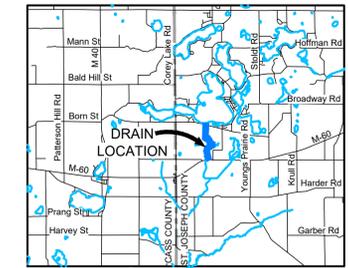




COREY LAKE INTERCOUNTY DRAIN

SECTIONS 11-14 & 23-26
T6S R13W
NEWBERG TOWNSHIP, CASS COUNTY

SECTIONS 7-8, 16-21 & 28-33
T6S R12W
FABIUS TOWNSHIP, ST. JOSEPH COUNTY



VICINITY MAP
NOT TO SCALE



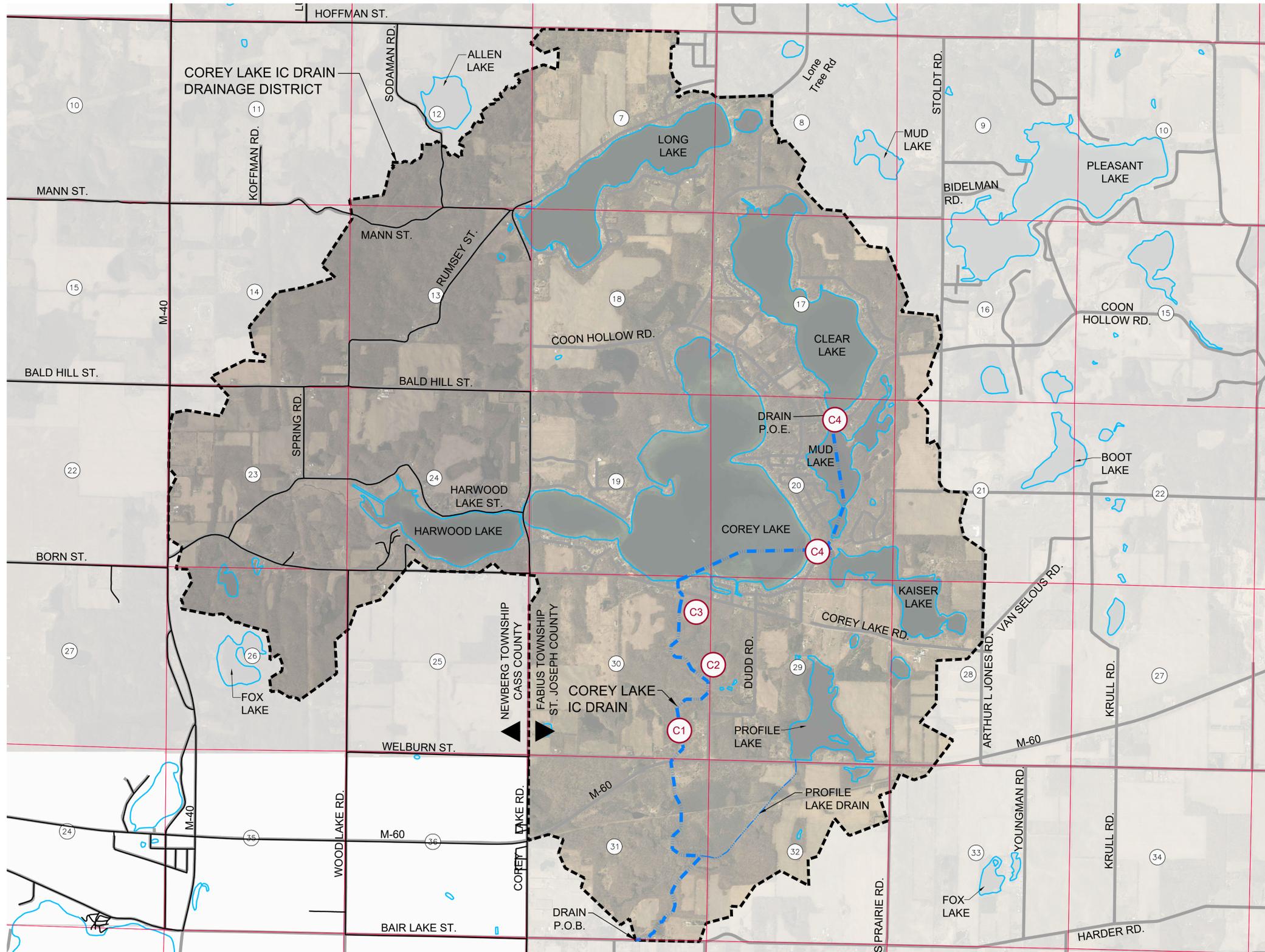
2121 3 Mile Rd. NW
Walker, MI 49544
Ph: 616-301-7888
www.LREM.com

REVISIONS:	NO.	ISSUED FOR:	DATE
	1.	DRAFT REVIEW	11/27/2019
	2.	BIDS & CONSTRUCTION	04/23/2025
	3.	FOR CONSTRUCTION	09/19/2025

CLIENT: COREY LAKE INTERCOUNTY DRAIN DRAINAGE BOARD
 2121 3 Mile Rd. NW, Walker, MI 49544
 PROJECT: COREY LAKE INTERCOUNTY DRAIN
 CASS AND ST. JOSEPH COUNTIES, MICHIGAN

PROJECT NUMBER:	DATE
19478	11/2019
	06/2022
	11/2019
	03/2025

SURVEYED BY: CPV-AOK
 DESIGNED BY: AWS
 DRAFTED BY: RAG
 CAGC/DJF



INDEX OF SHEETS

CS - COVER SHEET

C1 - PLAN & PROFILE
(STA. 0+00 - 24+50)

C2 - PLAN & PROFILE
(STA. 24+50 - 51+50)

C3 - PLAN & PROFILE
(STA. 51+50 - 68+00)

C4 - PLAN & PROFILE
MUD - CLEAR LAKE
COREY - KAISER LAKE

C5 - DETAIL SHEET

**C6 - LAKE LEVEL
STRUCTURE DETAILS**

DISTRICT INFORMATION:

DRAIN DISTRICT AREA:	
CASS COUNTY:	2,590.9 ACRES (30%)
ST. JOSEPH COUNTY:	5,973.0 ACRES (70%)
TOTALS	8,563.9 ACRES

LEGEND

- ENCLOSED CHANNEL DRAIN
- OPEN CHANNEL DRAIN
- DRAINAGE DISTRICT BOUNDARY
- SECTION LINE
- TOWNSHIP LINE
- COUNTY LINE
- ROADS
- PROPERTY LINES
- SECTION NUMBERS
- SHEET NUMBERS

MISCELLANEOUS QUANTITIES:

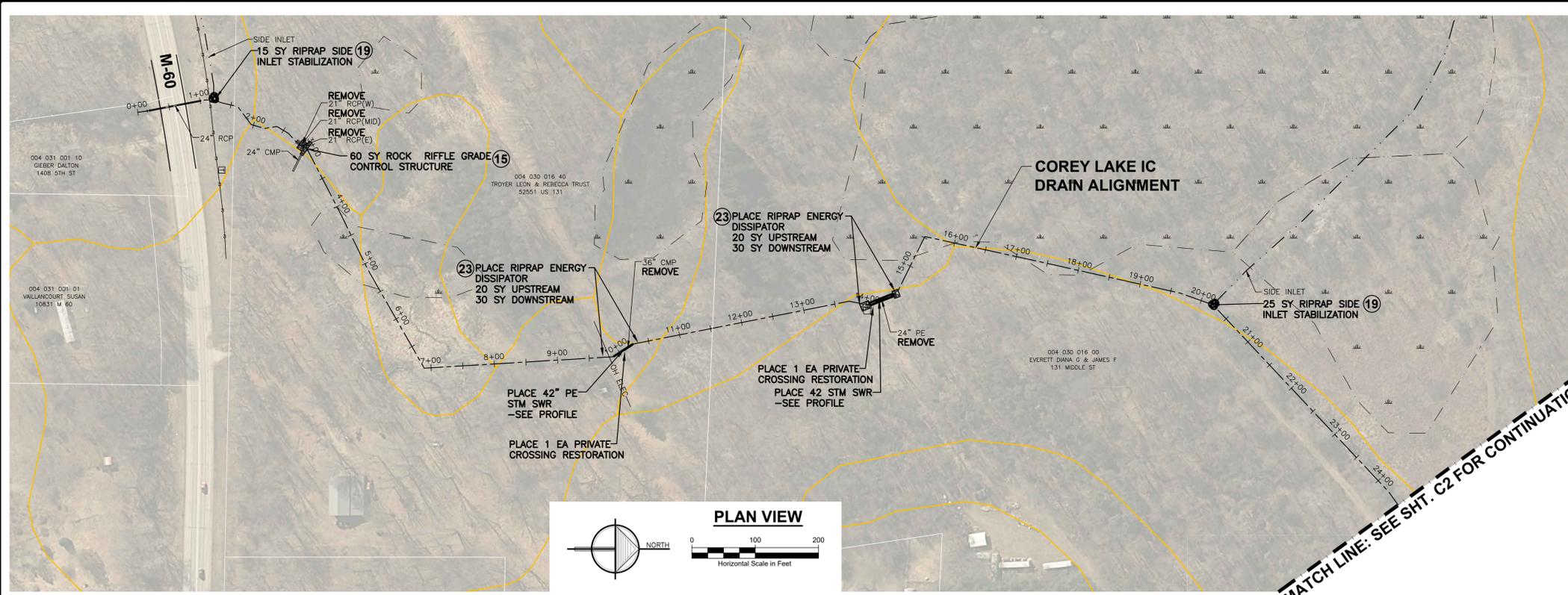
MOBILIZATION (10% MAX.)	1 LS
SESC MEASURES	1 LS
UTILITY COORDINATION	1 LS
SITE RESTORATION	1 LS



