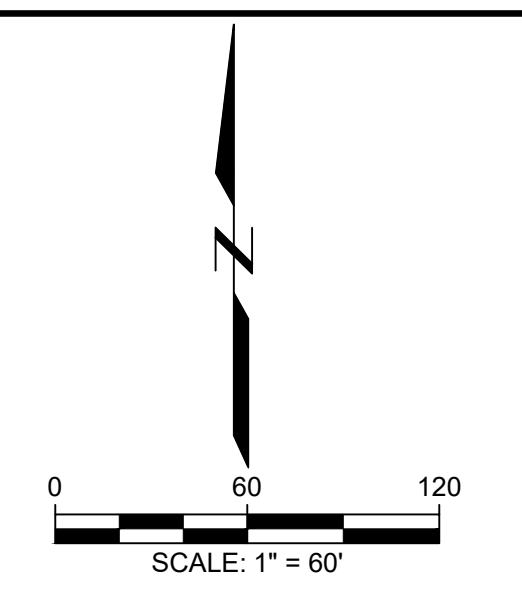


SHORELINE ENHANCEMENT
NOT TO SCALE



LEGEND

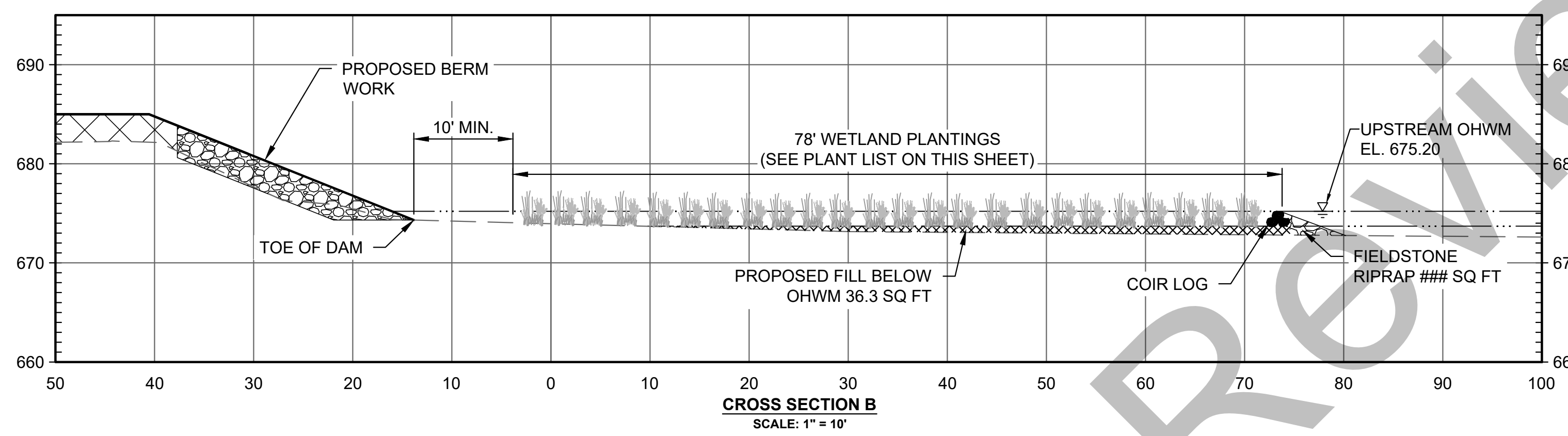
- ORDINARY HIGH WATER MARK (OHWM)
- PARCEL BOUNDARY
- PROPOSED STORM SEWER, CULVERTS, AND SEEPAGE TILES
- PROPOSED RIPRAP
- PROPOSED LIMITS OF DAM CONSTRUCTION
- ACCESS DRIVE
- PROPOSED RE-GRADE AREA
- PROPOSED EMBANKMENT SLOPES
- PROPOSED TOP OF EMBANKMENT IMPROVEMENTS
- PROPOSED SHORELINE ENHANCEMENT AREA
- EXISTING/PROPOSED LAYDOWN AREA

NOTES:

1. COIR LOGS:
 - A. INSTALLATION: 3 - 12" DIAMETER LOGS.
 - B. MATERIAL: COCONUT FIBER.
 - C. 10 FT LENGTH LOGS - TOTAL OF 320 FEET. (APPROXIMATELY 32 COIR LOGS).
 - D. STAKING: INSTALL A STAKE ON EACH END OF COIR LOG AND THEN 2 EVERY 5 FEET (AT 45° ANGLES).
3. BIOLOGIST AND ENGINEER MUST BE PRESENT DURING SHORELINE ENHANCEMENT INSTALLATION.

PLANTING LIST (SPECIES TO BE PLANTED)

Scientific Name	Common Name	Planting Location	Type
<i>Acorus americanus</i>	Sweet Flag	Near shore 1-2 inch water depth	Bare root and/or seed
<i>Alisma subcordatum</i>	Water Plantain	2-6 inch water depth	Bare root and/or seed
<i>Decodon verticillatus</i>	Swamp Loosestrife	1-4 inch depth	Bare root and/or seed
<i>Cephalanthus occidentalis</i>	Buttonbush	10 feet on center at shore	Bare root
<i>Eleocharis palustris</i>	Spikrush	4 to 18 inch depth	Bare root and/or seed
<i>Iris versicolor</i>	Blue Flag Iris	Near shore 1-2 inch water depth	Bare root and/or seed
<i>Pontederia cordata</i>	Pickeral Weed	1-3 inch water depth	Plugs and/or seed
<i>Sagittaria latifolia</i>	Arrowhead	1-6 inches water depth	Plugs and/or seed
<i>Schoenoplectus tabernaemontani</i>	Bullrush	4 to 18 inch depth	Bare root and/or seed
<i>Sparganium eurycarpum</i>	Bur-reed	2-4 inch water depth	Potted and/or seed
<i>Zizania aquatica</i>	Wild Rice	10 to 18 inch water depth	Bare root and/or seed



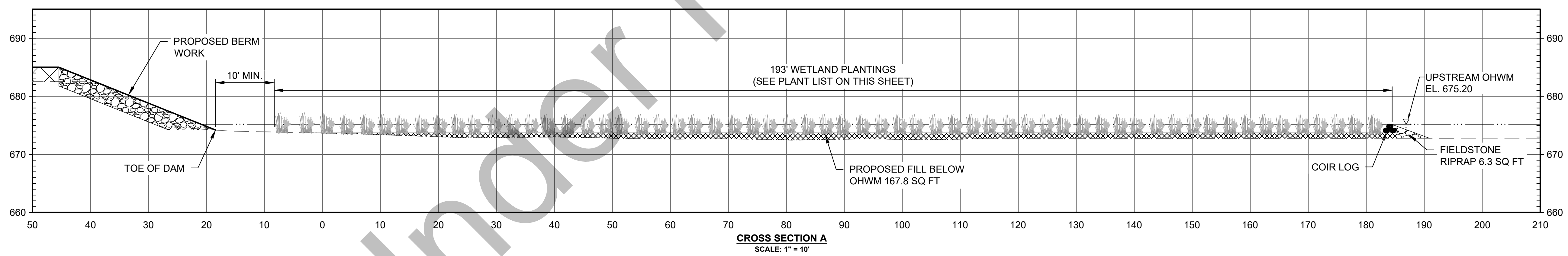
CROSS SECTION B
SCALE: 1" = 10'

PROPOSED IMPACTS BELOW OHWM

IMPACT TYPE ¹ (P/T)	IMPACT WATER BODY	MATERIAL TYPE	CUT AREA			FILL AREA			NET FILL		
			AVERAGE LENGTH (FT) X WIDTH (FT) X DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	AVERAGE LENGTH (FT) X WIDTH (FT) X DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)			
P	LAKE	NATIVE FILL				848.3' x 122.3' x 0.8'	82,998	3,074	3,074		
P	LAKE	FIELDSTONE RIPRAP				848.3' x 5' x 1.3'	5514	204	204		
P	LAKE	COIR LOG				848.3' x 2' x 1.5'	2,545	94	94		
TOTAL CUT			0	0		TOTAL FILL			91,057	3,372	3,372

NOTES:
1. IMPACT TYPE: P - PERMANENT, T - TEMPORARY

TOTAL PERMANENT LAKE FILL IMPACT: 91,057 CU. FT / 3,372 CU YD



CROSS SECTION A
SCALE: 1" = 10'

- NOTES:**
1. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
 2. HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83), MICHIGAN STATE PLANE, CENTRAL ZONE, INTERNATIONAL FEET

NO.	DATE	ISSUE/REVISION	APP
0	10/25/2023	100% DESIGN - ISSUED FOR PERMIT	BMB
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0	5/5/2023	100% DESIGN - ISSUED FOR PERMIT	BMB
0	4/21/2023	100% DESIGN - ISSUED FOR BID	BMB

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SAGINAW OFFICE
230 S. Washington Ave.
Saginaw, MI 48607 Tel.
989-754-4717 Fax.
989-754-4440
www.SpicerGroup.com

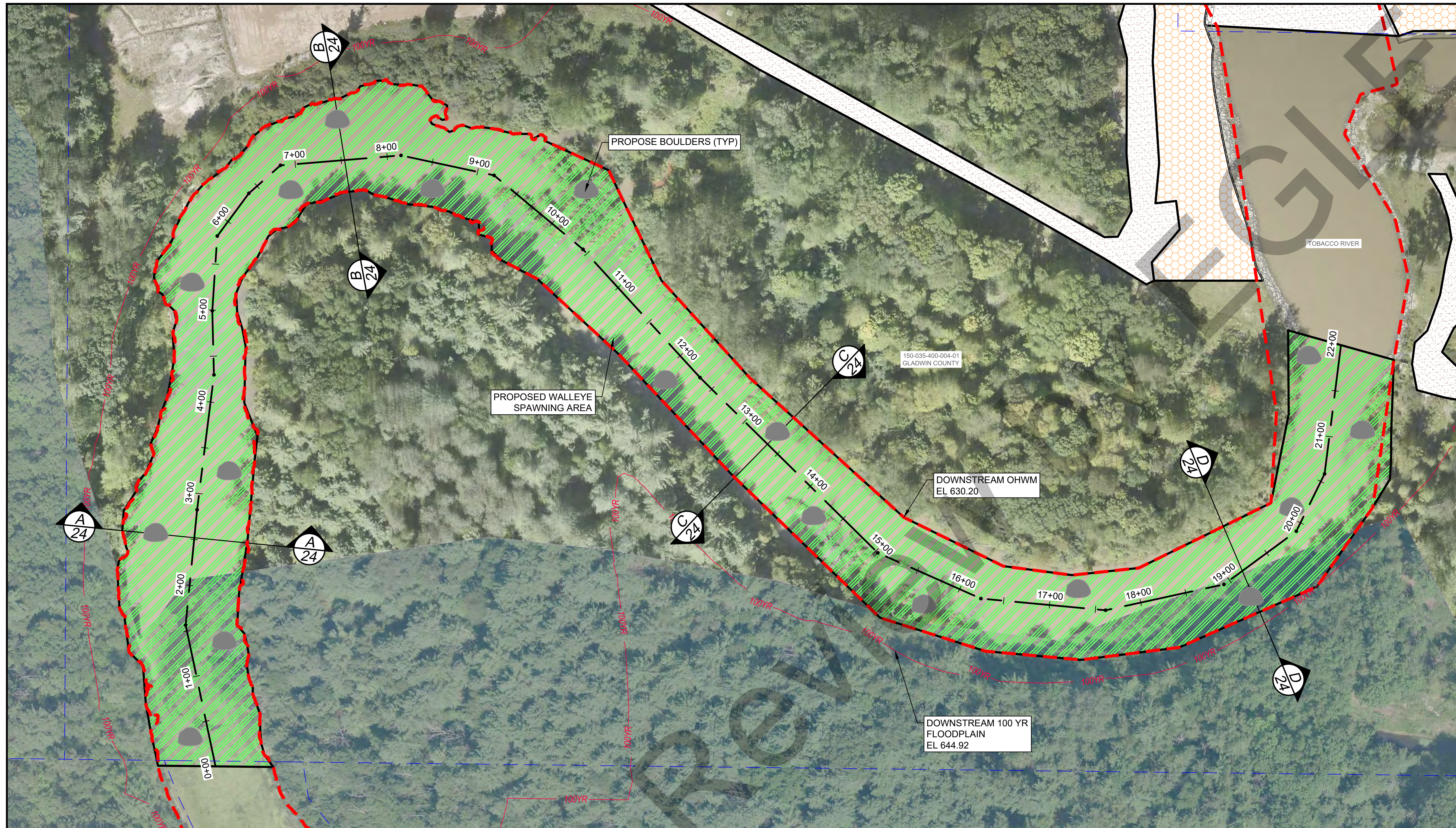
GEI Consultants
GEI CONSULTANTS OF MICHIGAN, P.C.
230 N. WASHINGTON SQUARE
SUITE 201
LANSING, MI 48933
(517)803-4600

Designed: POC
Checked: BMB
Drawn: CBS
Approved By: RBH

Four Lakes Task Force
GEI Project 2002879
SPICER GROUP Project 126234SG2018

Edenville Dam
Gladwin County, Michigan
PART 301 PROPOSED SHORELINE ENHANCEMENT

DWG. NO.
P-21
SHEET NO.
-



LEGEND

- ORDINARY HIGH WATER MARK (OHWM)
- PARCEL BOUNDARY
- 100YR 100 YEAR FLOODPLAIN BOUNDARY
- PROPOSED STORM SEWER, CULVERTS, AND SEEPAGE TILES
- ACCESS DRIVE
- PROPOSED SPAWNING AREA
- EXISTING/PROPOSED LAYDOWN AREA

NOTES:

- SUBSTRATE SPAWNING STONE TO CONSIST OF THE FOLLOWING:
 - A. 50% RUBBLE (ROCK SIZE 65-255 MM)
 - B. 50% GRAVEL (ROCK SIZE 2-65 MM)
 *NOTE - GRAVEL TO BE PLACED ON TOP OF RUBBLE. SUBSTRATE SPAWNING STONE (RUBBLE AND GRAVEL) TO BE PLACED WITHIN ENTIRE SHADED "PROPOSED SPAWNING AREA".
- BOULDERS (ROCK SIZE ± 48") TO BE PLACED AS SHOWN IN PLAN VIEW.
- BIOLOGIST AND ENGINEER MUST BE PRESENT DURING SPAWNING AREA INSTALLATION.

PROPOSED IMPACTS BELOW 100 YR FLOODPLAIN

IMPACT TYPE ² (P/T)	MATERIAL TYPE	AVERAGE LENGTH (FT) X WIDTH (FT) X DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	FILL AREA			NET FILL CUBIC YARDS (YD ³)
					AVERAGE LENGTH (FT) X WIDTH (FT) X DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	
P	SPAWNING SUBSTRATE: BOULDERS				100' x 100' x 2'	20,000	741	741
TOTAL PERMANENT IMPACT		TOTAL CUT	0	0	TOTAL FILL	20,000	741	741

NOTES:
 1. THE LENGTH, WIDTH AND DEPTH ARE TAKEN AS AVERAGES
 2. IMPACT TYPE: P - PERMANENT, T - TEMPORARY
 3. DIMENSIONS ARE FOR THE WORK BETWEEN THE 100 YEAR FLOODPLAIN ELEVATION AND THE OHWM. WORK BELOW THE OHWM IS NOT INCLUDED IN THE TABLE.

