

PLANS FOR CONSTRUCTION OF
BABCOCK DRAIN

BRIAN J. WENDLING, SAGINAW CO. PUBLIC WORKS COMMISSIONER

SECTION 9, T9N, R4E MAPLE GROVE TWP. SAGINAW CO. MICHIGAN

4/5/22	FOR BIDS	AJL
DATE	DESCRIPTION	BY
REVISIONS/SUBMITTALS		

NOTES

GENERAL

- Benchmarks
 - Found Remon/Monument Box Saginaw County Monument, stamped 39096, in existing Monument Box. 1/4 corner, Sections 4, 9, T9N-R4E, Maple Grove Township, Saginaw County, Michigan.
Elevation = 635.83 (Datum = NAVD88)
 - Found Remon/Monument Box Saginaw County Monument, stamped 39096, in existing Monument Box. Section Corner, Sections 4, 5, 8, 9, T9N-R4E, Maple Grove Township, Saginaw County, Michigan.
Elevation = 635.89 (Datum = NAVD88)
- The contractor shall call "MISS DIG" at 811 or 1-800-482-7171 at least 3 working days (excluding weekends and holidays) prior to construction.
- All work shall be done in accordance with the applicable codes, ordinances, design standards and standard specifications of the following agencies which have the responsibility of reviewing plans and specifications for construction of all items included in these plans:
 - Saginaw County Public Works Commissioner
 - Saginaw County Road Commission
 - Michigan Department of Environment, Great Lakes, and Energy
- The contractor shall apply for and obtain all necessary permits as required for construction of this project prior to the beginning of work from the previously mentioned agencies.
- The contractor shall notify the Saginaw County Road Commission a minimum of 24 hours prior to any construction in the road right-of-way of Chesaning Road.
- The contractor agrees that in accordance with generally accepted construction practices, the contractor will be required to assume sole responsibility for job site conditions during the course of construction of the project, including the safety of all persons and property. This requirement shall be made to apply continuously and not be limited to normal working hours.
- The locations and dimensions shown on the plans for existing facilities are in accordance with all available information. The engineer does not guarantee the accuracy of this information or that all existing underground facilities are shown.
- When any existing utility requires adjustment or relocation, the contractor shall notify the proper utility company and coordinate the work accordingly. There shall be no claim made by the contractor for any costs caused by delays in construction due to the adjustment or relocation of utilities.
- The contractor is to verify that the plans and specifications that he/she is building from are the very latest plans and specifications that have been approved by all applicable permit-issuing agencies and the owner. All items constructed by the contractor prior to receiving the final approval and permits having to be adjusted or re-done, shall be done at the contractor's expense.
- Should the contractor encounter conflict between these plans and specifications, either among themselves or with the requirements of any and all reviewing and permit-issuing agencies, he/she shall seek clarification in writing from this engineer before commencement of construction. Failure to do so shall be at the sole expense to the contractor.
- Unless otherwise noted the contractor shall furnish as-built drawings indicating all changes and deviations from approved drawings.
- All signs and traffic control measures during construction and maintenance activities shall be constructed and installed per the latest edition of the Michigan Manual of Uniform Traffic Control Devices (M.M.U.T.C.D.).
- LSG Engineers & Surveyors will not be responsible for field design changes made by the contractor or the contractor's surveyor where LSG Engineers & Surveyors has not approved these design changes.

GRADING AND SITE WORK

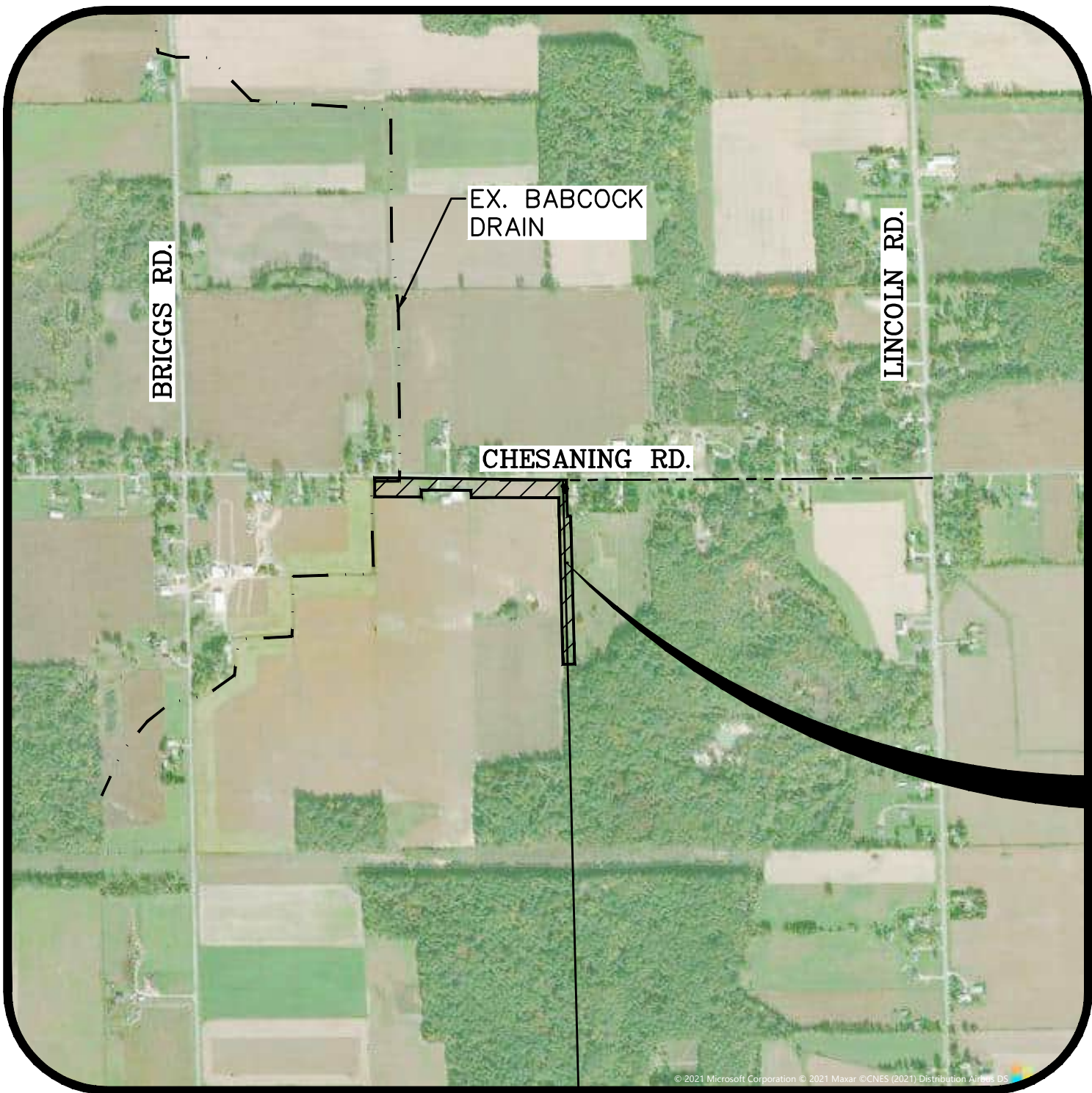
- All sedimentation and soil erosion control measures shall be constructed prior to the commencement of site grading and must conform to Part 91 of Act 451 of the Public Acts of 1994 as amended. All applicable permits shall be obtained before implementing these measures. The contractor shall be responsible for maintaining the sedimentation and soil erosion control measures throughout construction.
- Prior to grading, cutting and filling the contractor shall remove all topsoil, debris, vegetation, etc. from the site.
- All site grading must be performed to insure positive drainage across the entire site, throughout the period of construction and after project completion.