3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

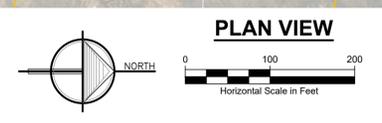
ALL UTILITIES AS SHOWN ARE APPROXIMATE LOCATIONS DERIVED FROM ACTUAL MEASUREMENTS AND AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATION NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THE AREA.

COVER SHEET
SHEET NUMBER
CS



- NOTES:**
- CONTRACTOR TO FIELD VERIFY HORIZONTAL & VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION AND MUST NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
 - PROPOSED EARTH CHANGE SHALL BE LIMITED TO EASEMENT AREA
 - CONTRACTOR SHALL USE CRANE MATS WHILE WORKING IN WETLANDS IDENTIFIED IN THE USFWS NWI TO REDUCE DISTURBANCE.
 - MULCH BLANKET BANKS AS DIRECTED BY ENGINEER.
 - IF DRAIN IS ACCESSED ACROSS PROPERTY OUTSIDE OF DRAIN EASEMENT, A LANDOWNER'S AGREEMENT FORM MUST BE EXECUTED.
 - QUANTITIES WILL NOT BE PAID ABOVE CONTRACT AMOUNT UNLESS APPROVED BY ENGINEER.
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 - REMOVE, SALVAGE AND REPAIR FENCES, STRUCTURES AND OTHER ITEMS THAT INTERFERE WITH CONSTRUCTION, PAID FOR AS 1 LS SITE RESTORATION.
 - CONTRACTOR TO DISPOSE OF REMOVED CULVERTS.
 - DRAINAGE EASEMENT: 66', 33' EACH SIDE OF DRAIN CENTERLINE UNLESS SHOWN OTHERWISE.

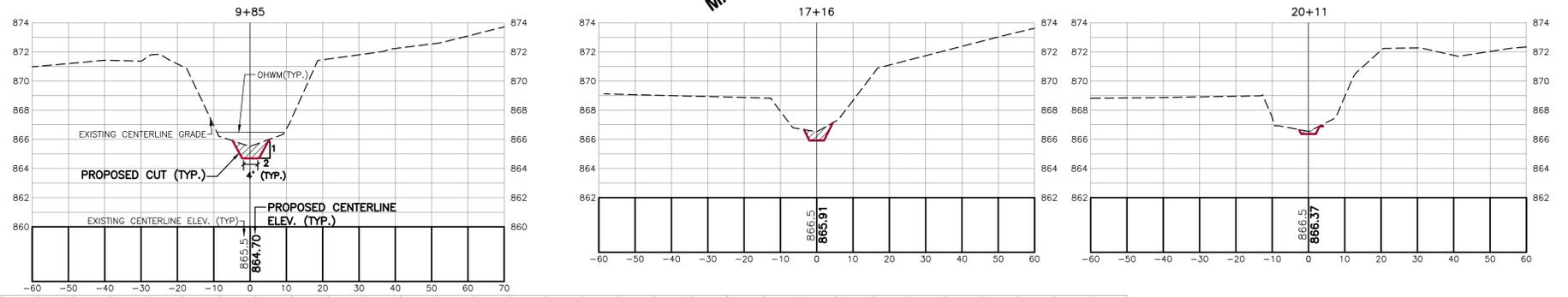
- LEGEND**
- WETLAND (USFWS NATIONAL WETLAND INVENTORY)
 - SOIL TYPE (USDA NRCS WEBSOIL SURVEY)



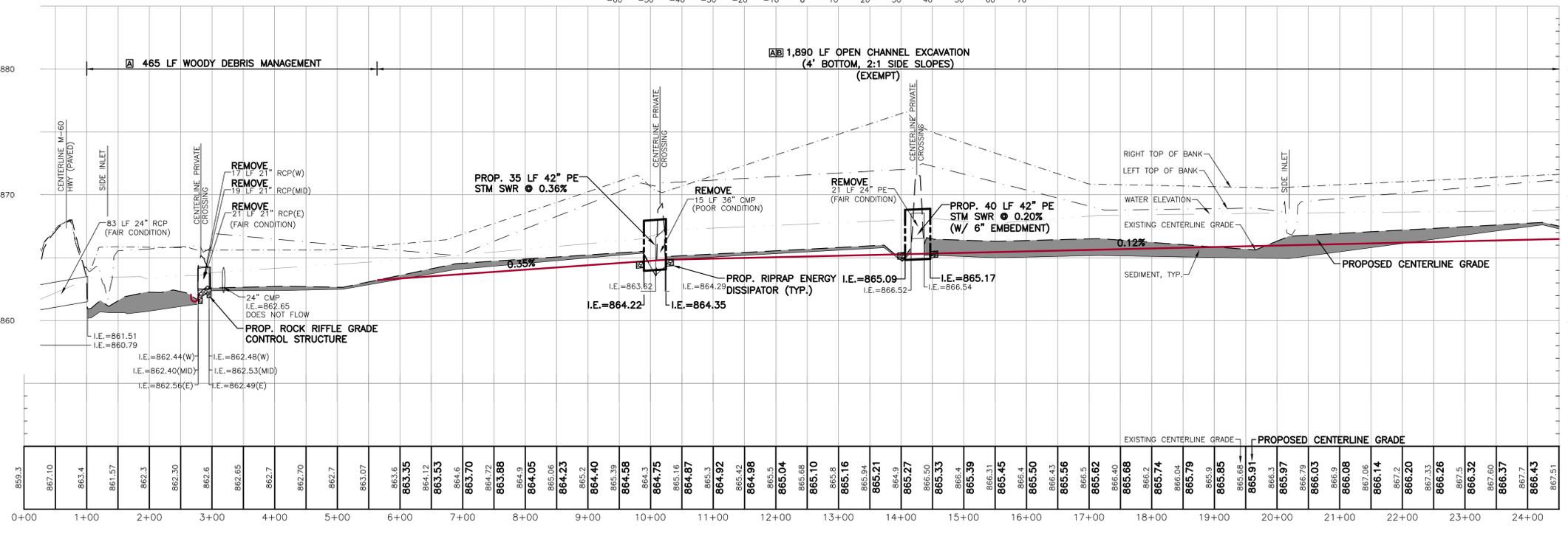
MATCH LINE: SEE SHT. C2 FOR CONTINUATION

CROSS SECTIONS
SCALE: HORIZONTAL: 1" = 20'
VERTICAL: 1" = 5'