TOTAL PERMANENT FLOODPLAIN FILL IMPACT: 20,000 CU FT / 741 CU YD
 NOTE: TOTAL IMPACT VOLUME EXCLUDES ALL RIPRAP

PROPOSED IMPACTS BELOW OHWM

IMPACT TYPE ¹ (P/T)	IMPACT WATER BODY	MATERIAL TYPE	CUT AREA			FILL AREA			NET FILL CUBIC YARDS (YD ³)
			AVERAGE LENGTH (FT) X WIDTH (FT) X DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	AVERAGE LENGTH (FT) X WIDTH (FT) X DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	
P	RIVER	SPAWNING SUBSTRATE: RUBBLE				2200' x 67.3' x 0.9'	133,254	4,935	4,935
P	RIVER	SPAWNING SUBSTRATE: GRAVEL				2200' x 67.3' x 0.9'	133,254	4,935	4,935
P	RIVER	SPAWNING SUBSTRATE: BOULDERS				100' x 100' x 2'	20,000	741	741
TOTAL CUT			0	0		TOTAL FILL	286,508	10,611	10,611

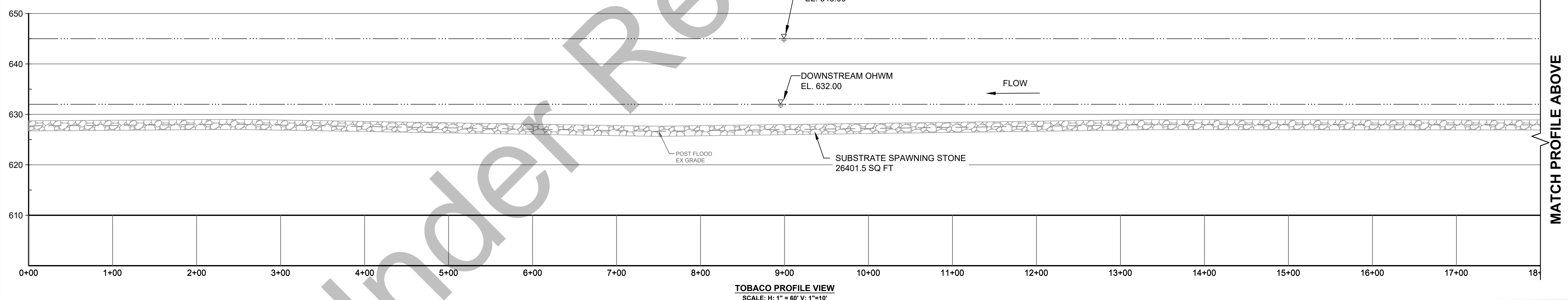
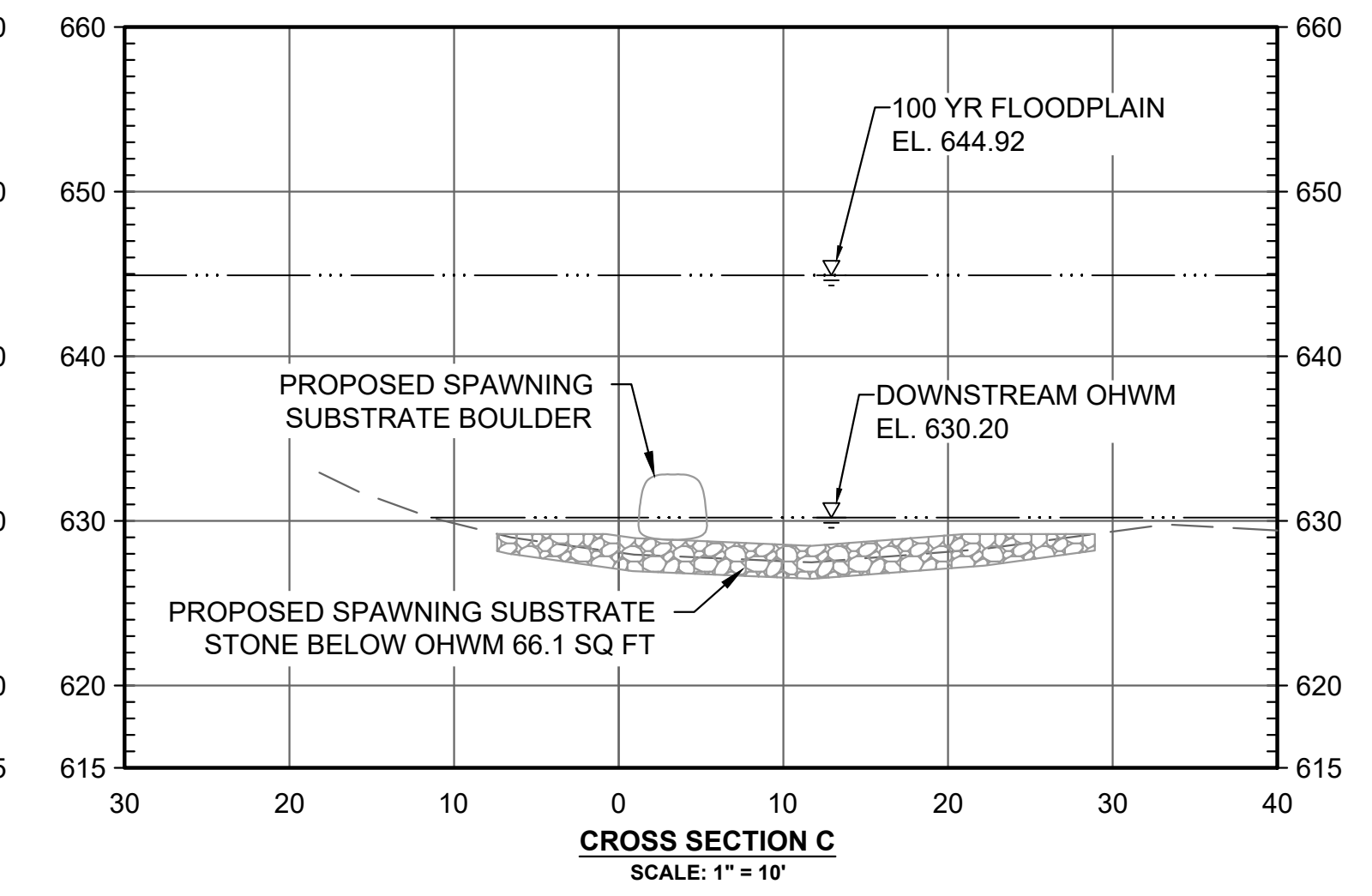
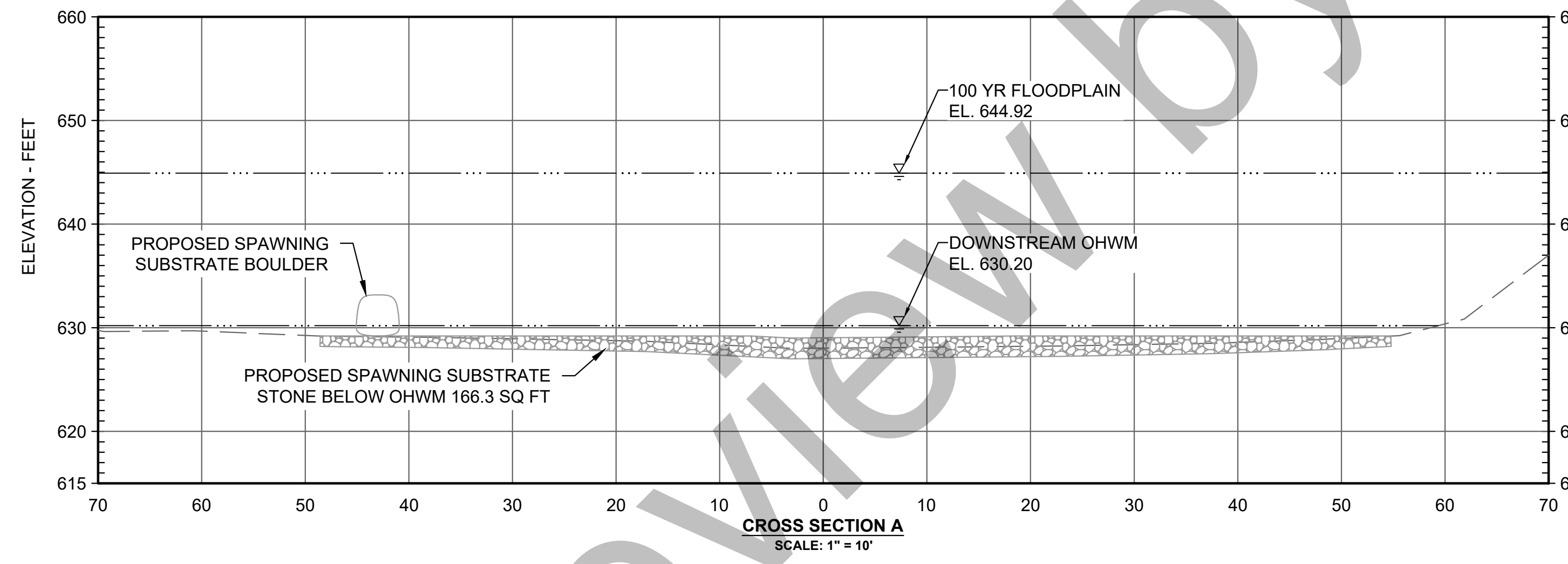
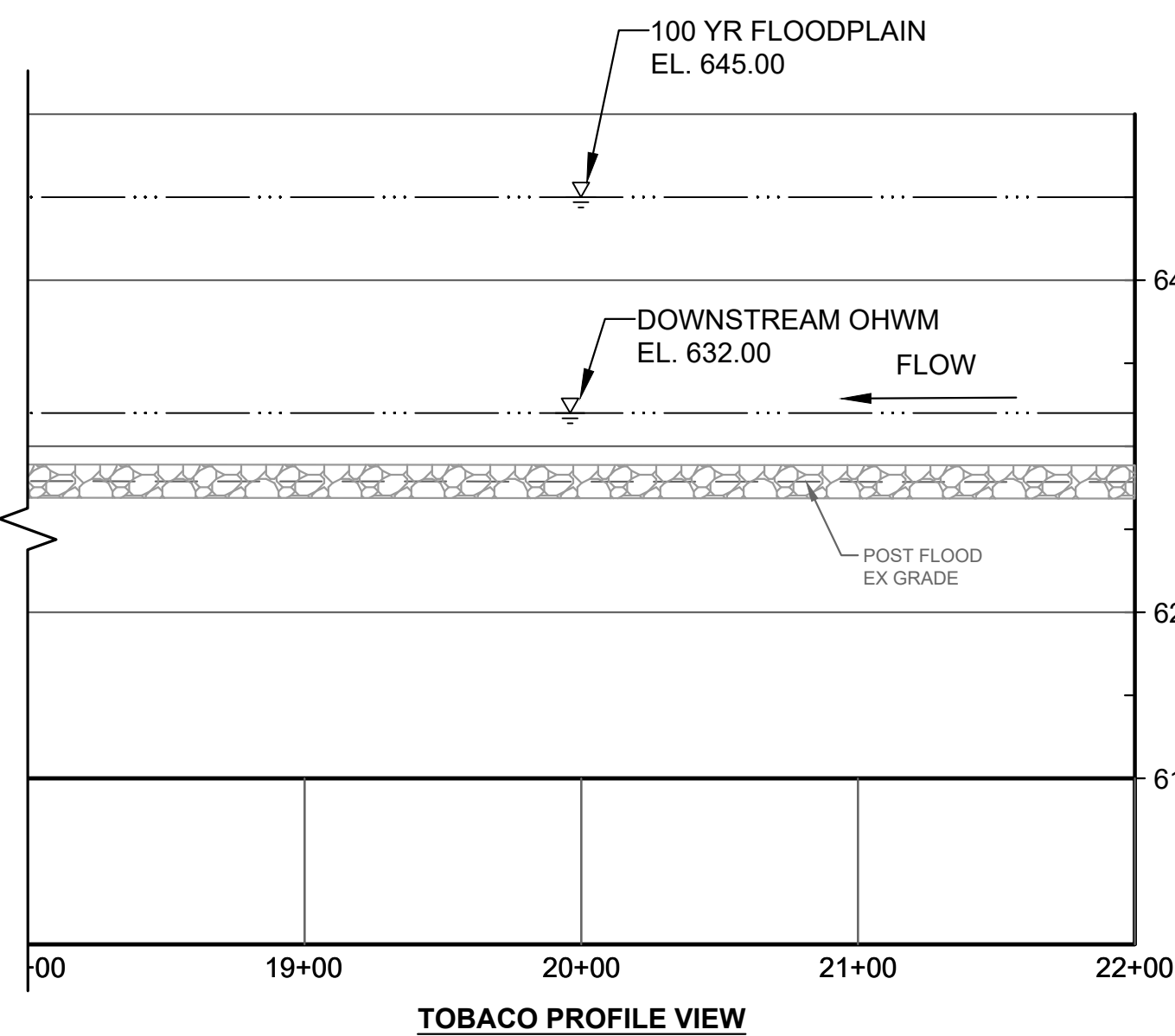
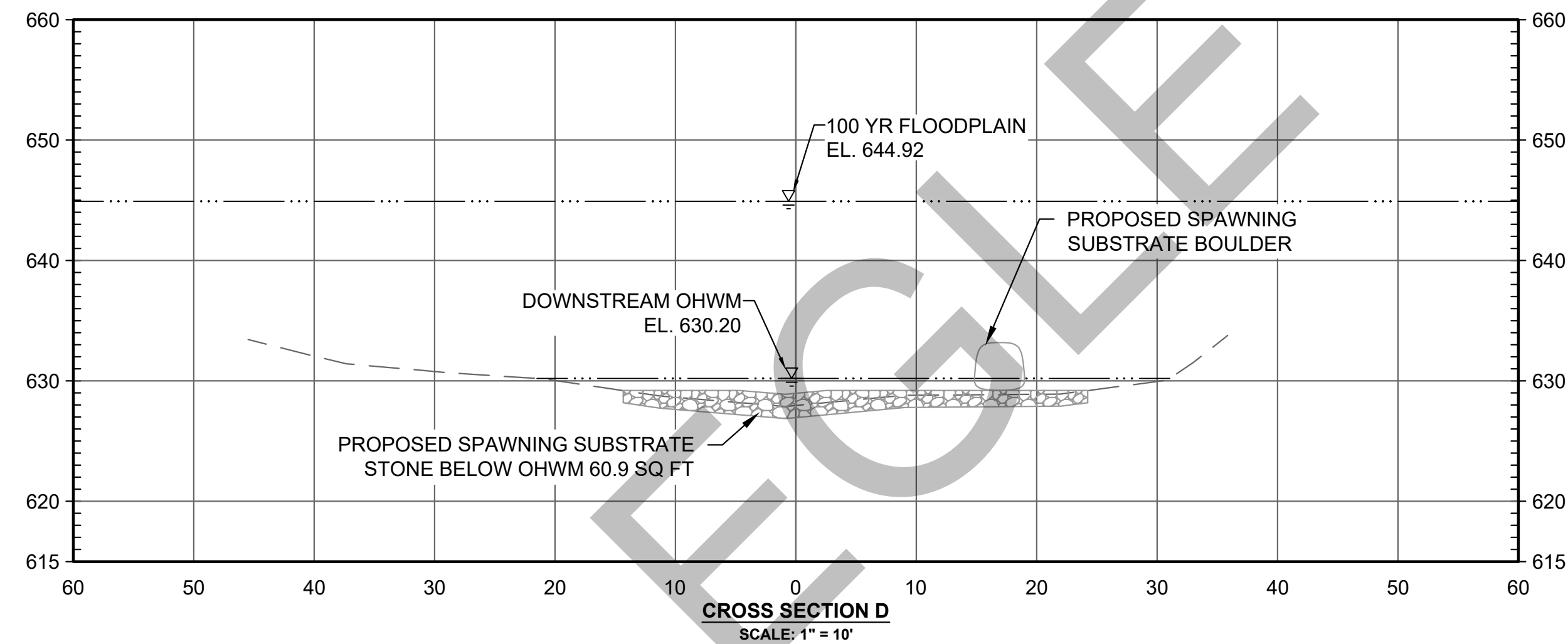
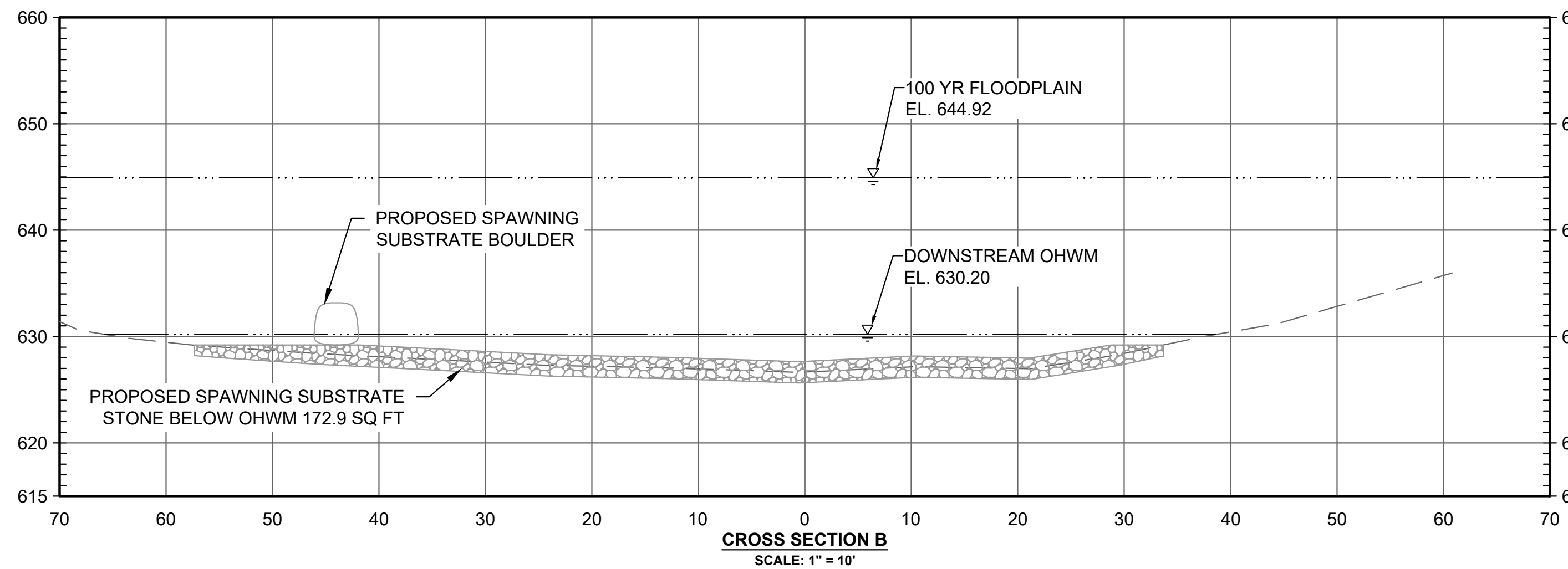
NOTES:
 1. IMPACT TYPE: P - PERMANENT, T - TEMPORARY