STORM DRAINAGE SYSTEM

- Unless otherwise noted all storm drain pipe shall be AASHTO M36 corrugated steel.
- All storm drain within the influence of roads, drives, walks, structures and foundations shall be backfilled with 100% granular material (or approved other) and compacted to 95% of its maximum unit weight (see typical trench details included in these plans).
- See drain details on sheets C2.0.

CONSTRUCTION NOTES

- No piling of debris will be allowed on this project. debris shall be chipped, or hauled away.
- Field diversion swales are incidental to the construction for spoil leveling (see details this sheet). Field diversions required for Soil Erosion Control Measures will be measured by linear foot.
- Sediment sumps will be constructed on this project. All sumps are to be maintained regularly throughout construction and cleaned out upon completion of this project.
- Upon completion of the project, all rock check dams shall be removed incidental to construction. All sediment that has been accumulated behind the check dams shall be removed from the drain and leveled according to the spoil leveling details.
- Fences on private property disturbed by the contractor on this project will be replaced as per general conditions.
- The contractor will be responsible for turf establishment along drain side slopes, spoil banks, culvert end slopes and other areas designated by the construction plans or by the engineer as per the open drain specifications.
- Drain inspection cost will be paid by the owner. Inspection charges by the road commission, railroads and the M.D.O.T. will be paid by the contractor, unless otherwise specified.

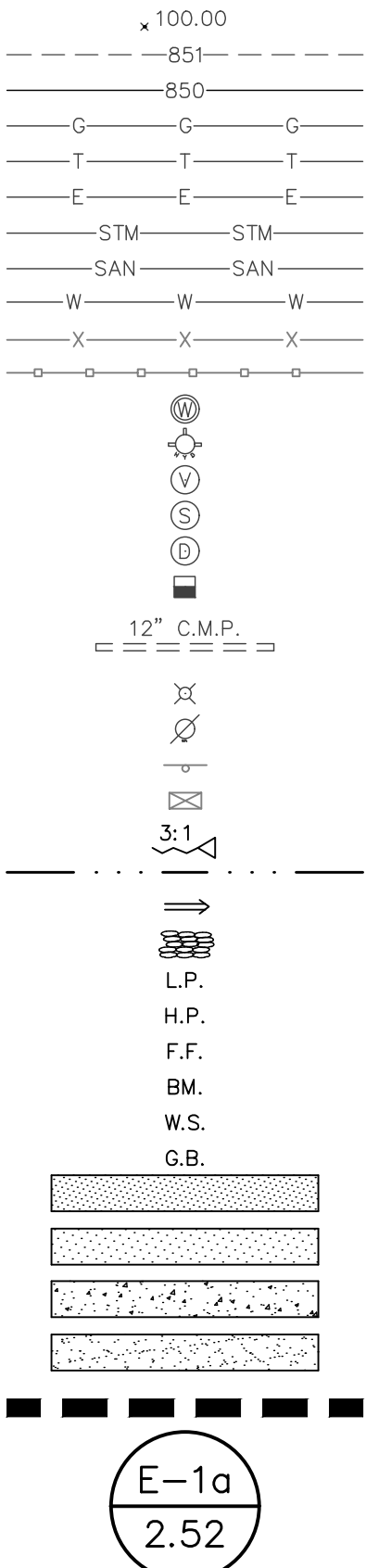


LOCATION MAP

SCALE: 1"=1000'

LEGEND

- (E) SPOT ELEVATION
(E) 1' CONTOURS
(E) 5' CONTOURS
(E) GAS LINE
(E) TELEPHONE LINE
(E) ELECTRIC LINE
(E) STORM DRAIN
(E) SANITARY SEWER
(E) WATER MAIN
(E) CHAIN LINK FENCE
(E) WOOD FENCE
(E) WATER WELL
(E) FIRE HYDRANT
(E) WATER VALVE
(E) SANITARY MANHOLE
(E) STORM MANHOLE
(E) CATCHBASIN
(E) CULVERT
(E) LIGHT POLE
(E) UTILITY POLE
(E) SIGN
(E) MAILBOX
(P) SIDE SLOPE
(P) DRAINAGE SWALE
(P) DRAINAGE FLOW ARROW
(P) RIP RAP
LOW POINT
HIGH POINT
FINISH FLOOR
BENCHMARK
WATER SURFACE
GRADE BREAK
(P) HEAVY DUTY ASPHALT AREA
(P) LIGHT DUTY ASPHALT AREA
(P) CONCRETE SURFACE
(P) AGGREGATE SURFACE
(P) DRAINAGE BASIN BOUNDARY
(P) BASIN DESIGNATION
(P) BASIN AREA IN ACRES