- MISCELLANEOUS QUANTITIES:**
- M-60 CULVERT CLEANOUT 1 LS
 - OPEN CHANNEL SEEDING 1,890 LF
 - MULCH BLANKET 750 SY



- LEGEND**
- BENCHMARK
 - WELL
 - MONUMENT
 - FOUND IRON STAKE
 - SET IRON STAKE
 - SET WOOD STAKE
 - RR SIGN
 - GUY POLE
 - GUY ANCHOR
 - UTILITY POLE
 - LIGHT POLE
 - POST
 - SOIL BORING
 - MAILBOX
 - AC UNIT
 - FLAGPOLE
 - FIRE HYDRANT
 - WATER VALVE
 - ELECTRIC TRANSFORMER
 - GAS METER
 - WATER METER
 - TELEPHONE RISER
 - ELECTRIC METER
 - CATCH BASIN
 - ROUND CATCH BASIN
 - UTILITY MANHOLE
 - STORM MANHOLE
 - FLARED END SECTION
 - SANITARY MANHOLE
 - ELECTRIC MANHOLE
 - TELEPHONE MANHOLE
 - DECIDUOUS TREE
 - CONIFEROUS TREE
 - WATER UTILITY LINE
 - TELEPHONE UTILITY LINE
 - ELECTRIC UTILITY LINE
 - GAS UTILITY LINE
 - STEAM UTILITY LINE
 - STORM UTILITY LINE
 - SANITARY UTILITY LINE
 - FIBER OPTIC UTILITY LINE
 - OVERHEAD UTILITY LINE
 - LAKE LINE
 - EXISTING CONTOUR



CENTERLINE PROFILE
SCALE: HORIZONTAL: 1" = 100'
VERTICAL: 1" = 5'

NOTE:
ELEVATIONS ARE BASED ON NGVD 29

3 WORKING DAYS
BEFORE YOU DIG CALL MISS DIG
1-800-482-7171

2121 3 Mile Rd. NW
Walker, MI 49544
Ph: 616-301-7888
www.LREI.com

LREI
ENGINEERS & SURVEYORS

REVISIONS:	NO.	DATE	ISSUED FOR
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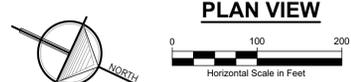
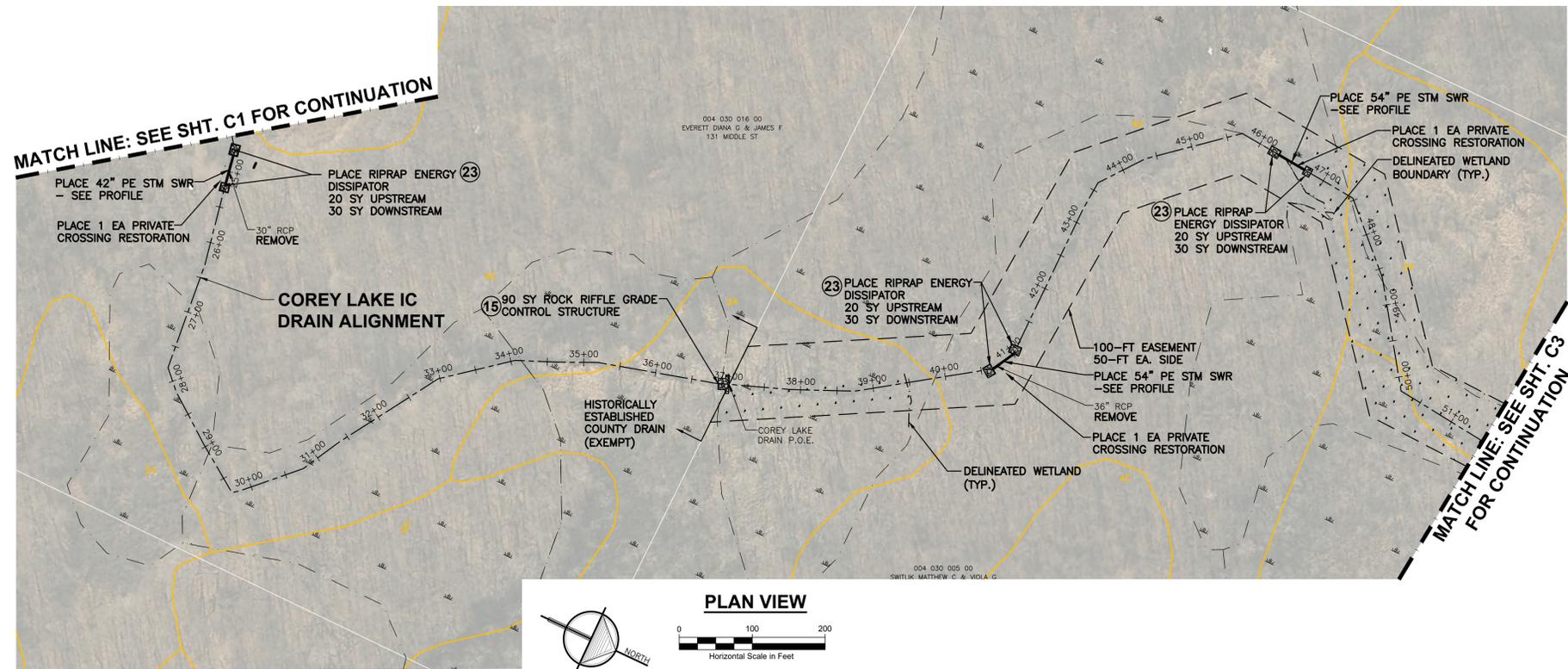
CLIENT: COREY LAKE INTERCOUNTY DRAIN DRAINAGE BOARD
MIDARD 528 W. ALLEGAN STREET, LANSING, MICHIGAN 48933

PROJECT: COREY LAKE INTERCOUNTY DRAIN
CASS AND ST. JOSEPH COUNTIES, MICHIGAN

PROJECT NUMBER:	DATE
19078	11/2019
SURVEYED BY:	DESIGNED BY:
CPV/AOK	AW
DRAFTED BY:	DATE
RAG	11/2019
CAO/CJ/DJF	03/2025

PLAN & PROFILE
STA: 0+00 - 24+50

C1



NOTES:

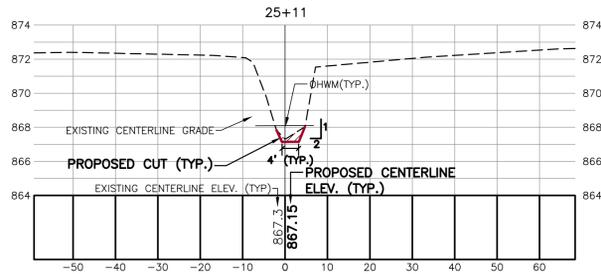
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9. CONTRACTOR TO DISPOSE OF REMOVED CULVERTS.
10. DRAINAGE EASEMENT: 66', 33' EACH SIDE OF DRAIN CENTERLINE UNLESS SHOWN OTHERWISE.

LEGEND

- WETLAND (USFWS NATIONAL WETLAND INVENTORY)
- SOIL TYPE (USDA NRCS WEBSOIL SURVEY)

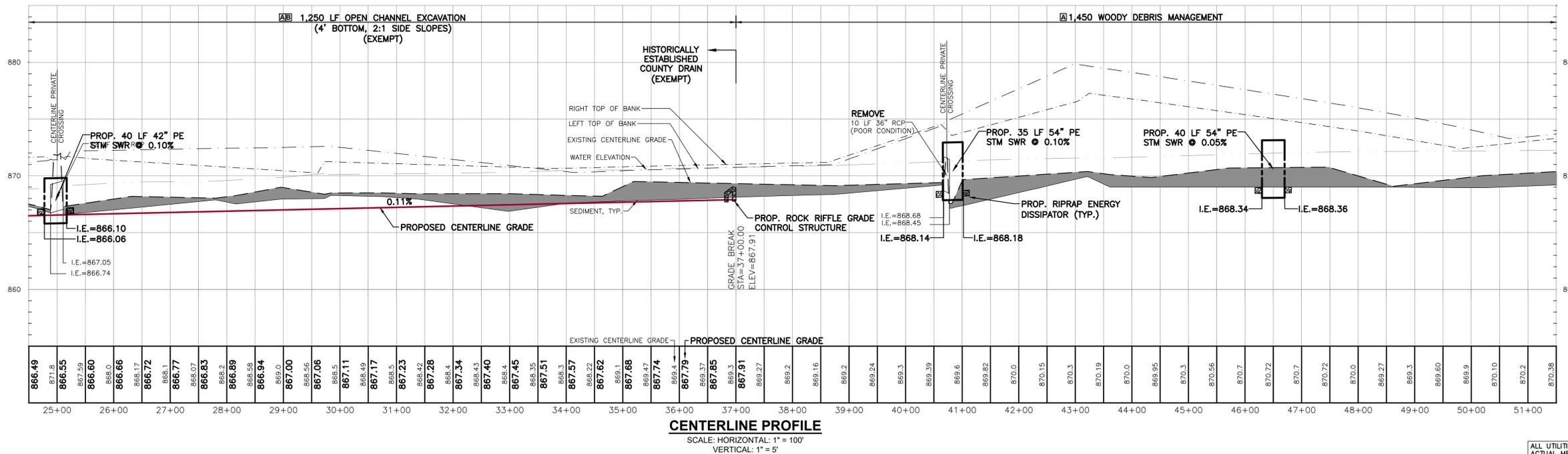
MISCELLANEOUS QUANTITIES:

