stones from the Living Revetment should be painted and have a number chiseled into one side. This should occur every 500 ft along the living revetment. At the beginning and each 500 ft increment, a total of 75 stones should be painted with marine grade paint and numbered (total of about 525 stones), and position noted in GPS coordinates. At 12-month intervals, each stone should be

MHK

3/10/23

located, GPS position noted, and then compared with the previous position to determine the amount of movement. The same stones should then be repainted for the next inspection, 12 months later.

Trails/Overlook/Boardwalk Monitoring

Twice-annual site visits will be performed by the City Engineer or staff to assess the condition of trails, overlook areas and boardwalks in the project area. The annual conditions will be compared with post-construction photographs and other records. Visits will be conducted in the same seasons each year.

Ecological Monitoring

Site visits will be performed three times each year for the first two years following planting installation. Plants will be inspected for biomass, growth compared to post-construction condition, and weed monitoring will be conducted throughout the project area. Areas for weed monitoring will be determined following construction but shall be representative of each plant habitat installed. Visits will be conducted in the same seasons each year.

Overall plant coverage, shoreline position, and dune positions will be assessed using the aerial orthoimagery collected as part of the living revetment/dune restoration monitoring, and will be assessed at 1-, 5-, and 10-years post-construction.

Underwater plankton colonization will be assessed by measuring coverage on submerged stones, and will be assessed after 1, 2, and 5 years post-construction as part of stone tracking.

Water levels will be recorded triennially using the NOAA gauge # 9099018 in Marquette, MI. If this gauge is decommissioned during the monitoring period, the next nearest gauge will be used.

Maintenance

Dune Restoration

Where erosion has been identified during the annual trails/overlook/boardwalk site visits be the City, or as identified in ad-hoc inspections, sand will be added to the dune restoration area on the lakeward face of the dune and elsewhere as needed. This maintenance will be undertaken by the City and will occur at least annually.

Living Revetment

Occasional grooming will be performed on the living revetment to re-establish the design profile and overall shoreline position, including re-placing material which has migrated out of the project area and/or adding new material. This maintenance will be undertaken by the City and will occur biennially.

Trails/Overlook/Boardwalk

Gravel paths will be regrading and stone will be added as needed. This maintenance will be undertaken by the City and will occur at least twice annually.

Composite decking will be repaired or replaced as needed. This maintenance will be undertaken by the City and will occur every five years.

Ecological Maintenance

Plantings will be replenished at select locations in the third, sixth and tenth years post-construction. This maintenance will be undertaken by Superior Watershed Partnership.

Weeding will be performed three times each year for the first two years following planting installation, during site visits or shortly thereafter. Following the third year post-construction until ten years post-construction, weeding will occur twice per year.

ADDENDUM No. 6

USACE PERMIT

Permit No. LRE-2018-01031-38-S23

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, DETROIT DISTRICT
477 MICHIGAN AVENUE
DETROIT, MI 48226-2550

November 20, 2023

Regulatory Branch
File No. LRE-2018-01031-38-S23

Mikael Kilpela
City of Marquette
1100 Wright Street
Marquette, Michigan 49855

Dear Mr. Kilpela:

We are enclosing Department of the Army Permit No. LRE-2018-01031-38-S23. We invite your special attention to Paragraph 2.a. under Further Information, which states that "This permit does not obviate the need to obtain Federal, state, or local authorizations required by law." We suggest that you contact the Michigan Department of Environment, Great Lakes, and Energy in Marquette, at 906-250-0588, to determine if state approval is required. You should not begin work until State approval is obtained.

We require that you inform this office immediately when you begin construction. When you have completed work, fill in and return the enclosed COMPLETION REPORT.

Any material changes in the location or plans of the work authorized herein must be submitted to the District Engineer prior to commencement of work. As required by law, the revised plans must have written approval of the Department of the Army.

You are responsible for assuring that your contractor abides by the conditions of this permit. Should you have any questions on this matter, please contact Rachel Nys at the above address, by E-Mail at Rachel.T.Nys@usace.army.mil, or by telephone at (313) 226-1329. In all communications, please refer to File Number LRE-2018-01031-38-S23.

We are interested in your thoughts and opinions concerning your experience with the Detroit District, Corps of Engineers Regulatory Program. If you are interested in letting us know how we are doing, you can complete an electronic Customer Service Survey from our web site at: https://regulatory.ops.usace.army.mil/customer-service-survey/. Or, you may contact us and request a paper copy of the survey that you may complete and return to us by mail or fax. Thank you for taking the time to complete the survey, we appreciate your feedback.

Sincerely,

Kerrie Kuhne
Chief, Western Section
Regulatory Branch

Enclosures

Copy Furnished

EGLE, Soucy; 52-Lakeshore Boulevard Relocation
Enforcement
NOAA (via e-mail ocs.ndb@noaa.gov)

STANDARD PERMIT COMPLETION REPORT

CELRE-OPR-W

Chief, Compliance and Enforcement Section
Regulatory Branch
U.S. Army Corps of Engineers
477 Michigan Avenue
Room 603
Detroit, MI 48226-2550

Dear Sir:

You are hereby notified that work under Department of the Army Permit No. LRE-2018-01031-38-S23 to construct a living revetment at Lakeshore Drive, Marquette, Marquette County, Michigan, issued to the City of Marquette was completed in accordance with the permit on:

_____.
(Date work completed)

_____
(Permittee's Signature)

I M P O R T A N T

1. This COMPLETION REPORT MUST BE MAILED to the above addressee within 10 days after completion of work covered by the FEDERAL PERMIT to ensure an accurate Government record of data affecting navigation.

2. Where dredging soundings are made of projects which include dredging, a copy of the soundings should accompany this report. If the soundings are measured from the water surface and have not been corrected to International Great Lakes Datum plane, the hour and date soundings was made should be noted on sounding reports.

NOTE: Although permits authorizing structures carry an expiration date, REPAIRS that conform to the permit plans are also within the scope of the authorization. Therefore, it is recommended that expired permits NOT be destroyed, but retained as proof that the work to be repaired has received the Corps of Engineers' approval.

DEPARTMENT OF THE ARMY PERMIT

Permittee City of Marquette (Mikael Kilpela)

Permit No. LRE-2018-01031-38-S23

Issuing Office U.S. Army Engineer District, Detroit

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

- Place approximately 44,800 cubic yards of stone in a 3,200 foot long shoreline area. The width of the proposed fill area would vary from 54 feet to a maximum of 96.7 feet waterward of the Ordinary High Water Mark elevation of 603.1' (IGLD 85). The proposed work would convert approximately 2.71 acres of Lake Superior from shallow open water to uplands.
- Mechanically dredge approximately 210 cubic yards of material from a 35 x 41 foot area to a bottom elevation of 599' (IGLD 85).

Project Location:

in Lake Superior, offshore property in Lakeshore Boulevard, Marquette, Michigan.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **December 31, 2026**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately stop work in that area and notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. Your signature, as permittee, indicates that, as consideration for the issuance of this permit, you voluntarily accept and agree to comply with all of the terms and conditions of this permit.

2. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

3. Temporary and/or permanent sidecasting of dredged material and/or placement of fill material into the waterway or wetland for any purpose, including operating and/or placing equipment, is not authorized.

4. All dredged and/or excavated materials will be disposed of in upland location(s) landward of the Ordinary High Water Mark with no placement in, or return to, any waterway or wetland.

5. All fill shall consist of clean, inert materials from an upland source. The fill material must be free from toxic substances, fines, oil and grease, debris, wood, general refuse, plaster, and other pollutants, and shall contain no broken asphalt, oil-based material, or metal.

6. You agree to successfully create 19.29 acres of a variety of habitats, as listed in Table 6.1 of the attached mitigation plan, dated November 1, 2023. The construction of the mitigation area must be completed within one year of the date of issuance of this permit. Notification of completion of construction must include as-built plans as provided in the mitigation plan. The determination of success rests solely with this office, and will be made in writing by December 31, 2028, unless the monitoring period is extended as detailed below. The criteria for success will be as stated in the final mitigation plan. Monitoring reports shall cover the period of January 1 through December 31 and be submitted to the Corps and EGLE prior to January 31 of the following year. Monitoring reports must include photographs with a 360-degree panorama taken from at least one fixed point in each of the habitat types listed in Table 6.1. The report must include drawings (drawn to scale) of the mitigation site, including the boundaries of wetlands, the sample points and photograph locations, and the land/water boundaries at the time of each monitoring visit. Each monitoring effort and report will be based on the sampling technique summarized in the plan. This office reserves the right to determine success based on our interpretation of success criteria, the information in the reports, and/or site visit(s). Should we determine that a deficiency exists during or at the conclusion of the

monitoring period, we reserve the right to compel you to take whatever measures are necessary, including starting over, to achieve success within an additional monitoring period to be established at that time. Specific remedial measures to be taken will be designed and executed by you and you will be responsible for unsuccessful remedial measures. Should we determine that the mitigation effort is successful, we will release you from this condition. You agree to allow access to the mitigation site by Corps employees in the future for study and long term evaluation. After achieving a determination of success by this office, the permittee shall notify and receive prior approval from this office for any proposed modification within the mitigation area.

7. Prior to beginning any dredging, the permittee shall install commercial-grade silt curtains that extend from a floating boom on the lake surface down to the bed of the waterway. The silt curtain shall continuously and completely enclose the dredge area. The silt curtain shall be properly anchored onshore, and anchored offshore at 25-foot intervals to provide a stable and functional barrier. The silt curtain shall be maintained in effective working condition until all dredging is completed and turbidity has returned to background levels. In the event that the silt curtain remains in place overnight, the applicant will coordinate proper marking of the silt curtain with the USCG and their requirements (e.g. lighting, reflective paints, etc.) will become special conditions under this permit.

Further Information:

1. Congressional Authorities: You have been so authorized to undertake the activity described above pursuant to:

Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

2. Limits of this authorization.

   a. This permit does not obviate the need to obtain Federal, state, or local authorizations required by law.

   b. This permit does not grant any property rights or exclusive privileges.

   c. This permit does not authorize any injury to the property or rights of others.

   d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

   a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

   b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

   c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

   d. Design or construction deficiencies associated with the permitted work.

   e. Damage claims associated with any future modifications, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance of the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Mikael Kilpela _____ 11/20/2023

(PERMITTEE) (DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Kerrie Kuhne _____ __20 Nov 2023_____

Kerrie Kuhne for: (DATE)
(DISTRICT ENGINEER)
Brett M. Boyle
Lieutenant Colonel, U.S. Army

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

_____ _____

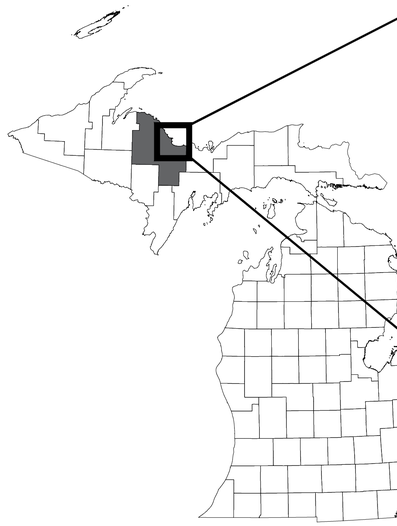
(TRANSFEREE) (DATE

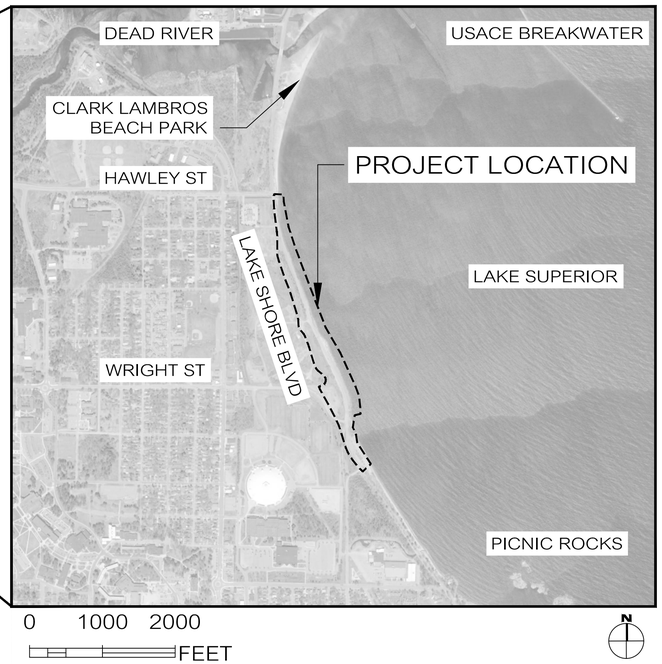
ENG FORM 1721, NOV 86 EDITION OF SEP 82 IS OBSOLETE. (33 CFR 325 (Appendix A)) (Proponent CECW-OR)

MARQUETTE, MI
LAKE SUPERIOR SHORELINE RESTORATION

USACE PERMIT DRAWINGS

N.T.S.





SHEET LIST	
SHEET NO.	SHEET TITLE
G-001	TITLE SHEET
01 - 05	PLAN DRAWINGS
XS01 - XS24	SECTION DRAWINGS

FILE NUMBER: LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 1 OF 29

PREPARED BY:

Baird.

W.F. BAIRD & ASSOCIATES LTD.
2924 MARKETPLACE DR
SUITE 200
MADISON, WI 53719

IN ASSOCIATION WITH:

res

RESOURCE ENVIRONMENTAL SOLUTIONS, INC.
17921 W SMITH ROAD
BRODHEAD, WI 53520

Foth

FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
2121 INNOVATION COURT
P.O. BOX 5095
DE PERE, WI 54115-5095

PREPARED FOR:

CITY OF MARQUETTE, MI
300 W BARAGA AVE
MARQUETTE, MI 49855

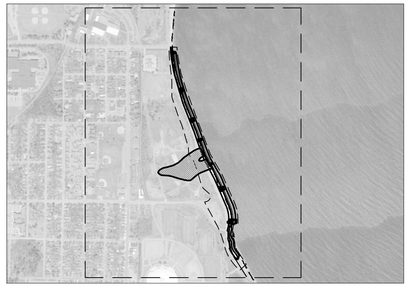
SUPERIOR WATERSHED PARTNERSHIP
2 PETER WHITE DRIVE
MARQUETTE, MI 49855

PERMIT DOCUMENTS
NOT FOR CONSTRUCTION

ISSUE NUMBER: 04

ISSUE DATE: 2023-03-23

KEY MAP



COORDINATE TABLE/NOTES

1. HORIZONTAL DATUM IS IN FEET RELATIVE TO THE MARQUETTE CITY DATUM.
2. VERTICAL DATUM IS IN FEET RELATIVE TO THE INTERNATIONAL GREAT LAKES DATUM OF 1985 (IGLD85). IGLD85 ELEVATIONS CONVERSION TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) IS ELEVATION IGLD85 + 0.002 FEET = ELEVATION NAVD88. CONVERSION SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) ONLINE VERTICAL DATUM TRANSFORMATION TOOL.

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 2 OF 29

QUANTITIES

	UNIT	QUANTITY
MATERIAL PLACED LAKEWARD OF OHWM, BELOW 603.1'	CY	29,500
MATERIAL PLACED LAKEWARD OF OHWM, ABOVE 603.1'	CY	15,300
MATERIAL PLACED LAKEWARD OF OHWM, TOTAL	CY	44,800
MATERIAL EXCAVATED LAKEWARD OF OHWM IN PLUME FOOTPRINT	CY	0
MATERIAL EXCAVATED LAKEWARD OF OHWM, ALL OTHER AREAS	CY	210

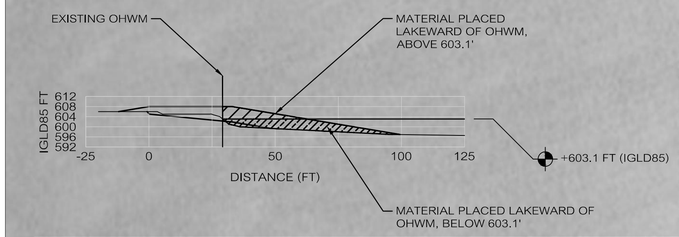


DIAGRAM OF QUANTITIES
N.T.S

LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- GROUNDWATER PLUME
- ORDINARY HIGH WATER MARK (OHWM)
- PROPOSED ORDINARY HIGH WATER MARK

LAKE SUPERIOR

AREA OF DISTURBANCE LAKEWARD OF OHWM +603.1'
224,200 SF/5.14 ACRES

CITY OF MARQUETTE/ NORTHERN MICHIGAN UNIVERSITY PROPERTY BOUNDARY

NO WORK LAKEWARD OF OHWM +603.1' WILL OCCUR ON NORTHERN MICHIGAN UNIVERSITY PROPERTY

ESTIMATED EXTENT OF GROUNDWATER PLUME

AREA OF BOTTOMLANDS CONVERSION (EXISTING OHWM TO PROPOSED OHWM)
117,900 SF/2.71 ACRES

PROPOSED OHWM +603.1'

EXISTING OHWM +603.1'

ISLANDER BEACH AND TENNIS CLUB/ CITY OF MARQUETTE PROPERTY LINE

41+64

0+00
1+54
3+22
5+00
9+60 BEGINNING OF WORK BELOW OHWM
10+00
15+00
20+00
25+00
30+00
35+00
40+00

EXISTING WETLAND - 15,900 SF/0.37 ACRES TO BE FENCED OFF DURING CONSTRUCTION AND PRESERVED

PINE ST
HAWLEY ST
PRESQUE ISLE AVE
WRIGHT ST

0 200 400 FEET
SCALE = 1:200

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:	(A) PRELIMINARY	(B) DESIGN	(C) PERMIT	(D) TENDER	(E) CONSTRUCTION	(F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2021-06-18
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-03-23

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

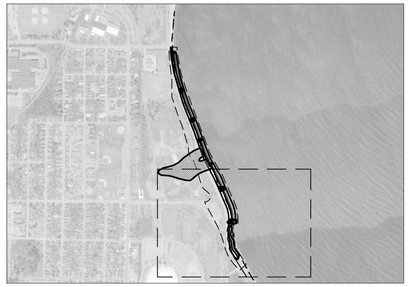
BOTTOMLANDS CONVEYANCE FIGURE
REVISED ALTERNATIVE

ISSUE NUMBER: 02
ISSUE DATE: 2023-03-23
SHEET NUMBER: 01
PROJECT NUMBER: 13290.101

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE PLANS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

KEY MAP



COORDINATE TABLE/NOTES

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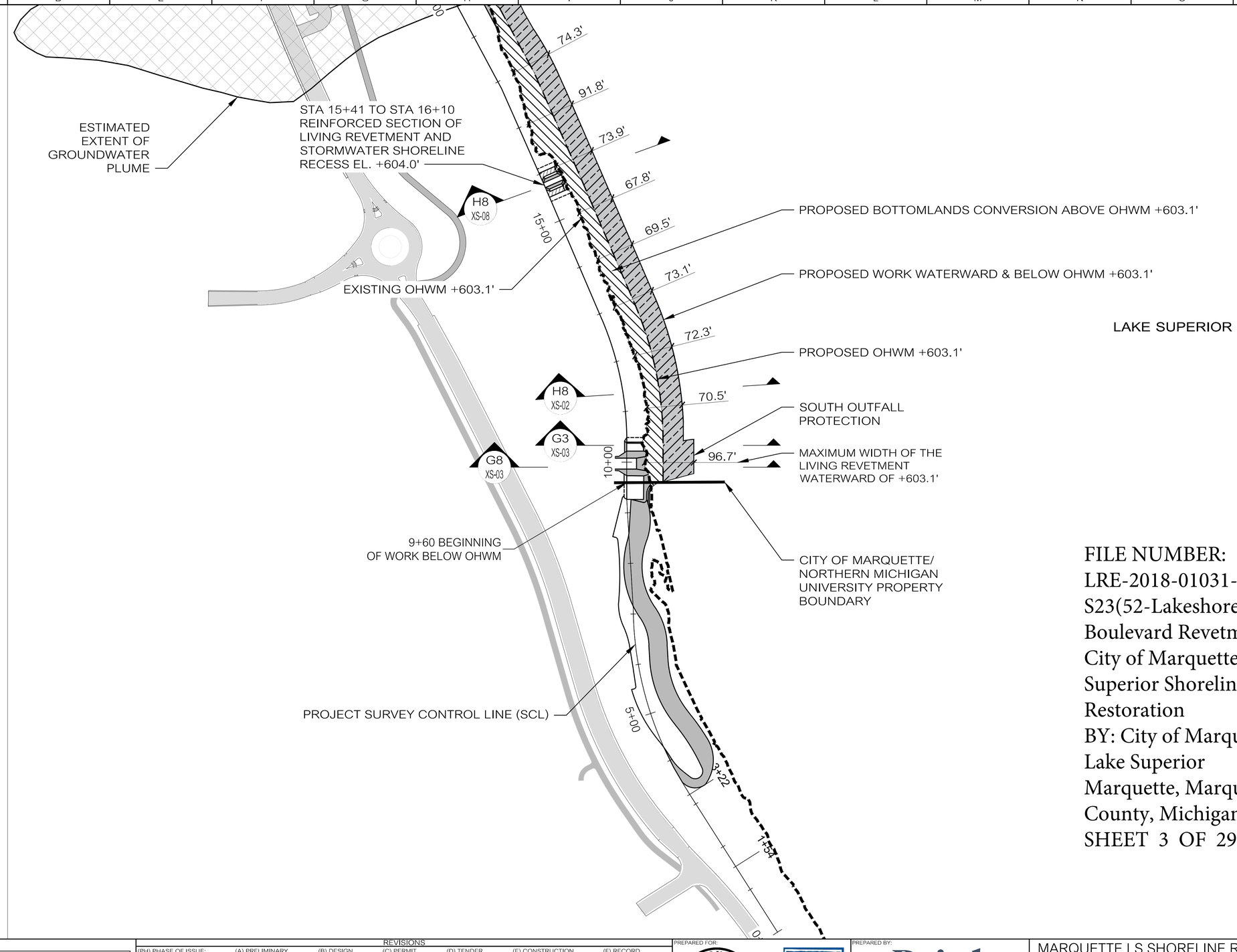
LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- GROUNDWATER PLUME
- ORDINARY HIGH WATER MARK (OHWM)



FILE NUMBER: LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 3 OF 29

0 100 200 FEET
SCALE = 1:100

N

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2021-06-18
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-03-23

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD

PREPARED FOR: City of Marquette, Michigan; Superior Watershed Partnership and Land Conservancy

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

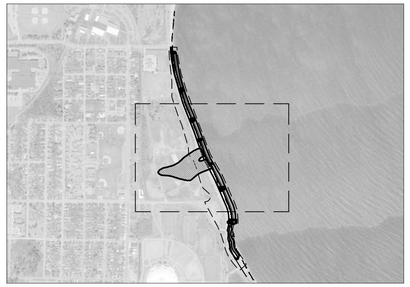
MARQUETTE LS SHORELINE RESTORATION
ORDINARY HIGH WATER MARK PROPOSED WORK FIGURE - SOUTH

ISSUE NUMBER: 04
ISSUE DATE: 2023-03-23
SHEET NUMBER: 02
PROJECT NUMBER: 13290.101

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE PLANS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

KEY MAP



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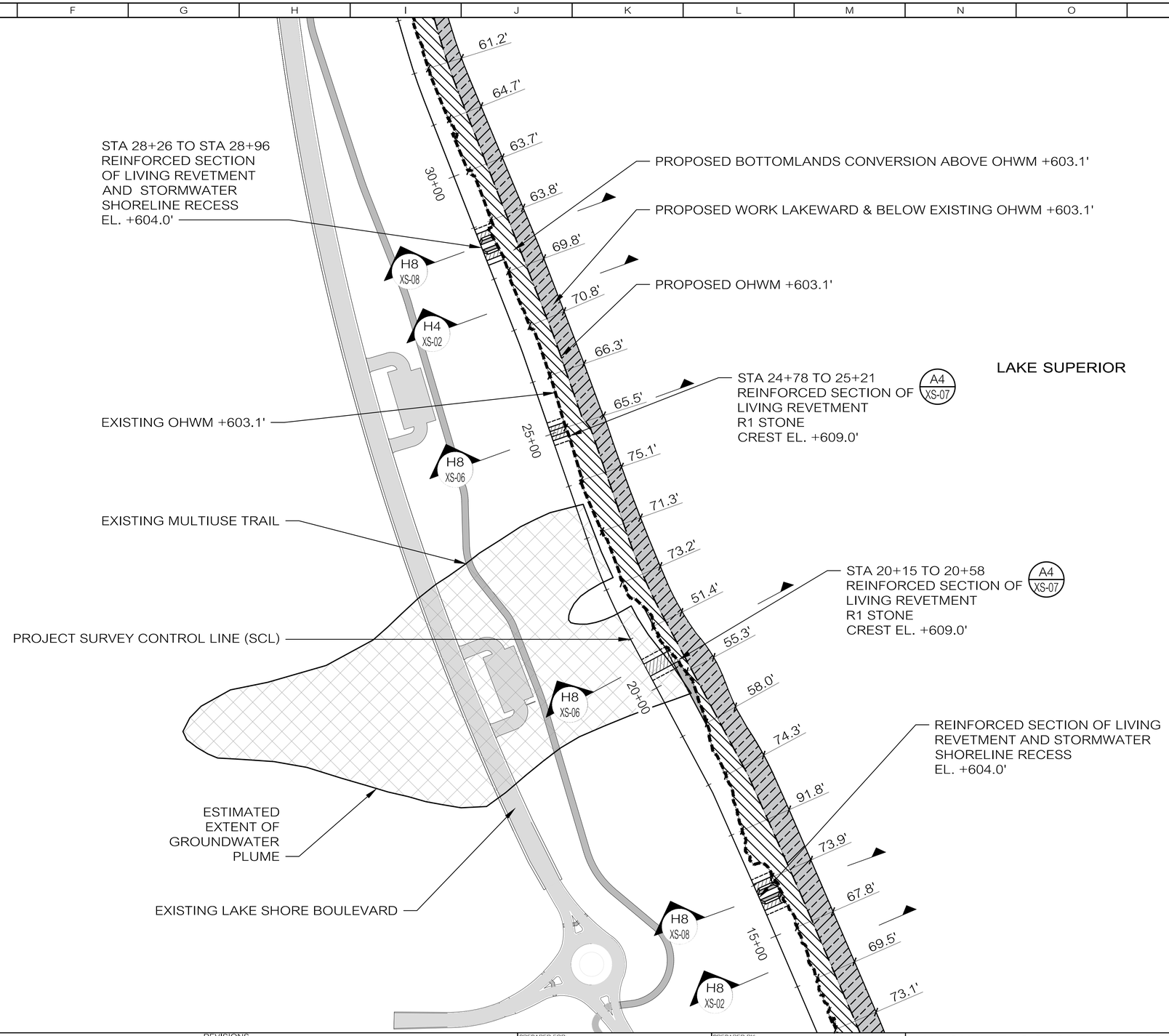
LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- GROUNDWATER PLUME
- ORDINARY HIGH WATER MARK (OHWM)

FILE NUMBER: LRE-2018-010 31-38-S23(52-Lakeshore Boulevard Revetment) City of Marquette - Lake Superior Shoreline Restoration BY: City of Marquette Lake Superior Marquette, Marquette County, Michigan SHEET 4 OF 29



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SCALE = 1:100

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PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD	
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2021-06-18								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC	–	2023-03-23								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