- (P) SPOT ELEVATION
(P) 1' CONTOUR
(P) 5' CONTOUR
(P) GAS LINE
(P) TELEPHONE LINE
(P) ELECTRIC LINE
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(P) WATER MAIN VALVE
(P) WATER MAIN BEND
(P) WATER MAIN REDUCER
(P) CURB INLET
(P) CATCH BASIN
(P) TRENCH DRAIN
(P) FLARED END SECTION
(P) MANHOLE
(P) LIGHT POLE
(P) SANITARY SEWER CLEANOUT
(P) UTILITY CROSSING
(P) BUILDING WALLPACK
(P) SIGN
(P) PARKING COUNT
(P) HANDICAP PARKING
(P) HANDICAP VAN ACCESSIBLE
(P) TRAFFIC FLOW
(P) MODIFIED CURB & GUTTER
(P) REGULAR CURB & GUTTER
(P) SCREEN WALL OR RETAINING WALL

NOTE:
(E) - INDICATES EXISTING
(P) - INDICATES PROPOSED

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- C COVER
- C1.0 PLAN AND PROFILE - P.O.B. TO STA 11+50
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- C2.0 CROSS SECTIONS
- C3.0 DRAIN NOTES AND DETAILS
- C3.1 DRAIN DETAILS
- C3.2 DRAIN DETAILS
- C4.0 SOIL EROSION CONTROL PLAN
- C4.1 SOIL EROSION CONTROL DETAILS
- C5.0 TRAFFIC DETOUR PLAN

CONTACTS

LSG ENGINEERS AND SURVEYORS

ALAN BOYER, P.E.
3135 PINE TREE ROAD, SUITE D
LANSING, MI 48911
PHONE: (517) 393-2902

SAGINAW COUNTY ROAD COMMISSION

HALEY SHEPHERD
3020 SHERIDAN AVE.
SAGINAW, MI 48601
PHONE: (989) 752-6140

CONSUMERS ENERGY COMPANY - GAS

JOSEPH RODEA
530 W WILLOW ST.
LANSING, MI 48906
PHONE: (989) 791-5869
EMAIL: JOSEPH.RODEA1@CMSENERGY.COM

CENTURY LINK

BOBBY WALTER
203 W 9TH ST.
LORAIN, OH 44052
PHONE: (440) 244-8415
EMAIL: BOBBY.D.WALTERS@CENTURYLINK.COM

FOR BID PURPOSES ONLY

PREPARED FOR:
SAGINAW COUNTY PUBLIC
WORKS COMMISSIONER
BRIAN J. WENDLING
111 S. MICHIGAN AVENUE
SAGINAW, MICHIGAN
PHONE: (989) 790-5258

LSG
Engineers
& Surveyors

3135 PINE TREE ROAD
SUITE D
LANSING, MI 48911
PH: (517) 393-2902
FAX (517) 393-2608
www.lsg-es.com

EGLE PERMIT NO.
WRP_026900 v.1

DATE: MARCH 18, 2022
PROJECT NO.
2409
SHEET NO.
C

SESC LEGEND

26 REFERS TO THE APPROPRIATE S.E.S.C. KEYING SYSTEM DETAIL (SEE SHEET C5.0)

NRCS SOIL BOUNDARY

EASEMENT AREA

SEED MIX AS DESCRIBED IN SEEDING TABLE (SHEET C5.1)

SCS SOIL TYPES

24 PARKHILL LOAM (0 TO 1 PERCENT SLOPES)

124A SELFREDGE LOAMY SAND (0 TO 3 PERCENT SLOPES)

PROFILE LEGEND

PROPOSED GRADE

EX. ϕ DRAIN

EX. ϕ ROAD

TOP OF BANK LEFT

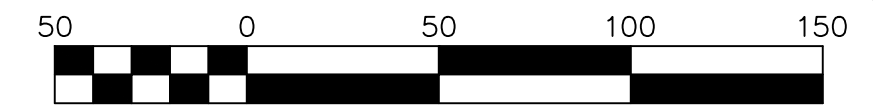
TOP OF BANK RIGHT

NOTES

- BENCHMARKS
 - #1. FOUND REMON/MONUMENT BOX SAGINAW COUNTY MONUMENT, STAMPED 39096, IN EXISTING MONUMENT BOX, 1/4 CORNER, SECTIONS 4, 9, T9N-R4E, MAPLE GROVE TOWNSHIP, SAGINAW COUNTY, MICHIGAN, ELEVATION = 635.83 (DATUM = NAVD88)
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- THE CONTRACTOR SHALL CALL "MISS DIG" AT 1-800-482-7171 AT LEAST THREE (3) WORKING DAYS (EXCLUDING WEEKENDS AND HOLIDAYS) PRIOR TO CONSTRUCTION.
- LSG ENGINEERS & SURVEYORS WILL NOT BE RESPONSIBLE FOR FIELD DESIGN CHANGES MADE BY THE CONTRACTOR OR THE CONTRACTOR'S SURVEYOR WHERE THESE DESIGN CHANGES HAVE NOT BEEN APPROVED BY LSG ENGINEERS & SURVEYORS.