- 1 OPEN CHANNEL SEEDING 1,250 LF
- 2 MULCH BLANKET 500 SY



CROSS SECTIONS

SCALE: HORIZONTAL: 1" = 20'
VERTICAL: 1" = 5'



CENTERLINE PROFILE

SCALE: HORIZONTAL: 1" = 100'
VERTICAL: 1" = 5'

3 WORKING DAYS
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LRE
ENGINEERS & SURVEYORS

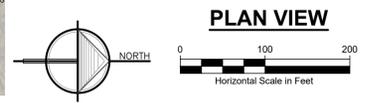
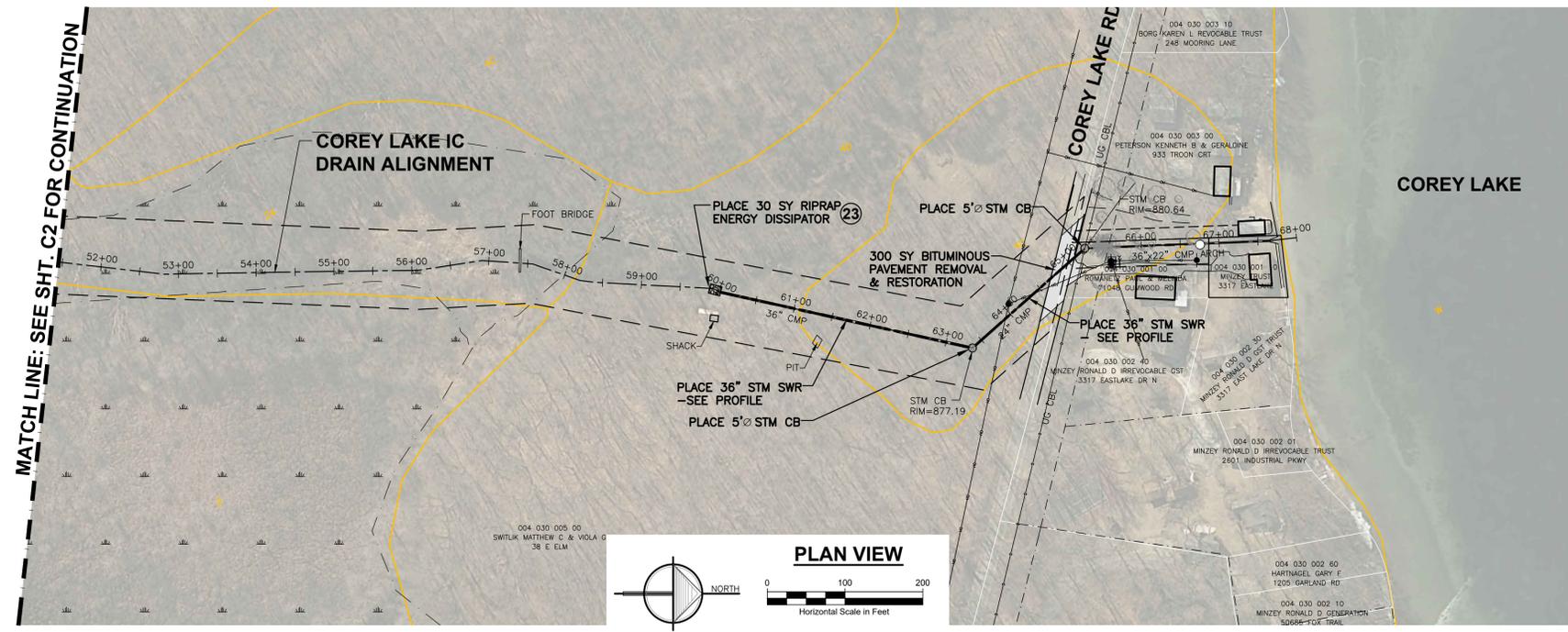
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MIDARD 528 W. ALLEGAN STREET, LANSING, MICHIGAN 48933
PROJECT: COREY LAKE INTERCOUNTY DRAIN
CASS AND ST. JOSEPH COUNTIES, MICHIGAN

PROJECT NUMBER:	DATE
19478	11/2019
SURVEYED BY:	DESIGNED BY:
CPV/AOK	AW
DRAFTED BY:	CHECKED BY:
RAG	DJF

PLAN & PROFILE
STA: 24+50 - 51+50

SHEET NUMBER
C2



NOTES:

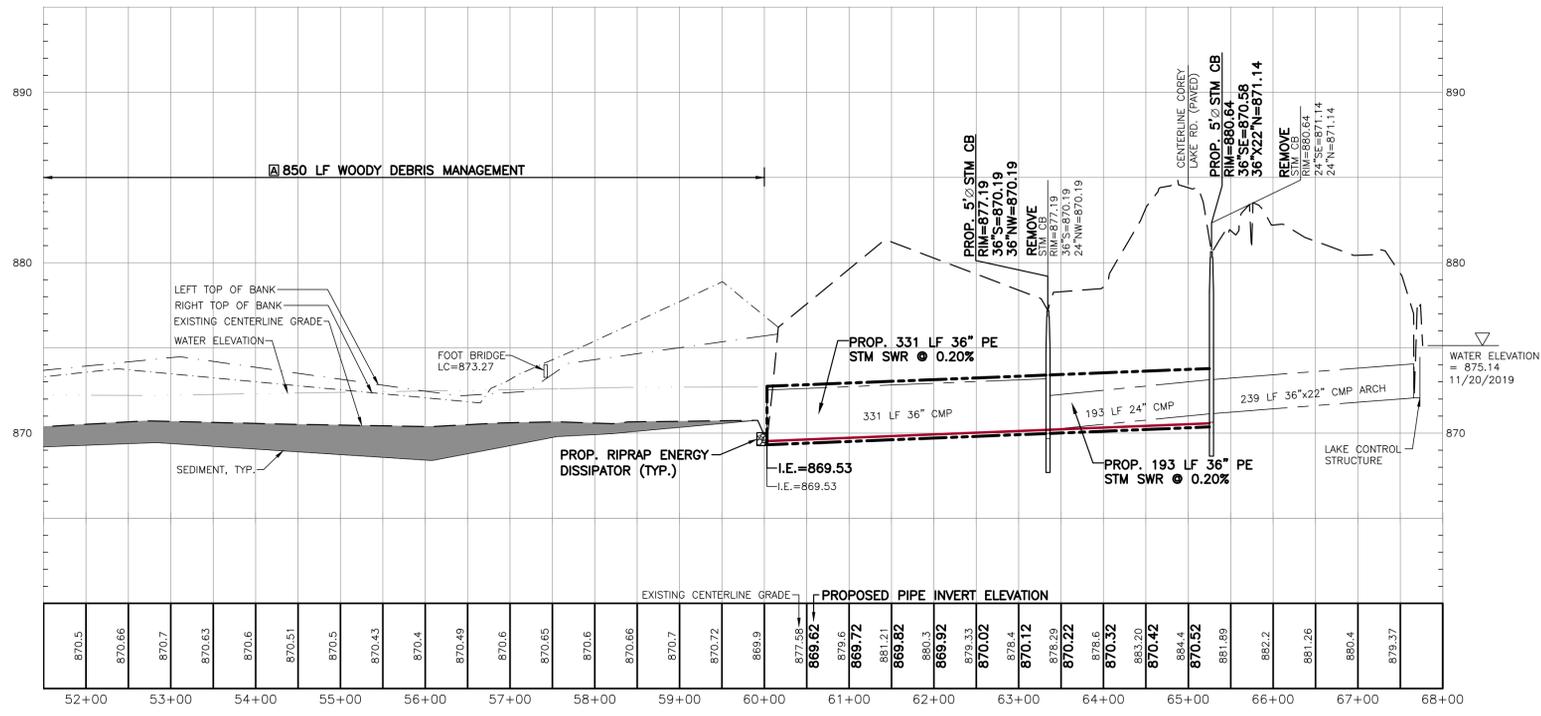
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10. CONTRACTOR TO DISPOSE OF CULVERTS AND STORM SEWER.
11. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVEWAYS WITHIN PROJECT LOCATION.
12. REMOVE, SALVAGE AND REPAIR FENCES, STRUCTURES AND OTHER ITEMS THAT INTERFERE WITH CONSTRUCTION, PAID FOR AS 1 LS SITE RESTORATION.