ORDINARY HIGH WATER MARK PROPOSED WORK FIGURE - CENTER

ISSUE NUMBER: 04
ISSUE DATE: 2023-03-23
PROJECT NUMBER: 13290.101
SHEET NUMBER: 03

KEY MAP

COORDINATE TABLE/NOTES

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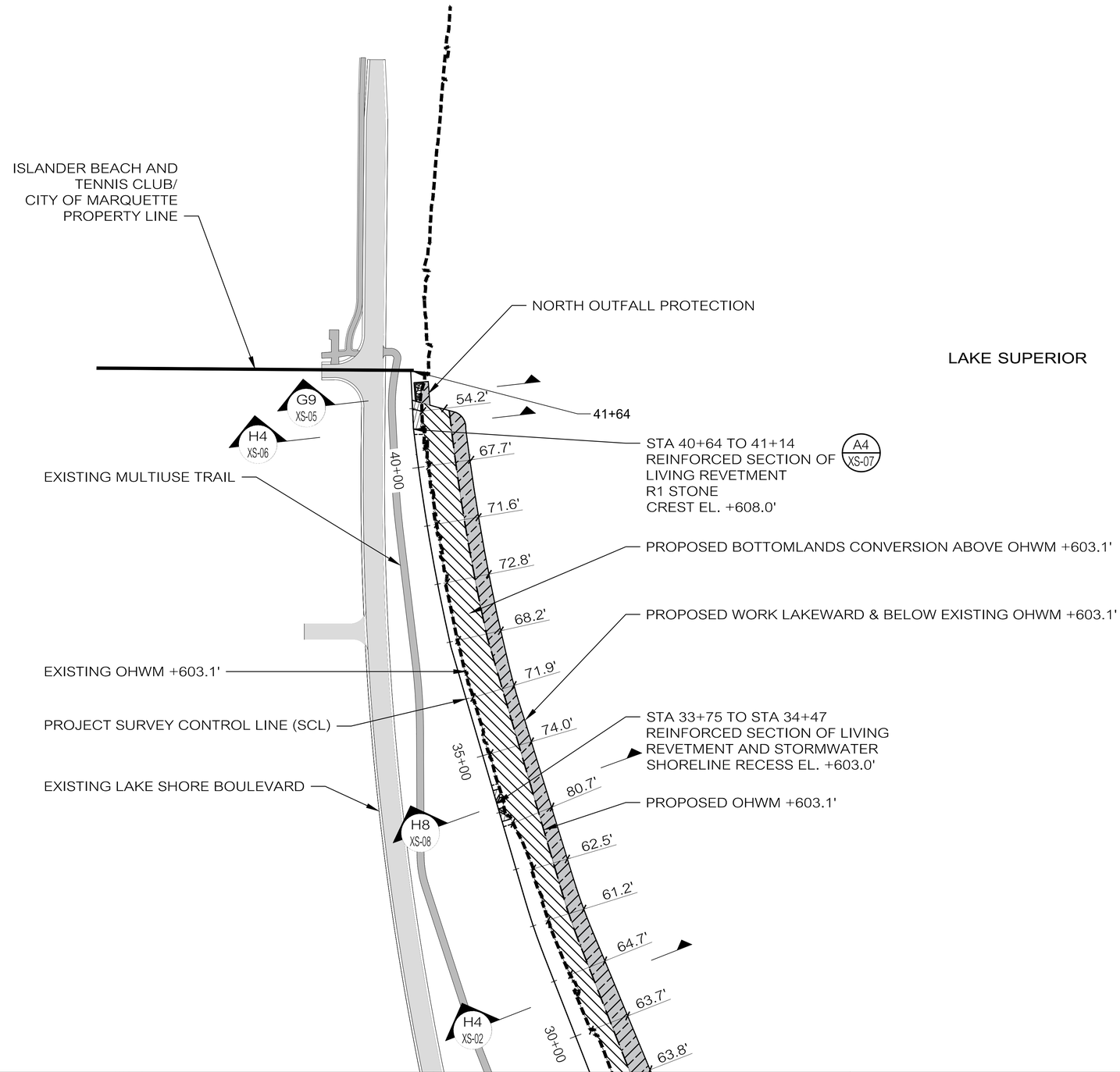
LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- ORDINARY HIGH WATER MARK (OHWM)

FILE NUMBER: LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment) City of Marquette - Lake Superior Shoreline Restoration BY: City of Marquette Lake Superior Marquette, Marquette County, Michigan SHEET 5 OF 29



0 100 200 FEET
SCALE = 1:100

N

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD	
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2021-06-18								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-03-23								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849 · SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res · Foth

MARQUETTE LS SHORELINE RESTORATION

ORDINARY HIGH WATER MARK PROPOSED WORK FIGURE - NORTH

ISSUE NUMBER: 02 | ISSUE DATE: 2023-03-23 | SHEET NUMBER: 04
PROJECT NUMBER: 13290.101

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE PLANS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

KEY MAP

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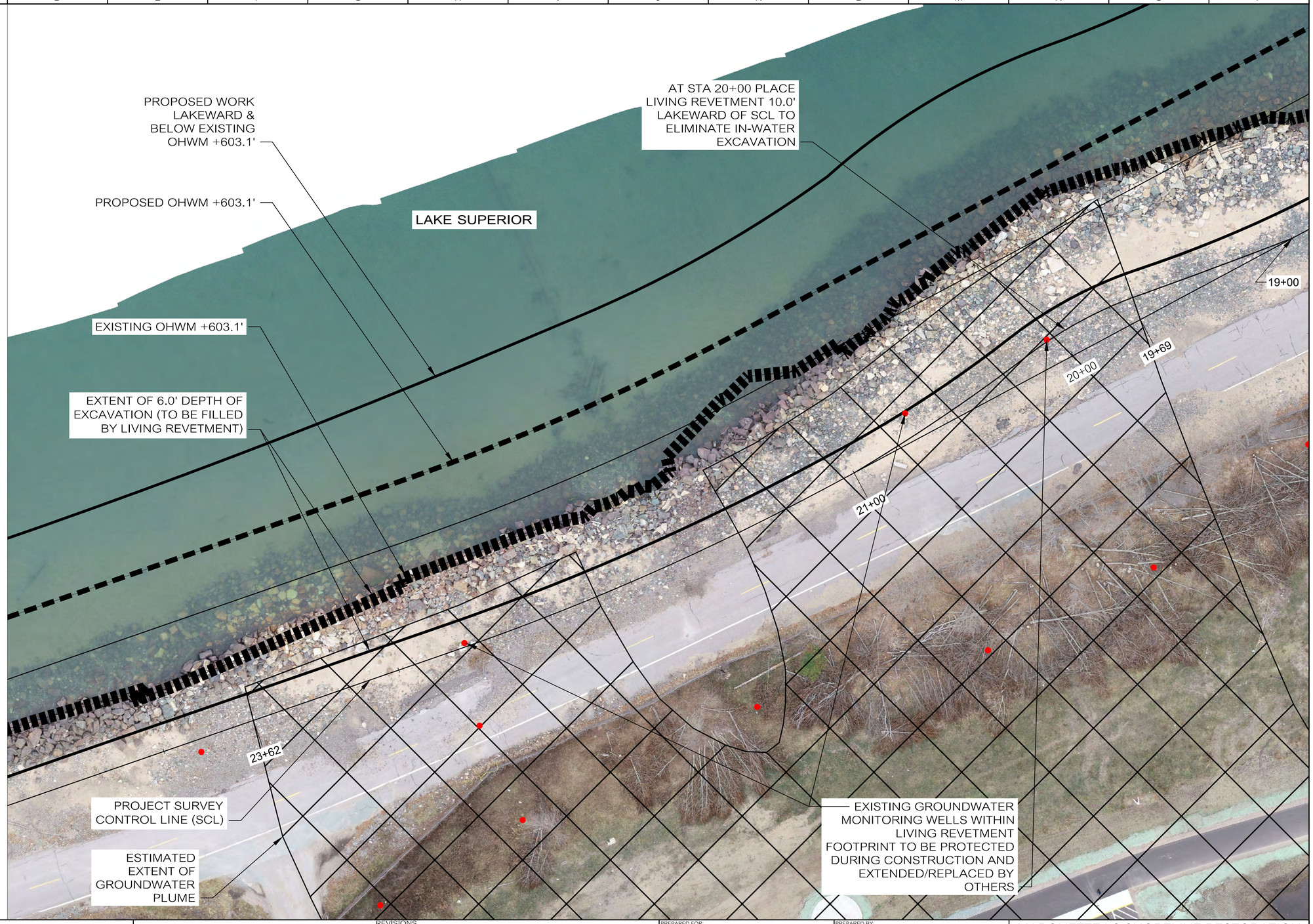
3. AERIAL IMAGE COMPILED BY ORTHOMOSAIC FROM UNMANNED AERIAL VEHICLE (UAV) SURVEY CONDUCTED BY GEI ASSOCIATES, INC., NOVEMBER 19, 2020. AERIAL IMAGE FOR REFERENCE PURPOSES ONLY.

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 6 OF 29

LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- GROUNDWATER PLUME
- ORDINARY HIGH WATER MARK (OHWM)
- EXISTING GROUNDWATER MONITORING WELL



0 20 40 FEET
SCALE = 1:100

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

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PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

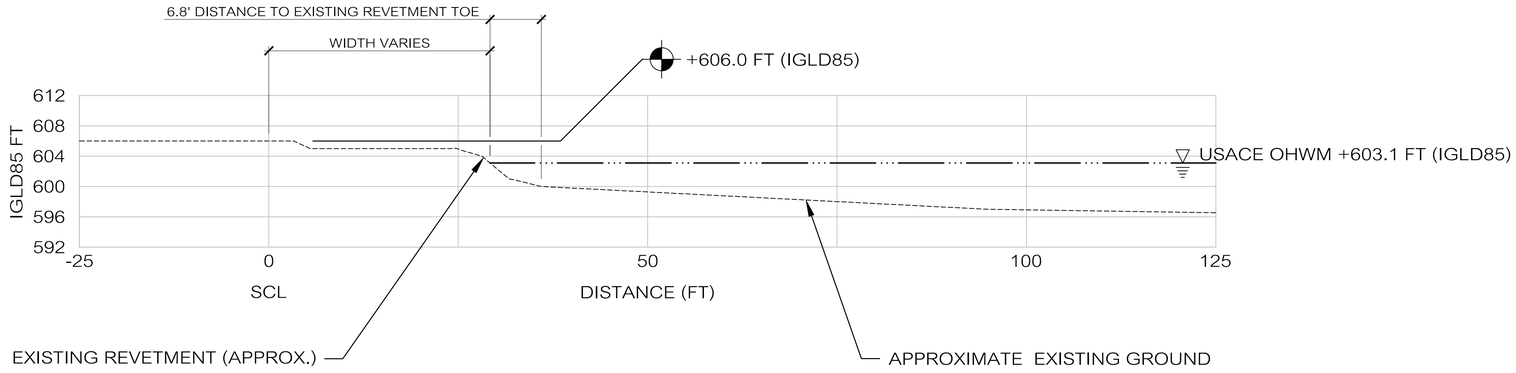
ENLARGEMENT - GROUNDWATER PLUME AREA ON AERIAL IMAGE

ISSUE NUMBER: 02
ISSUE DATE: 2023-03-23
SHEET NUMBER: 05
PROJECT NUMBER: 13290.101

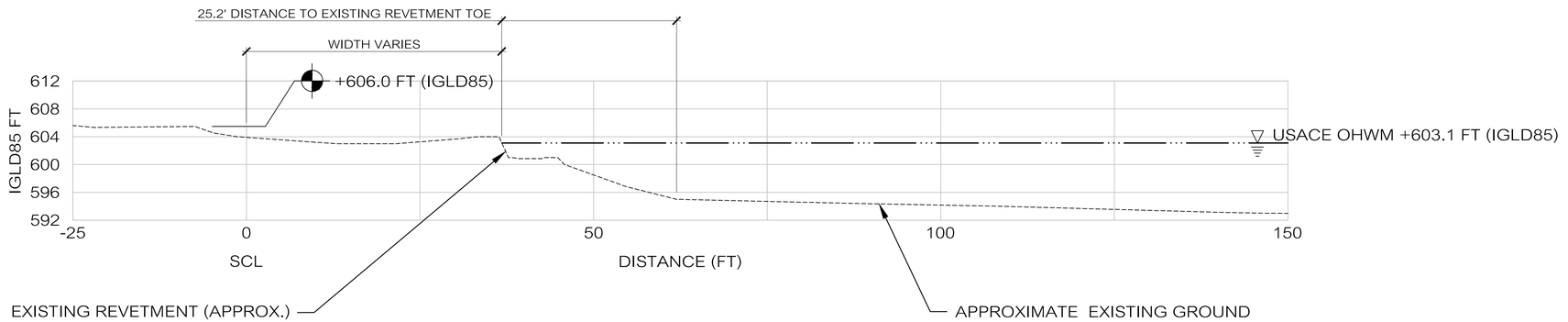
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE PLANS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

FILE NUMBER: LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 7 OF 29



H4 / XS-01 EXISTING CONDITIONS - NORTH (TYP.)



H8 / XS-01 EXISTING CONDITIONS - SOUTH (TYP.)

LEGEND

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:	(A) PRELIMINARY			(B) DESIGN			(C) PERMIT			(D) TENDER			(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD			
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10											
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10											

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

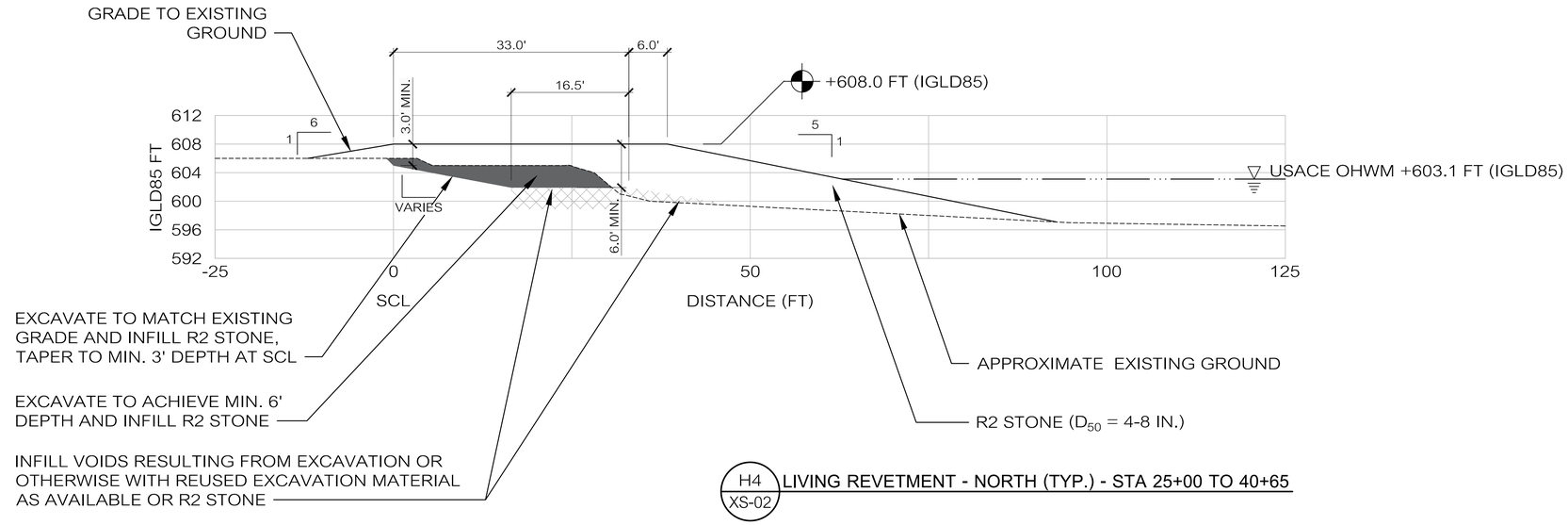
PREPARED BY: Baird.
IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION
TYPICAL SECTION - EXISTING CONDITION

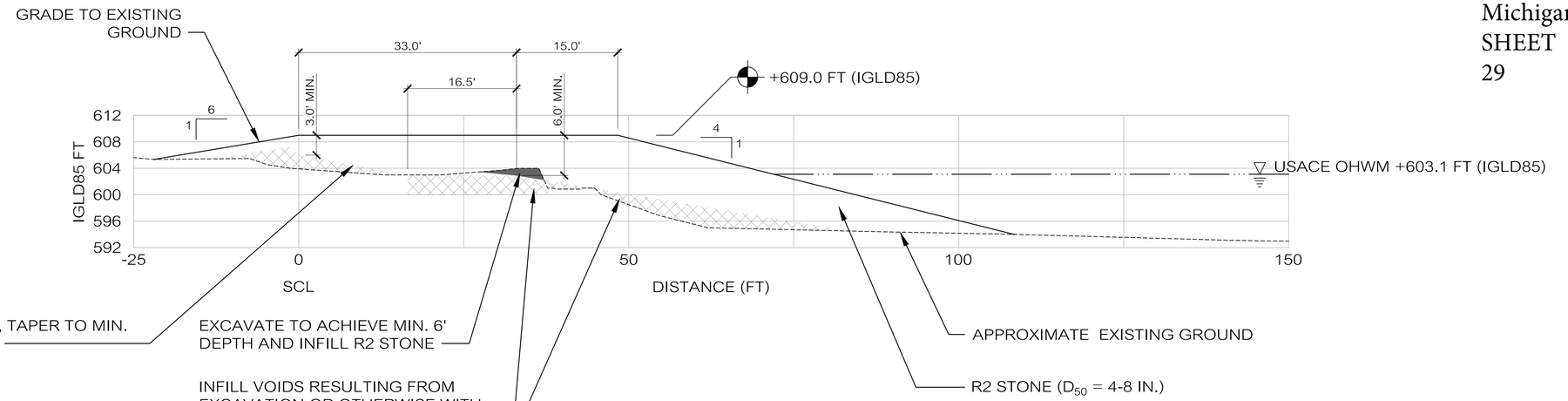
ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
SHEET NUMBER: XS-01
PROJECT NUMBER: 13290.101

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES



H4 / XS-02 LIVING REVETMENT - NORTH (TYP.) - STA 25+00 TO 40+65



H8 / XS-02 LIVING REVETMENT - SOUTH (TYP.) - STA 10+40 TO 25+00

LEGEND

INFILL VOIDS

EXCAVATION

FILE NUMBER: LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 8 OF 29

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD	
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - PROPOSED LIVING REVETMENT

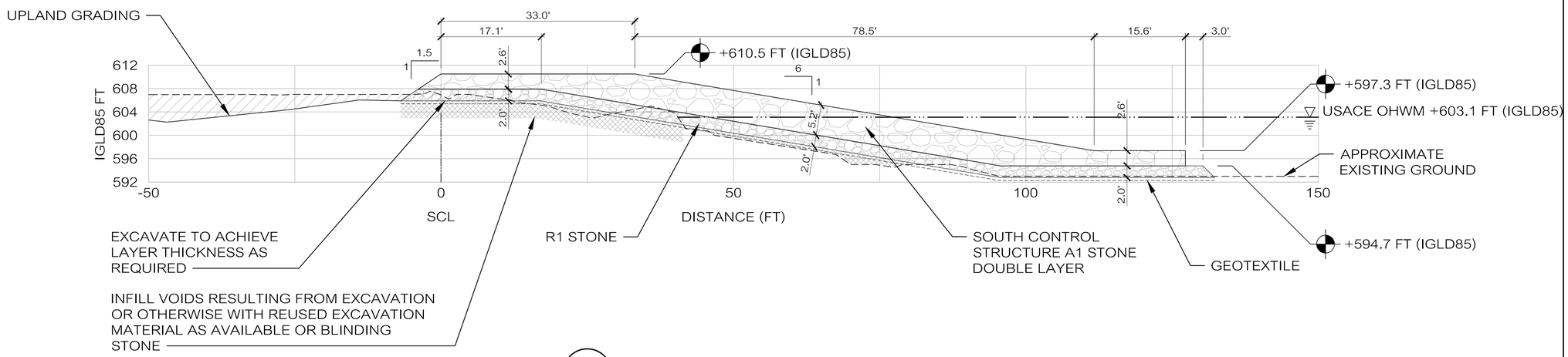
ISSUE NUMBER: 03 | ISSUE DATE: 2023-02-10 | SHEET NUMBER: XS-02

PROJECT NUMBER: 13290.101

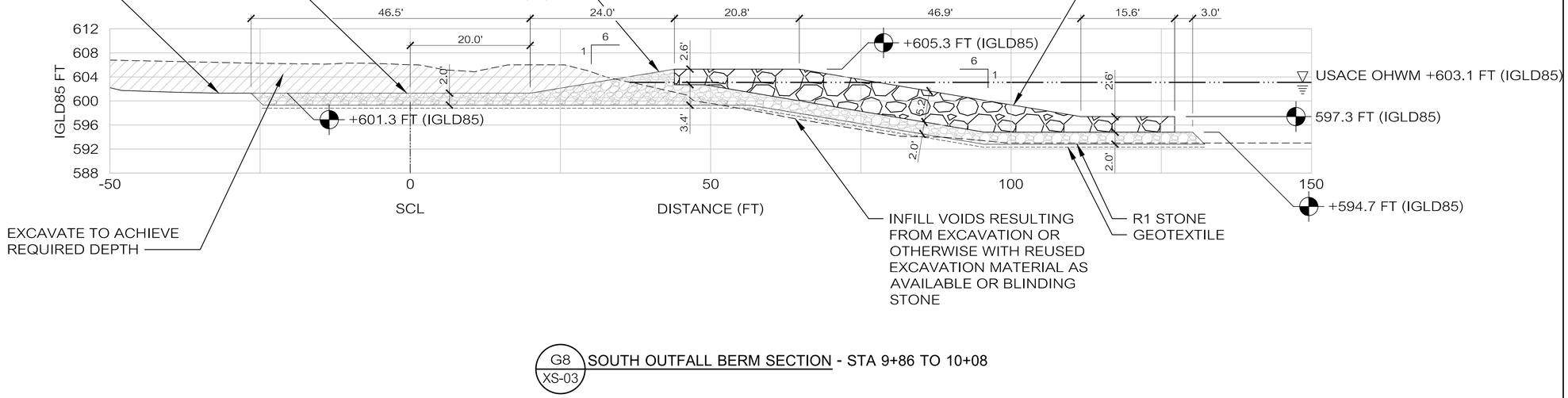
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette,
Marquette County,
Michigan
SHEET 9 OF 29



G3 / XS-03 SOUTH CONTROL STRUCTURE SECTION - STA 10+22 TO 10+38



G8 / XS-03 SOUTH OUTFALL BERM SECTION - STA 9+86 TO 10+08

LEGEND

- INFILL VOIDS
- EXCAVATION
- ARMOR STONE
- BEDDING STONE

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: City of Marquette, Michigan, Founded 1849

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

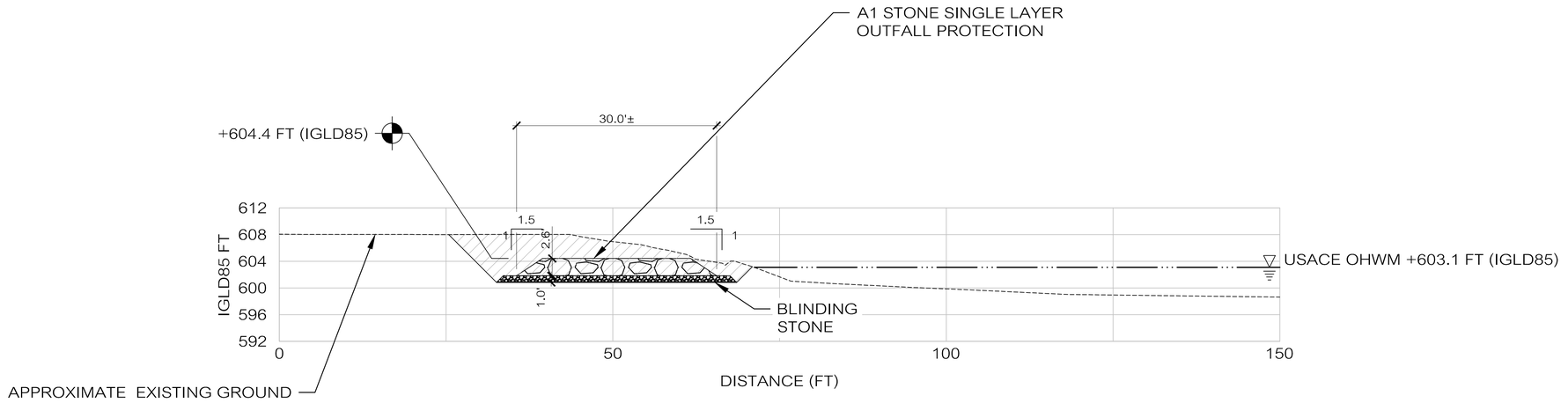
MARQUETTE LS SHORELINE RESTORATION
TYPICAL SECTION - PROPOSED SOUTH OUTFALL

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-03

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

FILE NUMBER:
LRE-2018-01031-38-S23(52-
Lakeshore Boulevard
Revetment)
City of Marquette - Lake
Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County,
Michigan
SHEET 10 OF 29



LEGEND

- EXCAVATION
- BEDDING STONE
- FILTER STONE
- ARMOR STONE

G9
XS-05
NORTH OUTFALL PROTECTION (TYP.)

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:	(A) PRELIMINARY	(B) DESIGN	(C) PERMIT	(D) TENDER	(E) CONSTRUCTION	(F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION
TYPICAL SECTION - PROPOSED NORTH OUTFALL

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-05

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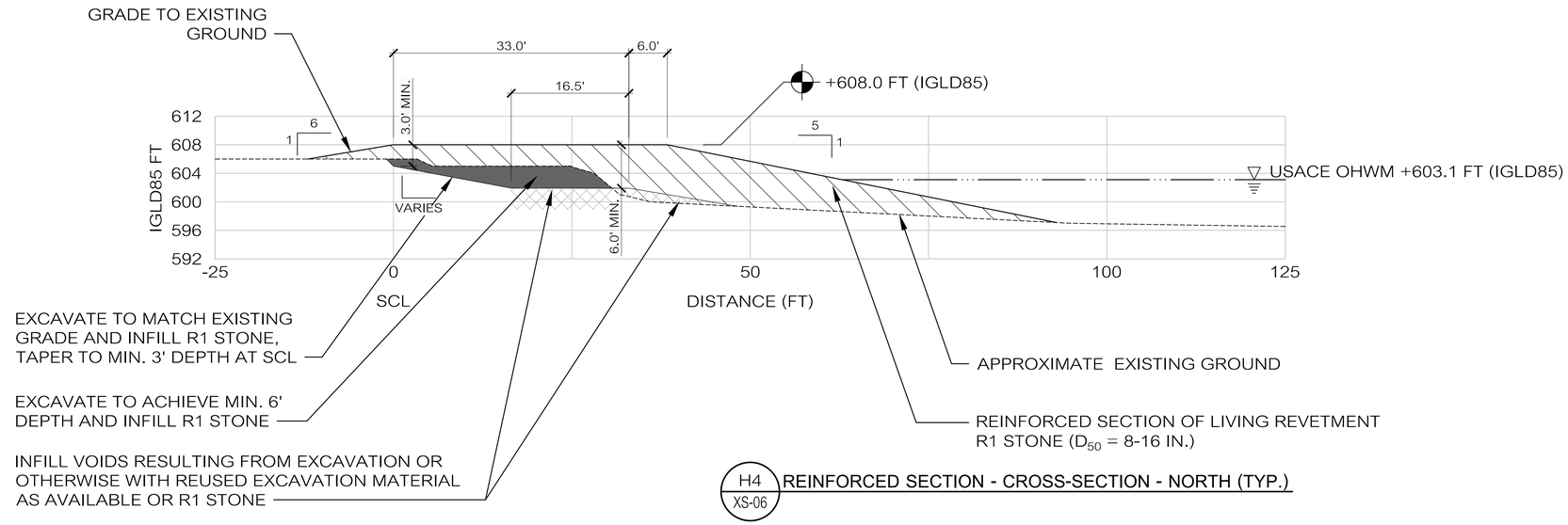
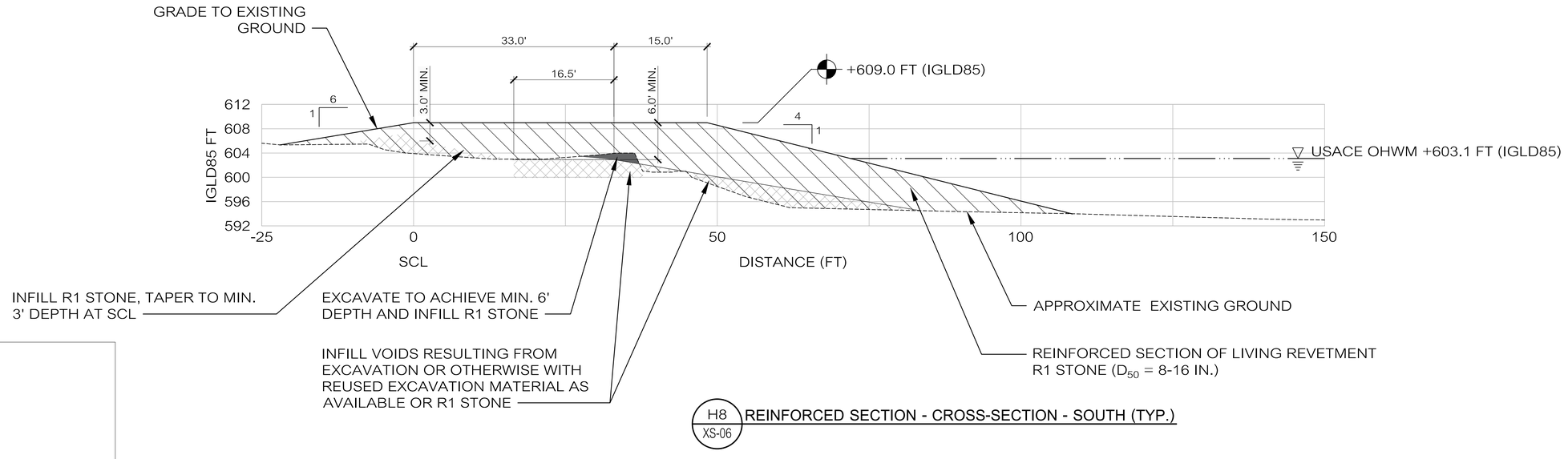
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 11 OF 29



H4 / XS-06 REINFORCED SECTION - CROSS-SECTION - NORTH (TYP.)