TOTAL PERMANENT RIVER FILL IMPACT: 286,508 CU FT / 10,611 CU YD

NOTES:
 1. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
 2. HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83), MICHIGAN STATE PLANE, CENTRAL ZONE, INTERNATIONAL FEET

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0	4/21/2023	100% DESIGN - ISSUED FOR BID	BMB

 SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48807 Tel. 989-754-4717 Fax. 989-754-4440 www.SpicerGroup.com	 GEI CONSULTANTS OF MICHIGAN, P.C. SUITE 201 230 N. WASHINGTON SQUARE LANSING, MI 48933 (517)803-4600	Designed: POC	Edenville Dam Gladwin County, Michigan Four Lakes Task Force GEI Project 2002879 SPICER GROUP Project 126234SG2018	DWG. NO. P-23
		Checked: BMB		SHEET NO. -
		Drawn: CBS		
		Approved By: RBH		



NOTES:
1. UPSTREAM OHWM EL. 675.20, DOWNSTREAM OHWM EL. 630.20, TOBACCO RIVER 100 YR FLOODPLAIN EL. 644.92, AND TITTABAWASSEE RIVER 100 YR FLOODPLAIN EL. 645.00.

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0	4/21/2023	100% DESIGN - ISSUED FOR BID	BMB

Attention:
0 10/25/2023 100% DESIGN - ISSUED FOR PERMIT BMB
0 8/25/2023 RIVER AND SHORELINE RESTORATION BMB
0 6/30/2023 100% DESIGN - ISSUED FOR CONSTRUCTION BMB
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0 4/21/2023 100% DESIGN - ISSUED FOR BID BMB

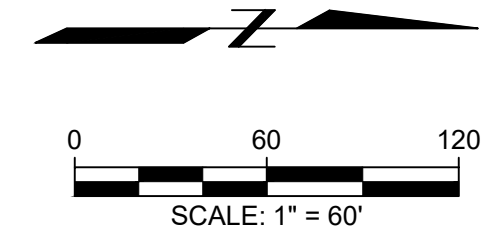
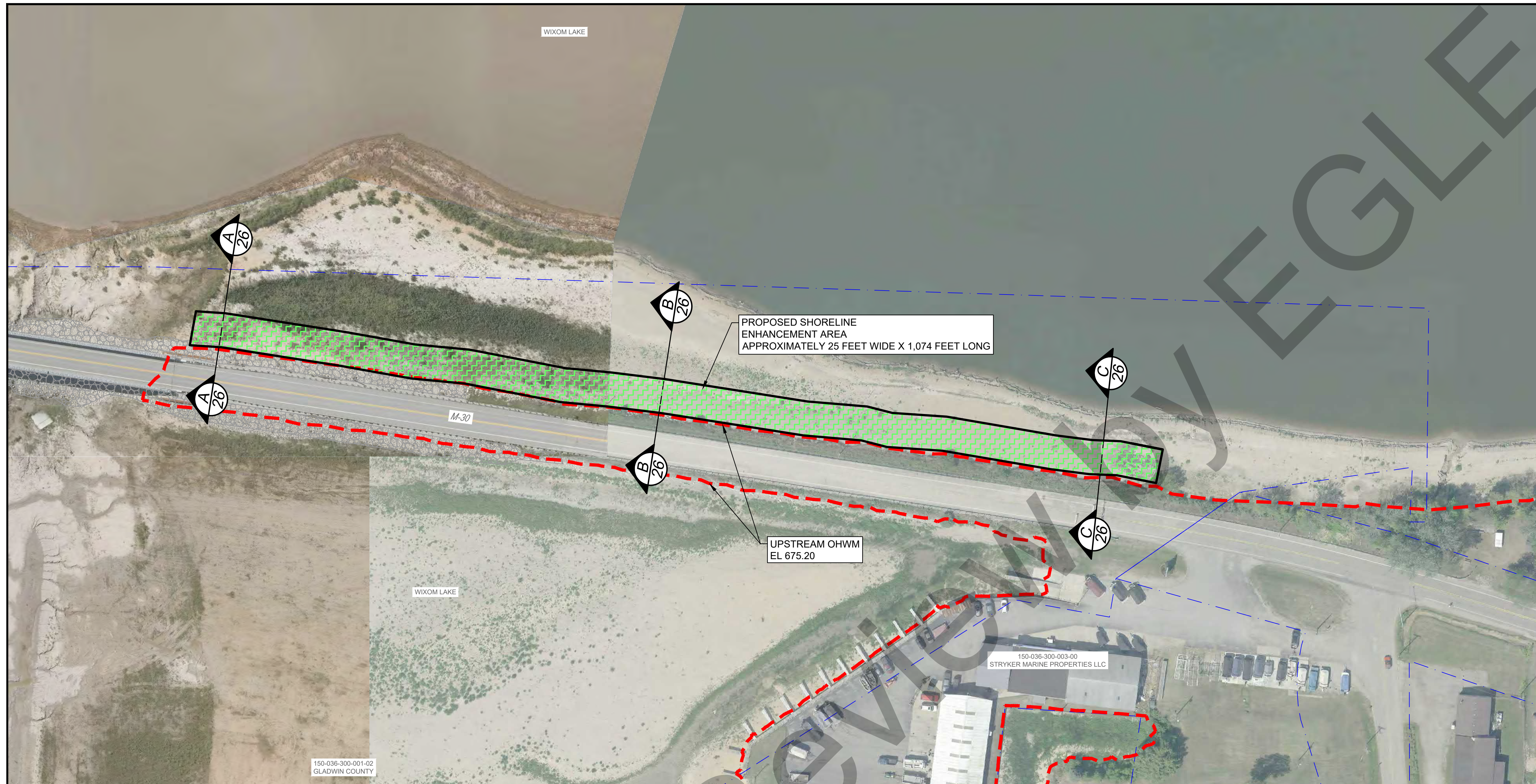


Designed: POC
Checked: BMB
Drawn: CBS
Approved By: RBH

Four Lakes Task Force
GEI Project 2002879
SPICER GROUP Project 126234SG2018

Edenville Dam
Gladwin County, Michigan
PARTS 31 & 301 FISH SPAWNING
PROFILE AND CROSS SECTIONS

DWG. NO.
P-24
SHEET NO.
-



LEGEND

- - - ORDINARY HIGH WATER MARK (OHWM)
- - - PARCEL BOUNDARY
- PROPOSED SHORELINE ENHANCEMENT AREA

SHORELINE ENHANCEMENT
SCALE 1" = 60'

PROPOSED IMPACTS BELOW OHWM

IMPACT TYPE ¹ (P/T)	IMPACT WATER BODY	MATERIAL TYPE	CUT AREA			FILL AREA			NET FILL CUBIC YARDS (YD ³)
			AVERAGE LENGTH (FT) X WIDTH (FT) X DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	AVERAGE LENGTH (FT) X WIDTH (FT) X DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	
P	LAKE	FIELDSTONE RIPRAP				1074' x 11.8' x 1.7'	21,544	798	798
P	LAKE	COIR LOGS				1074' x 2' x 1.5'	3,222	119	119
P	LAKE	TOPSOIL				1074' x 25' x 2'	53,700	1,989	1,989
			TOTAL CUT	0	0	TOTAL FILL	78,466	2,906	2,906

TOTAL PERMANENT RIVER FILL IMPACT: 286,508 CU FT / 10,611 CU YD

- NOTES:**
1. IMPACT TYPE: P - PERMANENT, T - TEMPORARY

NOTES:

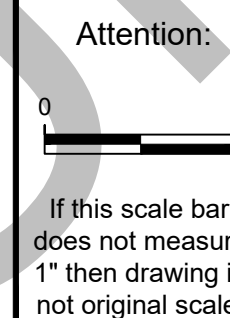
- COIR LOGS:
 - INSTALLATION: 3 - 12" DIAMETER LOGS.
 - MATERIAL: COCONUT FIBER.
 - 10 FT LENGTH LOGS - TOTAL OF 1,074 FEET. (APPROXIMATELY 32 COIR LOGS).
 - STAKING: INSTALL A STAKE ON EACH END OF COIR LOG AND THEN 2 EVERY 5 FEET (AT 45° ANGLES).
- BIOLOGIST AND ENGINEER MUST BE PRESENT DURING SHORELINE ENHANCEMENT INSTALLATION.

PLANTING LIST (SPECIES TO BE PLANTED)

Scientific Name	Common Name	Planting Location	Type
<i>Acorus americanus</i>	Sweet Flag	Near shore 1-2 inch water depth	Bare root and/or seed
<i>Alisma subcordatum</i>	Water Plantain	2 -6 inch water depth	Bare root and/or seed
<i>Decodon verticillatus</i>	Swamp Loostrife	1-4 inch depth	Bare root and/or seed
<i>Cephalanthus occidentalis</i>	Buttonbush	10 feet on center at shore	Bare root
<i>Eleocharis palustris</i>	Spikrush	4 to 18 inch depth	Bare root and/or seed
<i>Iris versicolor</i>	Blue Flag Iris	Near shore 1-2 inch water depth	Bare root and/or seed
<i>Pontederia cordata</i>	Pickeral Weed	1-3 inch water depth	Plugs and/or seed
<i>Sagittaria latifolia</i>	Arrowhead	1-6 inches water depth	Plugs and/or seed
<i>Schoenoplectus tabernaemontani</i>	Bullrush	4 to 18 inch depth	Bare root and/or seed
<i>Sparganium eurycarpum</i>	Bur-reed	2-4 inch water depth	Potted and/or seed
<i>Zizania aquatica</i>	Wild Rice	10 to 18 inch water depth	Bare root and/or seed