LEGEND

- WETLAND (USFWS NATIONAL WETLAND INVENTORY)
- BITUMINOUS PAVEMENT REMOVAL
- SOIL TYPE (USDA NRCS WEBSOIL SURVEY)

MISCELLANEOUS QUANTITIES

- 1 COREY LAKE OUTLET DEWATERING 1 LS
- 1 SURFACE RESTORATION 524 LF



CENTERLINE PROFILE

SCALE: HORIZONTAL: 1" = 100'
VERTICAL: 1" = 5'

2121 3 Mile Rd NW
Walker, MI 49544
Ph: 616-301-7888
www.LREM.com



NO.	ISSUED FOR	DATE
1.	DRAFT REVIEW	11/27/2019
2.	BIDS & CONSTRUCTION	04/23/2025
3.	FOR CONSTRUCTION	08/19/2025

CLIENT: COREY LAKE INTERCOUNTY DRAIN DRAINAGE BOARD
MIDARD 525 W. ALLEGAN STREET, LANSING, MICHIGAN 48933
PROJECT: COREY LAKE INTERCOUNTY DRAIN
CASS AND ST. JOSEPH COUNTIES, MICHIGAN

DATE	PROJECT NUMBER
11/2019	19078
06/2022	
11/2019	
03/2025	

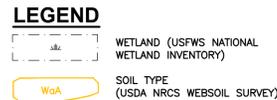
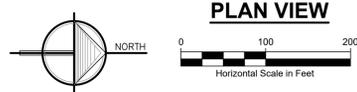
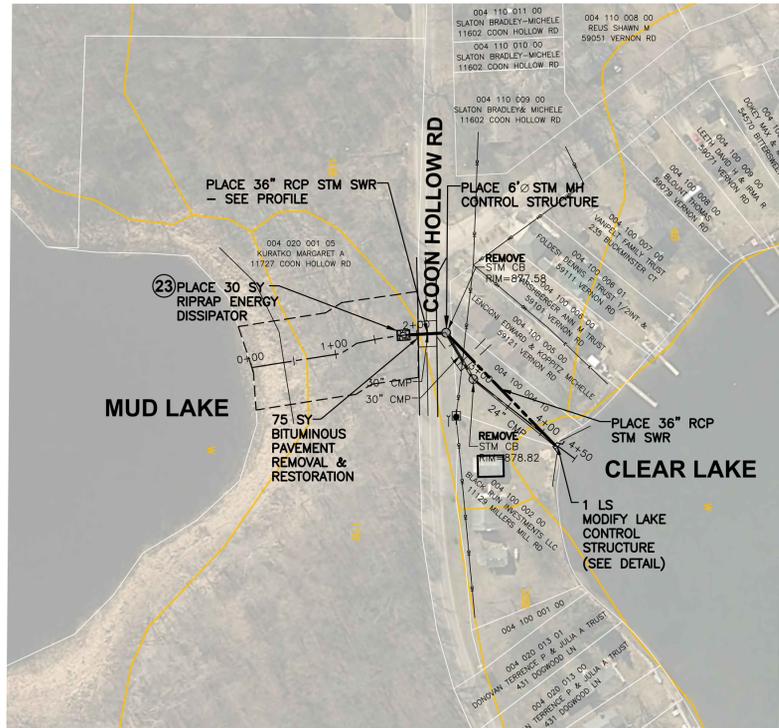
PROJECT NUMBER: 19078
SURVEYED BY: CRY-ADK
DESIGNED BY: AWS
DRAFTED BY: RAG
CADC:DJF

SHEET NAME: PLAN & PROFILE
STA: 51+50 - 68+000
SHEET NUMBER: C3

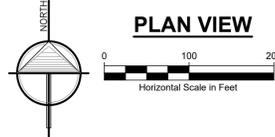
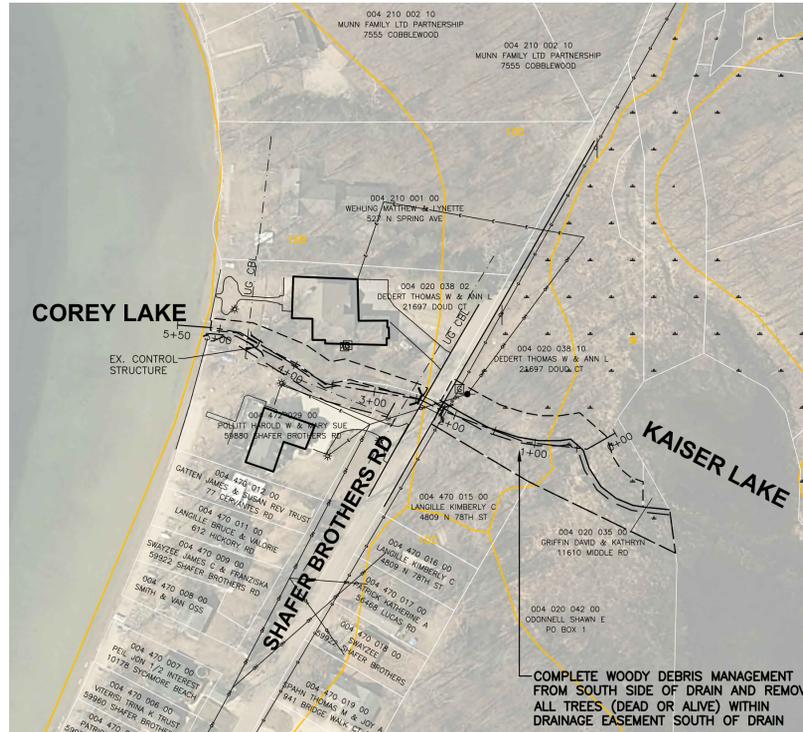


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MUD LAKE - CLEAR LAKE



COREY LAKE - KAISER LAKE



NOTES:

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9. CONTRACTOR SHALL ADHERE TO ALL LOCAL, STATE AND FEDERAL LAWS INCLUDING CONDITIONS OF EGLE PERMIT #: WRP04090B1.0. INCLUDING: NO WORK IN CLEAR LAKE MARCH 1ST - JUNE 30TH & NO WORK IN COREY LAKE MAY 1 - JUNE 30.
10. CONTRACTOR TO DISPOSE OF CULVERTS AND STORM SEWER.
11. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVEWAYS WITHIN PROJECT LOCATION.
12. REMOVE, SALVAGE AND REPAIR FENCES, STRUCTURES AND OTHER ITEMS THAT INTERFERE WITH CONSTRUCTION, PAID FOR AS 1 LS SITE RESTORATION.