H8 / XS-06 REINFORCED SECTION - CROSS-SECTION - SOUTH (TYP.)

LEGEND

- INFILL VOIDS
- EXCAVATION
- REINFORCED SECTION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: City of Marquette, Michigan, Founded 1849

Superior Watershed Partnership and Land Conservancy

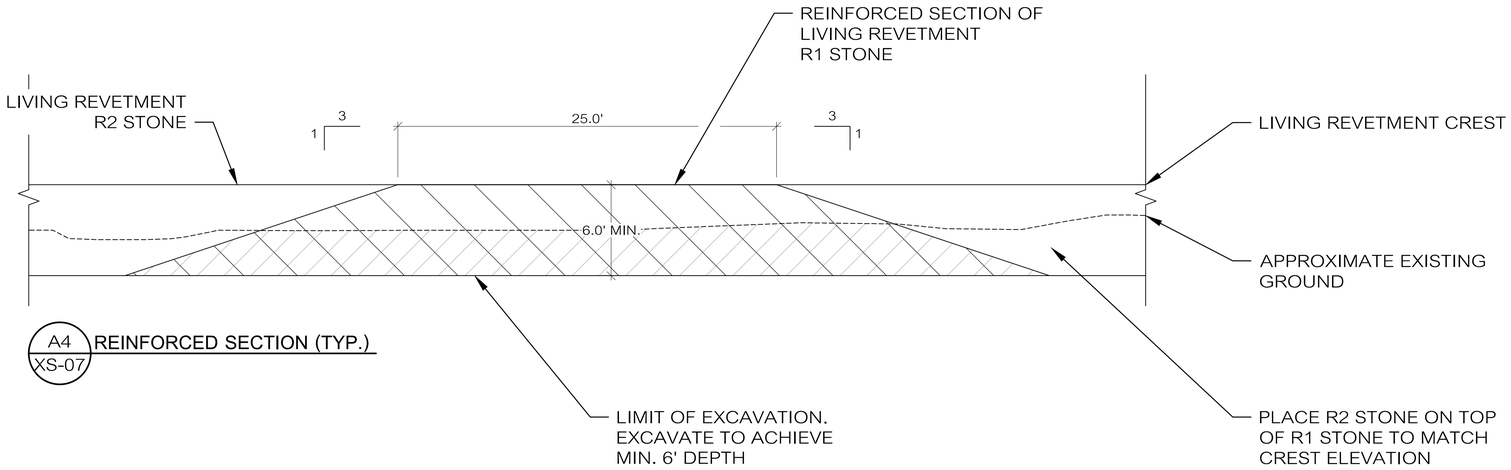
PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION
TYPICAL SECTION - REINFORCED SECTION (SHEET 1)

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-06

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES



LEGEND

EXCAVATION

REINFORCED SECTION

FILE NUMBER: LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 12 OF 29

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

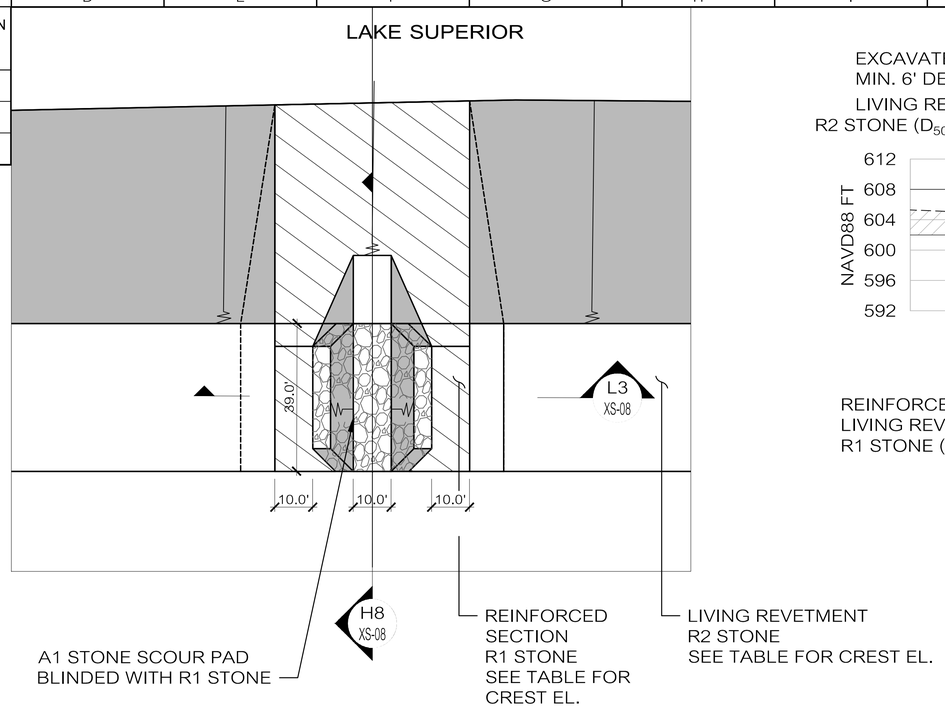
TYPICAL SECTION - REINFORCED SECTION (SHEET 2)

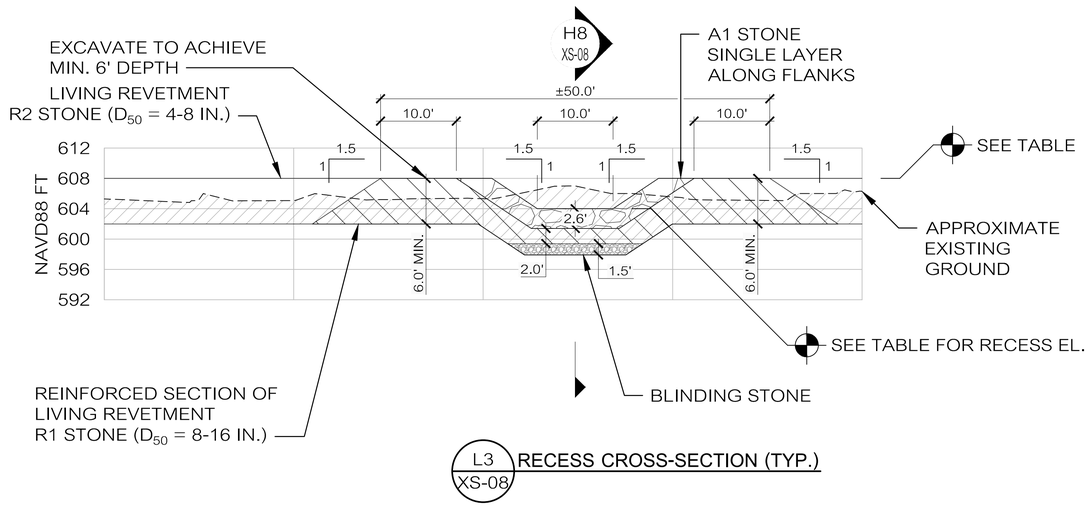
ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
SHEET NUMBER: XS-07
PROJECT NUMBER: 13290.101

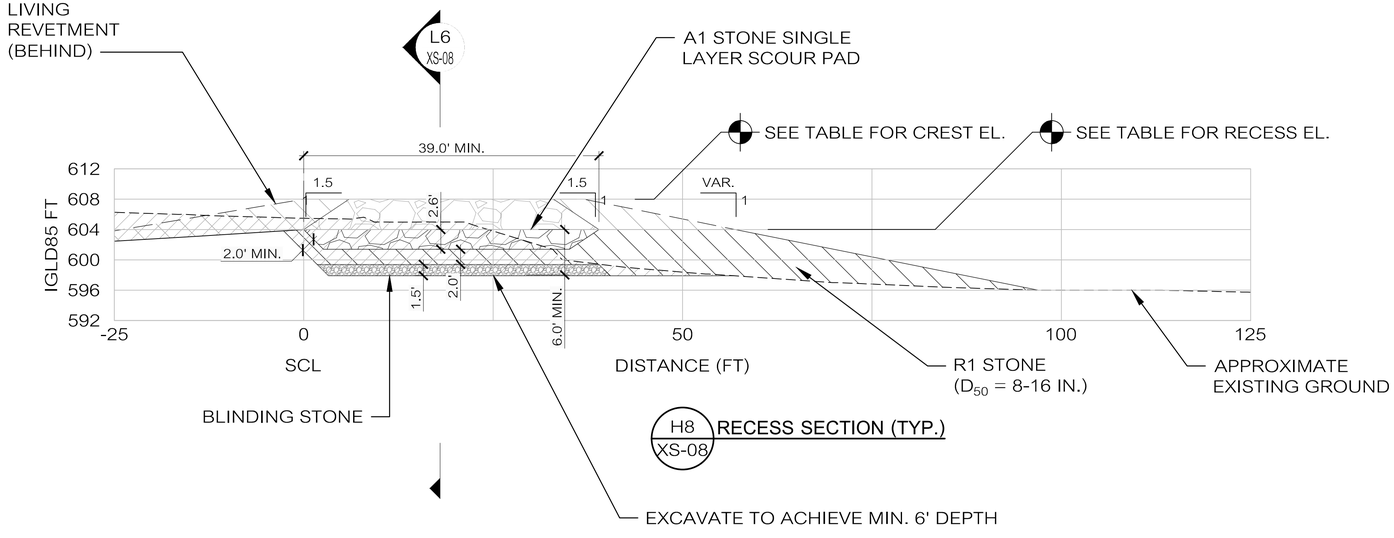
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

LOCATION (STATION)	CREST ELEVATION (ft, IGLD85)	RECESS ELEVATION (ft, IGLD85)
15+41 to 16+10	+609.0	+604.0
28+26 to 28+96	+608.0	+604.0
33+75 to 34+47	+608.0	+603.0







LEGEND

- EXCAVATION
- BEDDING STONE
- FILTER STONE
- ARMOR STONE

FILE NUMBER:
LRE-2018-01031-38
-S23(52-Lakeshore
Boulevard
Revetment)
City of Marquette -
Lake Superior
Shoreline
Restoration
BY: City of
Marquette
Lake Superior
Marquette,
Marquette County,
Michigan
SHEET 13 OF 29

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND ORDINANCE

PREPARED BY: Baird.

IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

TYPICAL SECTION - STORMWATER SHORELINE RECESS

ISSUE NUMBER: 03 | ISSUE DATE: 2023-02-10 | SHEET NUMBER: XS-08

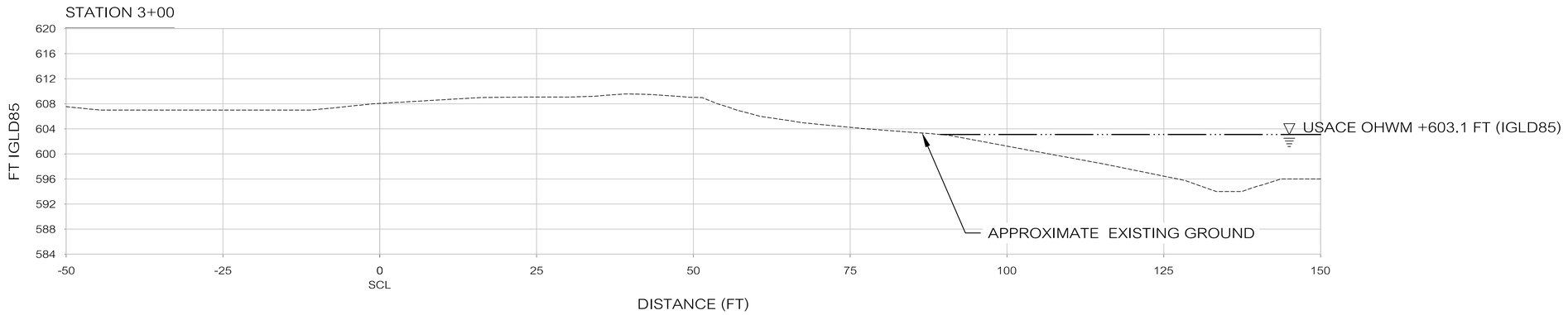
PROJECT NUMBER: 13290.101

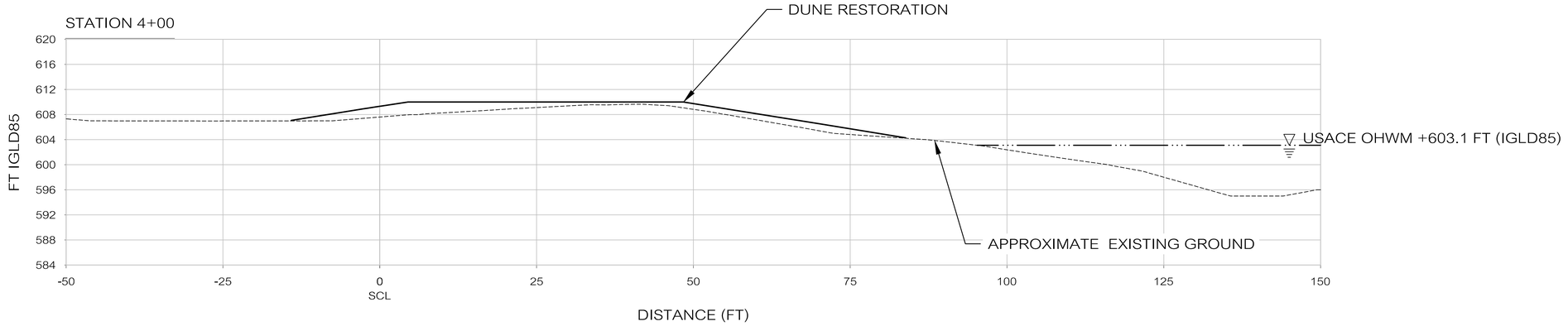
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

NOTE 1:
NO WORK LAKEWARD OF OHWM THIS SHEET

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 14 OF 29





LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION				(F) RECORD	
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

ORDINARY HIGH WATER LEVEL DISTURBANCE FIGURE

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-09

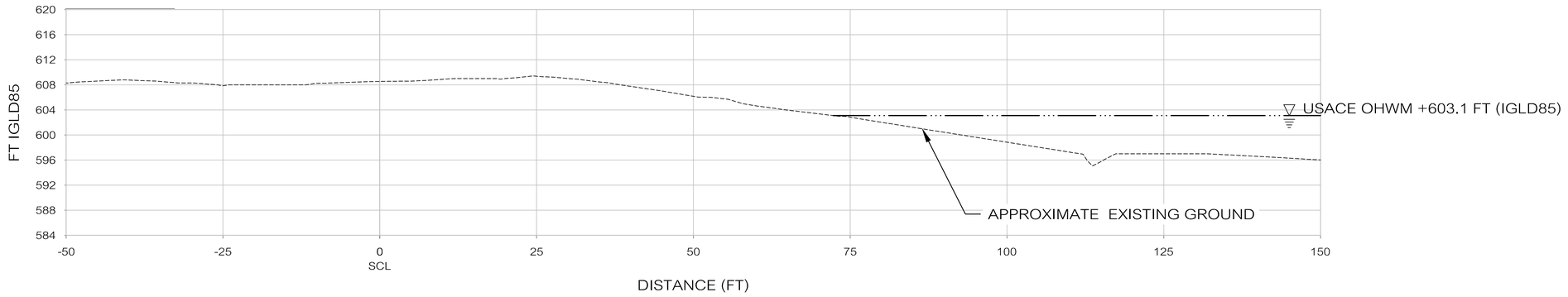
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

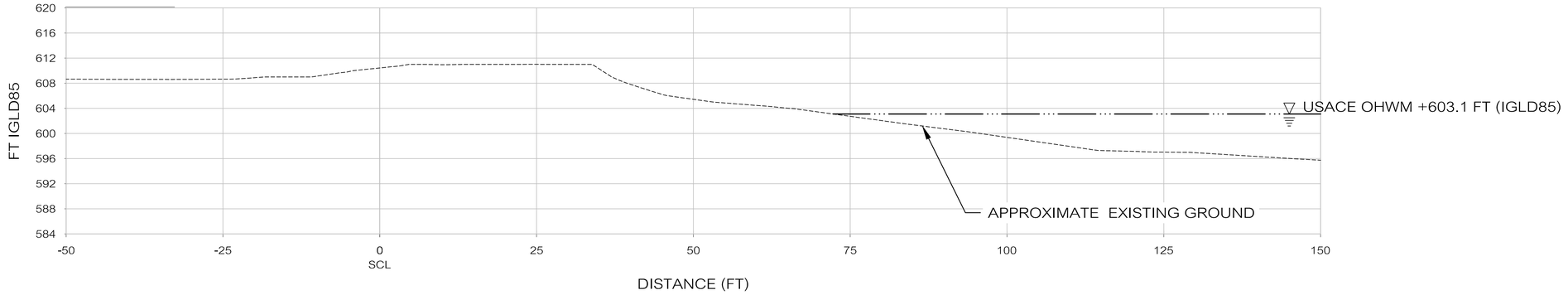
NOTE 1:
NO WORK LAKEWARD OF OHWM THIS SHEET

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
15 OF 29

STATION 0+00



STATION 1+00



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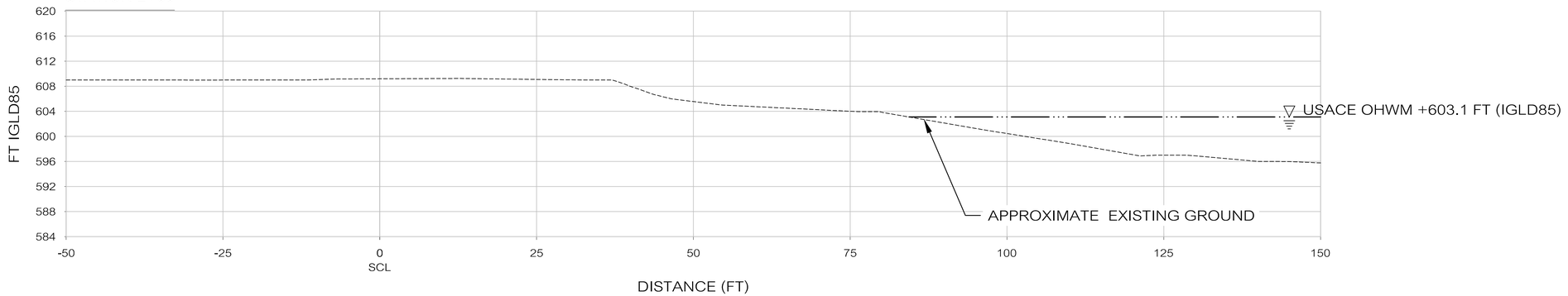


LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = ####

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 0+00 TO 2+00

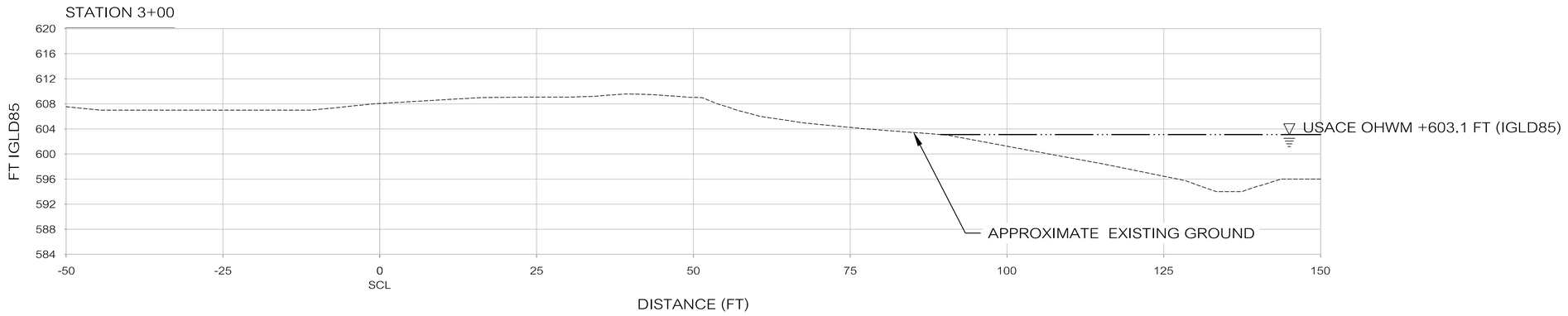
ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-10

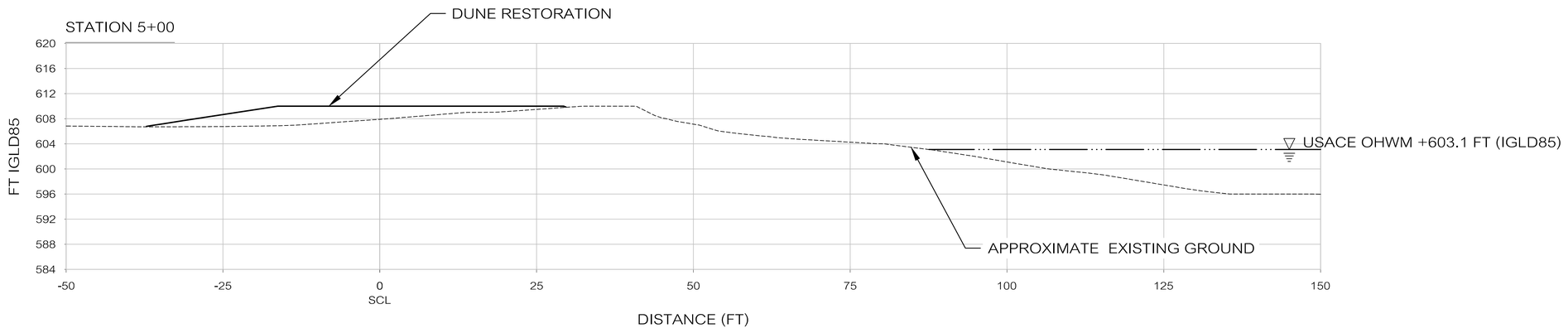
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

NOTE 1:
NO WORK LAKEWARD OF OHWM THIS SHEET

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 16 OF 29





LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = ####

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT			(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION
PROPOSED CROSS-SECTIONS STA 3+00 TO 5+00

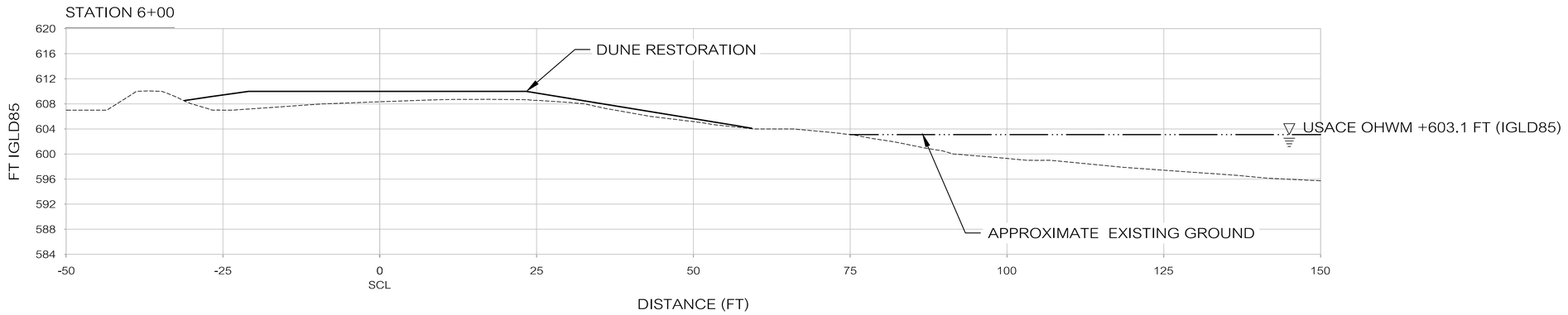
ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-11

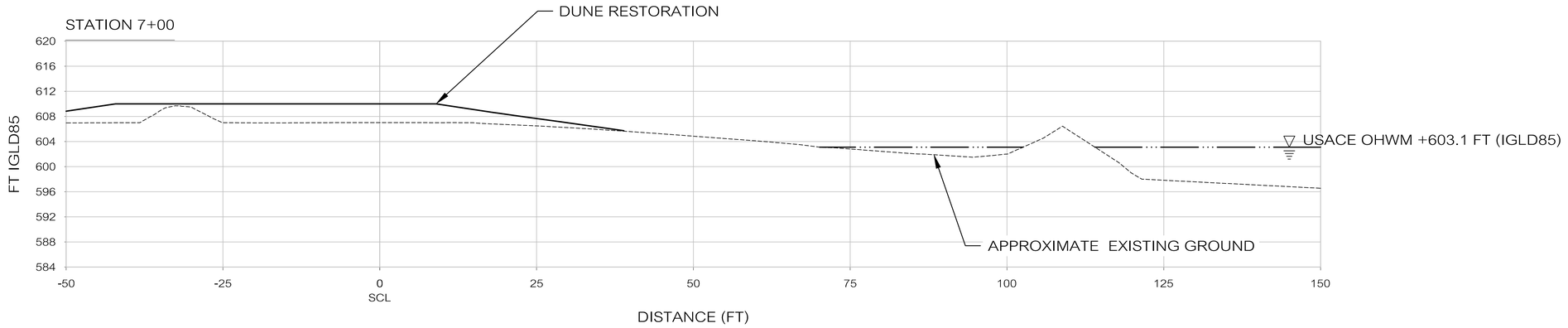
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