- NOTES:**
1. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
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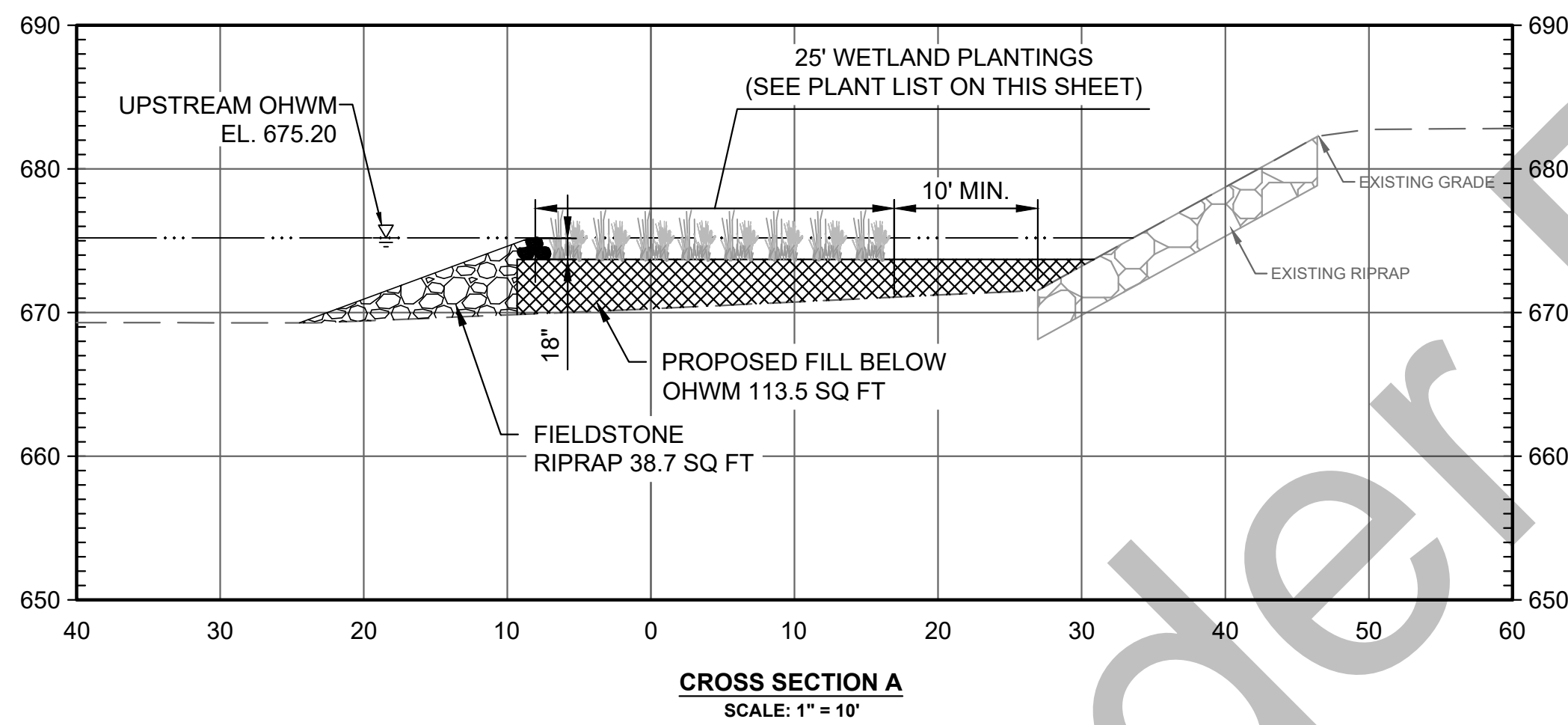
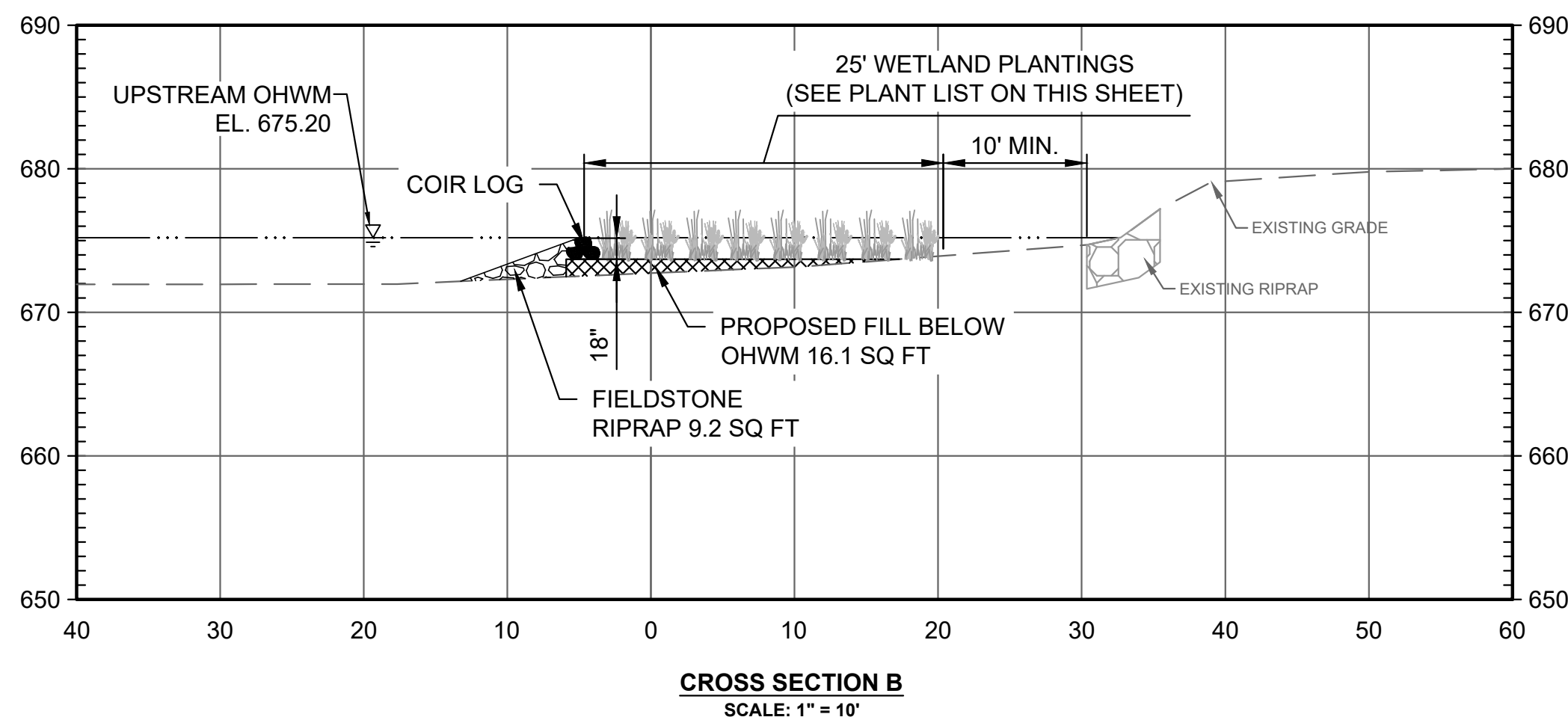
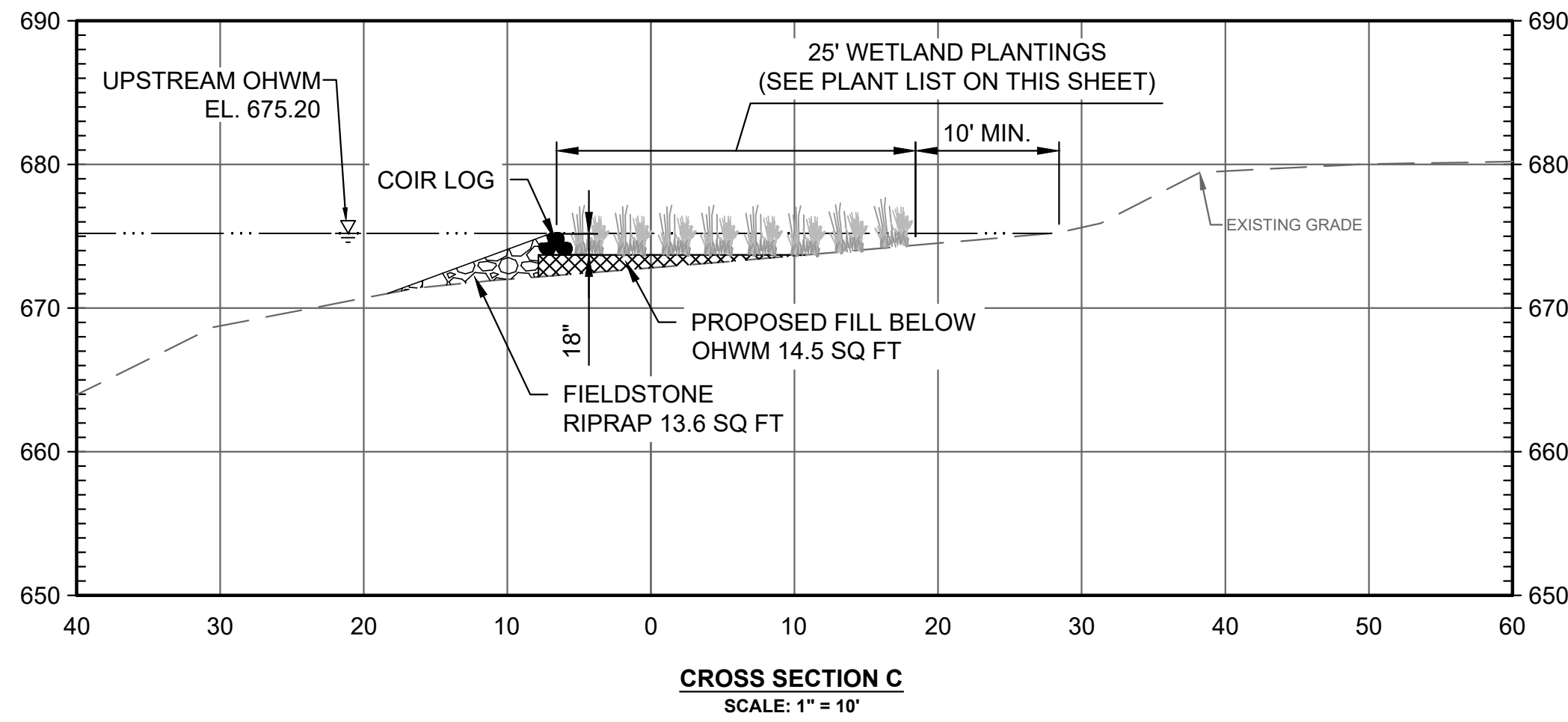
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0	4/21/2023	100% DESIGN - ISSUED FOR BID	BMB



Designed:	POC
Checked:	BMB
Drawn:	CBS
Approved By:	RBH

Four Lakes Task Force	Edenville Dam Gladwin County, Michigan
	PART 301 SHORELINE ENHANCEMENT M30 PLAN

GEI Project 2002879 SPICER GROUP Project 126234SG2018	DWG. NO. P-25
	SHEET NO. -



NOTES:
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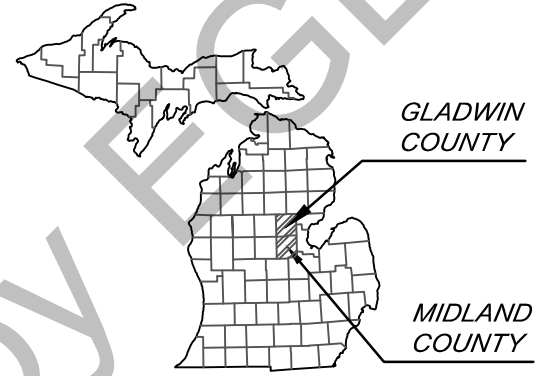
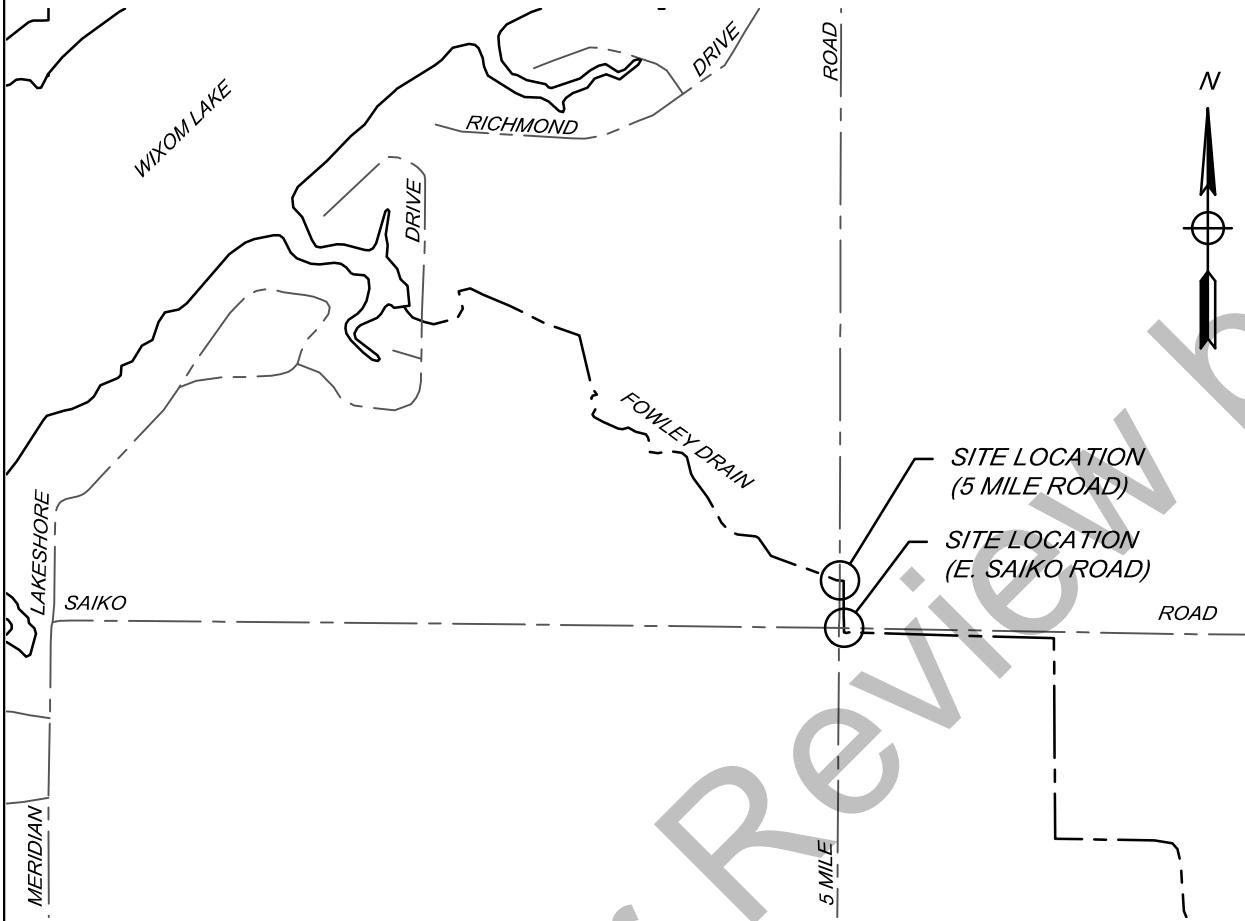
Designed:	POC
Checked:	BMB
Drawn:	CBS
Approved By:	RBH

Four Lakes Task Force
 GEI Project 2002879
 SPICER GROUP Project 126234SG2018

Edenville Dam
 Gladwin County, Michigan
**PART 301 SHORELINE
 ENHANCEMENT M30 CROSS
 SECTIONS**

DWG. NO.
P-26
 SHEET NO.
 -

5 MILE AND SAIKO ROAD CULVERT REPLACEMENTS EDENVILLE DAM RESTORATION PROJECT - PART 301 MITIGATION PROJECT FOUR LAKES TASK FORCE



SECTION 3, 4, & 10, T16N-R01E,
HOPE TOWNSHIP,
MIDLAND COUNTY, MICHIGAN

LINE TYPE LEGEND

- ROAD CENTERLINE
- DRAIN CENTERLINE
- WATER BOUNDARY

LOCATION MAP

CROSSING LOCATION

CROSSING	LATITUDE	LONGITUDE
5 MILE ROAD	43° 48' 55.83"N	84° 20' 52.74"W
E SAIKO ROAD	43° 48' 52.90"N	84° 20' 52.37"W

DATUM

*HORIZONTAL: STATE PLANE COORDINATES,
MI CENTRAL ZONE, INT'L FEET
VERTICAL: NAVD88*

PROPOSED: 5 MILE AND E. SAIKO ROAD CULVERT

WATERWAY: FOWLEY DRAIN

TOWNSHIP: HOPE TOWNSHIP

COUNTY: MIDLAND

S,T,R: 3, 4, & 10,16N,01E

HORZ. DATUM: SPC, MI SOUTH
VERT. DATUM: NAVD88
NAVD88 TO NGVD29 CONVERSION= -0.44'