MISCELLANEOUS QUANTITIES:

- ① SURFACE RESTORATION 227 LF
- ① OPEN CHANNEL SEEDING 363 LF
- CLEAR LAKE OUTLET DEWATERING 1 LS

TIMING AND SEQUENCE OF CONSTRUCTION & SESC MEASURES

CONSTRUCTION ACTIVITY	ACTIVITY BY MONTH/WEEKS														
	FALL 2025			WINTER 2026			SPRING 2026			SUMMER 2026			FALL 2026		
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1 MOBILIZE CONSTRUCTION EQUIPMENT															
2 PLACE TEMPORARY SESC MEASURES															
3 CONDUCT CLEARING, GRUBBING, & SNAGGING															
4 CONDUCT OPEN CHANNEL EXCAVATION															
5 INSTALL CULVERTS															
6 INSTALL PERMANENT IN-STREAM SESC MEASURES															
7 INSTALL STORM SEWER FROM LAKE OUTLETS															
8 INSTALL PERMANENT UPLAND SESC MEASURES															
9 CONDUCT FINAL RESTORATION MEASURES															
10 REMOVE TEMPORARY SESC MEASURES															

*NOTE: TEMPORARY CONTROL MEASURES TO BE REMOVED ONCE VEGETATION IS ESTABLISHED AND SITE IS STABILIZED.

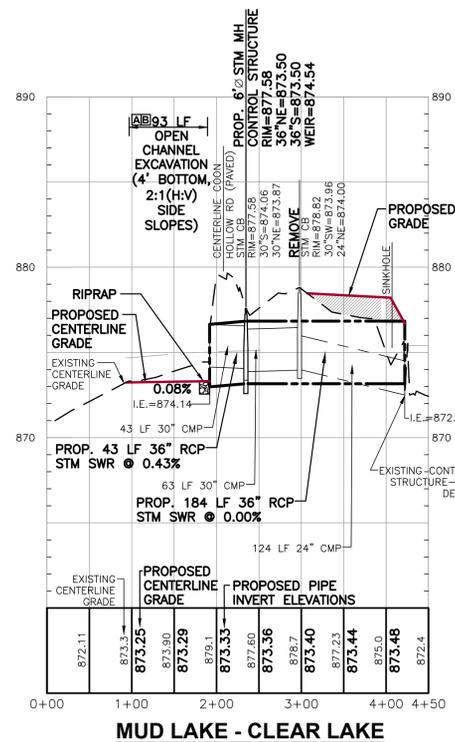
MACDC UNIFIED KEYING SYSTEM EROSION CONTROL MEASURES (SESC)

KEY	SESC MEASURE	SYMBOL	WHERE USED
1	Seeding		When bare soil is exposed, temporarily or permanently, to erosive forces from wind and/or water on flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles.
2	Mulch		On flat areas, slopes, grassed waterways and spillways, diversion ditches & dikes, borrow & stockpile areas, & spoil piles when areas are subject to raindrop impact, & erosive forces from wind or water.
9	Vegetation Removal without Grubbing		Retains existing root mat which assists in stabilizing slopes. Assists in the revegetation process by providing sprout growth. Reduces sheet flow velocities preventing rilling and gulying. Discourages off-road vehicle use.
13	Slope Stabilization		Slope stabilizing measures provide an immediate and effective cover over raw erodible slopes affording excellent protection against rain and wind erosion.
15	Riprap		Along drain banks, shorelines, or where concentrated flows occur. slows velocity, reduces erosion and sedimentation.
16	Riprap Toe of Slope		Riprap toe of slope protection is used in areas where velocities are causing drain bank erosion and are too high to stabilize using other methods.
19	Armored Spillway		When concentrated flow must be conveyed down a drain bank or slope of discharge into another drain. Where slope failure or channel scour is observed or is likely to occur, or when runoff must be redirected around work in the drain.
23	Outfall Stabilization		In the stream or drain bank usually above the ordinary high water mark where an enclosed drain or tile discharges to an open drain.

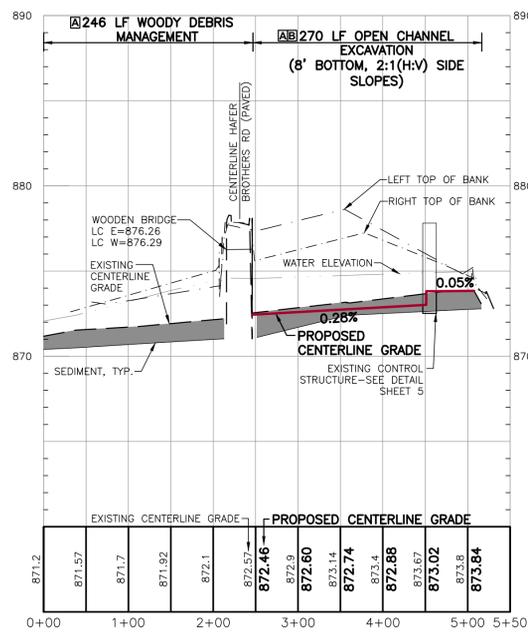
MACDC UNIFIED KEYING SYSTEM - ROUTINE MAINTENANCE ACTIVITIES

KEY	BEST MANAGEMENT PRACTICE	SESC PLAN
A	Debris Removal	NO
B	Sediment Removal	> 100 FEET

*NOTE: ALL SESC MEASURES TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH MACDC SESC MANUAL.



MUD LAKE - CLEAR LAKE



COREY LAKE - KAISER LAKE

CENTERLINE PROFILE

SCALE: HORIZONTAL: 1" = 100'
VERTICAL: 1" = 5'

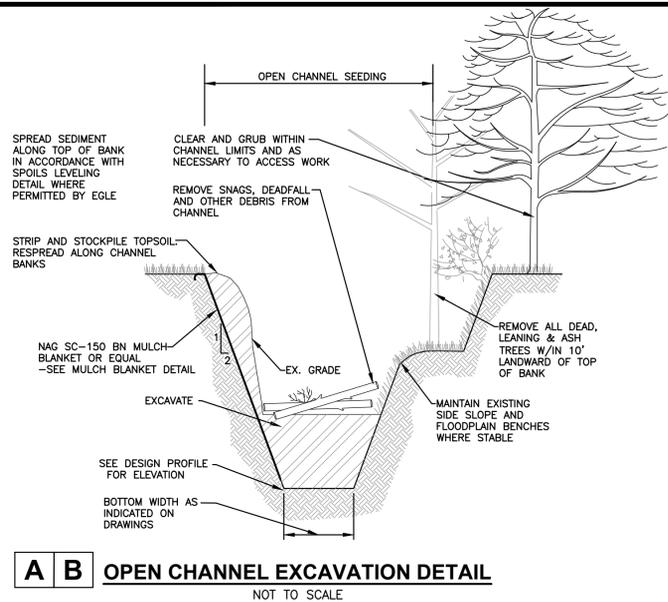
NOTE: ELEVATIONS ARE BASED ON NGVD 29

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DESIGNED BY: GFL/AOK	06/2022
DRAFTED BY: RAG	11/2019
CADC/DJF	03/2025

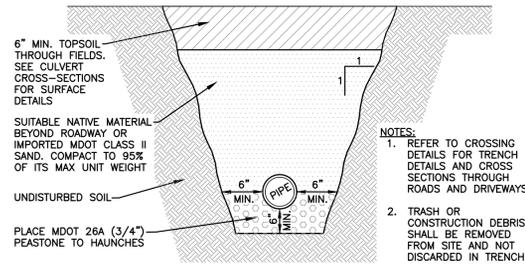




A B OPEN CHANNEL EXCAVATION DETAIL
NOT TO SCALE

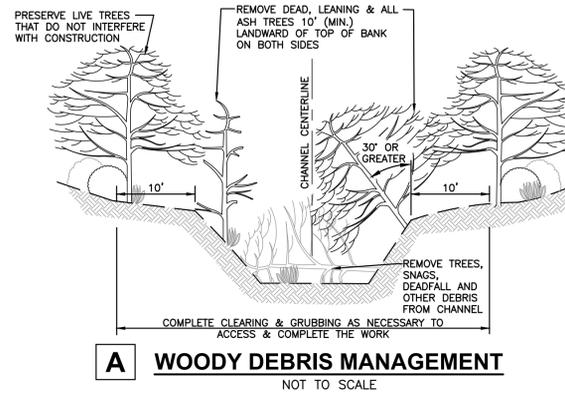
TRENCH WIDTH TABLE
MINIMUM TRENCH WIDTH FOR N-12 PLASTIC PIPE (PER ADS STANDARD DRAWING STD-101)

PIPE DIAMETER	TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
60"	96"

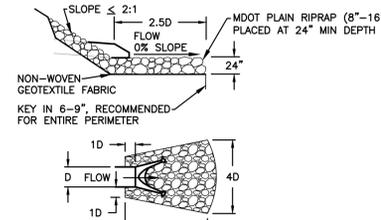


STORM SEWER TRENCH DETAIL
NOT TO SCALE

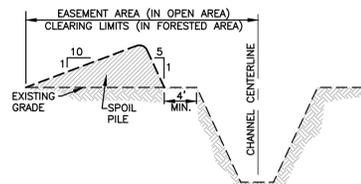
NOTES:
1. CUT STUMPS FLUSH WITH GROUND SURFACE.
2. LEAVE EMBEDDED MATERIAL WITHIN THE CHANNEL BOTTOM.