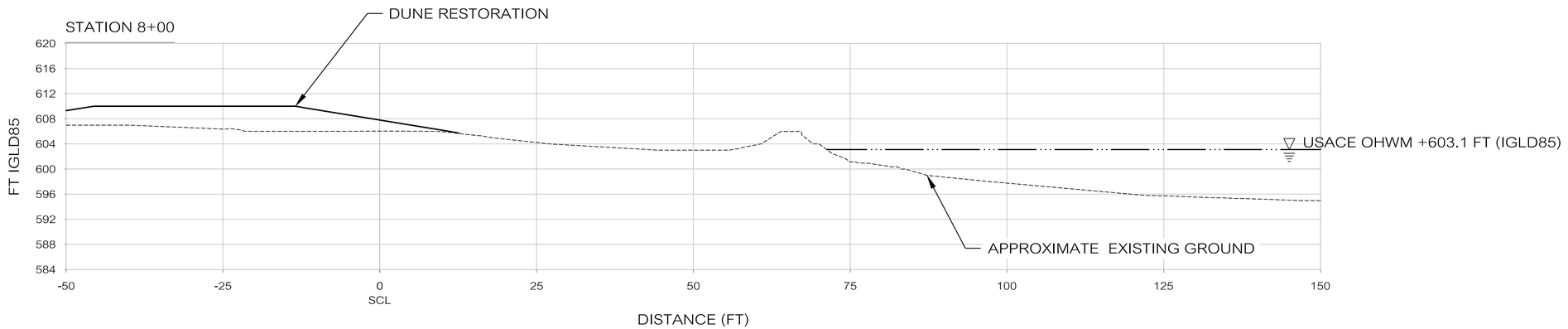
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

NOTE 1:
NO WORK LAKEWARD OF OHWM THIS SHEET

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 17 OF 29







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 6+00 TO 8+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
SHEET NUMBER: XS-12
PROJECT NUMBER: 13290.101

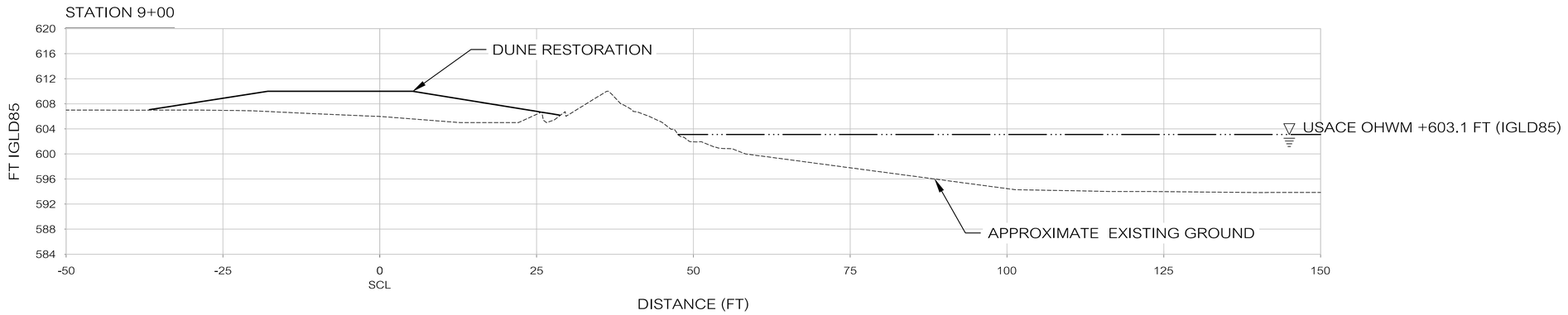
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

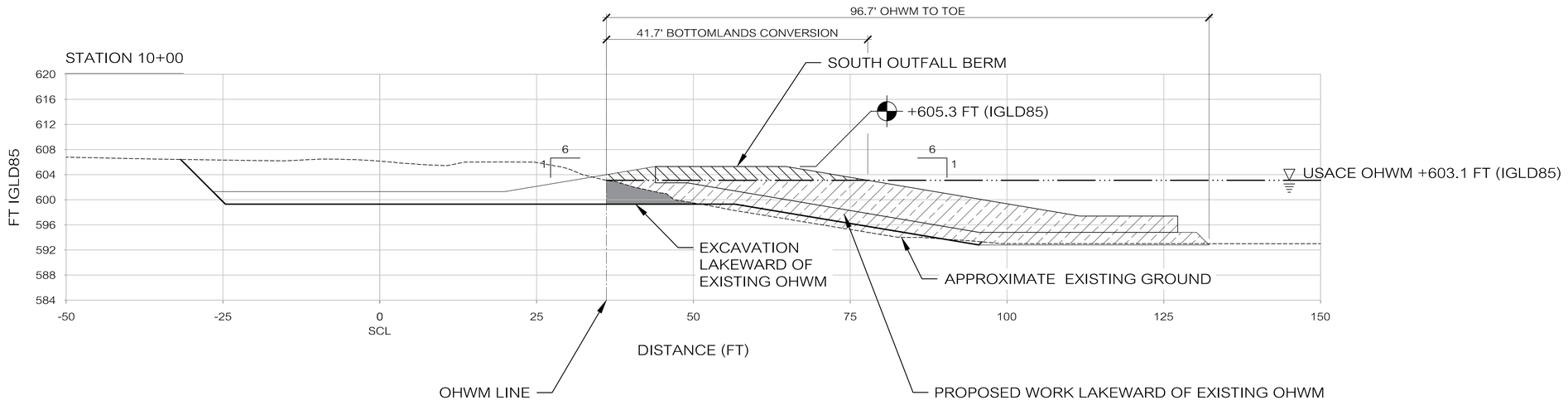
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

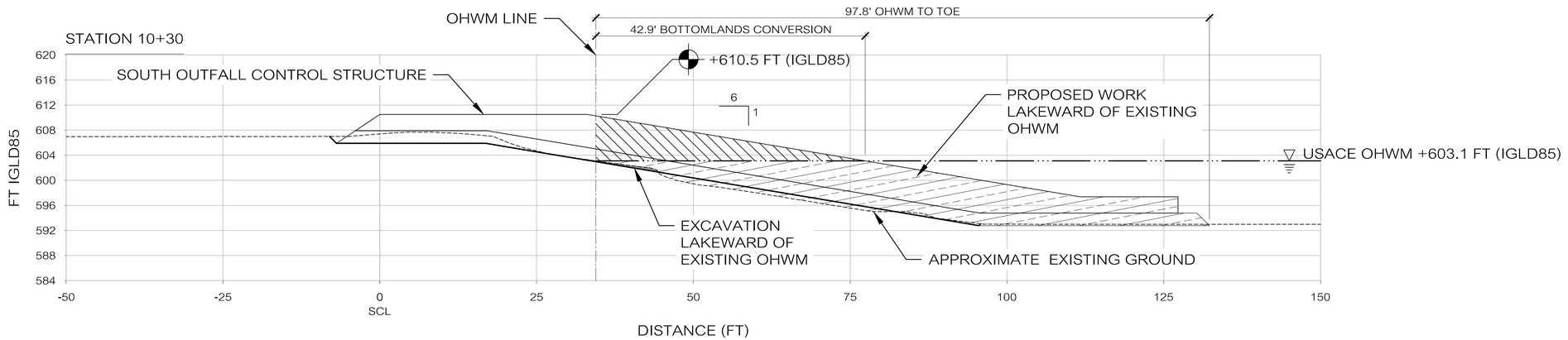
QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 9+00	0	0	0
STA 10+00	700	100	70
STA 10+30	1200	100	30

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 18 OF 29







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD	
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 9+00 TO 10+30

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-13

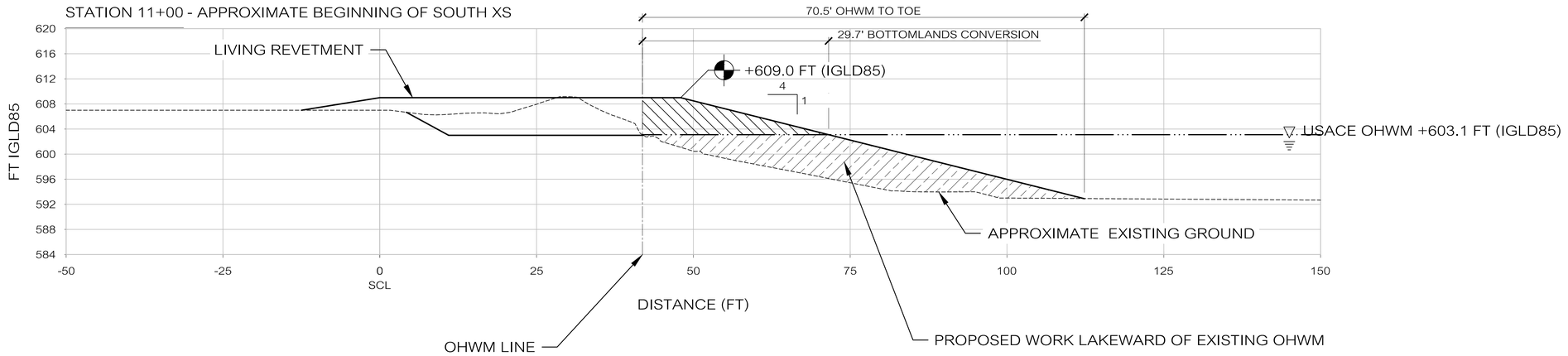
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

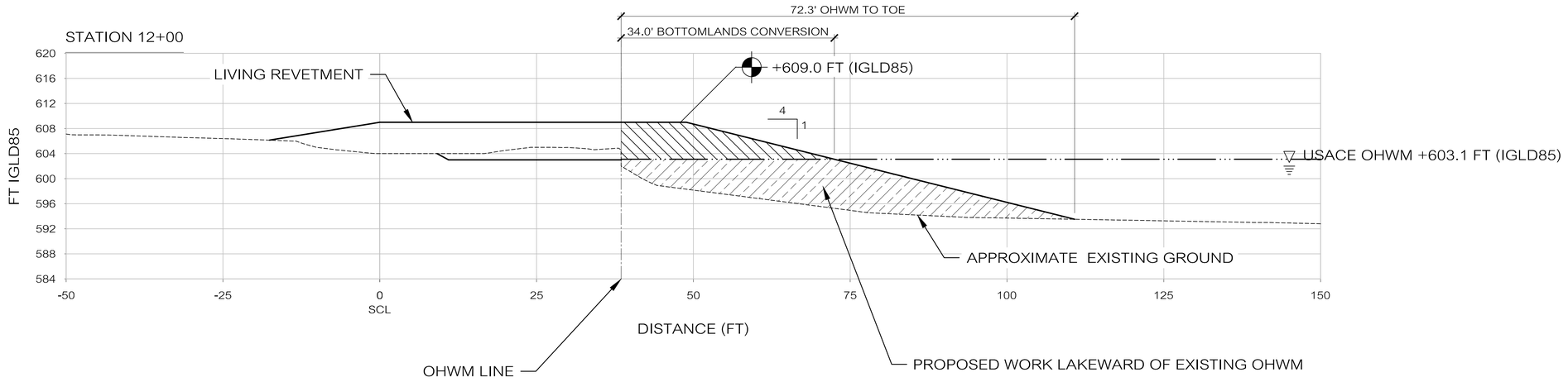
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

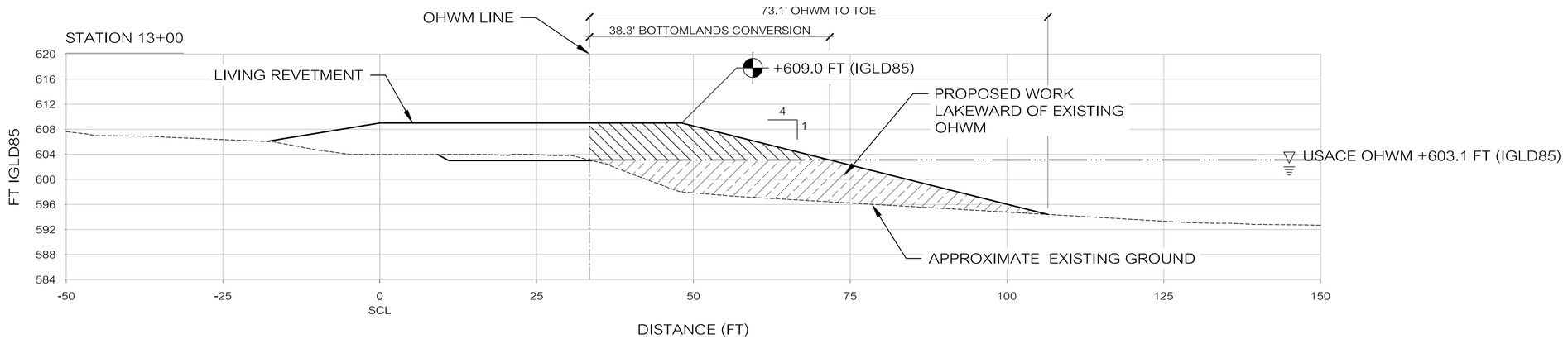
QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 11+00	1200	100	0
STA 12+00	1200	500	0
STA 13+00	1200	500	0

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 19 OF 29







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 11+00 TO 13+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-14

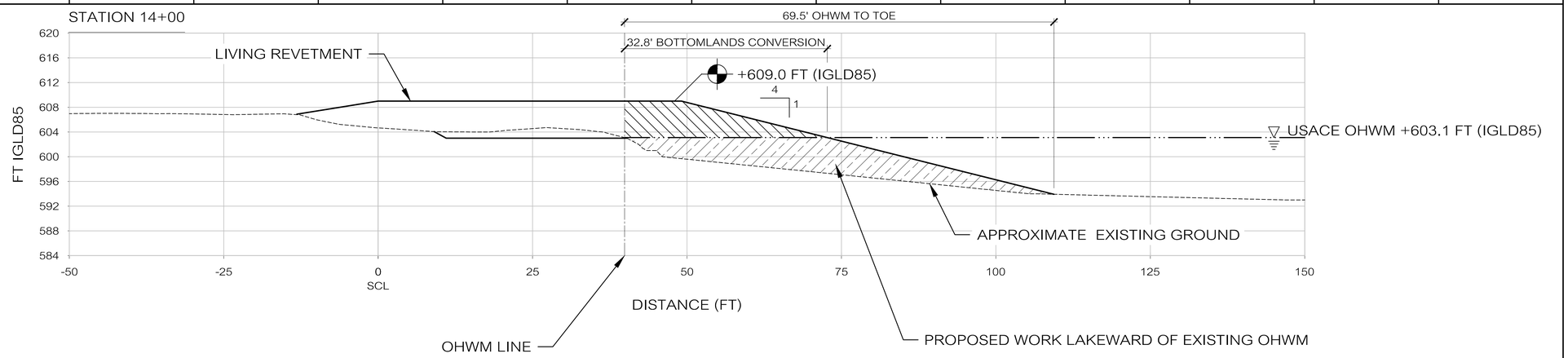
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

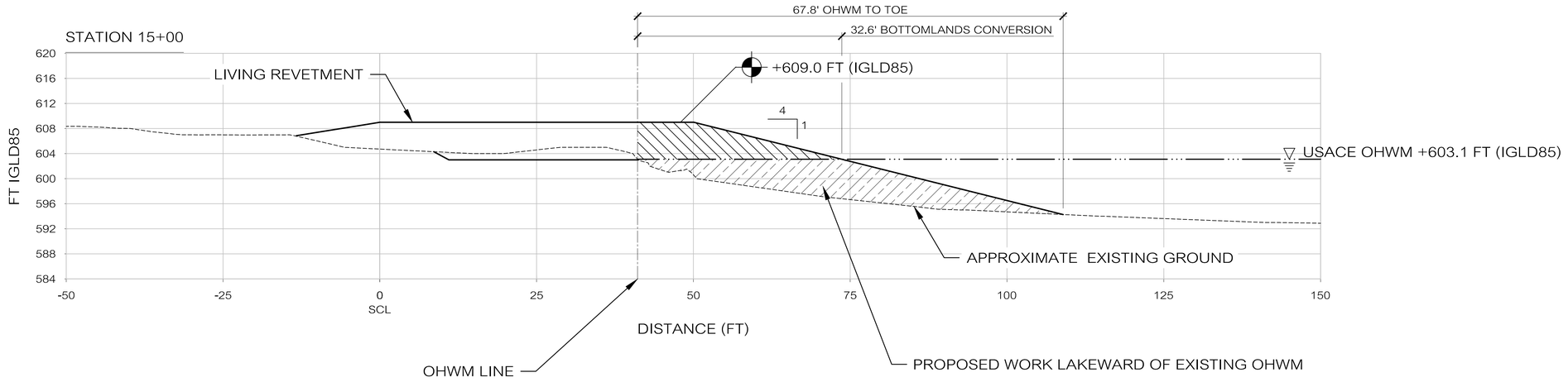
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

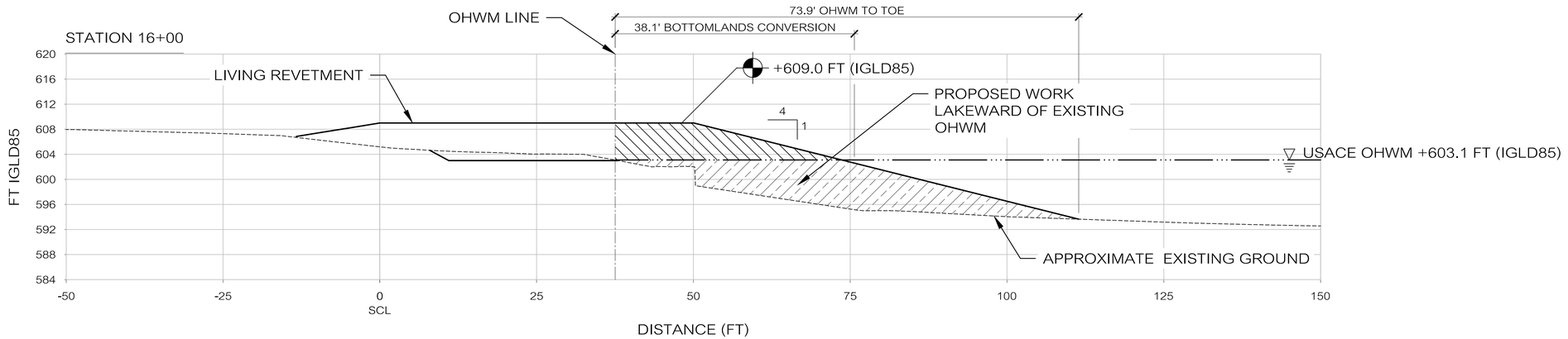
QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 14+00	1000	500	0
STA 15+00	900	500	0
STA 16+00	1000	500	0

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 20 OF 29







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 14+00 TO 16+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-15

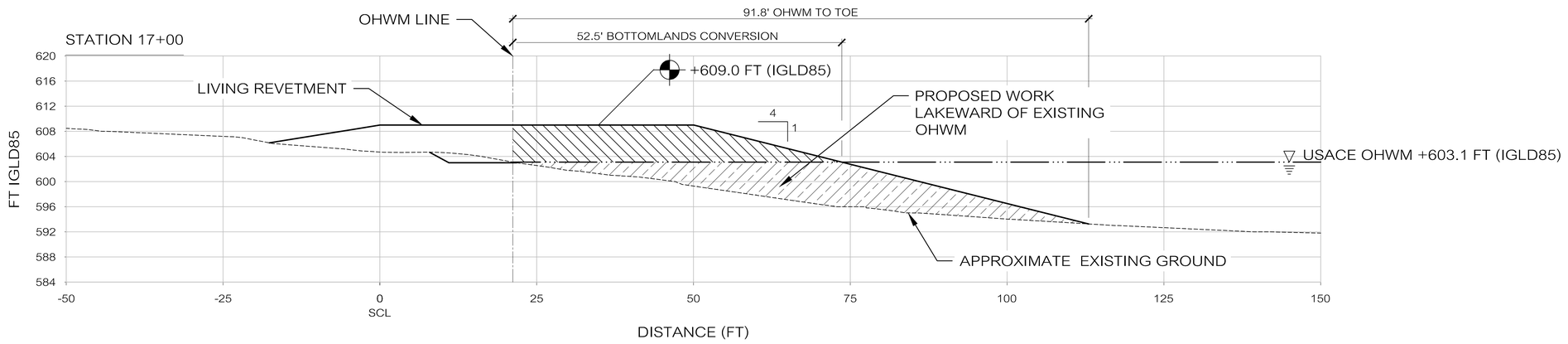
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

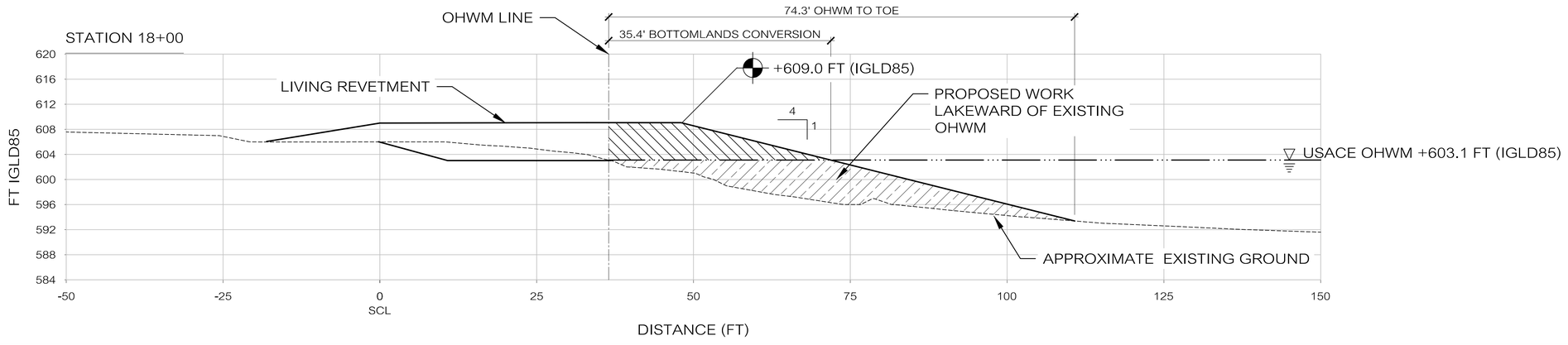
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 17+00	1200	700	0
STA 18+00	1100	700	0

FILE NUMBER: LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment) City of Marquette - Lake Superior Shoreline Restoration BY: City of Marquette Lake Superior Marquette, Marquette County, Michigan
SHEET 21 OF 29





LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION
PROPOSED CROSS-SECTIONS STA 16+75 TO 18+00

ISSUE NUMBER: 03 | ISSUE DATE: 2023-02-10 | SHEET NUMBER: XS-16
PROJECT NUMBER: 13290.101

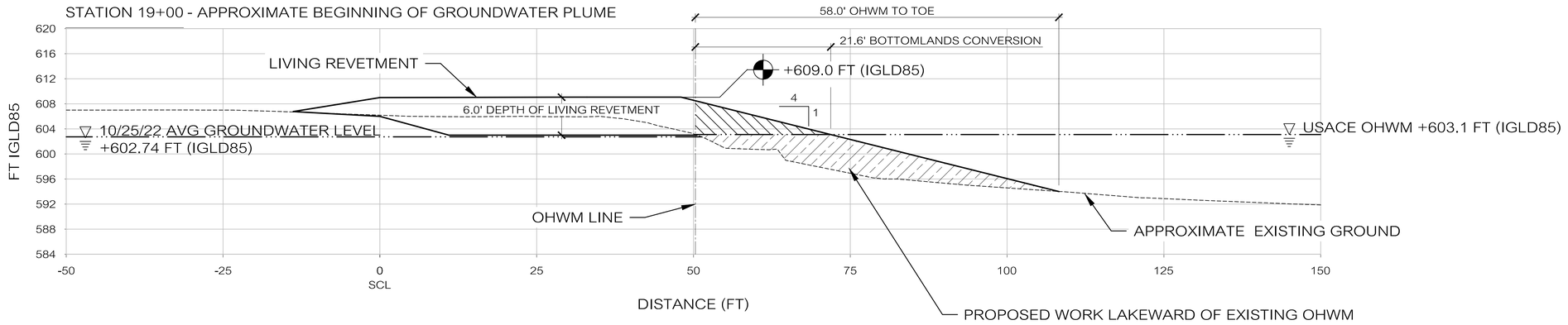
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

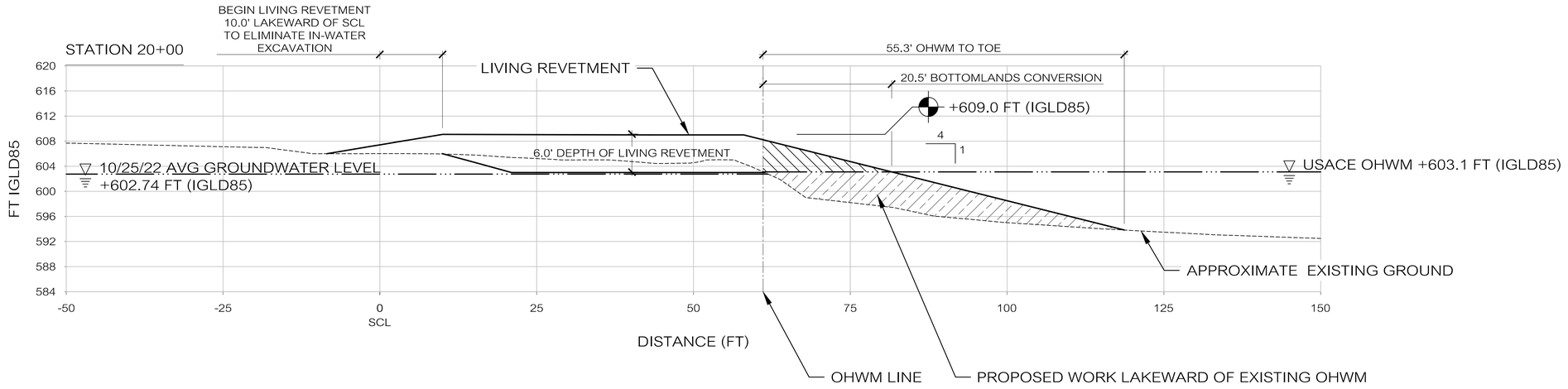
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

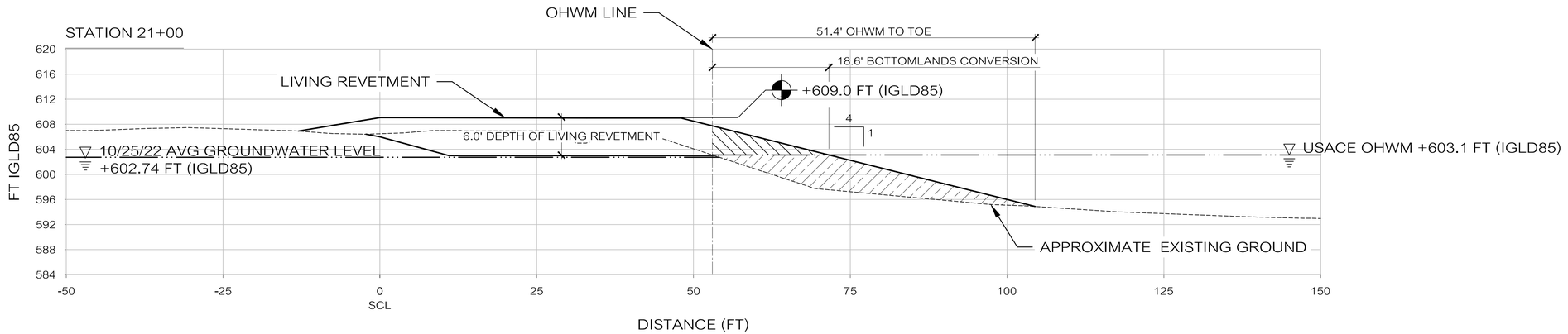
QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 19+00	800	400	0
STA 20+00	700	200	0
STA 21+00	700	200	0