SPOIL LEVELING (LOOKING UPSTREAM):

STATION TO STATION	SIDE (R OR L)
0+00 TO 1+57	R
1+57 TO 5+07	NONE
5+07 TO 11+50	R



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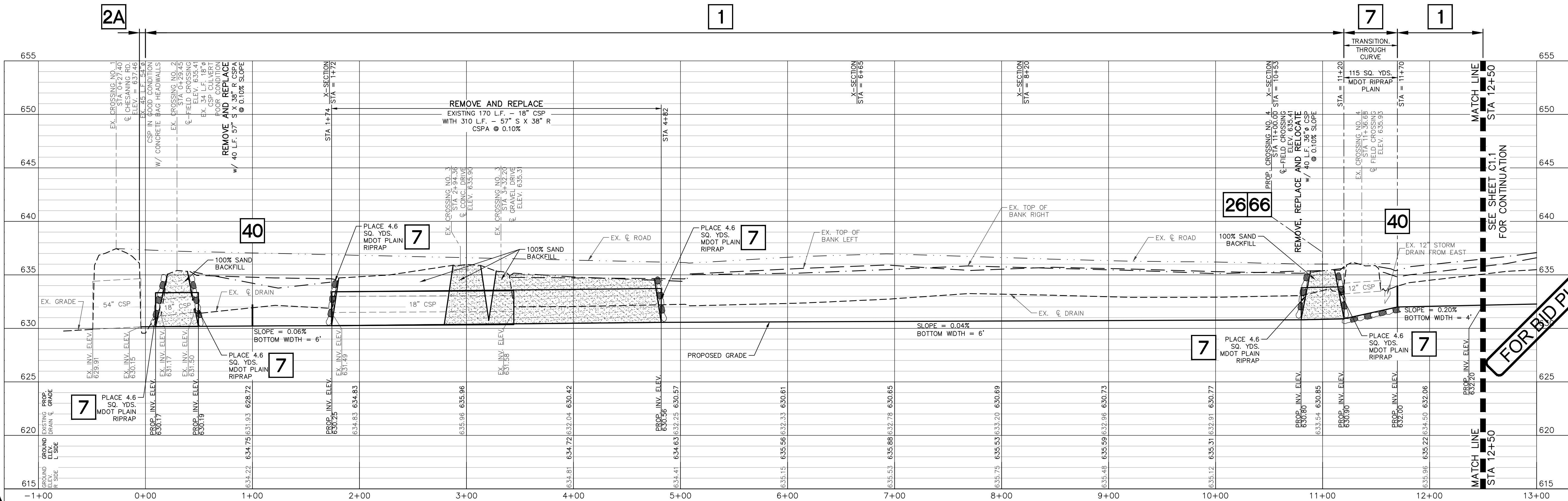
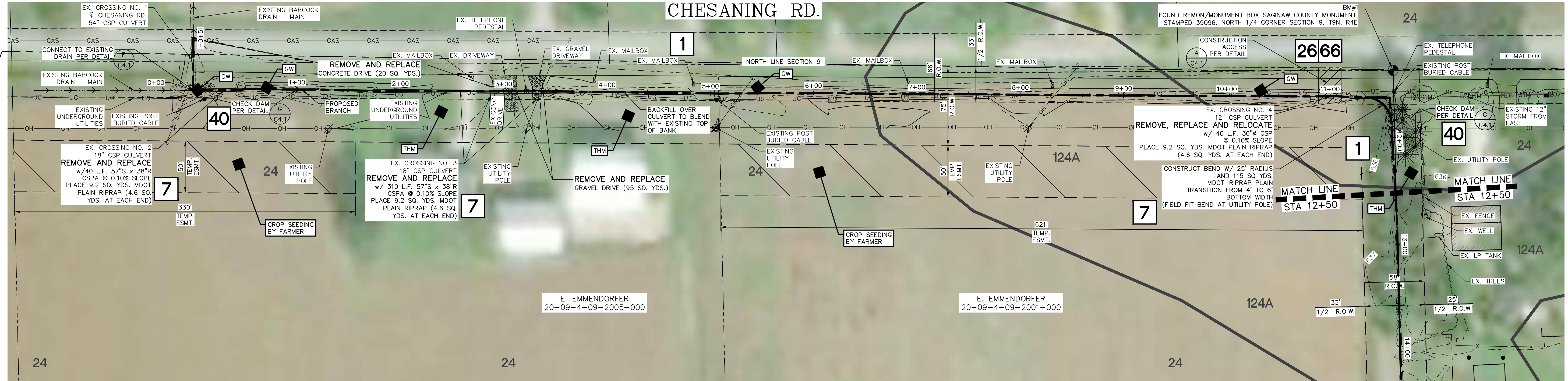
PREPARED FOR:
**SAGINAW COUNTY PUBLIC
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SAGINAW, MICHIGAN
PHONE: (989) 790-5258