DATE: 12.7.2023

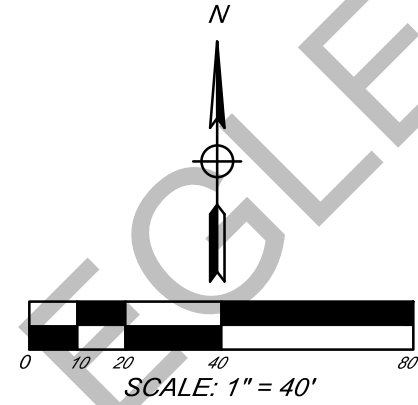
DRAWING: LOCATION MAP/COVER

SHEET: 1 OF 9

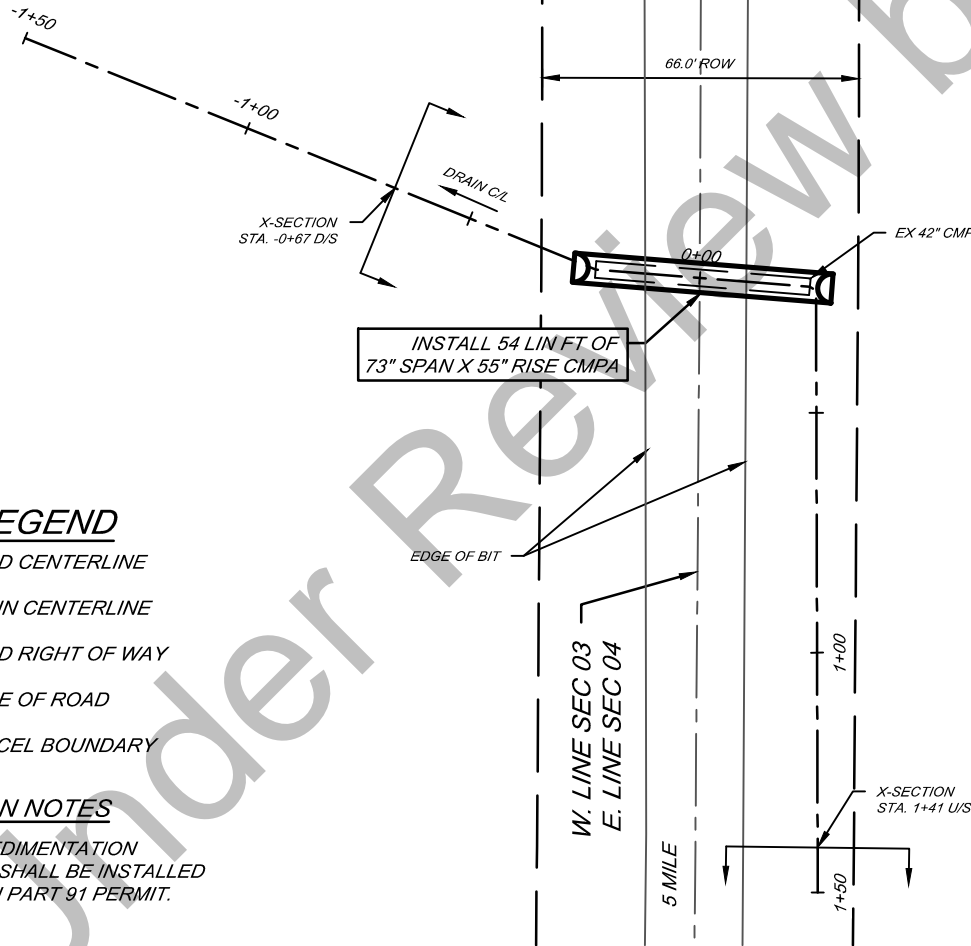
SECTION 04, T16N-R01E,
HOPE TOWNSHIP,
MIDLAND COUNTY, MICHIGAN

050-004-400-101-00
ANDERSON, S TRUST

ROAD



SECTION 03, T16N-R01E,
HOPE TOWNSHIP,
MIDLAND COUNTY, MICHIGAN



LINE TYPE LEGEND

- ROAD CENTERLINE
- DRAIN CENTERLINE
- ROAD RIGHT OF WAY
- EDGE OF ROAD
- PARCEL BOUNDARY

CONSTRUCTION NOTES

1. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH PART 91 PERMIT.

PLAN VIEW

PROPOSED: 5 MILE ROAD CULVERT

WATERWAY: FOWLEY DRAIN

S,T,R: 03, 04, 16N,01E

DATE: 12.7.2023

TOWNSHIP: HOPE TOWNSHIP

HORZ. DATUM: SPC, MI SOUTH
VERT. DATUM: NAVD88

DRAWING: PLAN VIEW

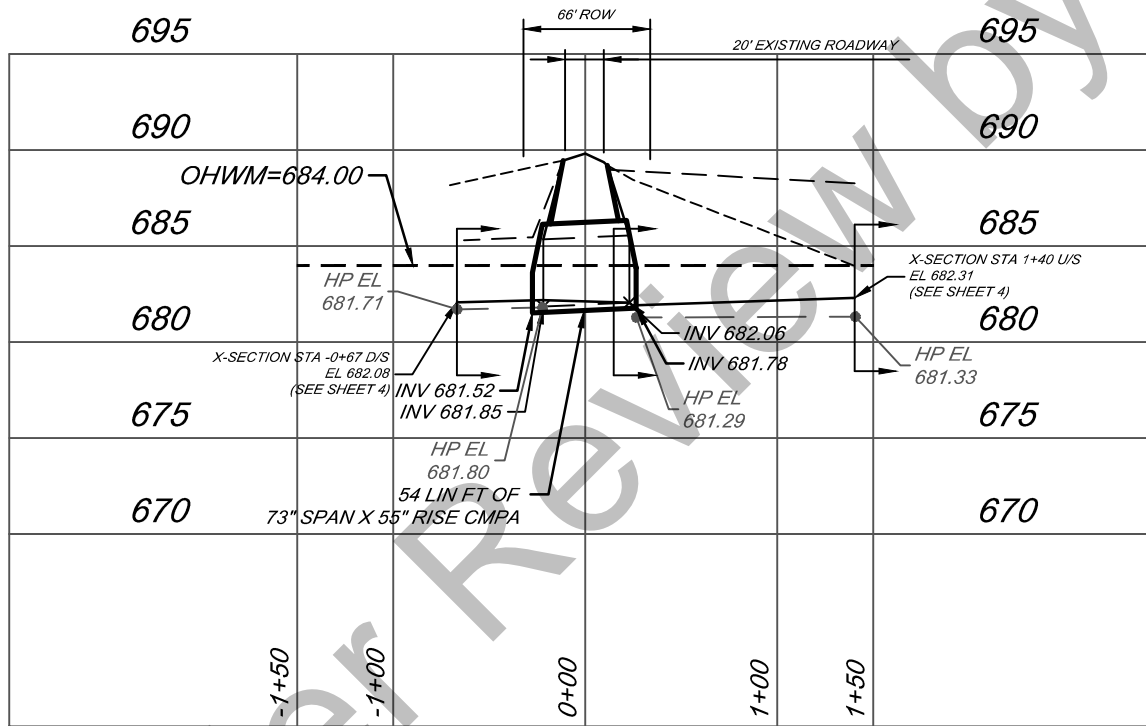
COUNTY: MIDLAND

NAVD88 TO NGVD29 CONVERSION= -0.44'

SHEET: 2 OF 9

WIXOM LAKE PART
 307 LEGAL LEVEL
 ELEVATION = 675.20 FT.

DRAIN OHWM
 ELEVATION = 684.00



DRAIN PROFILE VIEW
 SCALE: H: 1" = 100' V: 1" = 10'

LINE TYPE LEGEND

- EXISTING GROUND
- - - - - LEFT TOP OF BANK
- - - - - RIGHT TOP OF BANK



PROPOSED: 5 MILE ROAD CULVERT

WATERWAY: FOWLEY DRAIN

S,T,R: 03, 04, 16N,01E

DATE: 12.7.2023

TOWNSHIP: HOPE TOWNSHIP

HORZ. DATUM: SPC, MI SOUTH

DRAWING: PROFILE VIEW

COUNTY: MIDLAND

VERT. DATUM: NAVD88
 NAVD88 TO NGVD29 CONVERSION = -0.44'

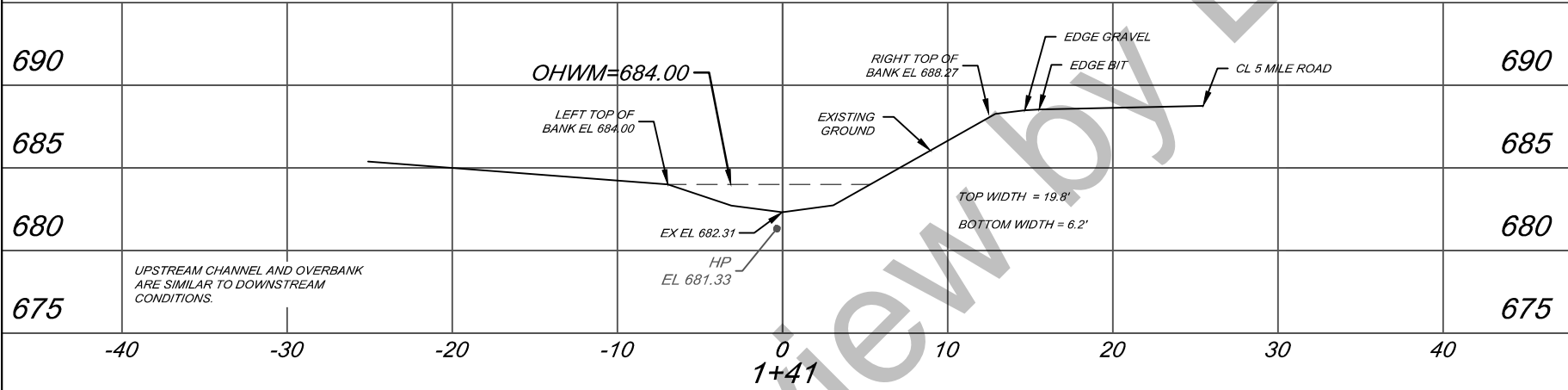
SHEET: 3 OF 9

WIXOM LAKE PART
 307 LEGAL LEVEL
 ELEVATION = 675.20 FT.

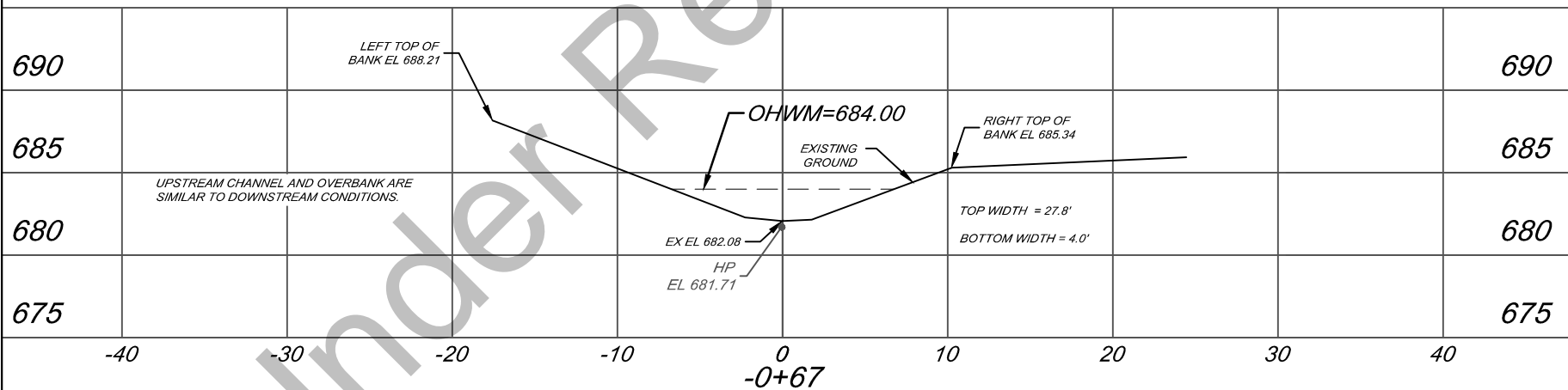
DRAIN OHWM
 ELEVATION = 684.00

LINE TYPE LEGEND

————— EXISTING GROUND
 - - - - - WATER SURFACE ELEVATION



UPSTREAM CROSS SECTION
 SCALE: 1" = 10'



DOWNSTREAM CROSS SECTION
 SCALE: 1" = 10'

PROPOSED: 5 MILE ROAD CULVERT

DATE: 12.7.2023	PROPOSED: 5 MILE ROAD CULVERT
DRAWING: DRAIN CROSS SECTION	S,T,R: 03, 04, 16N,01E
SHEET: 4 OF 9	HORZ. DATUM: SPC, MI SOUTH
	VERT. DATUM: NAVD88
	NAVD88 TO NGVD29 CONVERSION= -0.44'
	WATERWAY: FOWLEY DRAIN
	TOWNSHIP: HOPE TOWNSHIP
	COUNTY: MIDLAND

LINE TYPE LEGEND

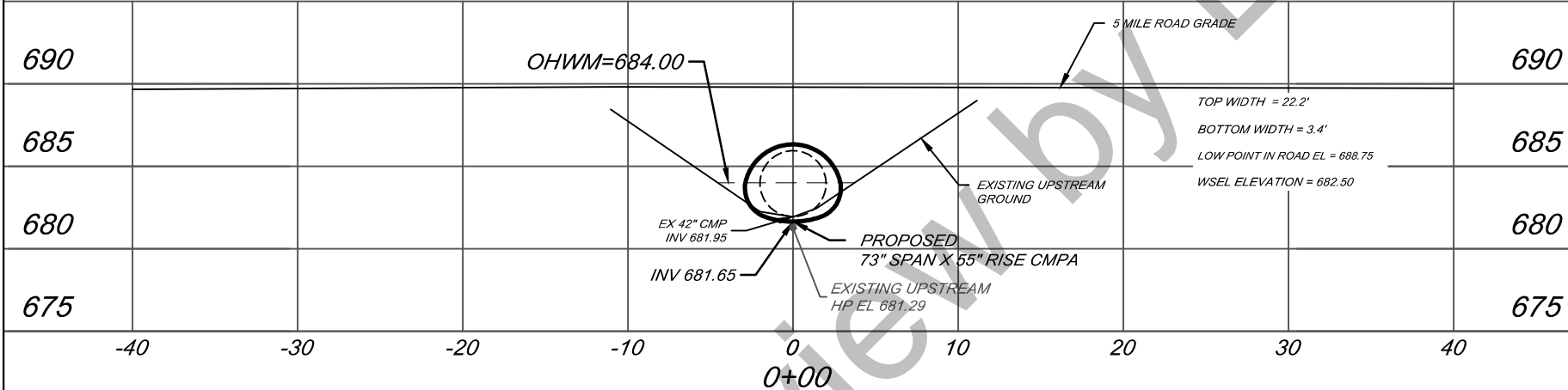
————— EXISTING GROUND
 - - - - - WATER SURFACE ELEVATION



WIXOM LAKE PART
 307 LEGAL LEVEL
 ELEVATION = 675.20 FT.

DRAIN OHWM
 ELEVATION = 684.00

UPSTREAM CHANNEL AND OVERBANK ARE
 SIMILAR TO DOWNSTREAM CONDITIONS.