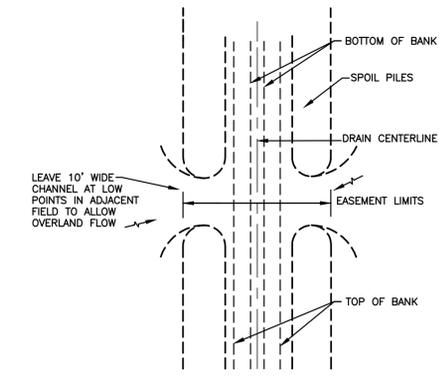
A WOODY DEBRIS MANAGEMENT
NOT TO SCALE



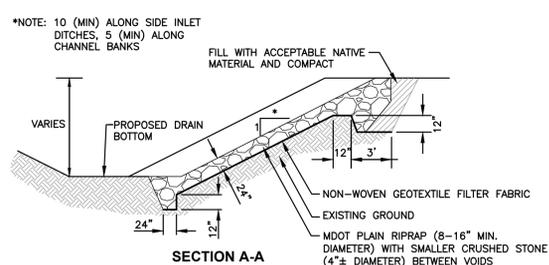
23 RIPRAP ENERGY DISSIPATOR
NOT TO SCALE



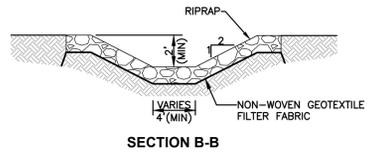
CROSS SECTION-SPOIL LEVELING AREA
NOT TO SCALE



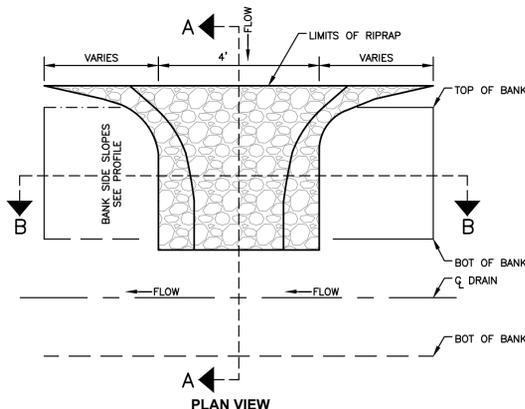
SPOIL LEVELING DETAIL
NOT TO SCALE



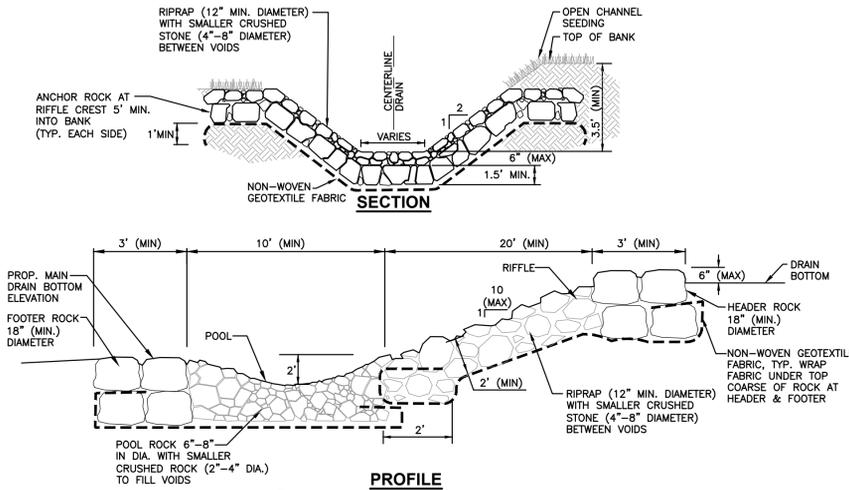
SECTION A-A



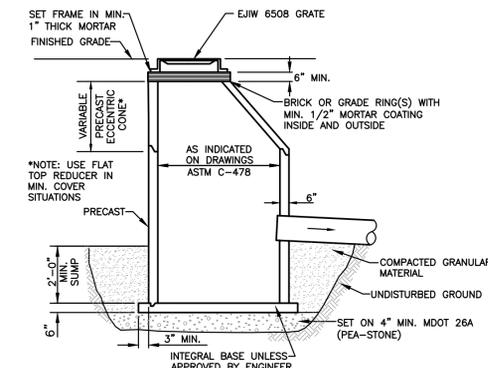
SECTION B-B



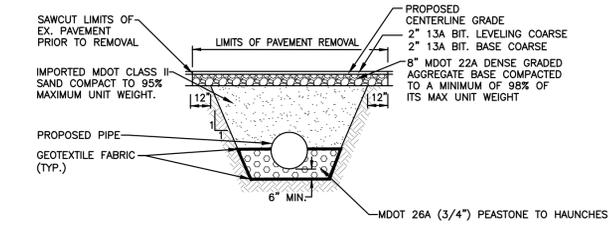
19 RIPRAP SIDE INLET DETAIL
NOT TO SCALE



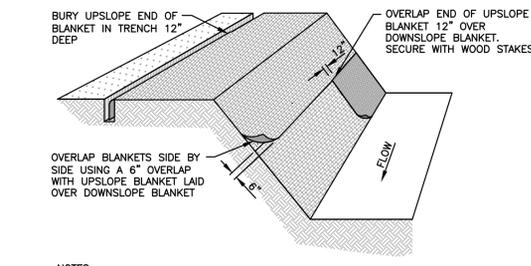
15 ROCK RIFLE DETAIL
NOT TO SCALE



STANDARD CATCH BASIN
NOT TO SCALE

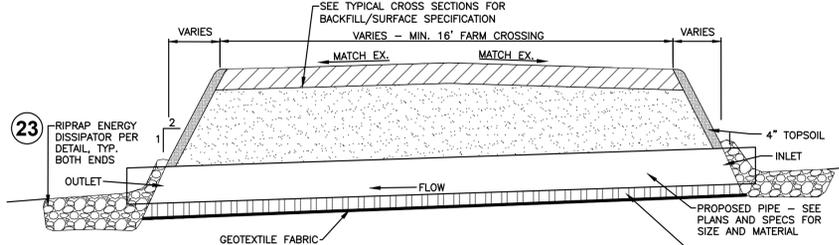


TYPICAL PAVED ROAD CROSS SECTION
NOT TO SCALE

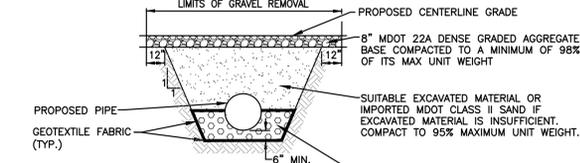


NOTES:
1. PLACE MULCH BLANKET PARALLEL TO FLOW AND ANCHOR SECURELY.
2. STAPLES INSTALLED/SECURED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
3. MULCH BLANKET SHALL BE NA GREEN SC 150 BN OR EQUAL.