PLAN AND PROFILE - P.O.B. TO STA 12+50
FOR
BABCOCK DRAIN
MAPLE GROVE TOWNSHIP
SAGINAW COUNTY, MICHIGAN

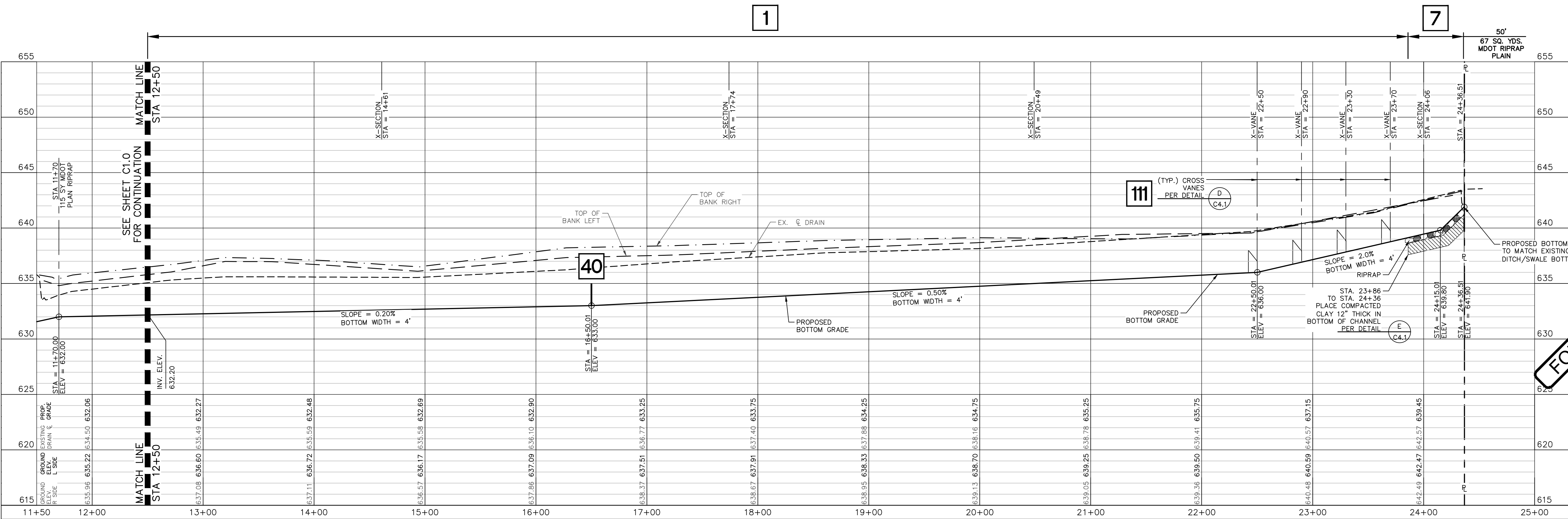
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WRP 026900 v.1



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DESIGNED BY: ADB
DRAWN BY: SEP/AJL
CHECKED BY: ADB
DATE: JAN. 11, 2021
SCALE:
HOR. 1" = 50'
VERT. 1" = 5'
PROJECT NO.: 2409
SHEET NO.: C1.0



FOR BID PURPOSES ONLY



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EGLE PERMIT NO.
WRP 026900 v.1

MISS
DIG
811
Know what's below.
Call before you dig.

PLAN AND PROFILE - STA 12+50 TO P.O.E.
FOR
BABCOCK DRAIN
MAPLE GROVE TOWNSHIP
SAGINAW COUNTY, MICHIGAN

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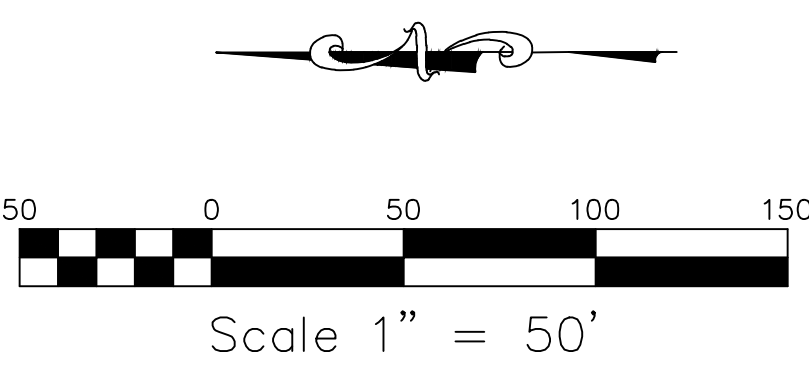
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REVISIONS/SUBMITTALS	DATE	DESCRIPTION	BY

NOTES

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SPOIL LEVELING (LOOKING UPSTREAM):
STATION TO STATION SIDE (R OR L)
12+50 TO 13+87 R
13+87 TO 24+36 L AND R (EQUALLY)



PROFILE LEGEND

PROPOSED GRADE
EX. Q. DRAIN
TOP OF BANK LEFT
TOP OF BANK RIGHT

SCS SOIL TYPES

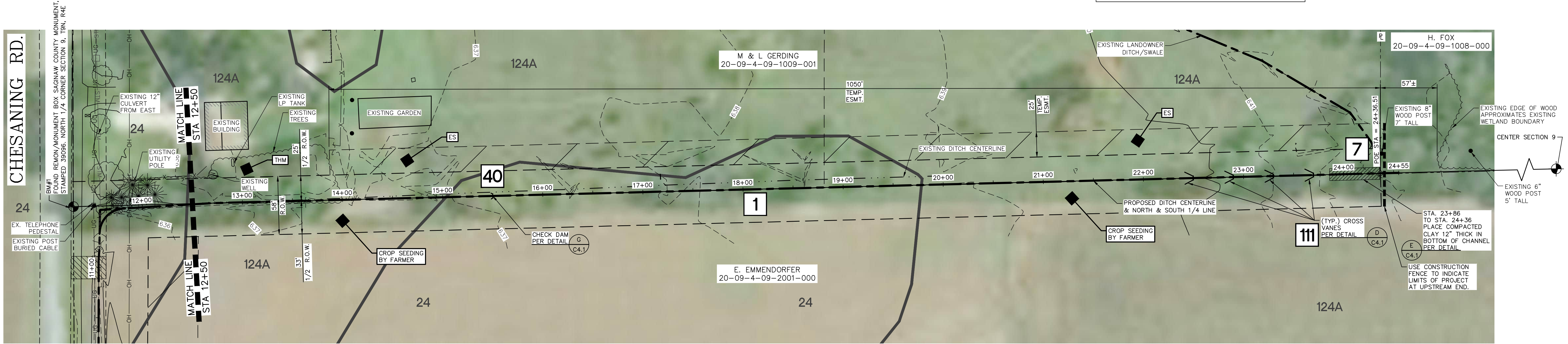
24 PARKHILL LOAM (0 TO 1 PERCENT SLOPES)
124A SELFREDGE LOAMY SAND (0 TO 3 PERCENT SLOPES)

SEEDING:
MIX AREA OF USE
MDOT, ES TOP OF BANK, NON-LAWN (USE SALVAGED TOPSOIL)
MDOT, THM TOP OF BANK, LAWN (USE IMPORTED TOPSOIL)
GW WITHIN CHANNEL LIMITS