5 MILE ROAD CROSS SECTION

SCALE: 1" = 10'

PROPOSED: 5 MILE ROAD CULVERT

DATE: 12.7.2023

S,T,R: 03, 04, 16N,01E

HORZ. DATUM: SPC, MI SOUTH
 VERT. DATUM: NAVD88
 NAVD88 TO NGVD29 CONVERSION= -0.44'

DRAWING: ROAD CROSS SECTION

SHEET: 5 OF 9

WATERWAY: FOWLEY DRAIN

TOWNSHIP: HOPE TOWNSHIP

COUNTY: MIDLAND

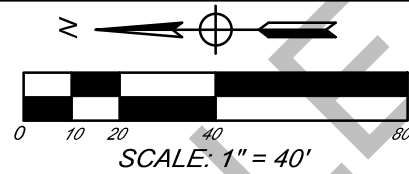
PROPOSED IMPACTS BELOW OHWM (5 MILE ROAD)

IMPACT AREA	IMPACT TYPE ¹ (P/T)	IMPACT WATER BODY	MATERIAL TYPE	CUT AREA			FILL AREA			NET FILL
				AVERAGE LENGTH (FT) X WIDTH (FT) x DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	AVERAGE LENGTH (FT) X WIDTH (FT) x DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	CUBIC YARDS (YD ³)
1	P	STREAM	CULVERT	54' x 6.1' x 2.5'	824	31	54' x 6.1' x 2.5'	824	31	0
TOTAL PERMANENT IMPACT				TOTAL CUT	824	31	TOTAL FILL	824	31	0

NOTES:
 1. IMPACT TYPE: P - PERMANENT, T - TEMPORARY.

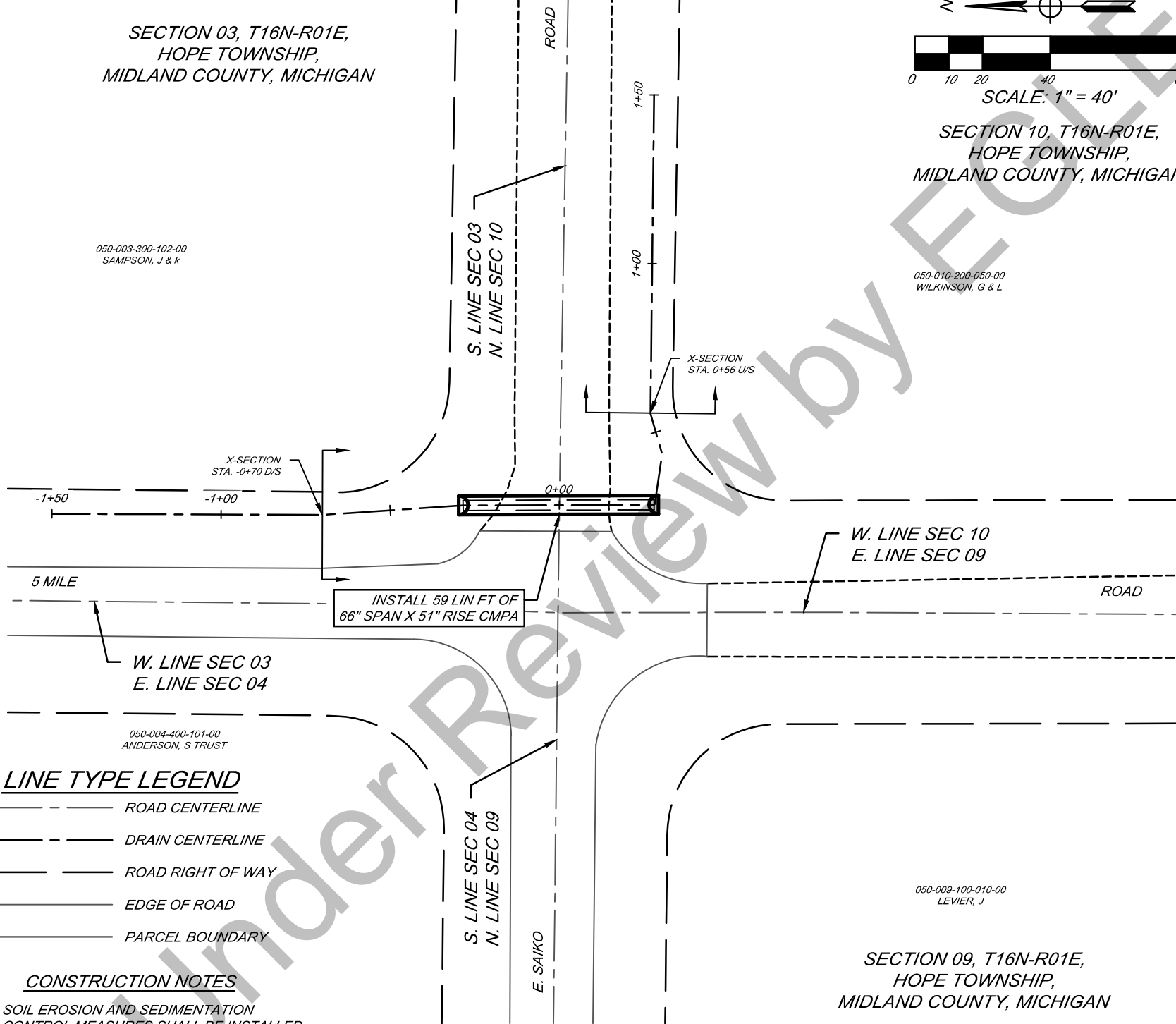
SECTION 03, T16N-R01E,
HOPE TOWNSHIP,
MIDLAND COUNTY, MICHIGAN

050-003-300-102-00
SAMPSON, J & k



SECTION 10, T16N-R01E,
HOPE TOWNSHIP,
MIDLAND COUNTY, MICHIGAN

050-010-200-050-00
WILKINSON, G & L



LINE TYPE LEGEND

- ROAD CENTERLINE
- - - DRAIN CENTERLINE
- ROAD RIGHT OF WAY
- EDGE OF ROAD
- PARCEL BOUNDARY

CONSTRUCTION NOTES

1. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH PART 91 PERMIT.

PLAN VIEW

SECTION 09, T16N-R01E,
HOPE TOWNSHIP,
MIDLAND COUNTY, MICHIGAN

050-009-100-010-00
LEVIER, J

PROPOSED: E. SAIKO ROAD CULVERT

WATERWAY: FOWLEY DRAIN

TOWNSHIP: HOPE TOWNSHIP

COUNTY: MIDLAND

S,T,R: 03,04,09,&10, 16N,01E

HORZ. DATUM: SPC, MI SOUTH
VERT. DATUM: NAVD88
NAVD88 TO NGVD29 CONVERSION= -0.44'

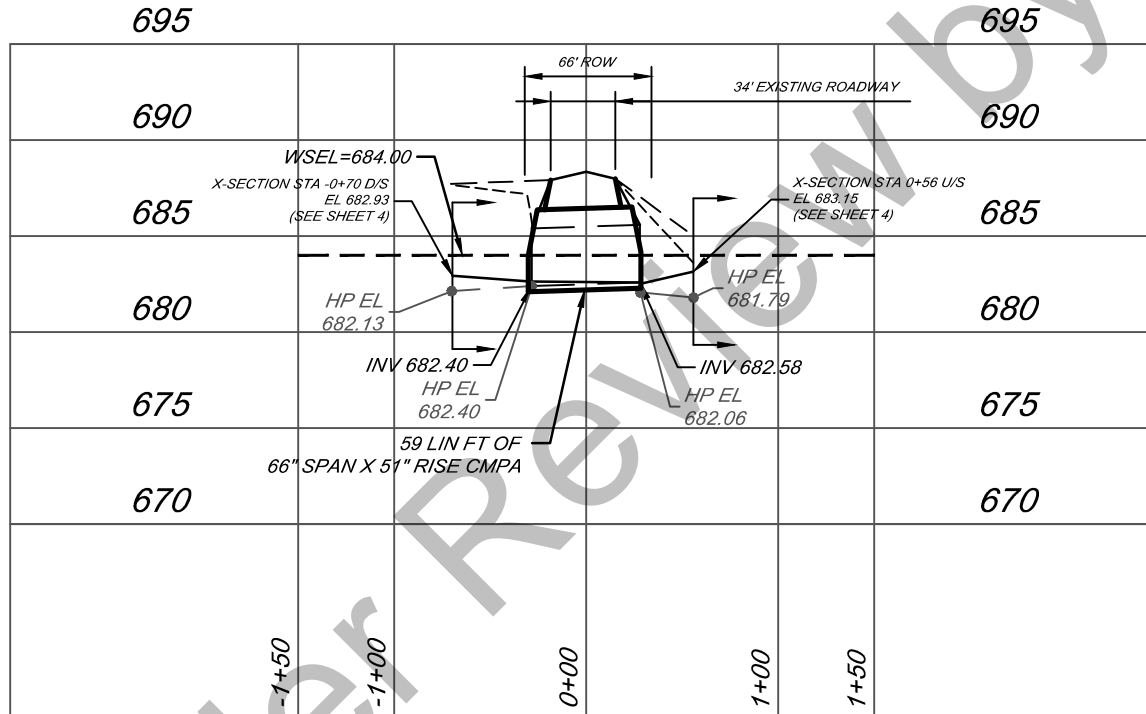
DATE: 12.7.2023

DRAWING: PLAN VIEW

SHEET: 6 OF 9

WIXOM LAKE PART
 307 LEGAL LEVEL
 ELEVATION = 675.20 FT.

DRAIN OHWM
 ELEVATION = 684.00



DRAIN PROFILE VIEW
 SCALE: H: 1" = 100' V: 1" = 10'

LINE TYPE LEGEND

- EXISTING GROUND
- LEFT TOP OF BANK
- - - - - RIGHT TOP OF BANK



PROPOSED: E. SAIKO ROAD CULVERT

WATERWAY: FOWLEY DRAIN

S,T,R: 03,04,09,&10, 16N,01E

DATE: 12.7.2023

TOWNSHIP: HOPE TOWNSHIP

HORZ. DATUM: SPC, MI SOUTH

DRAWING: PROFILE VIEW

COUNTY: MIDLAND

VERT. DATUM: NAVD88
 NAVD88 TO NGVD29 CONVERSION = -0.44'

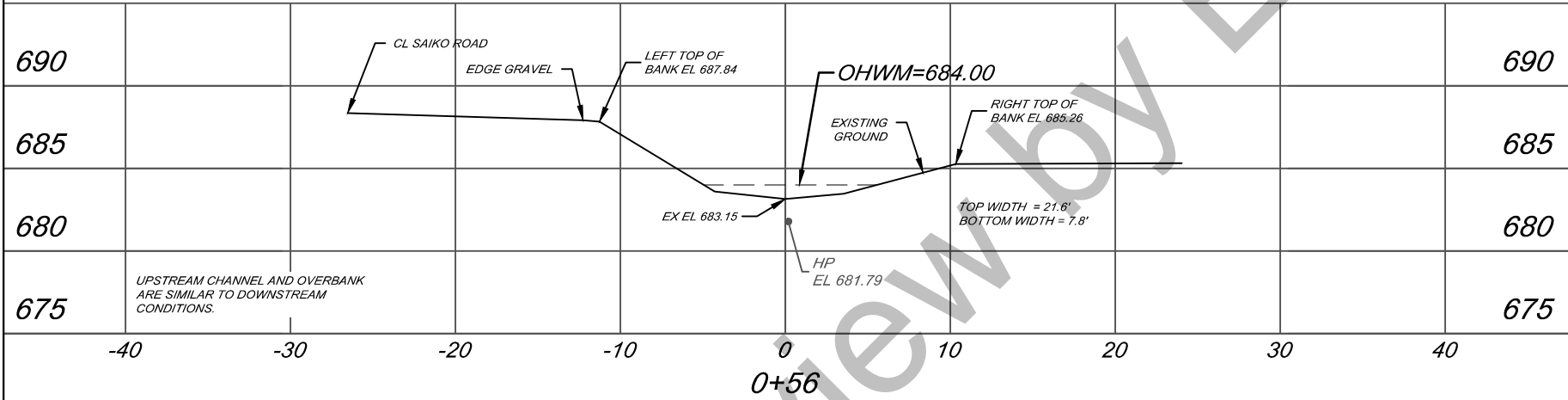
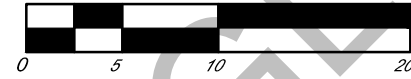
SHEET: 7 OF 9

WIXOM LAKE PART
 307 LEGAL LEVEL
 ELEVATION = 675.20 FT.

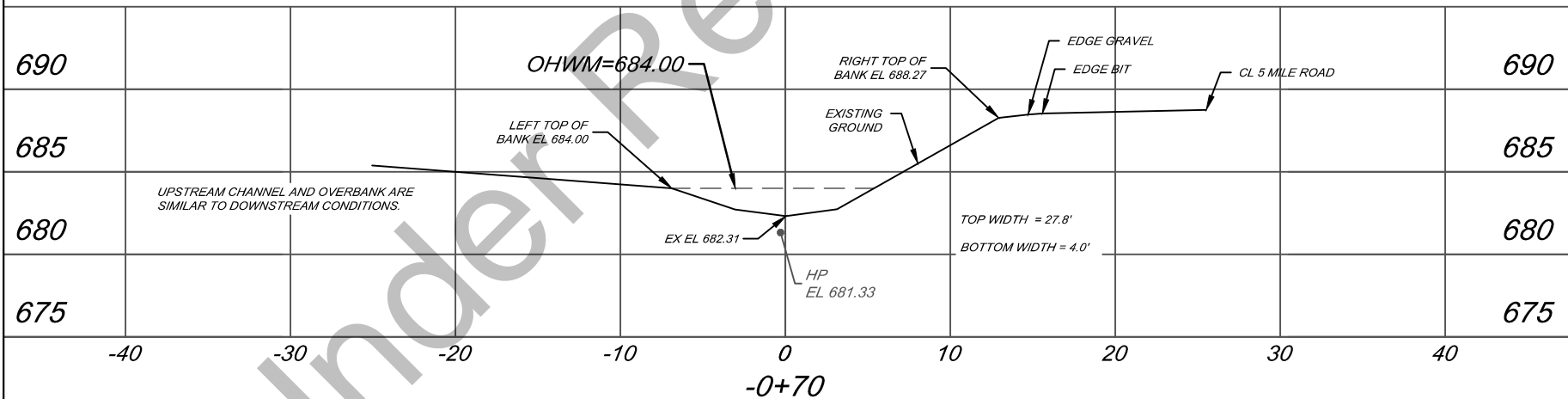
DRAIN OHWM
 ELEVATION = 684.00

LINE TYPE LEGEND

————— EXISTING GROUND
 - - - - - WATER SURFACE ELEVATION



UPSTREAM CROSS SECTION
 SCALE: 1" = 10'



DOWNSTREAM CROSS SECTION
 SCALE: 1" = 10'

PROPOSED: E. SAIKO ROAD CULVERT

WATERWAY: FOWLEY DRAIN	S,T,R: 03,04,09&10, 16N,01E	DATE: 12.7.2023
TOWNSHIP: HOPE TOWNSHIP	HORZ. DATUM: SPC, MI SOUTH	DRAWING: DRAIN CROSS SECTION
COUNTY: MIDLAND	VERT. DATUM: NAVD88	SHEET: 8 OF 9
	NAV88 TO NGVD29 CONVERSION = -0.44'	

LINE TYPE LEGEND

————— EXISTING GROUND
 - - - - - WATER SURFACE ELEVATION

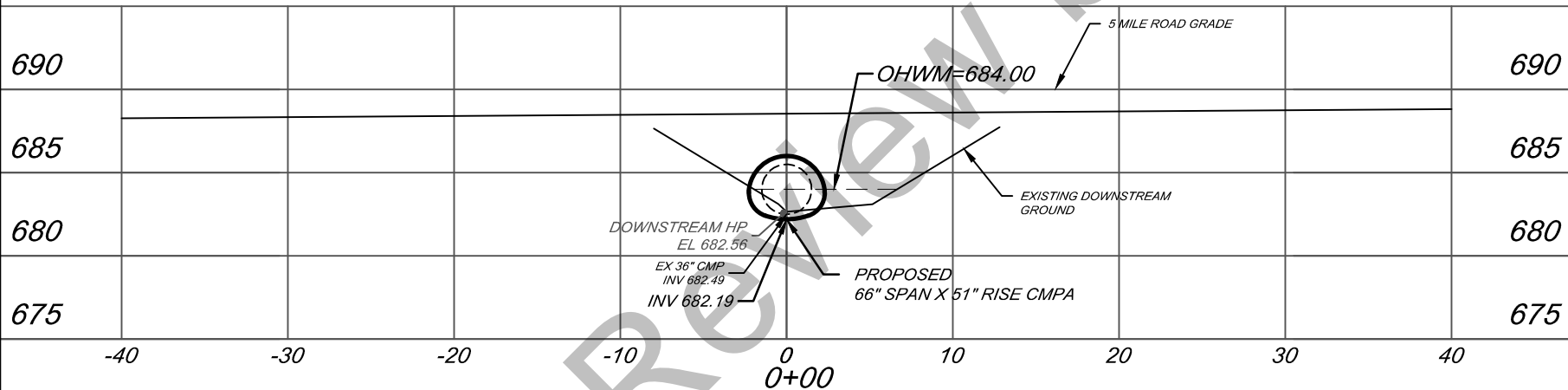


WIXOM LAKE PART
 307 LEGAL LEVEL
 ELEVATION = 675.20 FT.