FILE NUMBER:
LRE-2018-01031-3
8-S23(52-
Lakeshore
Boulevard
Revetment)
City of Marquette -
Lake Superior
Shoreline
Restoration
BY: City of
Marquette
Lake Superior
Marquette,
Marquette County,
Michigan
SHEET 22 OF 29







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 19+00 TO 21+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-17

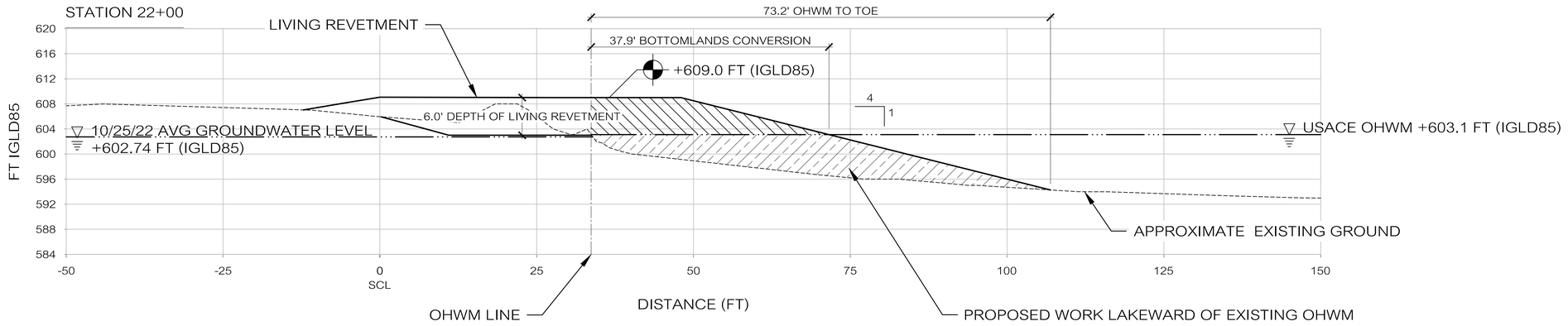
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

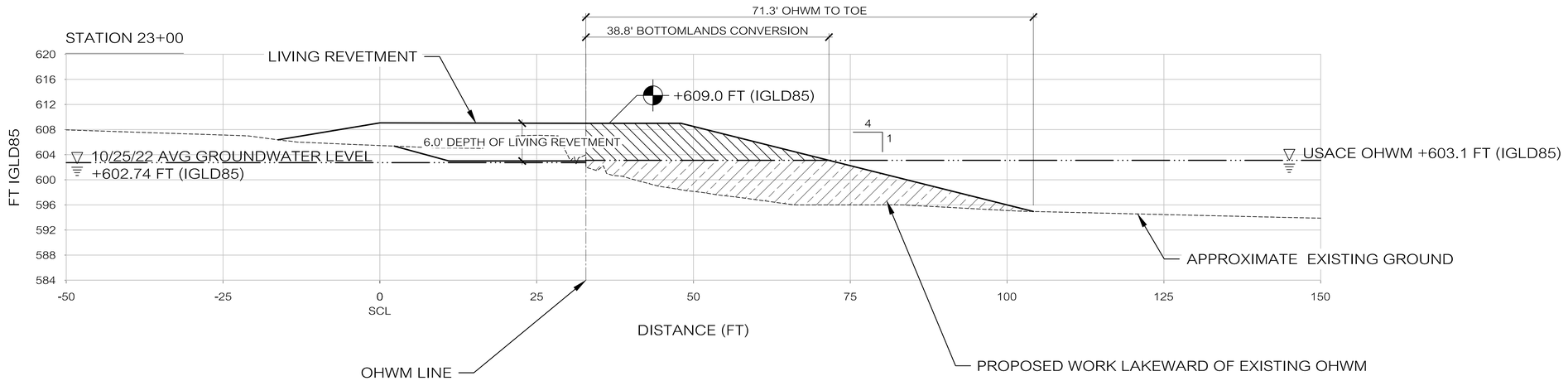
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

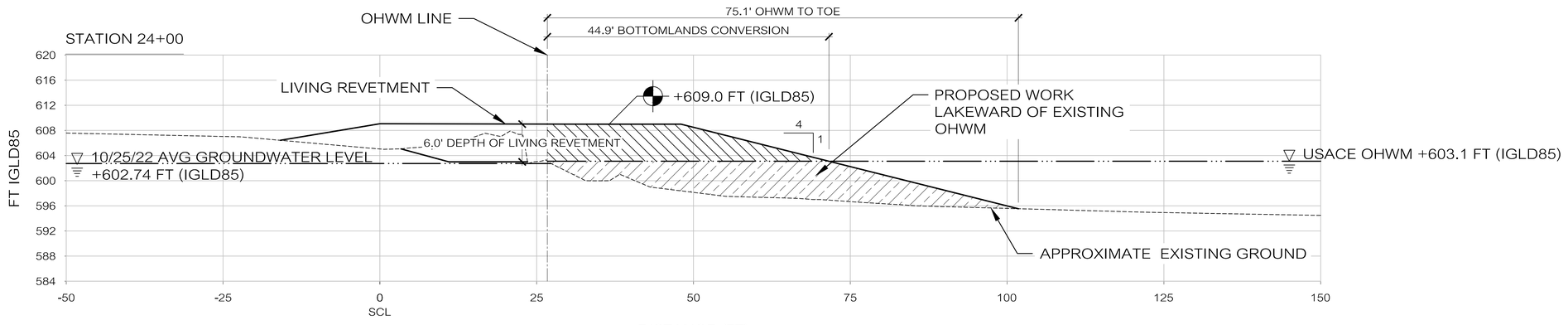
QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 22+00	800	400	0
STA 23+00	1100	600	0
STA 24+00	1100	700	0

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 23 OF 29







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:	(A) PRELIMINARY	(B) DESIGN	(C) PERMIT	(D) TENDER	(E) CONSTRUCTION	(F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD

PREPARED FOR: City of Marquette, Michigan – Founded 1849

Superior Watershed Partnership and Land Conservancy

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 22+00 TO 24+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-18

P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

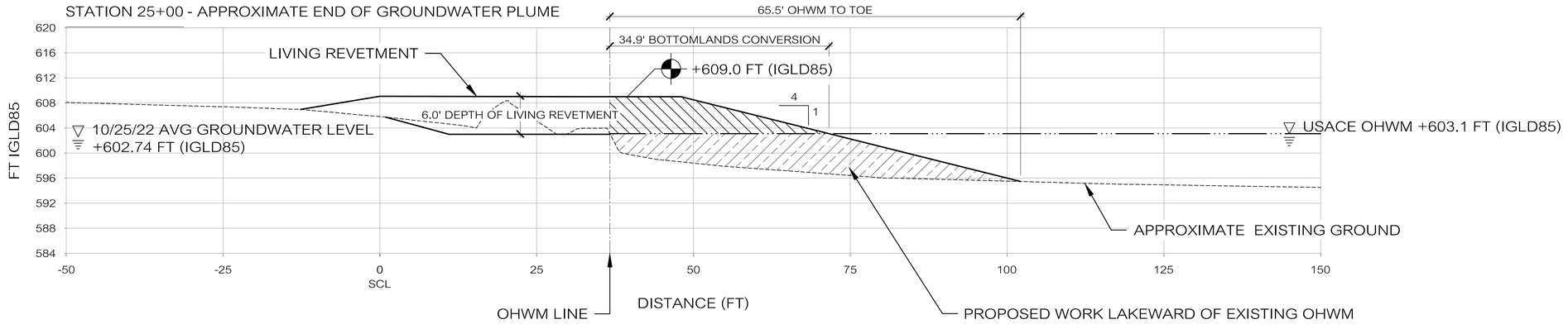
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

QUANTITIES (THIS SHEET)

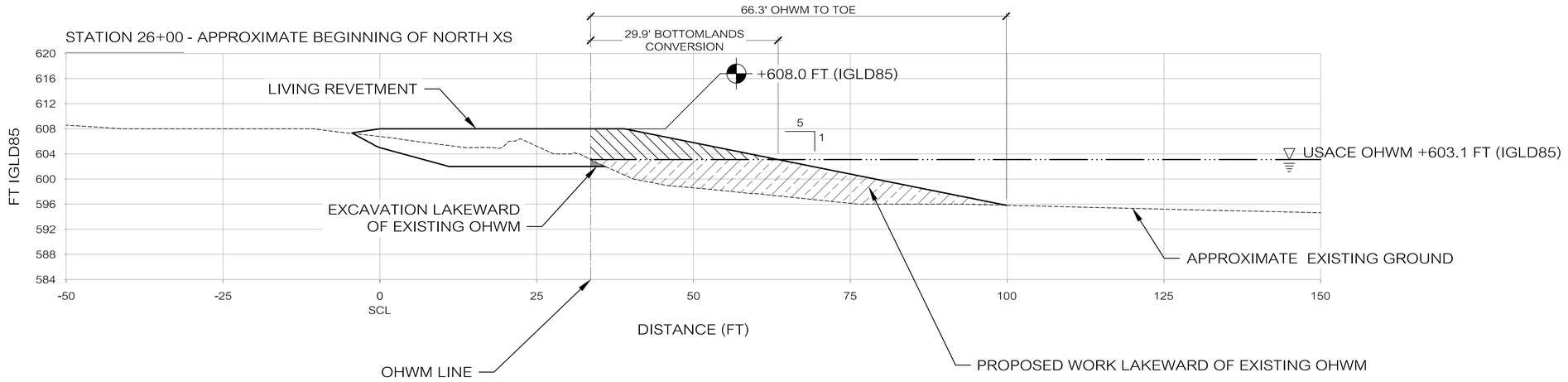
SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 25+00	1000	600	0
STA 26+00	900	500	10
STA 27+00	900	400	10

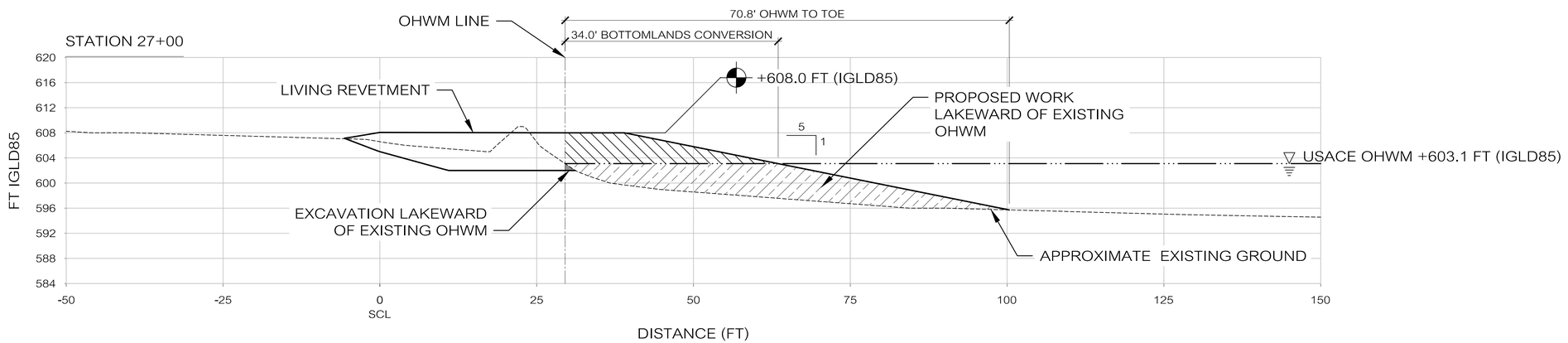
FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 24 OF 29

STATION 25+00 - APPROXIMATE END OF GROUNDWATER PLUME



STATION 26+00 - APPROXIMATE BEGINNING OF NORTH XS





LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10

PREPARED FOR: City of Marquette, Michigan

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 25+00 TO 27+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-19

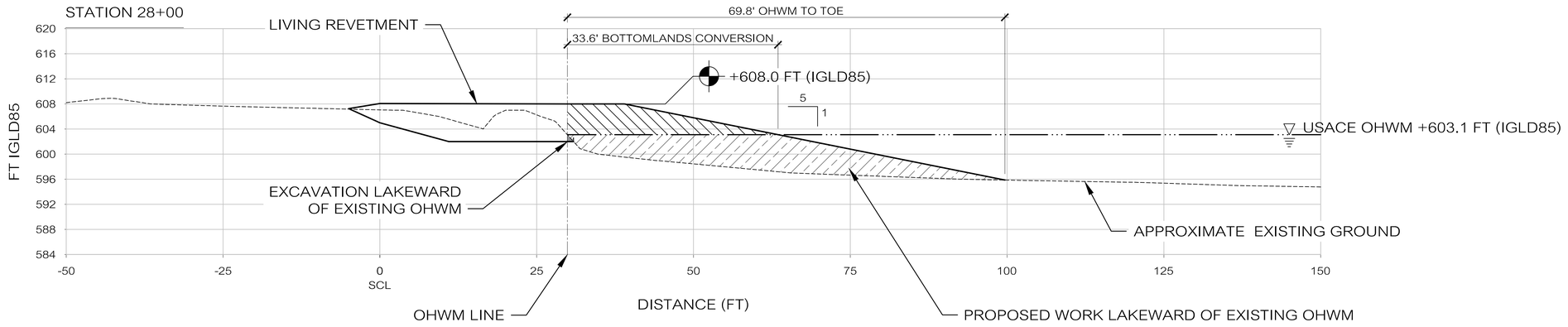
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

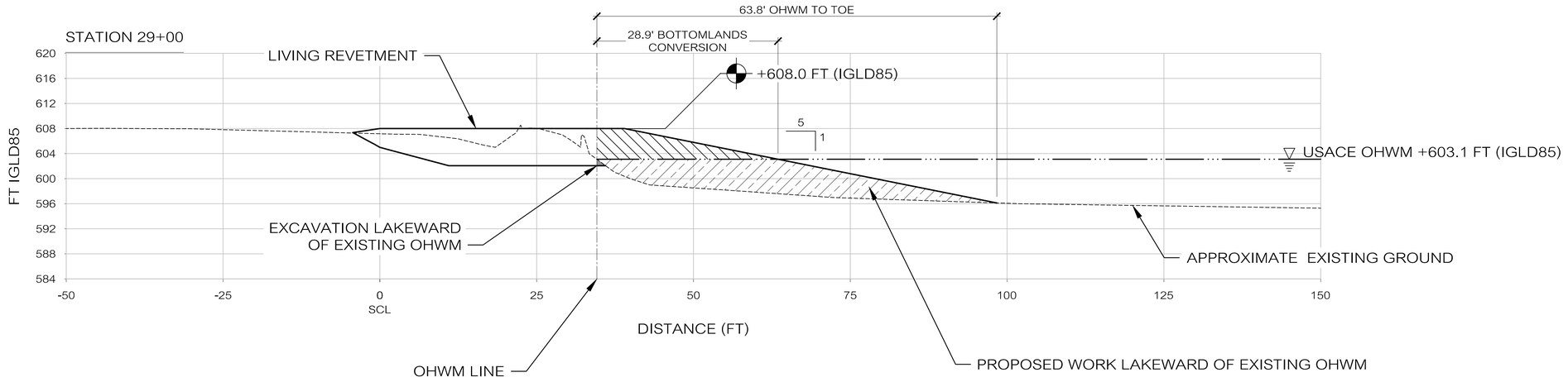
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

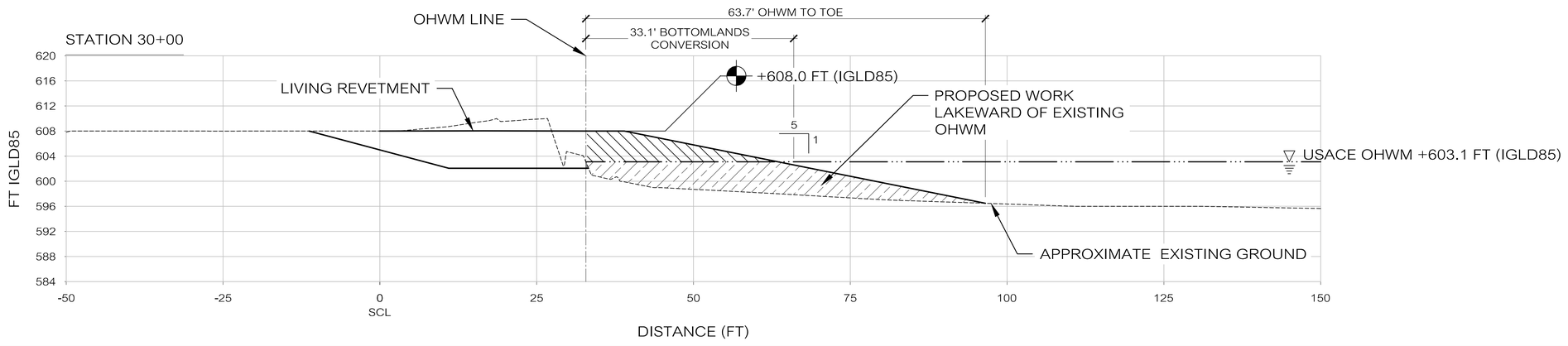
QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 28+00	900	400	10
STA 29+00	900	300	10
STA 30+00	800	300	10

FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 25 OF 29







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

0 10 20 FEET
SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN			(C) PERMIT		(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD	PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
C	0	PERMIT DRAWINGS	PST	MJC	MJC	--	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 28+00 TO 30+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-20

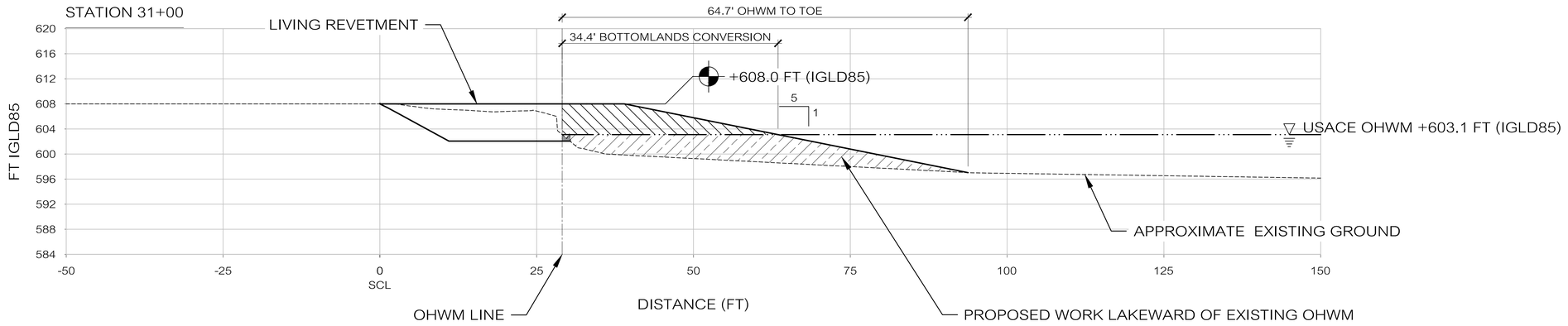
P:\13290.101 MARQUETTE LAKE SUPERIOR SHORELINE RESTORATION\08_CADD\WORKING\C-PERMIT\USACE XS_REVISED.DWG

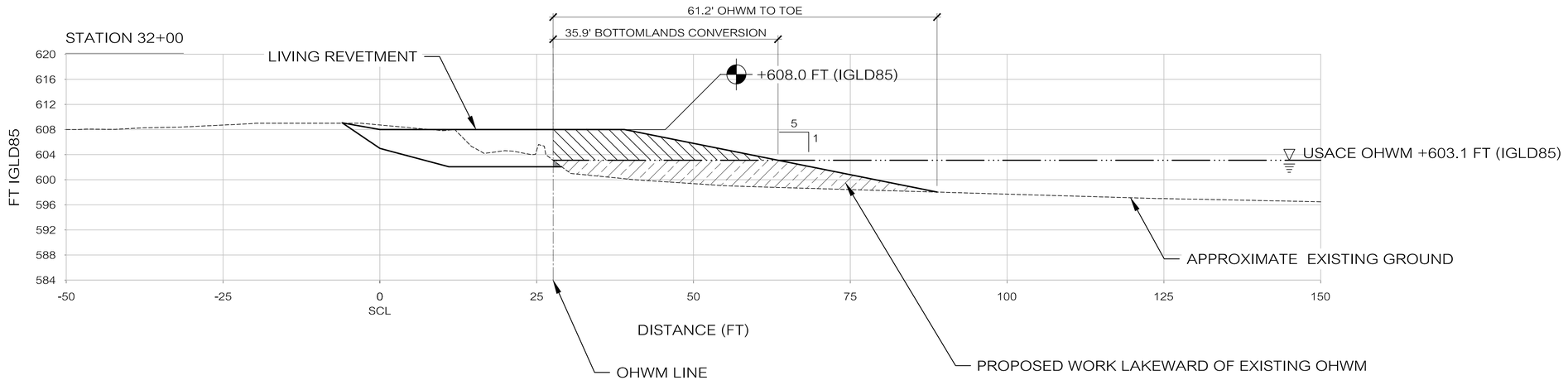
PLOT PAPER SIZE: ANSI D - 22.00 X 34.00 INCHES

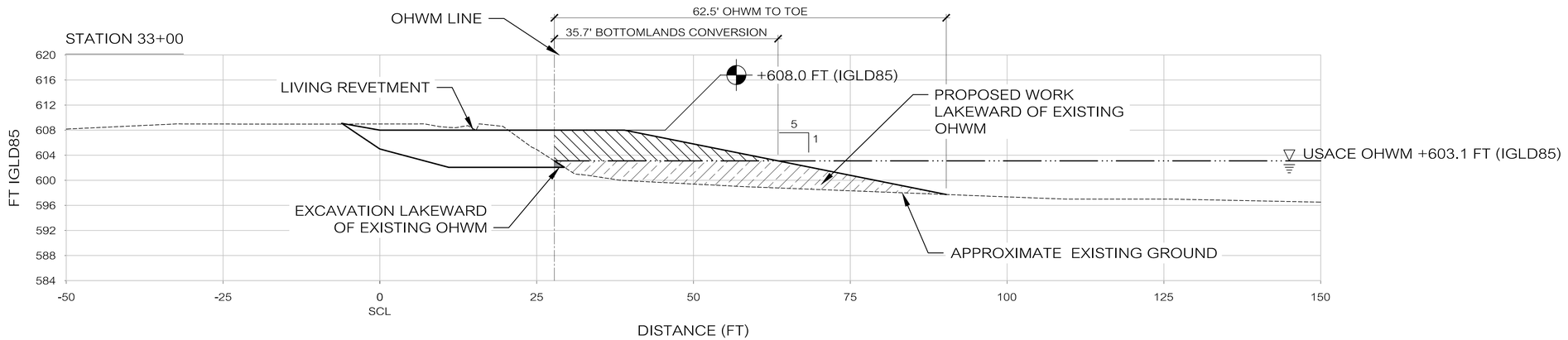
QUANTITIES (THIS SHEET)

SECTION	PLACEMENT (CY)	BOTTOMLANDS CONVERSION (CY)	EXCAVATION (CY)
STA 31+00	700	400	0
STA 32+00	700	400	0
STA 33+00	600	400	10

FILE NUMBER:
LRE-2018-01031-38-S23(52-
Lakeshore Boulevard
Revetment)
City of Marquette - Lake
Superior Shoreline
Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County,
Michigan
SHEET 26 OF 29







LEGEND

WORK LAKEWARD OF OHWM

BOTTOMLANDS CONVERSION

EXCAVATION

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SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT			(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
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C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.

IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 31+00 TO 33+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-21

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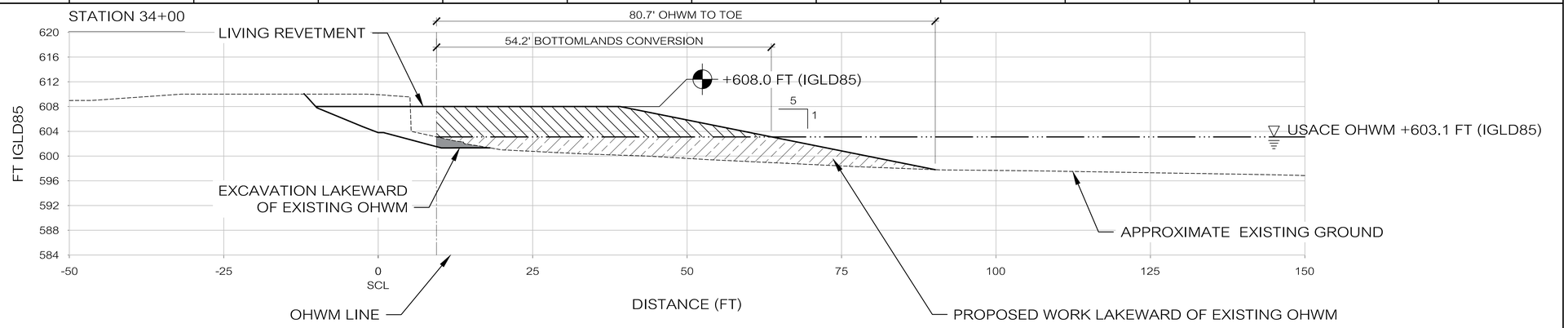
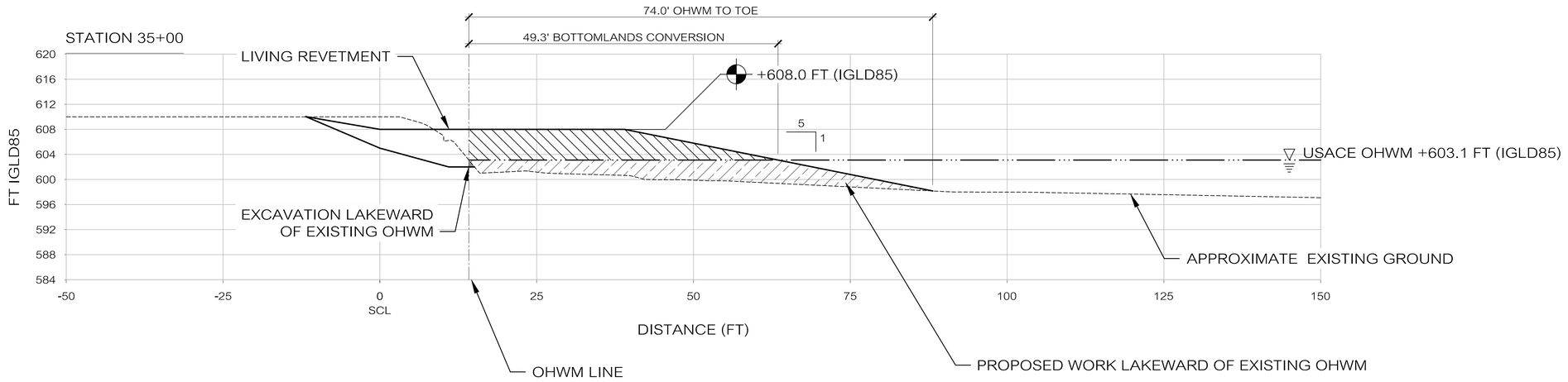
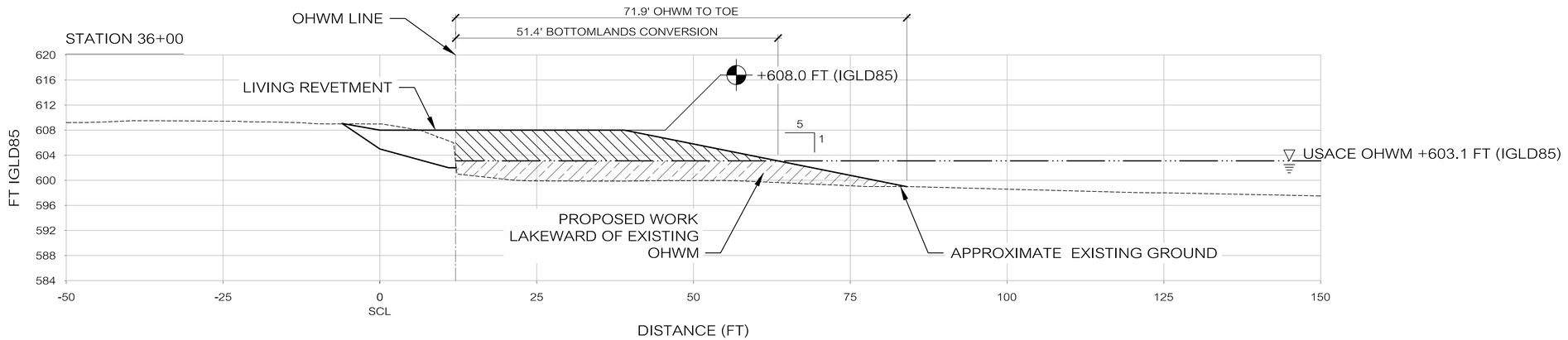
FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 27 OF 29







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- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

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SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD	
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C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 34+00 TO 36+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-22

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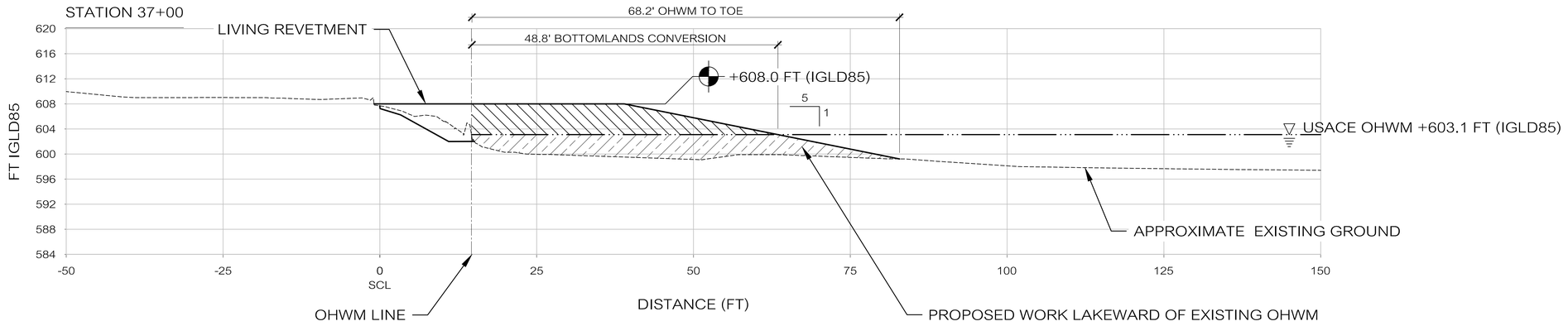
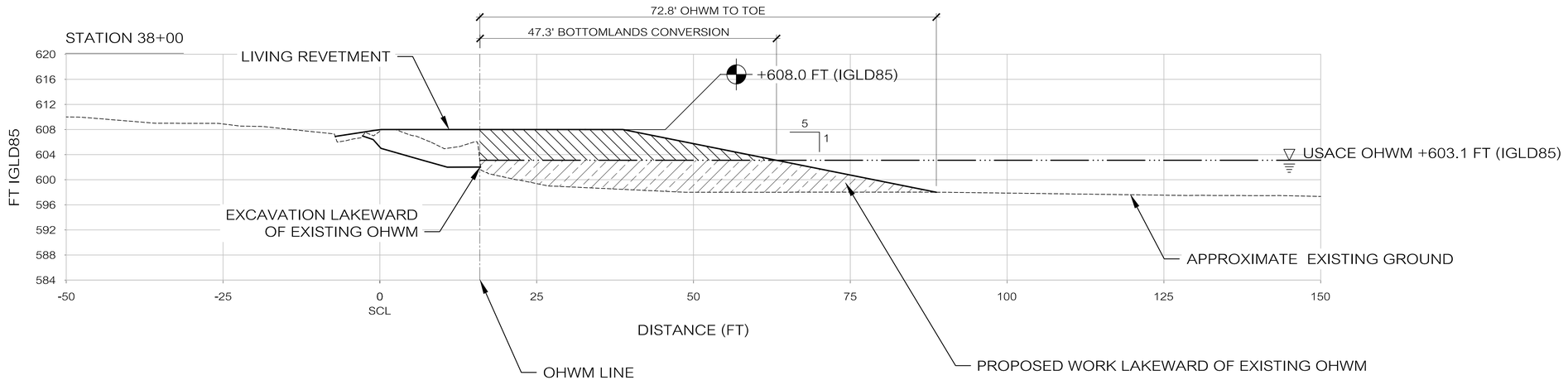
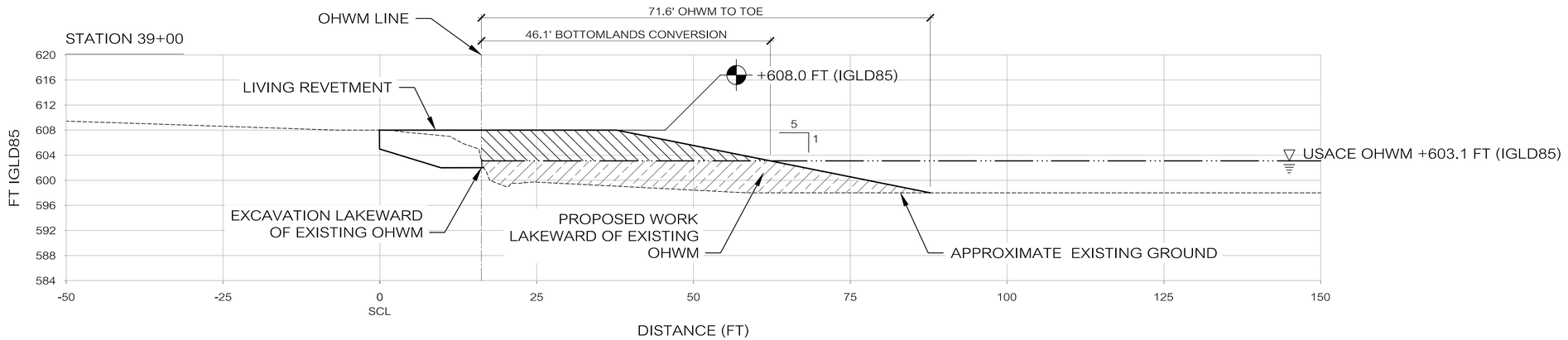
FILE NUMBER:
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette,
Marquette County,
Michigan
SHEET 28 OF 29







LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

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SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY		(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION		(F) RECORD	
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C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 37+00 TO 39+00

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-23

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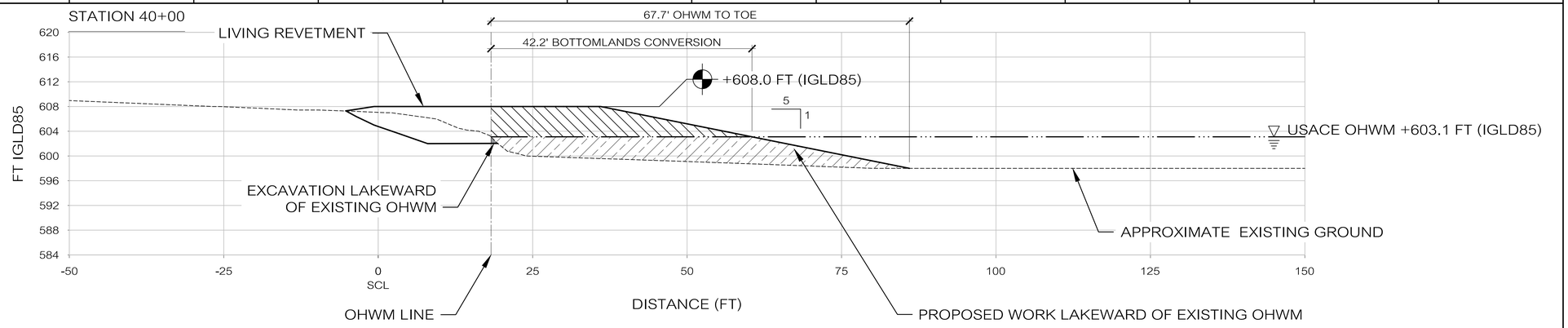

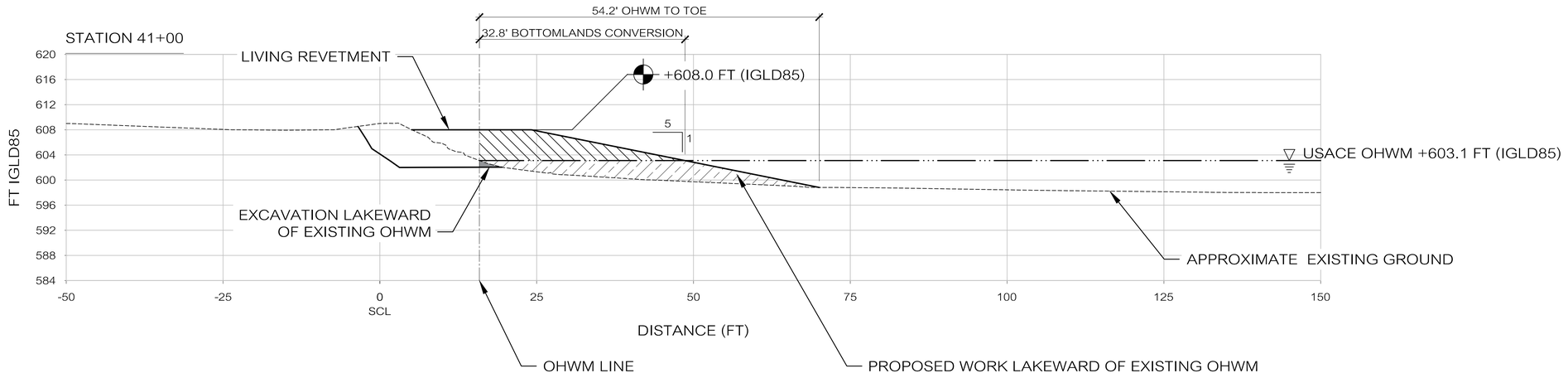

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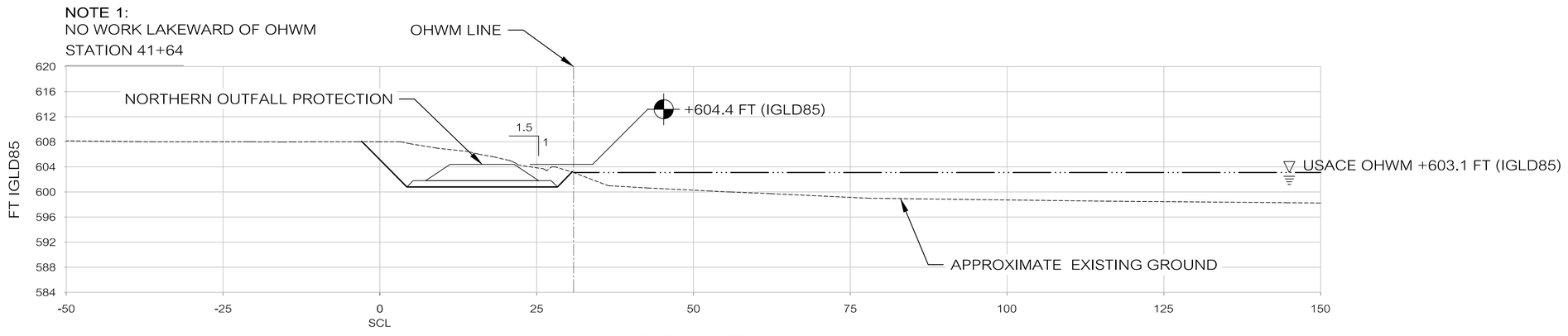
LRE-2018-01031-38-S23(52-Lakeshore Boulevard Revetment)
City of Marquette - Lake Superior Shoreline Restoration
BY: City of Marquette
Lake Superior
Marquette, Marquette County, Michigan
SHEET 29 OF 29

NOTE 1:
NO WORK LAKEWARD OF OHWM
STATION 41+64



LEGEND

- WORK LAKEWARD OF OHWM
- BOTTOMLANDS CONVERSION
- EXCAVATION

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SCALE = 1:10

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

REVISIONS

(PH) PHASE OF ISSUE:		(A) PRELIMINARY			(B) DESIGN		(C) PERMIT		(D) TENDER		(E) CONSTRUCTION			(F) RECORD		
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C	0	PERMIT DRAWINGS	PST	MJC	MJC	–	2023-02-10								
C	1	REVISED PERMIT DRAWINGS	PST	MJC	MJC		2023-02-10								

PREPARED FOR: MARQUETTE MICHIGAN FOUNDED 1849

SUPERIOR WATERSHED PARTNERSHIP AND LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res, Foth

MARQUETTE LS SHORELINE RESTORATION

PROPOSED CROSS-SECTIONS STA 40+00 TO 41+64

ISSUE NUMBER: 03
ISSUE DATE: 2023-02-10
PROJECT NUMBER: 13290.101
SHEET NUMBER: XS-24

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Compensatory Mitigation Plan

Lake Superior Shoreline Restoration

October 31, 2023 | 13290.105.R2.Rev1

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Compensatory Mitigation Plan

Lake Superior Shoreline Restoration

Prepared for:

Prepared by:

Superior Watershed Partnership / City of Marquette
2 Peter White Drive
Marquette, MI 49855

W.F. Baird & Associates Ltd.

For further information, please contact
Matthew Clark, PE, PMP at +1 608 273 0592
mclark@baird.com
www.baird.com

13290.105.R2.Rev1

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Revision	Date	Status	Comments	Prepared	Reviewed	Approved
1	20231031	Final		JID/MJC	MJC	MJC

Table of Contents

Tables

Figures

1. Objectives

As part of the Marquette Lake Superior Shoreline Restoration Project, USACE identification number LRE-2018-01031-38-S23, the City of Marquette (City) proposes to discharge fill material into Lake Superior that will convert 2.6 acres of industrially impacted and marginal quality Great Lakes Open Water habitat to uplands as part of a larger restoration project along the shoreline on the north side of the City. To comply with the requirements of the 1977 Clean Water Act this discharge of fill material into Lake Superior must be evaluated under criteria known as the 404(b)(1) Guidelines, which were developed to implement Section 404 of the 1977 Clean Water Act.

The Guidelines require compensatory mitigation to "…offset environmental losses resulting from unavoidable impacts to waters of the United States." This Mitigation Plan aims to address this requirement by specifically laying out how the habitat restoration measures proposed by our project will in fact provide positive environmental benefits in excess of the potential negative impacts caused by the 2.6 acres of proposed lake fill, Figure 1.1.

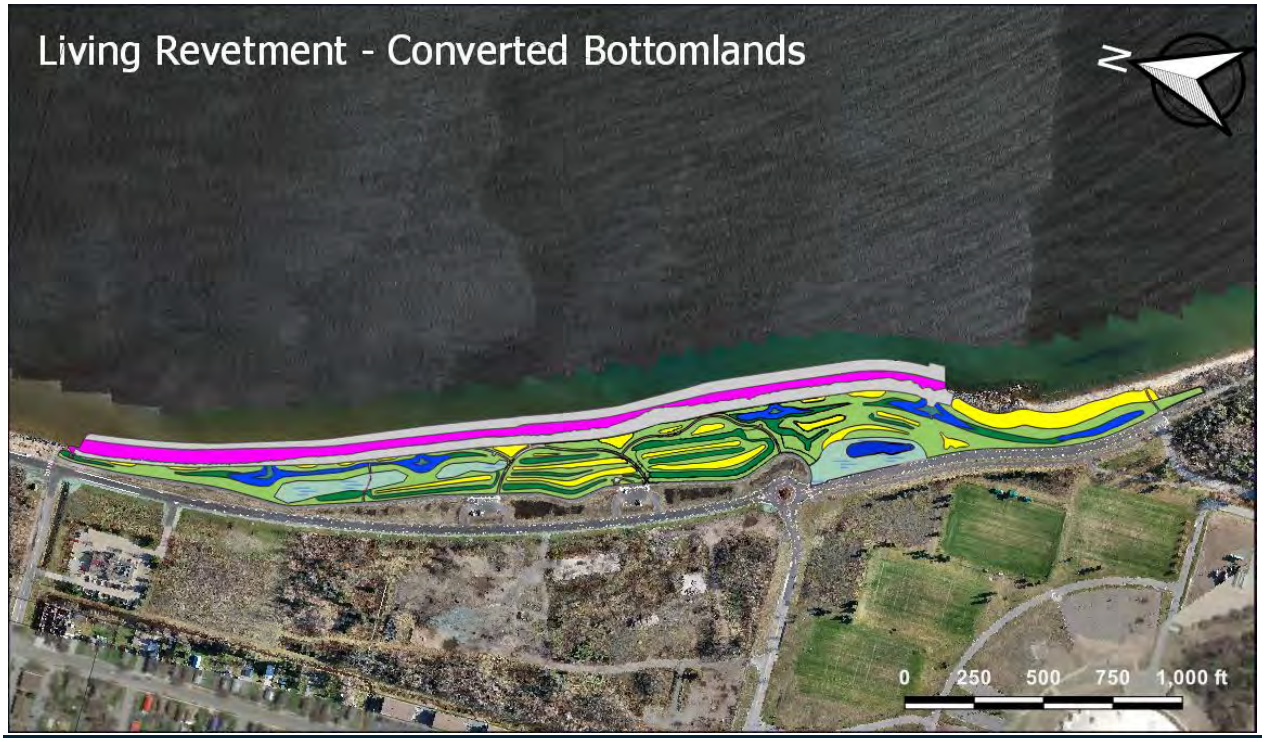

Figure 1.1: The area of impacted bottomlands is shown in magenta.

1.1 Conversion of Lake Superior Bottomlands

The existing condition of the nearshore area at the project site is industrially impacted and of moderate to low ecological value. The lake bottom in this area is currently occupied by the remains of an existing failed revetment (armor stone and timber) and industrial waste (slag, cinders, tar, splash iron, etc.). Due to the presence of the failed revetment and other waste, the shoreline in this area is inaccessible to both humans and other animals from the uplands. The steep nature of the shoreline caused by the failed revetment also

increases the nearshore wave energy environment when compared to adjacent shorelines, making it less hospitable to aquatic invertebrates and by extension their predators. Due to the physically, chemically, and ecologically degraded nature of the nearshore environment, the loss of this 2.6 acres of Great Lakes Bottomlands is expected to have minimal adverse ecological impacts.

2. Site Selection

The mitigation areas were selected based on their proximity to the site and the historical functions. Offsite alternatives were not considered due to the quality and proximity of onsite measures. The proximity to Lake Superior and shallow depth of groundwater makes this site suitable for self-sustaining mitigation measures. The land within the mitigation area is planned to be a natural area with no development.

3. Site Protection Instrument

The City of Marquette owns the mitigation site and is solely responsible for it. A conservation easement or deed restriction will be utilized to ensure that the mitigation site continues in its intended purpose.

4. Baseline Information

The proposed shoreline and upland habitat restoration activities are planned for a portion of the original Cliffs-Dow site that is bounded to the north by Hawley Street, to the west by the newly re-aligned Lakeshore Boulevard, to the south by Pine Street, and to the east by Lake Superior, see Figure 4.1. The photographs in Figure 4.2 show the current shoreline and nearshore upland conditions, reflecting recent and ongoing storm damage. A summary of the existing land uses within the project extent is given in Table 4.1. This site currently sits vacant awaiting the planned restoration measures and the permanent conversion to public green space.

Figure 4.1: Orthomosaic from November 20, 2020, showing the current site conditions following realignment of the old roadway and bike path, the white hatch represents the limit of the proposed improvements.

Figure 4.2: Photographs from October 17th, 2022, looking to the North and South on the left and right, respectively.

Table 4.1: Summary of existing resources and land use types within the project extents.

Resource Type	Amount (Acres)
Great Lakes Open Water – Sandy Bottom	3.10
Great Lakes Open Water – Existing Revetment	1.88
Existing Revetment – Upland Area	1.78
Old Right of Way, Site Access, and Over-wash Area	7.75
Wooded	2.56
Grassy	3.63
Dune	0.78
Wetlands – Wooded	0.37
Wetlands – Stormwater detention pond	0.43
Total	**22.28**

4.1 Existing Condition of Impacted Bottomlands

The Lake Superior bottomlands in the project area have been highly degraded due to human disturbance including extensive riprap, dumping of metal, concrete and other debris, and nearly a century of industrial pollution impacts from the adjacent Cliff's Dow site (1902-1968). Substrate composition includes boulders, cobble, and sand with pockets of tar/industrial pollution and little organic matter (see attached photos). In 2016, 2017, and 2018, Michigan Department of Environment, Great Lakes & Energy (EGLE) conducted sediment borings to identify pollution impacts within the upper layers of the sediment. These investigations found evidence of wastes from the historical industrial activities, including coal fragments and "campfire like" odors. In addition, a nearshore sediment coring investigation was undertaken by Foth Engineering during 2020 to further identify the extent of impacted materials within the near shore sediments. The sediment coring investigation was completed in May 2020 and observed coal-like material and the presence of odors within the sediments. Scrap pig iron and slag deposits were consistent across the majority of the nearshore area; this suggests the materials may have been placed there as fill. In addition, a wooden pile wall was observed, which appeared to extend along the entire length from Wright Street to Hawley Street. Recent erosion in this area has exposed the piles, the steel tieback wires, and anchors. The findings were consistent with the known field observations

previously presented by EGLE. Valuable information related to site contamination and other existing project constraints is shown in Figure 4.3 below. Results of these investigations were used in developing the shoreline restoration designs.

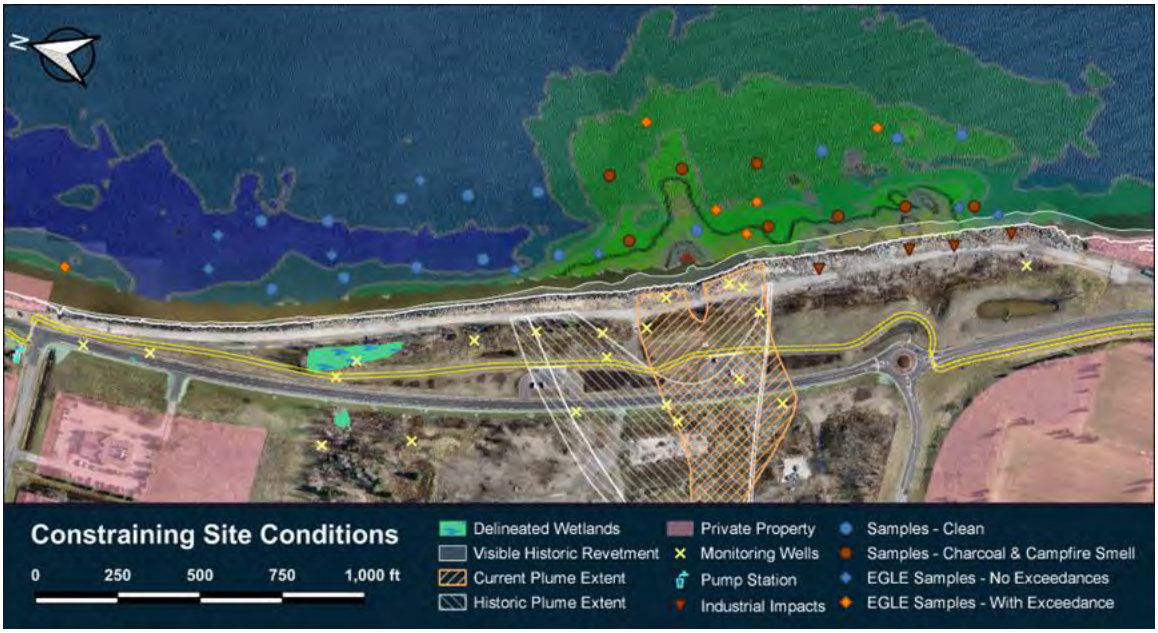

Figure 4.3: Map of industrial impacts on and near the proposed project site.

4.2 Habitat Functions and Values

In its current state, the Lake Superior bottomlands in the project area provide marginal habitat for fish and aquatic life due to the scattered debris and pollution. Data from previous larvae and juvenile fish surveys conducted by the Superior Watershed Partnership identified 18 fish species in the nearshore waters adjacent to the proposed project. The most prevalent species included *Coregonids* (lake whitefish, lake herring, and chubs), burbot, and three-spined stickleback (Great Lakes invasive species) (Table 4.2).

Table 4.2: Larval and juvenile fish species collected from Presque Isle Harbor (2006-2007)

	Presque Isle Harbor (Intake - Surface) Number of Larvae and Entrainable Juveniles Collected														
Species	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	Total	% of Total
Coregonid	13	21	6										6	46	33.6%
Burbot	2	23	4											29	21.2%
Threespine stickleback					10	1								11	8.0%
Gasterosteidae				7	3									10	7.3%
Rainbow smelt		8	1											9	6.6%
Catostomid		2	3											5	3.6%
Cyprinid			4	1										5	3.6%
Alewife					3	1								4	2.9%
Johnny darter	1	1		1										3	2.2%
Lake herring													3	3	2.2%
Yellow perch		1	1		1									3	2.2%
Ninespine stickleback					2									2	1.5%
Percid		2												2	1.5%
Mottled sculpin			1											1	0.7%
Notropis spp.						1								1	0.7%
Smallmouth bass					1									1	0.7%
Spoonhead sculpin													1	1	0.7%
Walleye		1												1	0.7%
TOTAL	**16**	**59**	**20**	**9**	**20**	**3**							**10**	**137**	**100.0%**

4.3 Littoral Context

As a shoreline restoration project on Lake Superior, it is important to understand the sediment transport context in which the project will be constructed.

As previously stated, before European settlement, the project site was part of a larger dune and swale wetland complex along the shoreline of Presque Isle Harbor. This shoreline was likely in a state of near equilibrium, with sediment supply to the littoral system approximately equal to the quantity of sediment leaving the system due to long-shore and offshore transport. This condition is still present at several locations in Marquette County, where dynamically stable shorelines front wooded dune and swale complexes, e.g., Big Bay, the mouth of the Pine River, etc.

To establish the iron ore export port in Presque Isle Harbor, a breakwater and series of extensions were constructed by the U.S. Army Corps of Engineers starting in 1896 and finally being completed in 1939. Within a similar timeframe a series of dams were erected for power generation and other industrial purposes on the Dead River. Dredging of the harbor area, with offshore and upland sediment disposal, would have begun at this time as well, although we only have dredge records extending back to 1935.

This combination of industrial activities has resulted in significant and ongoing impacts to the hydrodynamics and sediment dynamics of Presque Isle Harbor. These impacts were first quantified by the USACE in 1976 in a Section 111 report and later verified through work done by Baird as part of this and a previous project. These impacts are summarized visually in Figure 4.4 and explained in further detail here.

First, the Presque Isle breakwater's construction has significantly changed the hydrodynamics of the harbor area by creating a sheltered low wave energy area in the northern portion of the harbor basin. In turn this change to the hydrodynamic environment has resulted in changes to the sediment transport patterns. Prior to construction of the breakwater, sediment entering the harbor basin from the Dead River would be transported to the south along the shoreline and eventually lost to the offshore around Picnic Rocks which is net sediment transport from the north to the south along the entire shoreline of the littoral cell. After construction of the breakwater, the net sediment transport pattern has now diverged as can be seen in Figure 4.4.