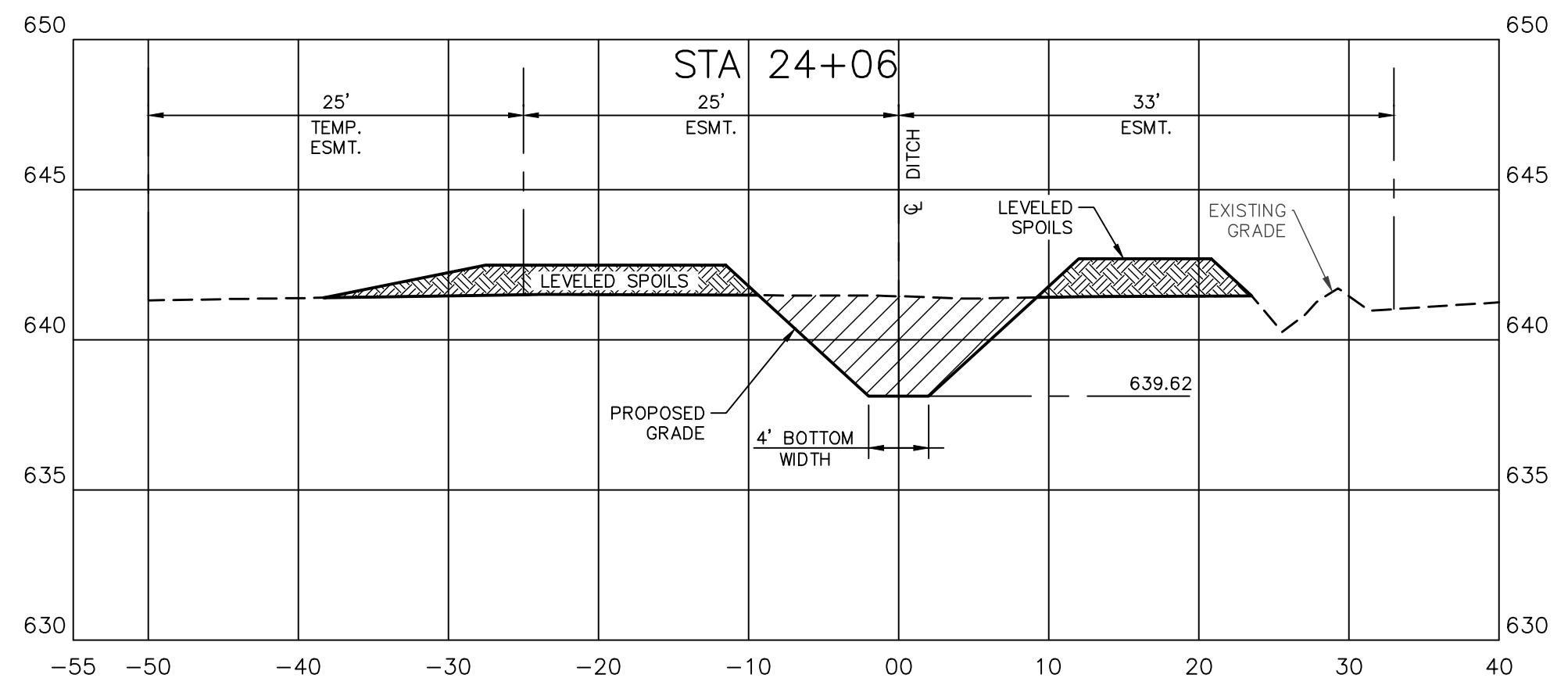
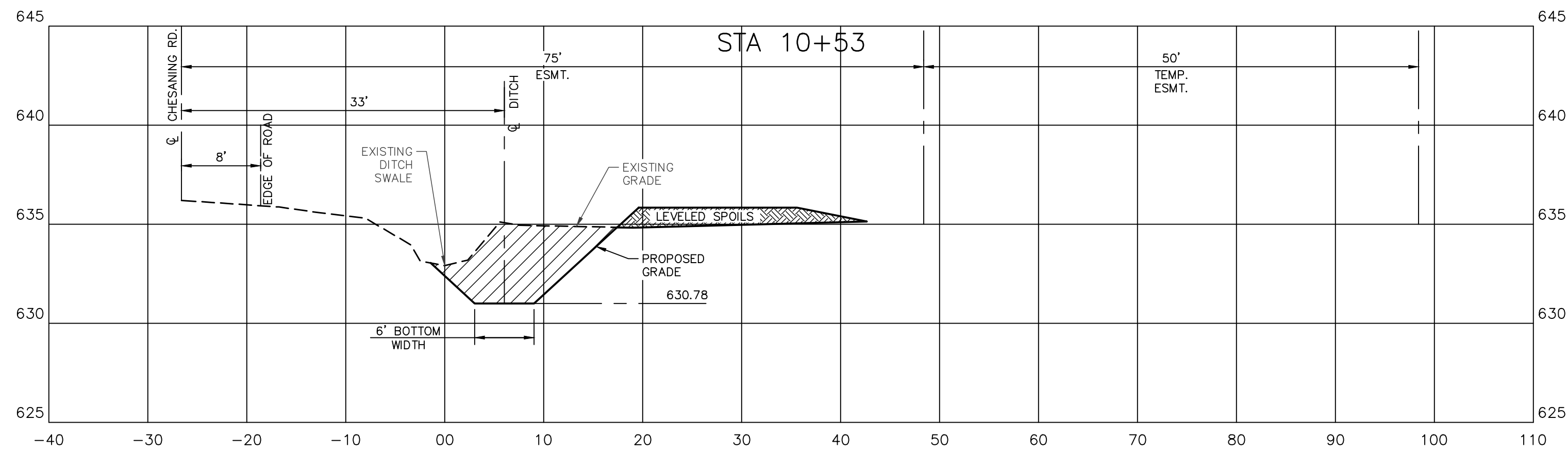