2 MULCH BLANKETS INSTALLATION DETAIL
NOT TO SCALE



23 TYPICAL CULVERT INSTALLATION
NOT TO SCALE



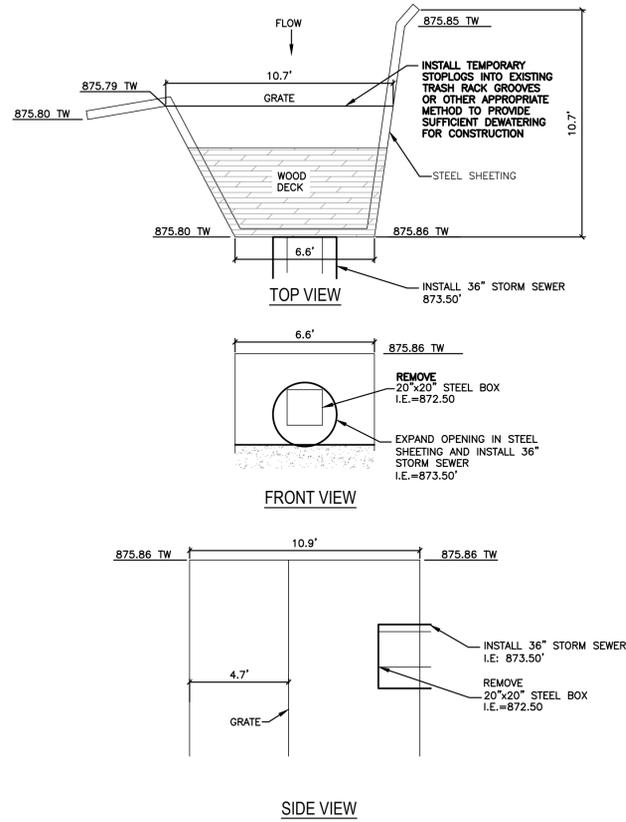
TYPICAL PRIVATE DRIVE CROSS SECTION
NOT TO SCALE

REVISIONS:

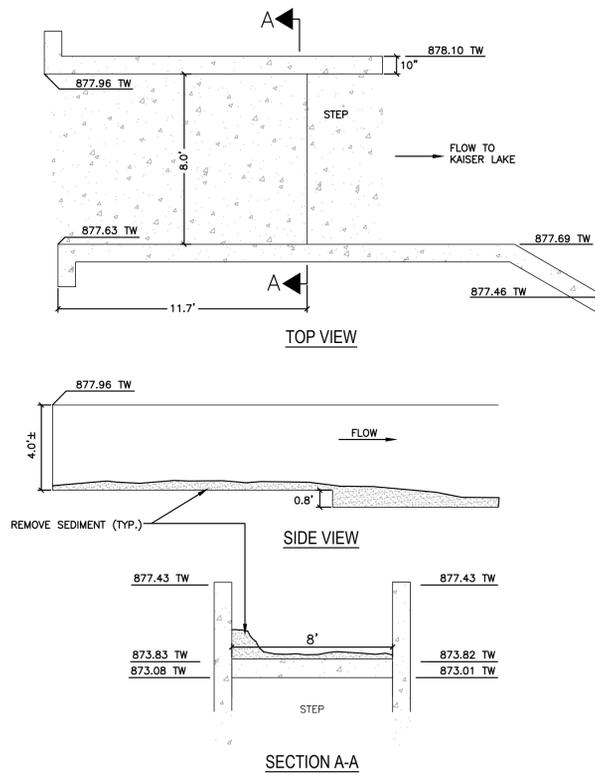
NO.	DATE	ISSUED FOR
1.	11/27/2019	DRAFT REVIEW
2.	04/23/2025	BIDS & CONSTRUCTION
3.	08/19/2025	FOR CONSTRUCTION

PROJECT NUMBER: 19078

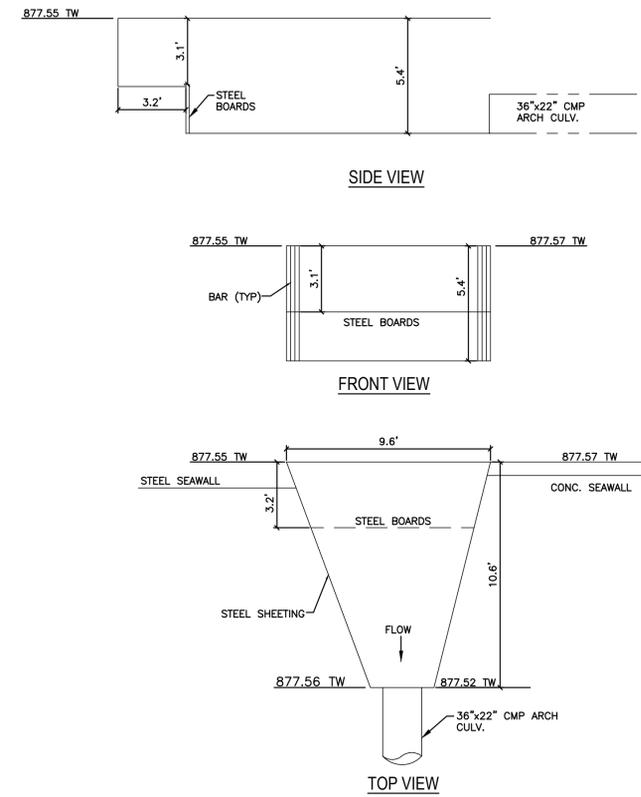
DATE	BY
11/2019	CPV/AOK
06/2022	AW/S
11/2019	AW/S
03/2025	DAJ



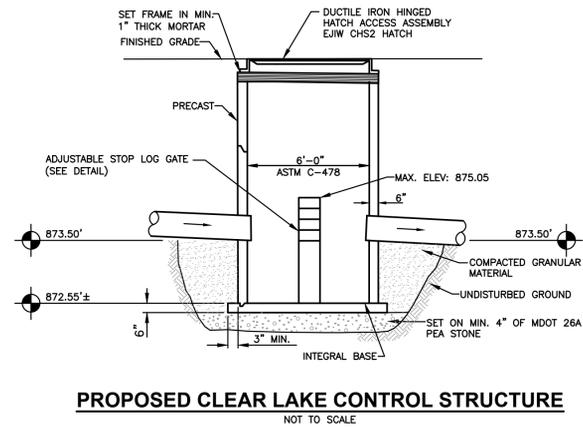
EXISTING CONTROL STRUCTURE CLEAR LAKE
 SCALE: 1"=4"
 ELEVATIONS ARE BASED ON NGVD 29



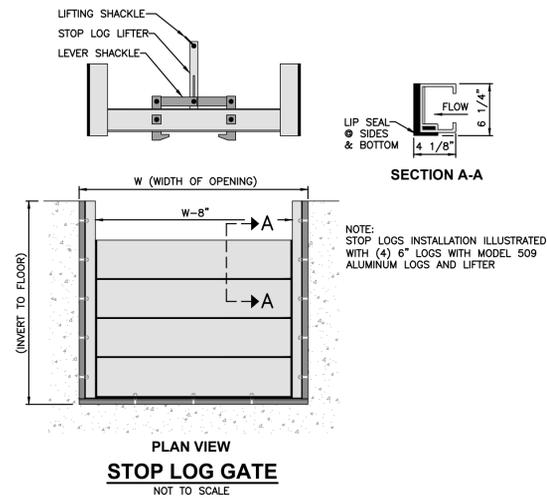
EXISTING CONTROL STRUCTURE KAISER LAKE TO COREY LAKE
 SCALE: 1"=4"
 ELEVATIONS ARE BASED ON NGVD 29



EXISTING CONTROL STRUCTURE COREY LAKE
 SCALE: 1"=4"
 ELEVATIONS ARE BASED ON NGVD 29



PROPOSED CLEAR LAKE CONTROL STRUCTURE
 NOT TO SCALE



STOP LOG GATE
 NOT TO SCALE

ALL UTILITIES AS SHOWN ARE APPROXIMATE LOCATIONS DERIVED FROM ACTUAL MEASUREMENTS AND AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATION NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THE AREA.



REVISIONS:	NO.	DATE	ISSUED FOR
	1.	11/27/2019	DRAFT REVIEW
	2.	04/23/2025	BIDS & CONSTRUCTION
	3.	09/19/2025	FOR CONSTRUCTION

CLIENT: COREY LAKE INTERCOUNTY DRAINAGE BOARD
 MIDARD 528 W. ALLEGAN STREET, LANSING, MICHIGAN 48933

PROJECT: COREY LAKE INTERCOUNTY DRAIN
 CASS AND ST. JOSEPH COUNTIES, MICHIGAN

PROJECT NUMBER:	DATE
19478	11/2019
	06/2022
	11/2019
	03/2025

SURVEYED BY: CPV-ADK
 DESIGNED BY: AWS
 DRAFTED BY: RAG
 CADC/DJF

LAKE LEVEL
 STRUCTURE DETAILS

SHEET NUMBER
C6