DRAIN OHWM
 ELEVATION = 684.00

UPSTREAM CHANNEL AND OVERBANK ARE
 SIMILAR TO DOWNSTREAM CONDITIONS.

TOP WIDTH = 20.8'
 BOTTOM WIDTH = 5.2'
 LOW POINT IN ROAD EL = 688.34
 WSEL ELEVATION = 683.53



E. SAIKO ROAD CROSS SECTION

SCALE: 1" = 10'

PROPOSED IMPACTS BELOW OHWM (E. SAIKO ROAD)

IMPACT AREA	IMPACT TYPE ¹ (P/T)	IMPACT WATER BODY	MATERIAL TYPE	CUT AREA			FILL AREA			NET FILL
				AVERAGE LENGTH (FT) X WIDTH (FT) x DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	AVERAGE LENGTH (FT) X WIDTH (FT) x DEPTH (FT)	CUBIC FEET (FT ³)	CUBIC YARDS (YD ³)	CUBIC YARDS (YD ³)
1	P	STREAM	CULVERT	59' x 5.5' x 2'	649	24	59' x 5.5' x 2'	649	24	0
TOTAL PERMANENT IMPACT				TOTAL CUT	649	24	TOTAL FILL	649	24	0

NOTES:

1. IMPACT TYPE: P - PERMANENT, T - TEMPORARY.

PROPOSED: E. SAIKO ROAD CULVERT

WATERWAY: FOWLEY DRAIN

TOWNSHIP: HOPE TOWNSHIP

COUNTY: MIDLAND

S,T,R: 03,04,09,&10, 16N,01E

DATE: 12.7.2023

HORZ. DATUM: SPC, MI SOUTH

DRAWING: ROAD CROSS SECTION

VERT. DATUM: NAVD88
 NAVD88 TO NGVD29 CONVERSION= -0.44'

SHEET: 9 OF 9









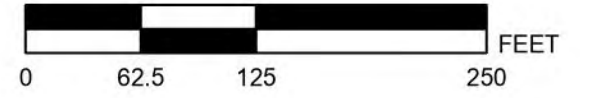
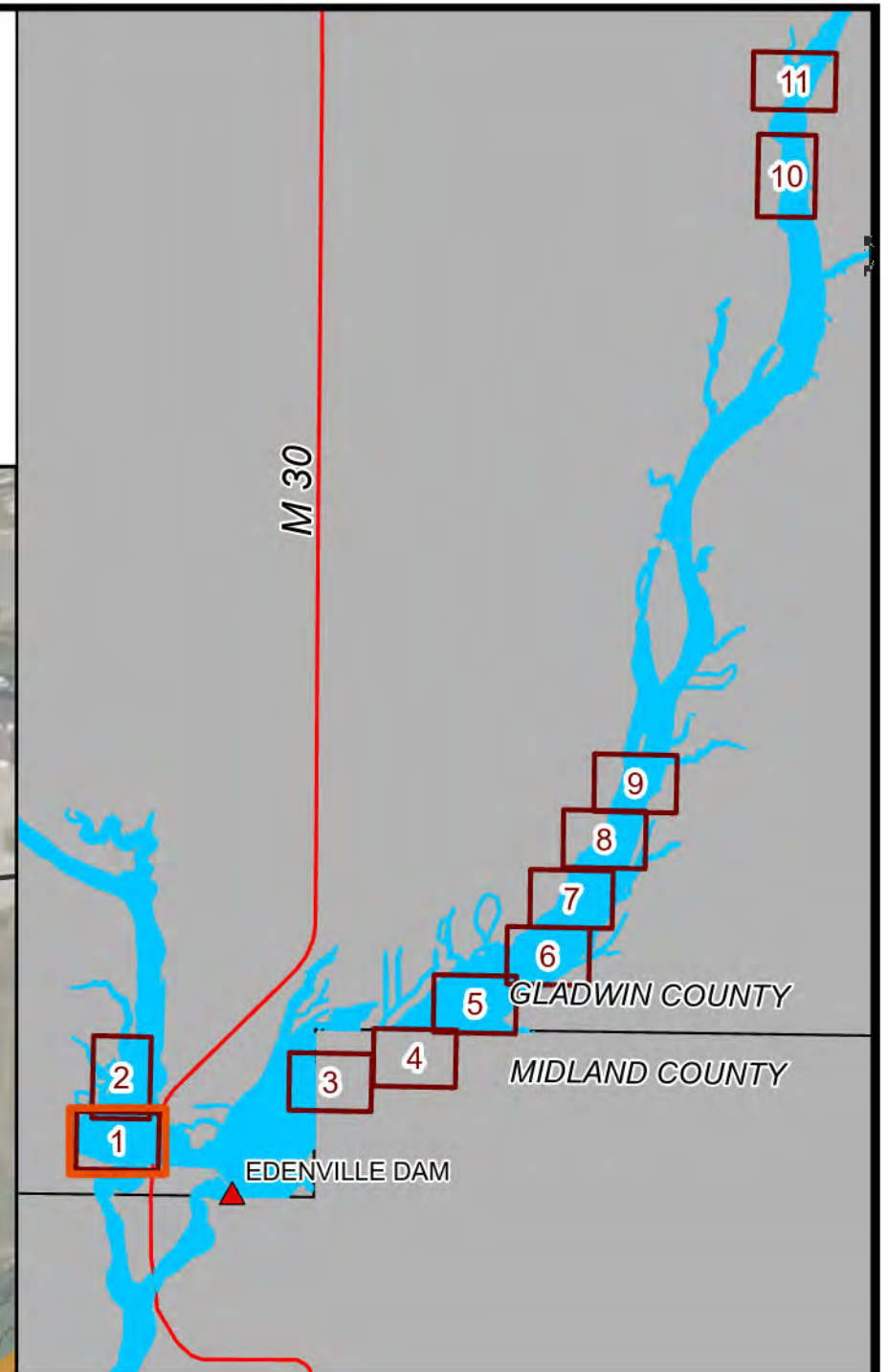
NO
OUTLET





PROPOSED BOTTOMLAND HABITAT MITIGATION LOCATIONS

WIXOM LAKE
GLADWIN COUNTY, MICHIGAN



LEGEND

- WIXOM LAKE CONTOURS
- PROPOSED HABITAT AREA
 - DEEP
 - SHALLOW
- 42-FT STANDING WATER BUFFER
- 80FT NO SPRAY BUFFER
- MUNICIPALITY BOUNDARY
- STATE ROAD
- COUNTY ROAD
- LOCAL ROAD

BY	MARK	REVISIONS	DATE

THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREIN IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.

WIXOM LAKE
GLADWIN COUNTY, MICHIGAN

PROPOSED BOTTOMLAND HABITAT MITIGATION LOCATIONS

Spicer group
SAGINAW OFFICE
230 S. Washington Ave.
Saginaw, MI 48607
Tel: 989-754-4747
www.SpicerGroup.com

DE. BY: DR	CH. BY: KS	PROJECT NO.
DR. BY: MB	APP. BY: RH	126234SG2018
STDS.	SHEET 1 OF 11	DR
DATE: OCTOBER 2023	FILE NO.	1
SCALE: 1:1,250		

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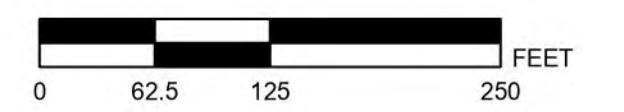
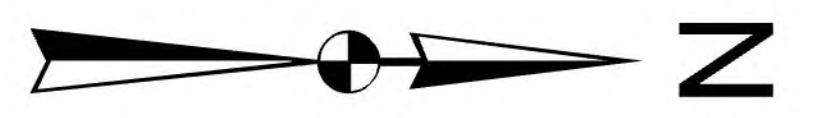
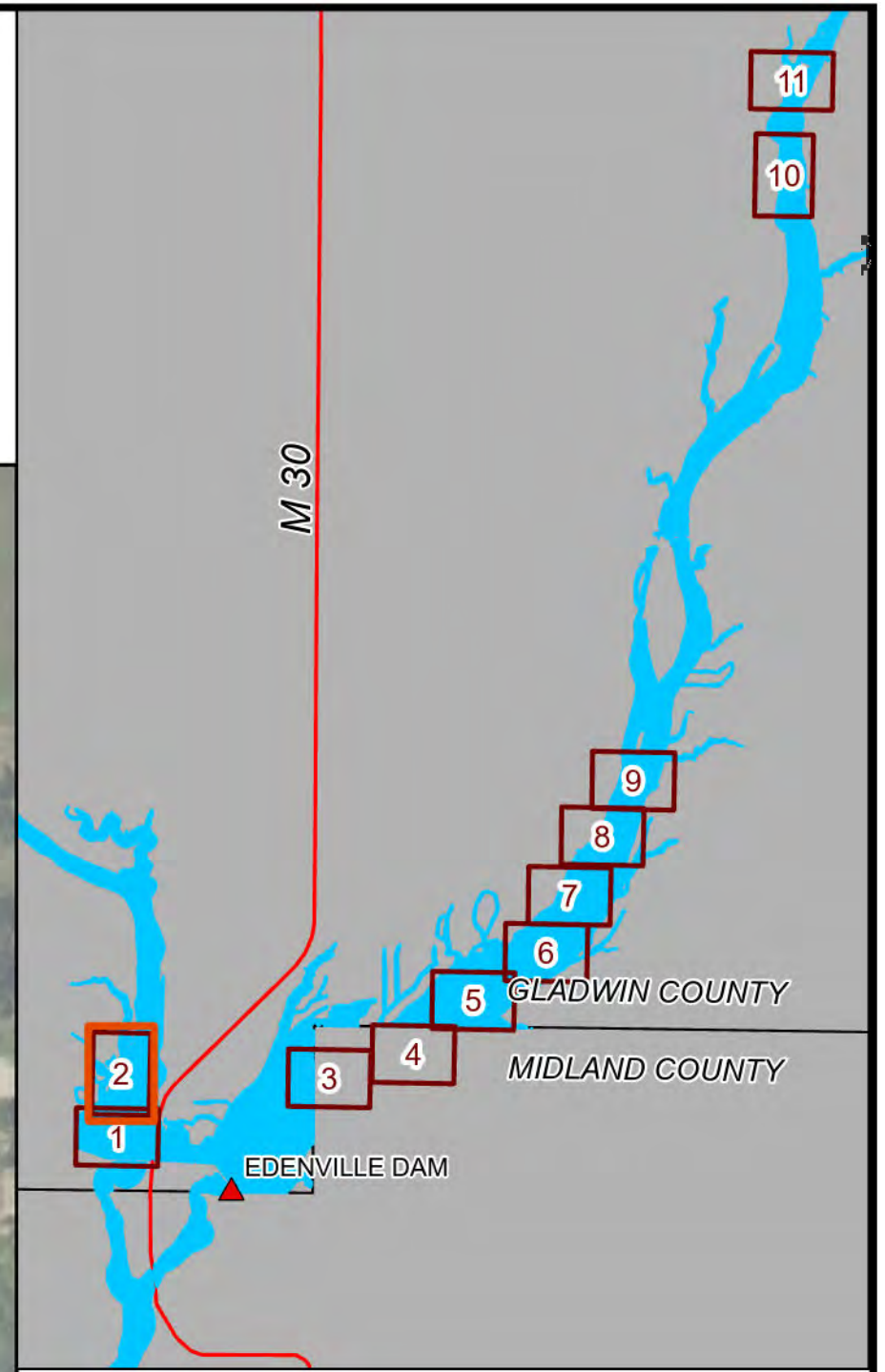


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PROPOSED BOTTOMLAND HABITAT MITIGATION LOCATIONS

WIXOM LAKE
GLADWIN COUNTY, MICHIGAN



LEGEND

- WIXOM LAKE CONTOURS
- PROPOSED HABITAT AREA**
- DEEP
- SHALLOW
- 42-FT STANDING WATER BUFFER
- 80FT NO SPRAY BUFFER
- MUNICIPALITY BOUNDARY
- STATE ROAD
- COUNTY ROAD
- LOCAL ROAD