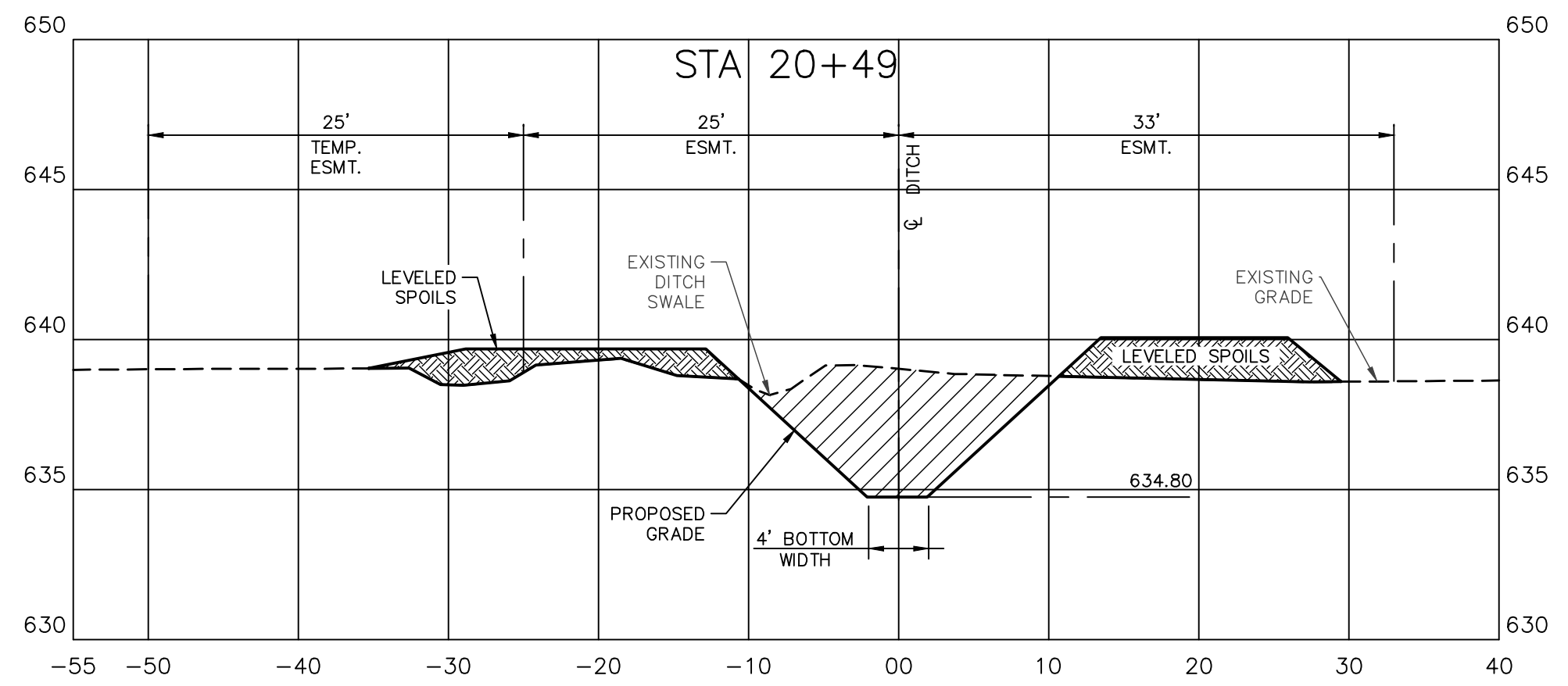
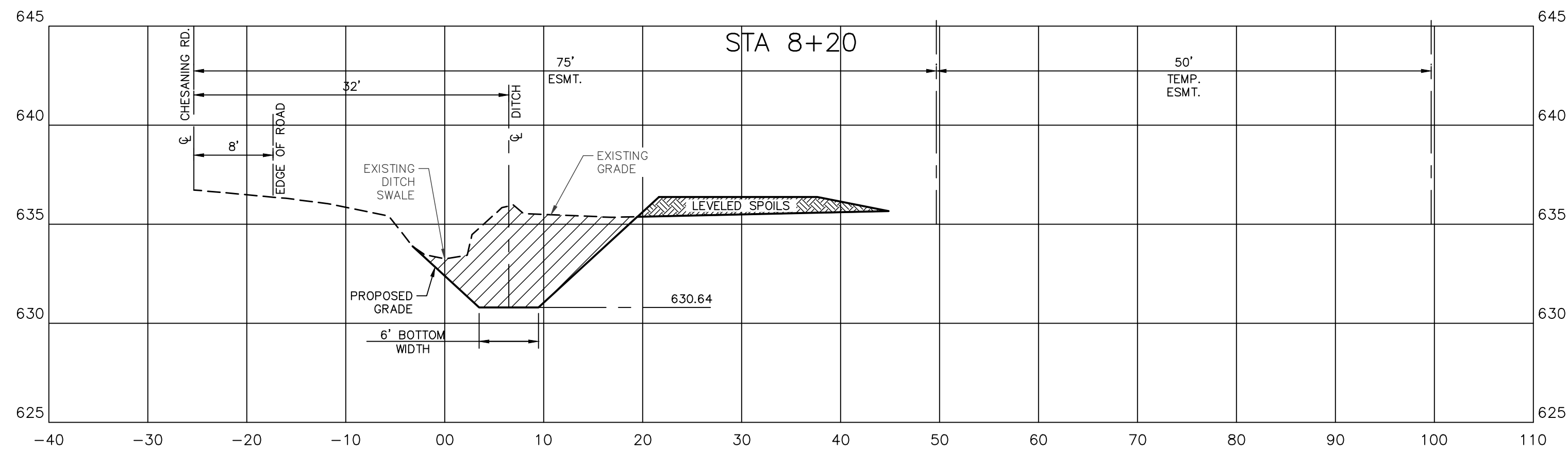