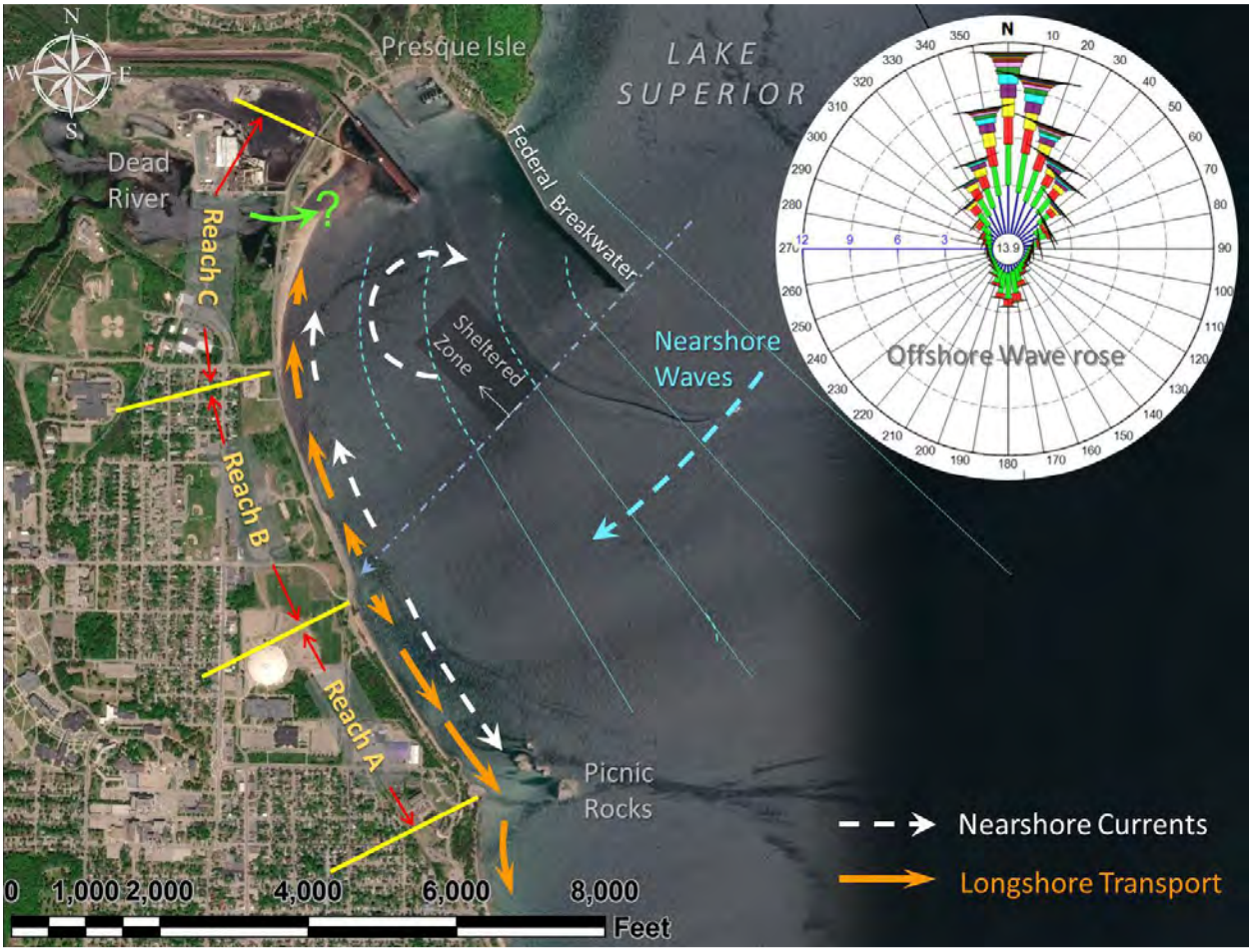

Figure 4.4: Conceptual figure showing the existing longshore transport, wave diffraction, and nearshore current patterns following construction of the Presque Isle Harbor breakwater.

Second, the damming of the Dead River has significantly reduced the quantity of sediment entering the littoral system. While the magnitude of this reduction is unknown, it is evidenced by ongoing sedimentation in the various dam basins along the river.

Third, ongoing maintenance dredging at the Port has further reduced the quantity of sediment entering the Presque Isle Harbor littoral system.

The combined effects of these three actions on sediment transport in the Presque Isle Harbor littoral cell have resulted in the creation of three distinct zones along the shoreline of the Harbor basin between the mouth of the Dead River and Picnic rocks. The 1976 USACE Section 111 report labeled these areas as Reaches A, B, and C, see Figure 4.4. In Reach C net sediment transport is to the north and the shoreline is accreting, in Reach A net sediment transport is to the south and the shoreline is eroding. Our project location is in Reach B, which has had a hardened shoreline since prior to 1929, as evidenced by the revetment visible in Figure 4.1 and Figure 4.2. Sediment transport in this Reach is to the north and south, with a divergence point near Pine Street. The shoreline position has been relatively stable due to this revetment. However, with net sediment transport out of Reach B and recent high lake levels, storms have severely damaged the revetment and the

nearshore uplands are now experiencing erosion under storm conditions. Figure 4.5 shows the progression of shoreline change at the project site since 1902.

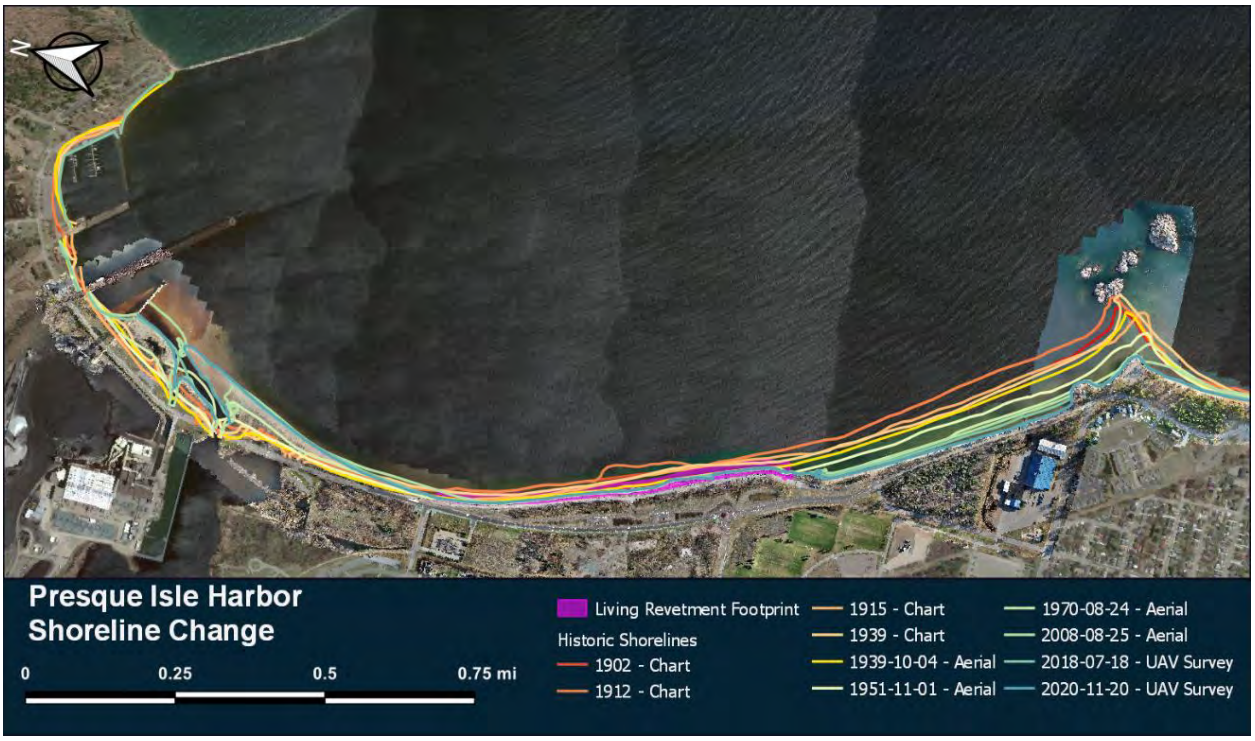

Figure 4.5: Historical shoreline change in Presque Isle Harbor littoral cell.

4.4 Hydrological Context

Establishing whether the proposed mitigation site is suitable for the planned wetland and habitat restoration measures requires an understanding of the local hydrology at the site and the surrounding watershed's hydrology.

4.5 Watershed

The project site is located in the Compeau Creek-Frontal Lake Superior watershed (USGS HUC: 040201050106), a sub-basin of the larger Dead-Kelsey Watershed (HUC: 04020105) and is bordered to the northwest by the Raney Creek Dead River Watershed (040201050205) and to the South by the Carp River Watershed (040201050102), also sub-basins of the Dead-Kelsey Watershed, see Figure 4.6.

Figure 4.6: Project vicinity map showing HUC-12 watersheds.

4.6 Hydric Soils

Publicly available data from Michigan's EGLE do not show hydric soils occurring within the project site. However, as noted, the entire site was part of a larger dune and swale wetland complex. Additionally, recent delineation work has identified two small patches of wooded wetlands within the proposed project footprint, see Figure 4.7.

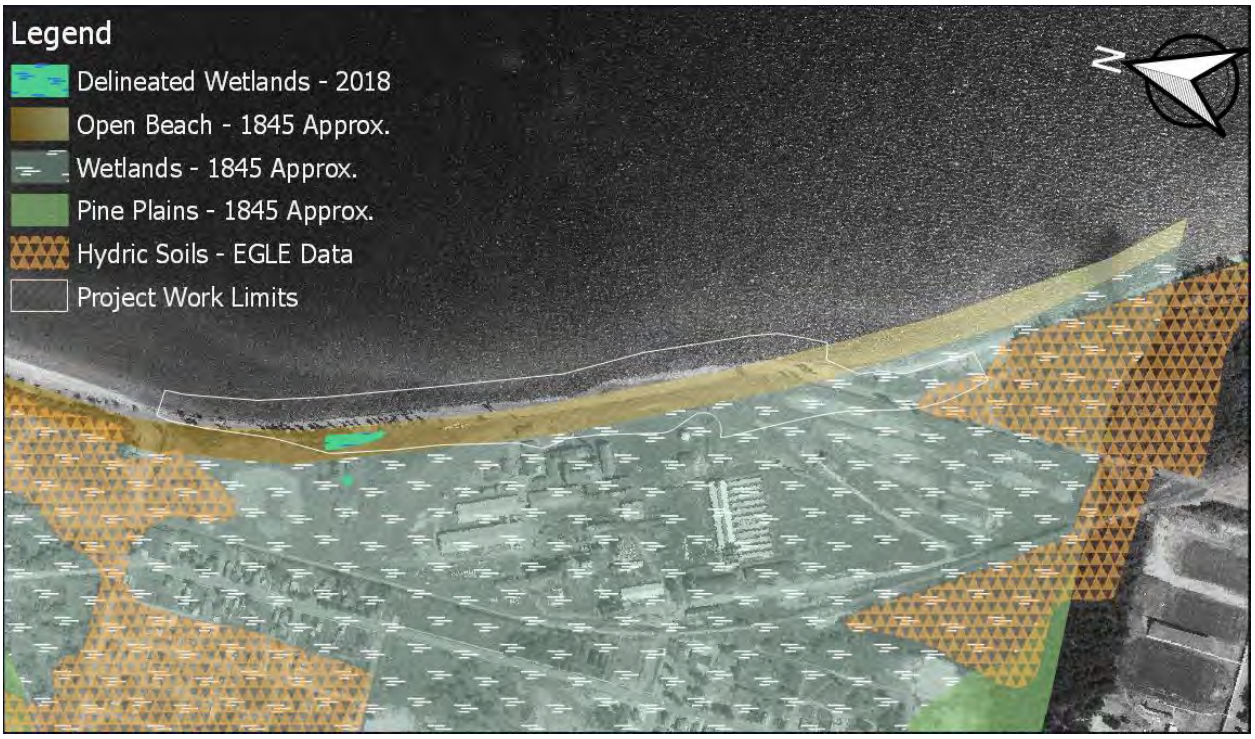

Figure 4.7: Map showing hydric soils, delineated wetlands, and historic wetlands at and near the project site.

4.7 Surface Water

North of Wright Street, precipitation and surface water occurring in the uplands west of the realigned Lakeshore Boulevard is diverted north away from the project site by the Hawley Street Ditch which empties into Lake Superior. South of Wright Street, surface water is diverted through a remnant wooded dune and swale wetland and reaches Lake Superior just north of East Fair Avenue. Precipitation falling on the project site and realigned roadway either flows through a new stormwater detention pond (constructed in 2019) or runs directly to Lake Superior as sheet flow through the existing revetment (Ref Figure 4.8).

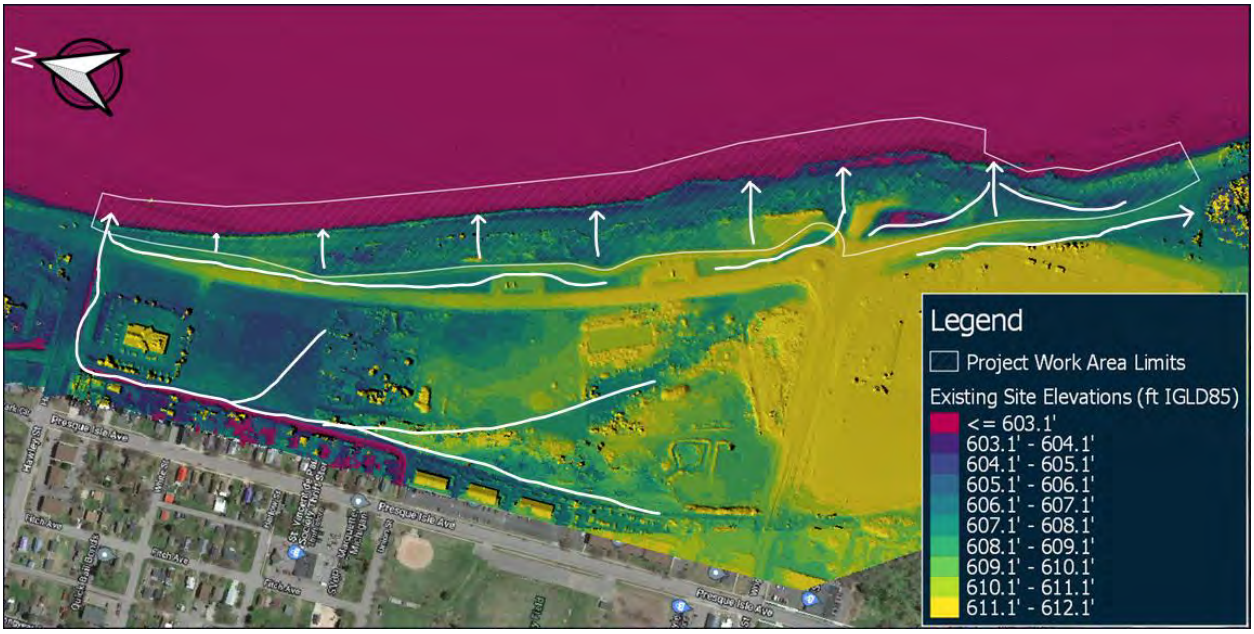

Figure 4.8: Map showing existing topography at the project site. White arrows show conceptual surface water flow paths.

4.8 Groundwater

Being immediately adjacent to Lake Superior, the water table on the project site is directly tied to the water levels of Lake Superior. A series of historical and existing monitoring wells (related to a regulated groundwater plume and SGI) show this relationship clearly. Moving landward from the shoreline, the water table level gradually increases at an approximate rate of 0.6 feet per 100 feet inland, see Figure 4.9.

Figure 4.9: Map showing ground water contours present at the project site, data comes from existing monitoring wells.

4.9 Site History

The Treaty of La Pointe transferred control of the land now occupied by the City of Marquette from the indigenous Ojibwe people to the United States government in the fall of 1842. Prior to European settlement and industrialization, the proposed project mitigation site was occupied by a wooded dune and swale wetland complex, fronted by a mixed sand and gravel shoreline. The wetlands characterization of the upland area is reflected in the original township survey which was completed in the spring of 1845 (see Figure 4.10), less than three years after the Treaty of La Pointe was first signed.

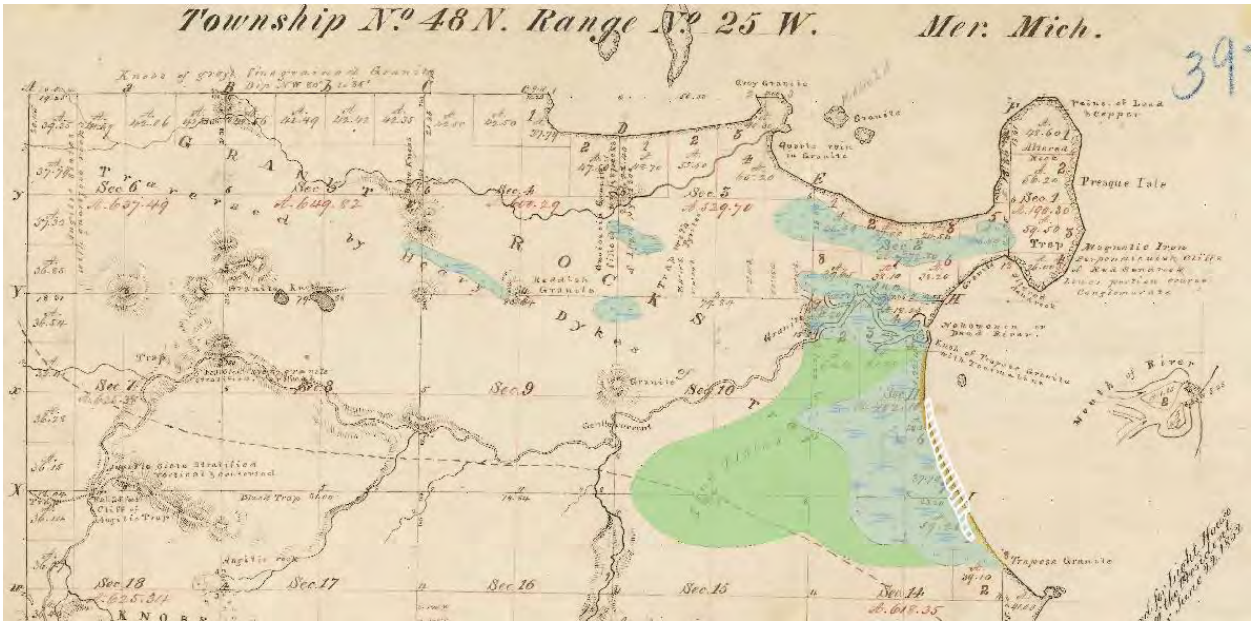

Figure 4.10: Original township survey map of the Marquette area from 1846 representing survey data from Q2 1845. Area shown is only a portion of the full map. Areas in blue were characterized as wetlands, the green area was identified as "Pine Plains" (color added for clarity). The proposed mitigation project boundaries are shown by the white hatching.

5. Determination of Credits

The project as a whole is proposed as an overall improvement to the shoreline. Each acre of bottomland conversion to upland is being mitigated at a ratio of 7.42 acres per 1 acre of fill.

6. Mitigation Work Plan

In order to compensate for the loss of 2.6 acres of Great Lakes open water and bottomlands on Lake Superior, the City proposes the mitigation measures listed in Table 6.1.

Table 6.1: Summary of proposed restoration and mitigation measures.

Mitigation Areas	Amount (Acres)	Mitigation Type
Living Revetment – Below OHWM	2.39	Enhance
Living Revetment – Above OHWM	2.34	Restore
Coastal Wetland	1.10	Establish
Coastal Dune and Swale	11.67	Restore
Wooded Wetlands	0.80	Enhance
Pond and Pond Edge	0.99	Enhance
Total Mitigation Area	**19.29**	

The proposed mitigation measures total approximately 19.3 acres, which is a ratio of 7.42 acres of mitigation for each 1.00 acre of Great Lakes Open Water impacted. Each of the mitigation areas proposed in Table 6.1 is described briefly below along with a summary of the expected benefits to native species. Appendix A provides the project overview/planting plan and the species listing.

6.1 Living Revetment

The proposed Living Revetment will function much like the Volcanic Cobble Shoreline, Michigan Natural Community type. This type of shoreline habitat is dominated by wave and ice driven processes and is naturally found in Marquette County. The high-energy environment of this shoreline type appears to provide little stable habitat for terrestrial insects, but the sediments and rock surfaces are sometimes rich in aquatic invertebrates. The presence of aquatic invertebrates makes this a valuable foraging habitat for lake fish and shorebirds that feed on these organisms. The planned Living Revetment will create 7.33 acres of native Volcanic Cobble Shoreline habitat along the project shoreline. This area includes 2.39 acres of industrially impacted nearshore bottomlands which will remain below the OHWM (Figure 6.1), 2.34 acres of industrially impacted nearshore uplands (Figure 6.2), and 2.6 acres of converted Great Lakes Bottomlands (Figure 1.1), the impacts to which the proposed mitigation activities are meant to offset.

The construction of the Living Revetment is expected to promote wave breaking in shallow water, reduce the wave energy directly impacting the shoreline, and create a less energetic nearshore wave environment more suitable for aquatic invertebrates, and their predators, than the existing conditions.

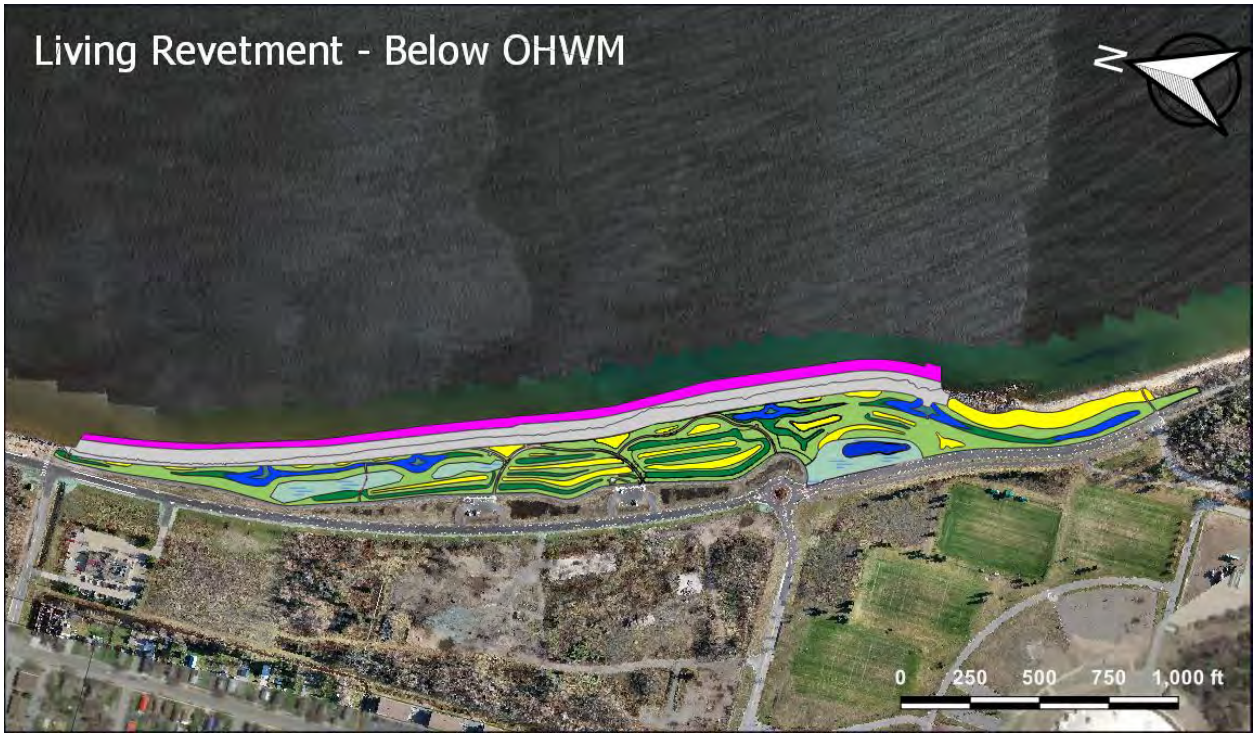

Figure 6.1: The area of new Living Revetment below the USACE OHWM is shown in magenta.

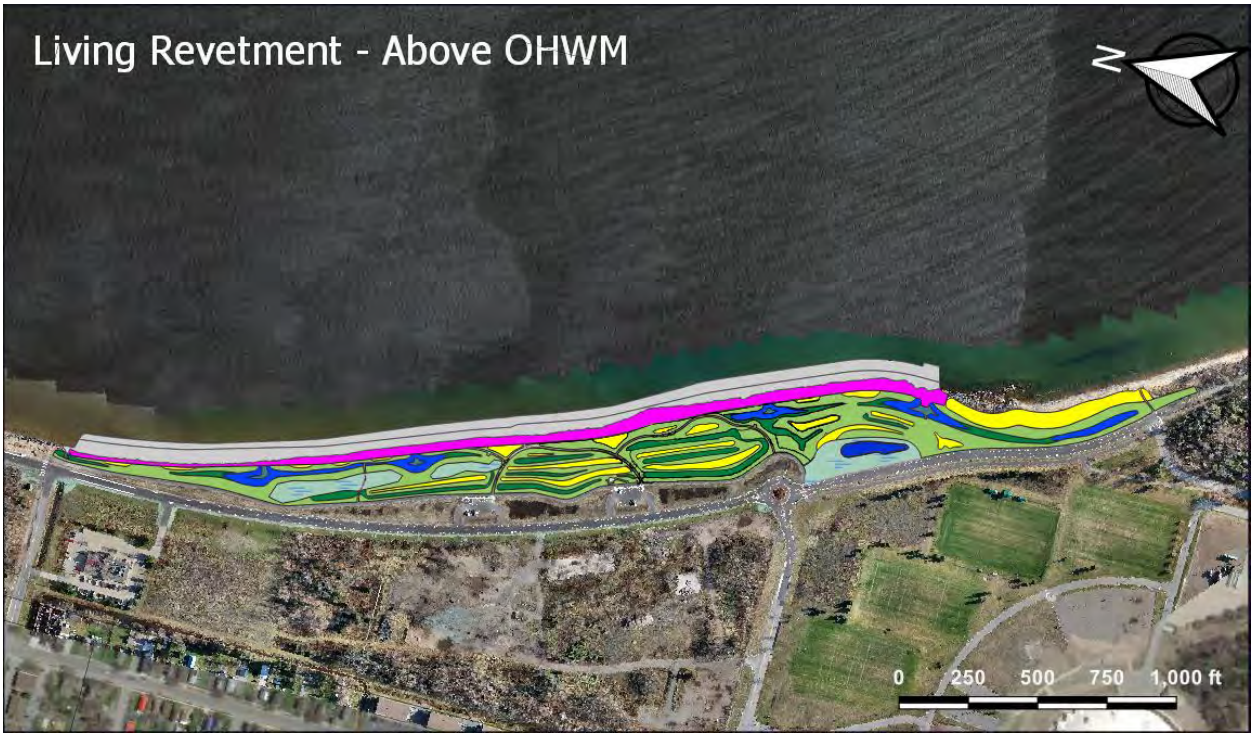

Figure 6.2: The area of new Living Revetment above the USACE OHWM is shown in magenta.