BY	MARK	REVISIONS	DATE

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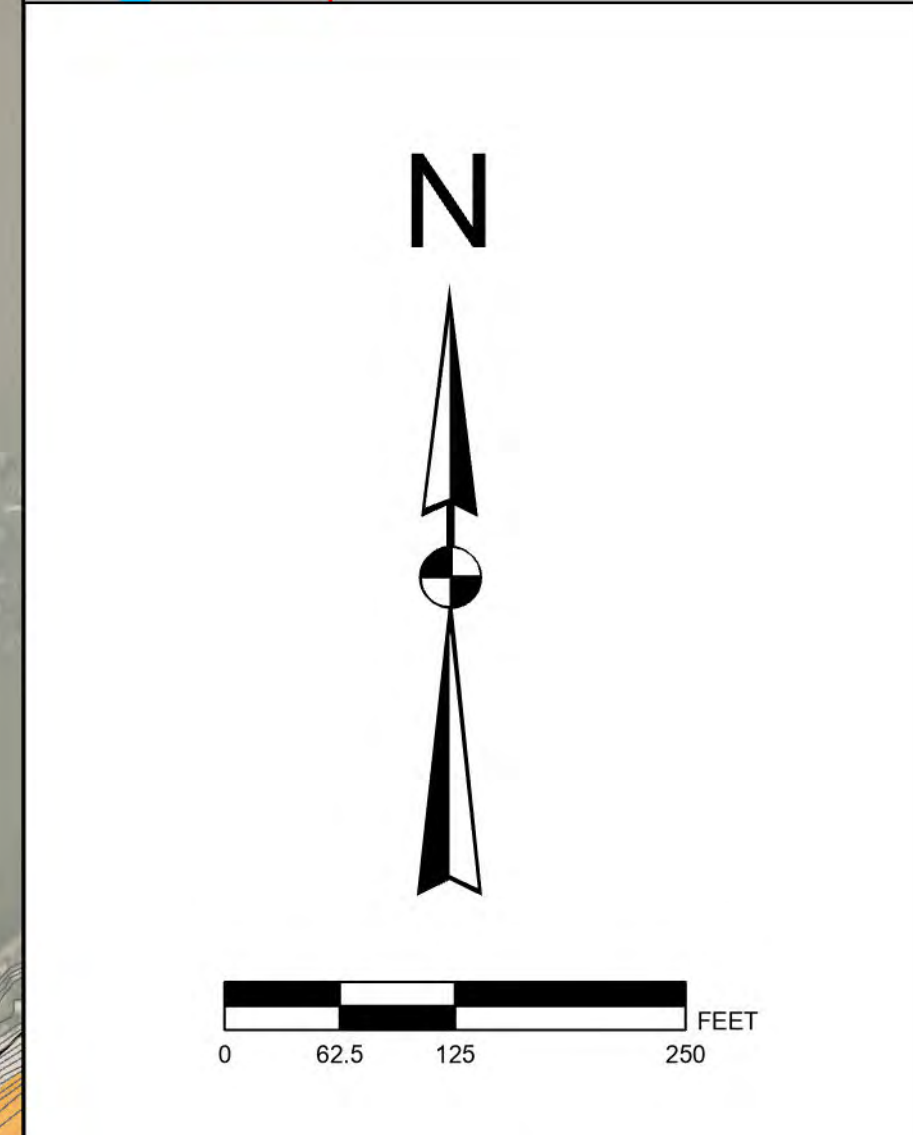
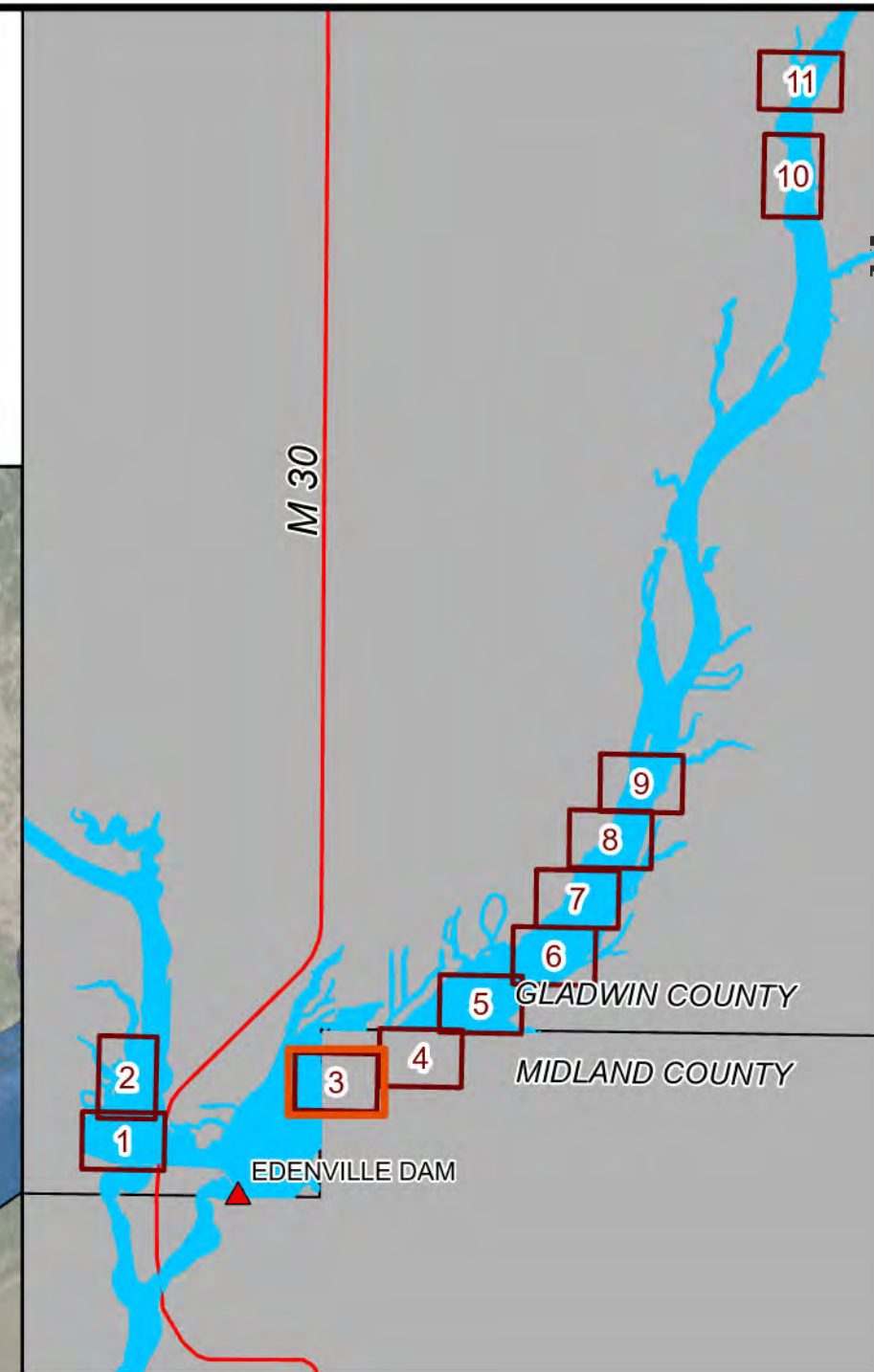
DE BY: DR	CH BY: KS	PROJECT NO.
DR BY: MB	APP BY: RH	126234SG2018
STDS.	SHEET 2 OF 11	DR
DATE: OCTOBER 2023	FILE NO.	2
SCALE: 1:1,250		

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PROPOSED BOTTOMLAND HABITAT MITIGATION LOCATIONS

WIXOM LAKE
GLADWIN COUNTY, MICHIGAN



LEGEND

- WIXOM LAKE CONTOURS
- PROPOSED HABITAT AREA
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BY	MARK	REVISIONS	DATE

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DR. BY: MB	APP. BY: RH	126234SG2018
STDS.	SHEET 3 OF 11	DR
DATE: OCTOBER 2023	FILE NO.	3
SCALE: 1:1,250		

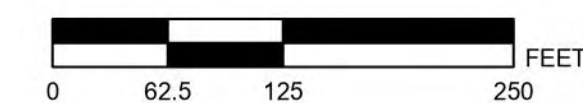
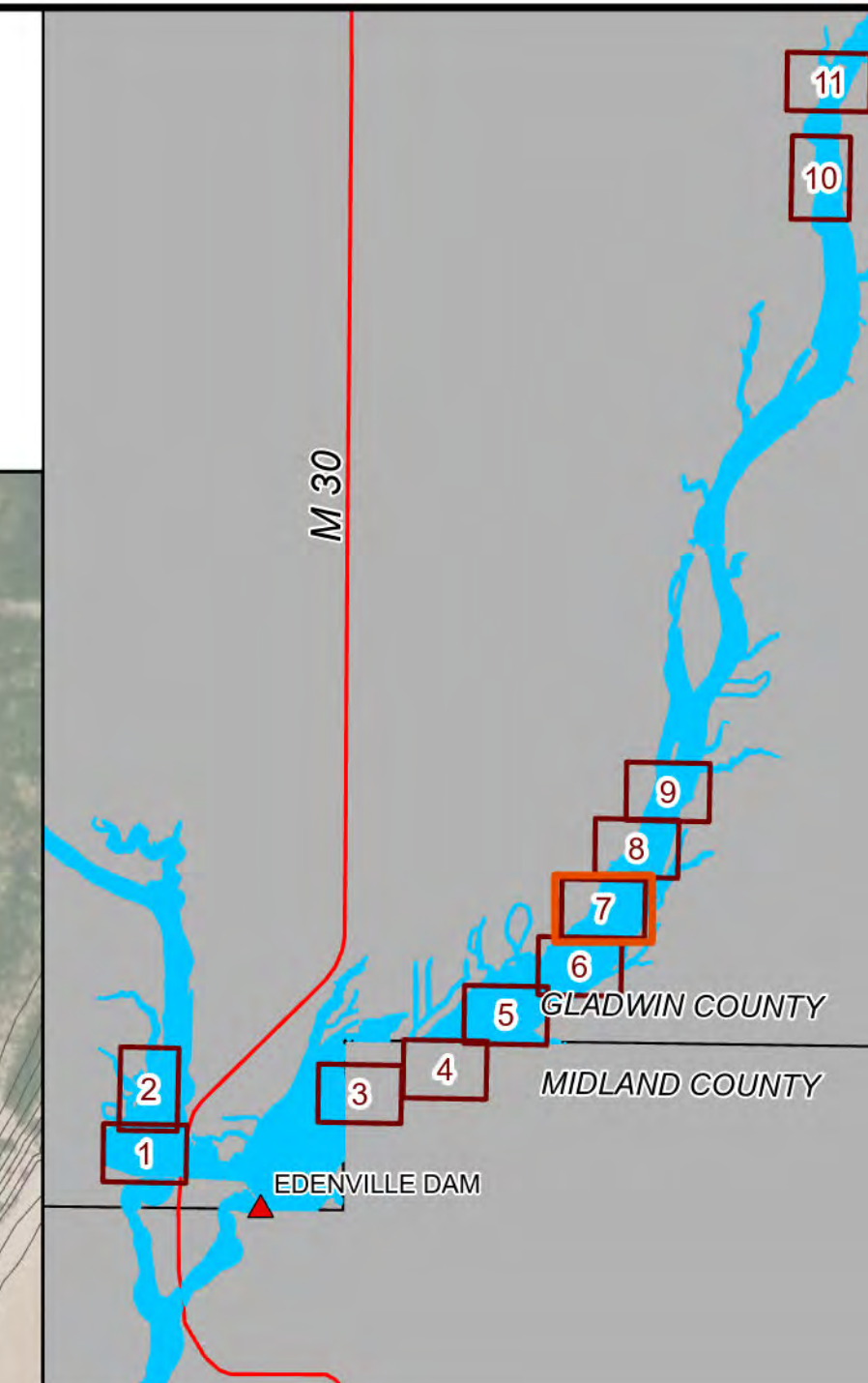
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PROPOSED BOTTOMLAND HABITAT MITIGATION LOCATIONS

WIXOM LAKE
GLADWIN COUNTY, MICHIGAN



LEGEND

- WIXOM LAKE CONTOURS
- PROPOSED HABITAT AREA**
- DEEP
- SHALLOW
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- 80FT NO SPRAY BUFFER
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- COUNTY ROAD
- LOCAL ROAD

BY	MARK	REVISIONS	DATE

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DR BY: MB	APP BY: RH	126234SG2018
STDS.	SHEET 7 OF 11	DR 7
DATE: OCTOBER 2023	FILE NO.	
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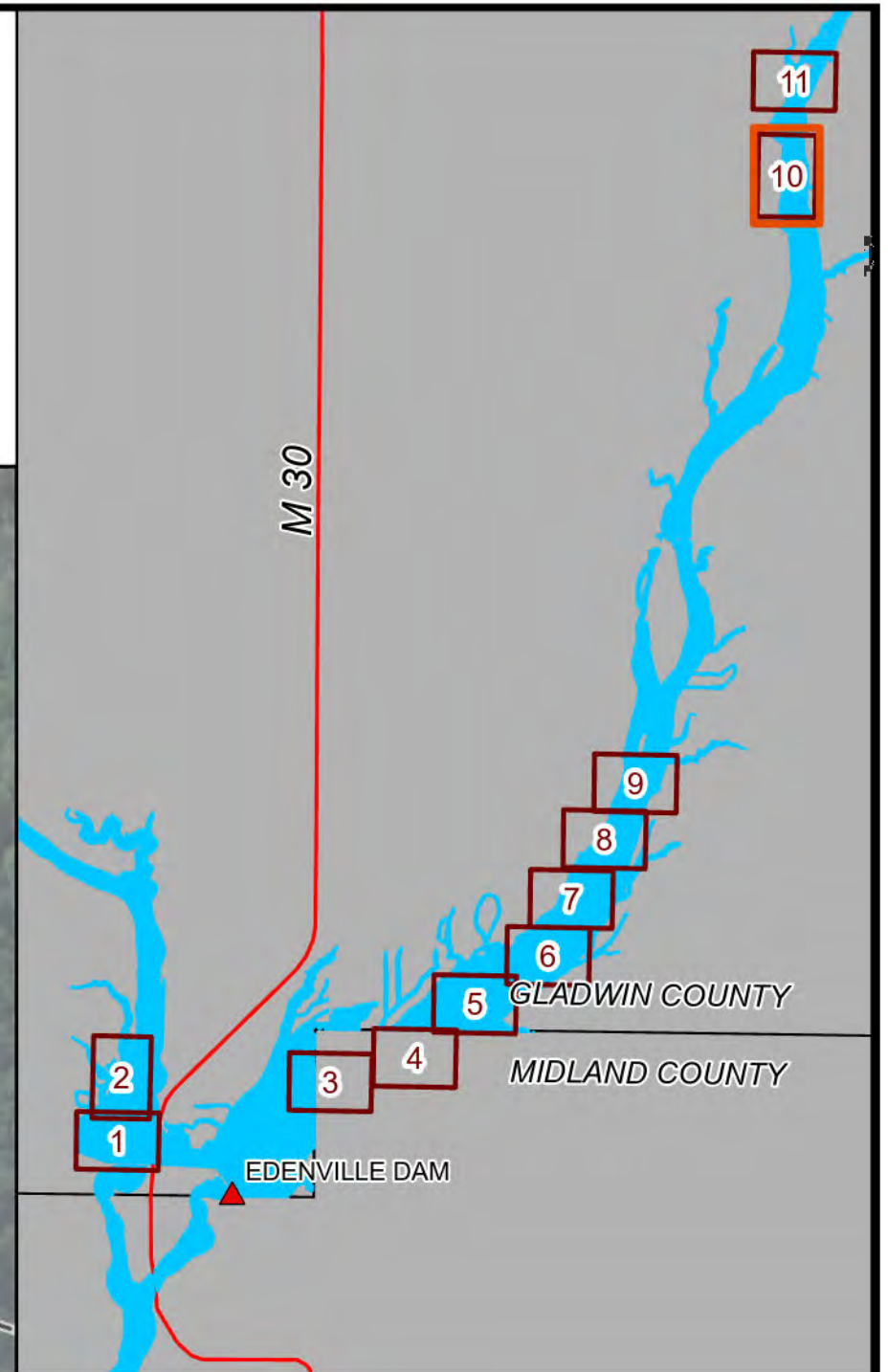
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PROPOSED BOTTOMLAND HABITAT MITIGATION LOCATIONS

WIXOM LAKE
GLADWIN COUNTY, MICHIGAN



LEGEND

- WIXOM LAKE CONTOURS
- PROPOSED HABITAT AREA
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DATE: OCTOBER 2023	FILE NO.	10
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