6.2 Coastal Wetland

The proposed 1.1 acres of new Coastal Wetland habitat, Figure 6.3, is expected to function similarly to the Great Lakes Marsh, Michigan Natural Community type. The dominant species of vegetation in this habitat type are adapted to water level fluctuations over a variety of timescales (short-term/event-driven, annual/seasonal, and interannual), making them suitable for this project site. Great Lakes coastal wetlands provide habitat for a wide variety of wildlife – including insects, fish, waterfowl, water birds, and mammals. Fish utilize coastal wetlands in all parts of their life cycle, including egg, larval, immature, and adult stages. A broad range of invertebrates occupy this habitat, providing food for fish, birds, herptiles, and small mammals. Coastal wetlands have long been recognized as critical habitat for the migration, feeding, and nesting of waterfowl and shorebirds. The Great Lakes and connecting rivers are parts of several major flyways. During spring migration, when few alternative sources of nutrients are available, terrestrial migratory songbirds feed on midges from the Great Lakes marshes. Mammals known to utilize coastal wetlands include beaver, muskrat, river otter, and mink.

Figure 6.3: The area of new Coastal Wetland is shown in magenta.

6.3 Coastal Dune and Swale

The 11.67 acres of restored Coastal Dune and Swale proposed as part of this mitigation plan is shown in Figure 6.4. The two Michigan Natural Community types most similar to the planned restored area are Great Lakes Barrens and Wooded Dune and Swale Complex, both of which are naturally occurring in Marquette County. In addition to a wide variety of native plant and animal species, these habitat types are known to be associated with and utilized by the following rare animals: Prairie Warbler, Bald Eagle, Piping Plover, Gray Wolf, Northern Goshawk, Red-Shouldered Hawk, Merlin, Dune Cutworm, and Osprey.

Figure 6.4: The area of restored Coastal Dune and Swale is shown in magenta.

6.4 Wooded Wetland

In addition to the restoration of 11.84 acres of Dune and Swale Complex, an existing 0.80 acres of wooded and wetland habitat will be preserved and enhanced through select tree cutting and additional native plantings, see Figure 6.5. This area is most similar to the Wooded Dune and Swale Complex, Michigan Natural Community type and will provide habitat for similar species to those supported by the planned Coastal Dune and Swale restoration area.

Figure 6.5: The area of enhanced Wooded Wetlands is shown in magenta.

6.5 Pond and Pond Edge

An area of 0.99 acres, including an existing stormwater detention pond and surrounding area shown in Figure 6.6, will be enhanced through additional native plantings. This area will provide similar habitat functions to the Coastal Wetland and Coastal Dune and Swale restoration areas already described.

Figure 6.6: The area of enhanced Pond and Pond Edge is shown in magenta.

7. Maintenance Plan

The City of Marquette will be responsible for maintenance of the entire project, with assistance from the Superior Watershed Partnership. The plan and schedule for maintenance involves the following activities.

7.1 Living Revetment

Occasional grooming will be performed on the living revetment to re-establish the design profile and overall shoreline position, including re-placing material which has migrated out of the project area and/or adding new material. This maintenance will be undertaken by the City and will occur biennially.

7.2 Uplands

A site visit by City staff will occur on an annual basis, reviewing trails, overlook, boardwalk and the uplands area.

- Dune Restoration - Where erosion has been identified by the City, sand will be added to the dune restoration area on the lakeward face of the dune and elsewhere as needed. This maintenance will occur as needed.
- Living Revetment - Occasional grooming will be performed on the living revetment to re-establish the design profile and overall shoreline position, including re-placing material which has migrated out of the project area and/or adding new material. This maintenance will occur biennially.
- Trails/Overlook/Boardwalk - Gravel paths will be regraded, and stone will be added as needed. Maintenance to all other structures will be completed as needed.

7.3 Ecological Maintenance

Plantings will be replenished at select locations in on an as needed basis for up to 5 yrs. post-construction. This maintenance will be undertaken by Superior Watershed Partnership.

Weeding will be performed as needed three times each year for the first two years following planting installation, during site visits or shortly thereafter. Following the third-year post-construction until ten years post-construction, weeding will occur twice per year.

8. Performance Standards

The following performance standards will be applied to the mitigation efforts for this project:

- Living Revetment - Shoreline profile reflects a stabile profile.
- Living Revetment - Cobble remain within 100 ft of placement
- Living Revetment - Colonization occurs over 25 percent of wet area
- Uplands - Vegetation diversity, richness and abundance will increase each growing season following planting for a period of three years and will not decrease in subsequent years.
- Uplands - Wetlands do not decrease in size
- Uplands - Dune/swale position is generally stable
- Uplands - Loss of trees is less than 10 percent of population in wooded wetland

9. Monitoring Requirements and Plan

9.1 Monitoring of Mitigation Measures

Implementation of the Lake Superior Shoreline Restoration project will result in an improved level of erosion protection and flood risk reduction. As the improvements will be comprised of new construction and upgrades to existing natural features, it is important to establish a record of performance. The monitoring methods described below and summarized in Table 9.1, are based on the NFWF/NOAA guidelines and requirements of the USACE. The City of Marquette will be responsible for coordinating the work described below related to monitoring of the project performance and reporting. The Lake Superior Watershed Partnership will be involved as a major partner in carrying out the field data collection and providing subject matter expertise, as needed.

9.2 Living Revetment – Shoreline Position Monitoring

Benchmark locations will be surveyed and 6-ft benchmark rods with protective concrete-filled collars will be installed in the ground at 400-800 ft. spacing along the back of the living revetment and 1000 ft. north and south of the project area (to monitor impact on adjacent properties), parallel to the shoreline. Shoreline profiles will be developed along transects from these benchmarks running perpendicular to the shoreline and will record the elevation at a minimum of 20 ft. intervals at least to the ordinary high-water mark or the waterline, whichever is lower. Additionally, aerial orthoimagery will be collected by unmanned aerial vehicle (UAV) and topographic data will be compiled from this using photogrammetry or other survey techniques (e.g., lidar). Surveys will be undertaken, during ice free conditions, along the entire project area as well as NMU shoreline every three months for the first year of the post-construction period.

At the end of each survey, data from all available surveys, including the post-construction as-built survey, should be compared to determine trends and understand overall performance of the shoreline protection, as well as to determine littoral drift of living revetment material. Additional surveys will be collected at 1, 2 and 5 yrs. post-construction and as needed thereafter.

9.3 Living Revetment - Monitoring Cobble Movement

Monitoring for cobble movement will occur before any maintenance activity on the shoreline. At the time of construction, a select group of stones from the Living Revetment should be marked, have a number chiseled into one side, and their position noted in GPS coordinates. This should occur every 500 ft along the living revetment. At 12-month intervals, each stone should be located, GPS position noted, and then compared with the previous position to determine the amount of movement. The same stones should then be repositioned for the next inspection. The frequency of the monitoring will be 1, 2, and 5-years post-construction.

9.4 Living Revetment - Colonization

Underwater plankton colonization will be assessed by measuring coverage on submerged stones, and will be assessed after 1, 2, and 5-years post-construction during the same time as cobble tracking.

9.5 Uplands - General

Monitoring will occur in uplands during the July-August period.

The monitoring event will consist of a meander search in each upland community to document the presence of each species in each community type; to document the location and relative abundance of invasive weeds; and to note areas of erosion or bare soil that should be repaired and/or reseeded.

Additional efforts will consist of measuring species abundance and richness in 3 ft. x 3 ft. quadrats along transects segregated by community type. The number of quadrats along each transect will vary based on the size and diversity of the community but will consist of at least five quadrats per transect. The percent aerial cover of each species, bare soil and duff will be recorded in each quadrat using the USGS NCVS system. Areas of erosion or bare soil that should be repaired and/or reseeded, the location and relative abundance of invasive weeds, and any other management recommendations will be recorded.

Monitoring that is specific to each community, in addition to that described above, is described in the subsequent sections.

9.6 Uplands - Coastal Wetland

Elevation, distance from the shoreline, and water level elevation will be measured on an annual basis. Comparisons of the quadrat data will be made for a length of 5 years, post construction.

9.7 Uplands – Coastal Dune and Swale

This sub-area represents the largest area of the uplands by a large margin. The dune swale landform will be reviewed using aerial photos taken every two years (for 4 years) to assess the stability of the dunes, which are comprised of soil and sand. Comparisons with previously collected data will be made.

9.8 Uplands - Wooded Wetland

This sub-area is located in the northern portion of the uplands. Monitoring will consist of evaluating each planted tree or shrub at the end of construction to identify species, size (diameter at breast height (dbh.) for trees, and number of stems for shrubs), and health. The survey will be repeated at project completion and year-5 post construction. Herbaceous vegetation under trees will be measured annually along transects as described above.

9.9 Uplands - Pond and Pond Edge

Water level and pond depth will be measured at the time of survey. Water quality will be visually assessed, focusing on water clarity, presence of debris, and identification of sheens. The data collection will continue annually for a period of three years post construction.

9.10 Reporting

Analysis of the monitoring plan data will be undertaken to understand how the shoreline and uplands area are evolving, identify trends in the data, review of performance standards, and make recommendations for future action. Wetland areas will be delineated and measured for area prior to final reporting and release from monitoring to ensure that they meet the required size listed in this plan. The delineation will be done according to the Corps' 87 manual and appropriate regional supplement.

This effort will provide much needed support to ensuring the project thrives and continues to function for many years. The report will be a single document compiling the findings from all the monitoring actions, with supporting data included as appendices. Reporting will be completed for a period of 5 years as required by the MI EGLE permit.

Table 9.1: Proposed Monitoring Schedule Summary

Monitoring Activity	Data Collected	Frequency	Performance Standard
Shoreline			
Shoreline Position	Transect profile points, aerial survey data	Yr. 1, 2 and 5 yrs. Post Construction	Shoreline profile reflects a stable profile.
Cobble Movement	Position of cobbles (coordinates)	Yr. 1, 2 and 5 yrs. Post Construction	Cobble movement is limited to 100 ft in a given year
Colonization	Survey of plankton colonization	Yr. 1, 2 and 5 yrs. Post Construction	Colonization occurs over 25 percent of wet area
Uplands			
Biomass Measurements	Percent of quadrat coverage per species or cover type	Annually for 5 yrs. Post Construction	Vegetation diversity, richness and abundance will increase each growing season following planting for a period of three years and will not decrease in subsequent years.
Survey	Position and elevation of landform and water surface elevation	Annually for 5 yrs. Post Construction	Wetlands do not decrease in size
Aerial Survey	Dune/swale position	Biennially for 4 yrs. Post Construction, then as needed	Dune/swale position is stable
Tree Survey	Type, diameter, height, dripline position	0 and 5 yrs. Post Construction	Loss of trees is less than 10 percent of population
Water Quality	Qualitative observation of water clarity, presence of debris and sheen	Annually for 3-yrs Post Construction, then as needed.	Water quality does not decrease post construction.

10. Long Term Management Plan

Once the performance standards are achieved, the work will involve annual site visits to review the site condition, comparing the results with previous visits, and preparing a factual report/checklist for City review and project records. The site visits will involve walking the entire shoreline and review of all upland components. The result will enable the City to confirm that the project performance is as expected as well as identify issues that need to be addressed. It is anticipated that these costs will be incorporated into the operating budget. The City of Marquette is solely responsible for management of the project site over the long term, including maintenance and remedial measures.

11. Adaptive Management Plan

Adaptive management is related to unforeseen changes in project conditions and will be coordinated and arranged for by the City of Marquette. The changes will be identified by the City during their regular, and as needed, site reviews. An example of changed condition involves very strong and extremely rare coastal storms, which will be addressed as follows:

Living Revetment – this would involve damage to the structure from an extremely rare storm. If this occurs, the City will undertake a visual review of the structure, post-storm. For areas which show a cobble movement that is greater than normal, a survey will be conducted to understand the profile change. Remedial action will involve placement of additional material and shaping with City equipment. Given the flexible nature of the Living Revetment, it is expected that the structure will be able to function during this time.

Uplands - this relates to uplands being damaged from extreme storms along the edge eastern edge of the site. Similar to the revetment, the City will conduct an assessment and take remedial action involving placing and re-establishing the pre-storm condition.

12. Financial Assurances

The City of Marquette will be financially responsible for the entire cost of implementing the mitigation plan, monitoring plan, maintenance, and reporting to the regulatory agencies. The City will incorporate the cost of this work within their planned budgets. The City has been highly active during the previous 25 years regarding the stewardship of its extensive park system and is fully capable of carrying out the work needed for a successful long-term outcome of this project. The City completely understands its obligations in implementing the efforts described above.

13. Conclusion

The unavoidable loss of 2.6 acres of Lake Superior bottomlands is in accordance with permitting statues and guidelines. A mitigation and monitoring plan is required to ensure that proposed measures are appropriate and can meet required thresholds for their long-term viability.

- Mitigation Plan - From review of the measures described above, it is clear that proposed mitigation more than compensates for the unavoidable loss of Lake Superior bottomlands. This approach will restore more than seven acres of high-quality habitat for a variety of native plants and animals for each acre of bottomland lost.
- Monitoring Plan - Monitoring of the mitigation will be rigorous and involve a planned campaign of scheduled field measurements, data analysis to define status and identify trends, annual reporting, and recommendation related to future actions, as described above.

Appendix A

Project Overview/Planting Plan and Species List

Table A.1: Dune

Scientific Name	Common Name
Perennials	
Ammophila breviligulata	Dune Grass

Table A.2: Great Lakes Barrens A

Scientific Name	Common Name
Grasses, Sedges, & Rushes	
Bouteloua curtipendula	Side-oats Grama
Bromus kalmii	Prairie Brome
Calamovilfa longifolia	Prairie Sand Reed
Elymus canadensis	Canada Wild Rye
Koeleria cristata	June Grass
Schizachyrium scoparium	Little Bluestem
Sporobolus heterolepis	Prairie Dropseed
Forbs	
Anemone virginiana	Tall Thimbleweed
Asclepias tuberosa	Butterfly Milkweed
Aster laevis	Smooth Blue Aster
Aster sagittifolius	Arrow-leaved Aster
Baptisia lactea	White Wild Indigo
Chamaecrista fasciculata	Partridge Pea
Coreopsis lanceolata	Lance-leaf Coreopsis
Desmodium illinoense	Prairie Tick Trefoil
Echinacea purpurea	Purple Coneflower
Eryngium yuccifolium	Rattlesnake Master
Kuhnia eupatorioides	False Boneset
Liatris aspera	Rough Blazing Star
Lupinus perennis	Lupine
Monarda fistulosa	Wild Bergamot
Penstemon digitalis	Foxglove Beardtongue
Dalea purpureum	Purple Prairie Clover
Potentilla arguta	Prairie Cinquefoil
Ratibida pinnata	Yellow Coneflower

Scientific Name	Common Name
Rudbeckia hirta	Black-eyed Susan
Solidago rigida	Stiff Goldenrod
Tradescantia ohiensis	Common Spiderwort
Verbena stricta	Hoary Vervain
Zizia aptera	Prairie Golden Alexander
Shrubs	
Arctostaphylos uva-ursi	Kinnikinnick Bearberry
Aronia prunifolia	Purple Chokeberry
Corylus americana	Hazelnut
Gaylussacia baccata	Black Huckleberry
Juniperus horizontalis	Creeping Juniper
Prunus pumila	Sand Cherry
Salix cordata	Sand Dune Willow
Perennials	
Arabis lyrata	Lyrate Rockcress
Artemisia ludoviciana	White Sage
Asclepias tuberosa	Butterfly Milkweed
Calamovilfa longifolia	Prairie Sandreed
Coreopsis lanceolata	Lance-leaf Coreopsis
Echinacea purpurea	Purple Coneflower
Lathyrus japonicus	Beach Pea
Liatris aspera	Liatris
Pteridium aquilinum	Western Bracken Fern
Schizachyrium scoparium	Little Bluestem
Temporary Cover Crop	
Lolium multiflorum	Annual Ryegrass
Avens sativa	Oats

Table A.3: Great Lakes Barrens B

Scientific Name	Common Name
Grasses, Sedges, & Rushes	
Bouteloua curtipendula	Side-oats Grama
Carex bicknellii	Bicknell's Sedge

Scientific Name	Common Name
Carex molesta	Field Oval Sedge
Elymus canadensis	Canada Wild Rye
Koeleria cristata	June Grass
Schizachyrium scoparium	Little Bluestem
Sporobolus heterolepis	Prairie Dropseed
Forbs	
Agastache scrophulariaefolia	Purple Giant Hyssop
Amorpha canescens	Leadplant
Asclepias syriaca	Common Milkweed
Asclepias tuberosa	Butterfly Milkweed
Aster laevis	Smooth Blue Aster
Aster novae-angliae	New England Aster
Chamaecrista fasciculata	Partridge Pea
Coreopsis lanceolata	Lance-leaf Coreopsis
Echinacea purpurea	Purple Coneflower
Eryngium yuccifolium	Rattlesnake Master
Liatris aspera	Rough Blazing Star
Liatris spicata	Marsh Blazing Star
Lupinus perennis	Lupine
Monarda fistulosa	Wild Bergamot
Penstemon digitalis	Foxglove Beardtongue
Dalea purpureum	Purple Prairie Clover
Pycnanthemum tenuifolium	Slender Mountain Mint
Ratibida pinnata	Yellow Coneflower
Rudbeckia fulgida	Orange Coneflower
Rudbeckia hirta	Black-eyed Susan
Silphium terebinthinaceum	Prairie Dock
Solidago rigida	Stiff Goldenrod
Vernonia gigantea	Tall Ironweed
Zizia aurea	Golden Alexander
Temporary Cover Crop	
Lolium multiflorum	Annual Ryegrass
Avens sativa	Oats

Table A.4: Great Lakes Barrens C

Scientific Name	Common Name
Grasses, Sedges, & Rushes	
Bouteloua curtipendula	Side-oats Grama
Calamagrostis canadensis	Bluejoint Grass
Carex comosa	Bristly Sedge
Carex molesta	Field Oval Sedge
Carex vulpinoidea	Fox Sedge
Elymus canadensis	Canada Wild Rye
Elymus virginicus	Virginia Wild Rye
Juncus effusus	Soft Rush
Koeleria cristata	June Grass
Leersia oryzoides	Rice Cut Grass
Panicum virgatum	Switchgrass
Schizachyrium scoparium	Little Bluestem
Scirpus atrovirens	Dark Green Bulrush
Scirpus cyperinus	Wool Grass
Spartina pectinata	Prairie Cordgrass
Sporobolus heterolepis	Prairie Dropseed
Forbs	
Asclepias incarnata	Swamp Milkweed
Aster laevis	Smooth Blue Aster
Aster novae-angliae	New England Aster
Bidens cernua	Nodding Bur Marigold
Boltonia asteroides	False Aster
Cassia hebecarpa	Wild Senna
Chamaecrista fasciculata	Partridge Pea
Coreopsis lanceolata	Lance-leaf Coreopsis
Dalea purpurea	Purple Prairie Clover
Echinacea purpurea	Purple Coneflower
Eryngium yuccifolium	Rattlesnake Master
Eupatorium maculatum	Joe Pye Weed
Helenium autumnale	Sneezeweed
Helianthus grosserratus	Saw-toothed Sunflower
Hypericum pyramidatum	Great St. John's Wort

Scientific Name	Common Name
Iris virginica	Southern Blue Flag Iris
Liatris spicata	Marsh Blazing Star
Lobela siphilitica	Great Blue Lobelia
Lupinus perennis	Lupine
Lycopus americanus	Water Horehound
Mimulus ringens	Monkey Flower
Monarda fistulosa	Wild Bergamot
Penstemon digitalis	Foxglove Beardtongue
Pycnanthemum virginianum	Mountain Mint
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-eyed Susan
Silphium terebinthinaceum	Prairie Dock
Solidago riddellii	Riddell's Goldenrod
Verbena hastata	Blue Vervain
Zizia aurea	Golden Alexander
Shrubs	
Amelanchier alnifolia	Saskatoon Serviceberry
Arctostaphylos uva-ursi	Kinnikinnick Bearberry
Aronia prunifolia	Purple Chokeberry
Corylus americana	Hazelnut
Potentilla fruticosa	Shrubby Cinquefoil
Salix cordata	Sand Dune Willow
Vaccinium myrtilloides	Velvet Leaf Huckleberry
Temporary Cover Crop	
Lolium multiflorum	Annual Ryegrass
Avens sativa	Oats

Table A.5: Great Lakes Marsh

Scientific Name	Common Name
Grasses, Sedges, & Rushes	
Bromus ciliatus	Fringed Brome
Calamagrostis canadensis	Bluejoint Grass
Carex bebbii	Bebb's Oval Sedge

Scientific Name	Common Name
Carex comosa	Bristly Sedge
Carex hystericina	Porcupine Sedge
Carex vulpinoidea	Fox Sedge
Elymus virginicus	Virginia Wild Rye
Juncus effusus	Soft Rush
Leersia oryzoides	Rice Cut Grass
Panicum virgatum	Switchgrass
Poa palustrus	Fowl Bluegrass
Scirpus atrovirens	Dark Green Bulrush
Scirpus cyperinus	Wool Grass
Spartina pectinata	Prairie Cordgrass
Forbs	
Actinomeris alternifolia	Wingstem
Angelica atropurpurea	Angelica
Asclepias incarnata	Swamp Milkweed
Aster novae-angliae	New England Aster
Aster puniceus	Swamp Aster
Bidens cernua	Nodding Bur Marigold
Boltonia asteroides	False Aster
Cassia hebecarpa	Wild Senna
Eupatorium maculatum	Joe Pye Weed
Eupatorium perfoliatum	Boneset
Helenium autumnale	Sneezeweed
Helianthus grosserratus	Saw-toothed Sunflower
Hypericum pyramidatum	Great St. John's Wort
Iris virginica	Southern Blue Flag Iris
Liatris spicata	Marsh Blazing Star
Lobela siphilitica	Great Blue Lobelia
Ludwigia alternifolia	Seedbox
Lycopus americanus	Water Horehound
Mimulus ringens	Monkey Flower
Monarda fistulosa	Wild Bergamot
Penstemon digitalis	Foxglove Beardtongue
Physotegia virginiana	Obedient Plant

Scientific Name	Common Name
Pycnanthemum virginianum	Mountain Mint
Rudbeckia hirta	Black-eyed Susan
Rudbeckia laciniata	Golden Glow
Rumex orbiculatus	Green Water Dock
Silphium terebinthinaceum	Prairie Dock
Solidago riddellii	Riddell's Goldenrod
Verbena hastata	Blue Vervain
Zizia aurea	Golden Alexander
Shrubs	
Betula pumila	Bog Birch
Cornus stolonifera	Red Osier Dogwood
Myrica gale	Sweetgale
Salix serissima	Autumn Willow
Vaccinium macrocarpon	Cranberry
Salix cordata	Sand Dune Willow
Vaccinium myrtilloides	Velvet Leaf Huckleberry
Perennials	
Carex stricta	Tussock Sedge
Carex lasiocarpa	Woollyfruit Sedge
Cladium mariscoides	Smooth Sawgrass
Comptonia peregrina	Sweet Fern
Hierochloe hirta	Northern Sweetgrass
Iris lacustris	Dwarf Lake Iris
Juncus balticus	Baltic Rush
Schoenoplectus acutus	Hardstem Bulrush
Sparganium natans	Small Bur-reed
Spiraea alba	Meadowsweet
Thelypteris palustris	Marsh Fern
Triglochin maritima	Seaside arrowgrass
Temporary Cover Crop	
Lolium multiflorum	Annual Ryegrass
Avens sativa	Oats

Table A.6: Emergent Plugs

Scientific Name	Common Name
Perennials	
Calamagrostis canadensis	Bluejoint Grass
Iris lacustris	Dwarf Lake Iris
Schoenoplectus acutus	Hardstem Bulrush
Schoenoplectus americanus	Chainmaker's Bulrush
Spiraea alba	Meadowsweet
Sparganium natans	Small Bur-reed

Table A.7: Trees

Scientific Name	Common Name
Abies balsamea	Balsam
Acer rubrum	Red Maple
Acer saccharum	Sugar Maple
Betula papyrifera	Paper Birch
Pinus resinosa	Red Pine
Pinus strobus	Eastern White Pine
Populus balsamifera	Balsam Poplar
Populus grandidentata	Bigtooth Aspen
Quercus rubra	Northern Red Oak
Thuja occidentalis	Eastern White Ceda

KEY MAP

COORDINATE TABLE/NOTES

1. UTILITIES LINEWORK BASED ON PHASE 1 AS-BUILT DRAWINGS PROVIDED BY THE CITY OF MARQUETTE. REFER TO SHEETS C-102, C-103, AND C-104 FOR DETAILED UTILITY INFORMATION.
2. GROUNDWATER PLUME DEFINITION: AN APPROXIMATE PLAN AREA WHERE ONE OR MORE CONTAMINANTS SOMEWHERE IN THE GROUNDWATER COLUMN LIKELY EXCEED ONE OR MORE PART 201 CRITERIA.
3. HORIZONTAL DATUM IS IN FEET RELATIVE TO THE MARQUETTE CITY DATUM.
4. VERTICAL DATUM IS IN FEET RELATIVE TO THE INTERNATIONAL GREAT LAKES DATUM OF 1985 (IGLD85). IGLD85 ELEVATIONS CONVERSION TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) IS ELEVATION IGLD85 + 0.002 FEET = ELEVATION NAVD88. CONVERSION SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) ONLINE VERTICAL DATUM TRANSFORMATION TOOL.

LAKE SUPERIOR
SOUTH OUTFALL BERM
REINFORCED DUNE EXTENSION
LIVING REVETMENT
SOUTH CONTROL STRUCTURE
CONSTRUCTION LIMITS
STORMWATER SHORELINE RECESS
STORMWATER SHORELINE RECESS
3+22
5+00
6+00
PINE ST
EXISTING WETLAND
15+00
SURVEY CONTROL LINE
20+00
10+00
EXISTING MULTI-USE TRAIL
25+00
EXISTING STORMWATER DETENTION POND
30+00
CONSTRUCTION LIMITS
EMERGENT HABITAT - EDGE OF POND
35+00
41+64
40+00
PEDESTRIAN TRAIL
EXISTING GROUNDWATER PLUME
SHORELINE OVERLOOK
GREAT LAKES MARSH
EXISTING PARKING LOTS
NORTH OUTFALL PROTECTION
EXISTING HERBACEOUS GROUNDCOVER MANAGEMENT
GREAT LAKES BARRENS - ZONE C
GREAT LAKES BARRENS - ZONE A & B
DUNE
EXISTING LAKE SHORE BOULEVARD
EXISTING MULTI-USE TRAIL
HAWLEY ST
PRESQUE ISLE AVE
WRIGHT ST

LEGEND

GROUNDWATER PLUME		DUNE - RIDGES, OPEN DUNE	
EXISTING WETLAND		GREAT LAKES BARRENS - ZONES A & B	
EXISTING WATER MAIN	W	GREAT LAKES BARRENS - ZONES C	
EXISTING SANITARY SEWER	SAN	GREAT LAKES MARSH	
EXISTING STORM SEWER	STM	EMERGENT HABITAT	
EXISTING PROPERTY LINE		EXISTING HERBACEOUS GROUNDCOVER MANAGEMENT	

0 200 400
SCALE = 1:200
FEET

BID DOCUMENTS

REVISIONS

(PH) PHASE OF ISSUE: (A) PRELIMINARY (B) DESIGN (C) PERMIT (D) TENDER (E) CONSTRUCTION (F) RECORD

PH	REV	DESCRIPTION	DRN	DSN	APR	QCM	YYYY-MM-DD
D	1	BID DOCUMENTS	PST	JID	MJC	–	2022-02-21
D	2	REVISED LAYOUT	MM	MJC	MJC	–	2023-10-20

PREPARED FOR: MARQUETTE TWP MICHIGAN FOUNDED 1843 — SUPERIOR WATERSHED PARTNERSHIP and LAND CONSERVANCY

PREPARED BY: Baird.
IN ASSOCIATION WITH: res Foth

MARQUETTE LS SHORELINE RESTORATION

PROJECT OVERVIEW PLAN

ISSUE NUMBER:
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