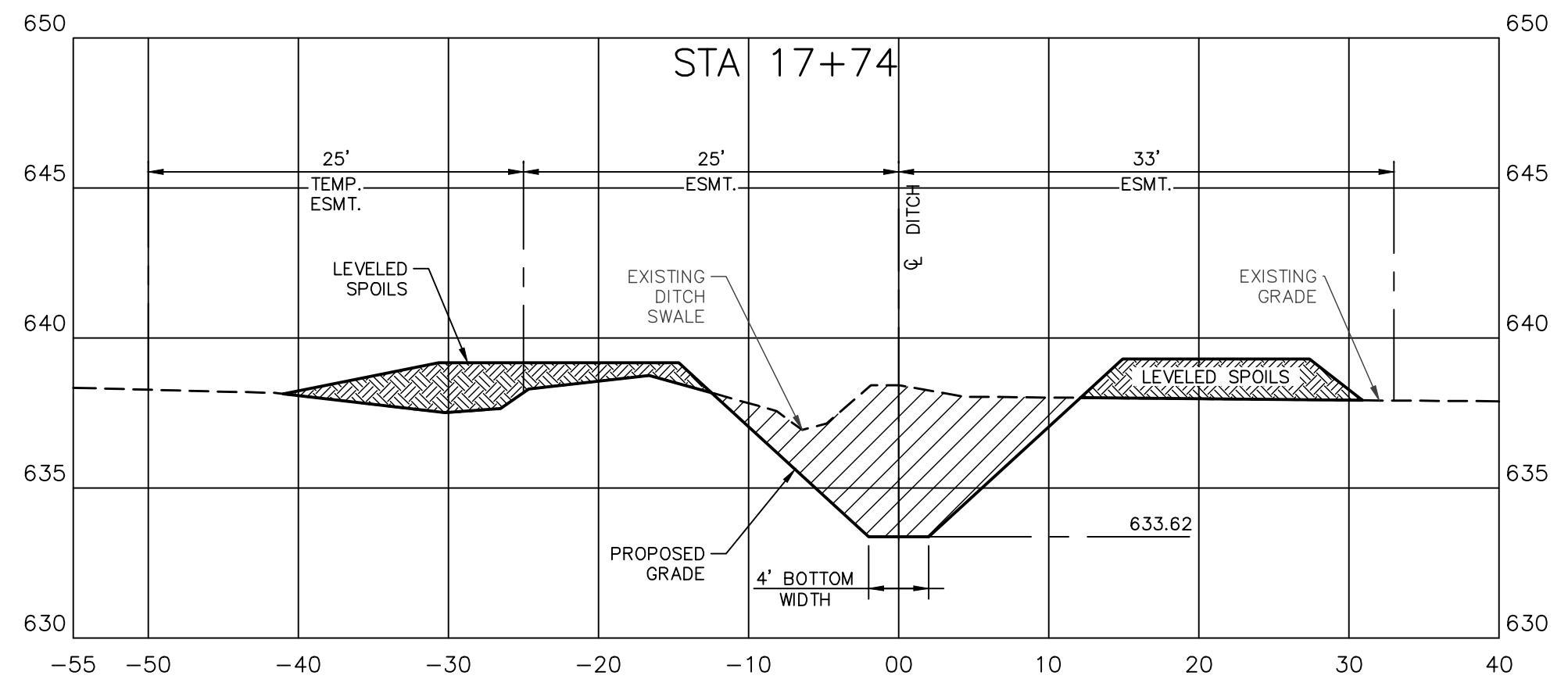
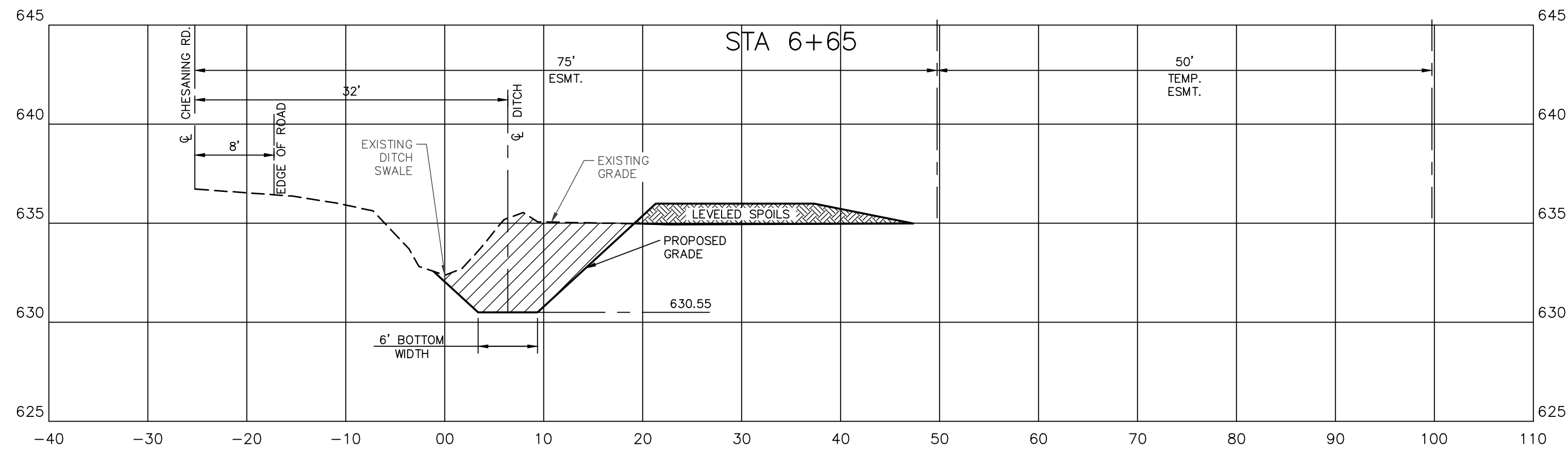
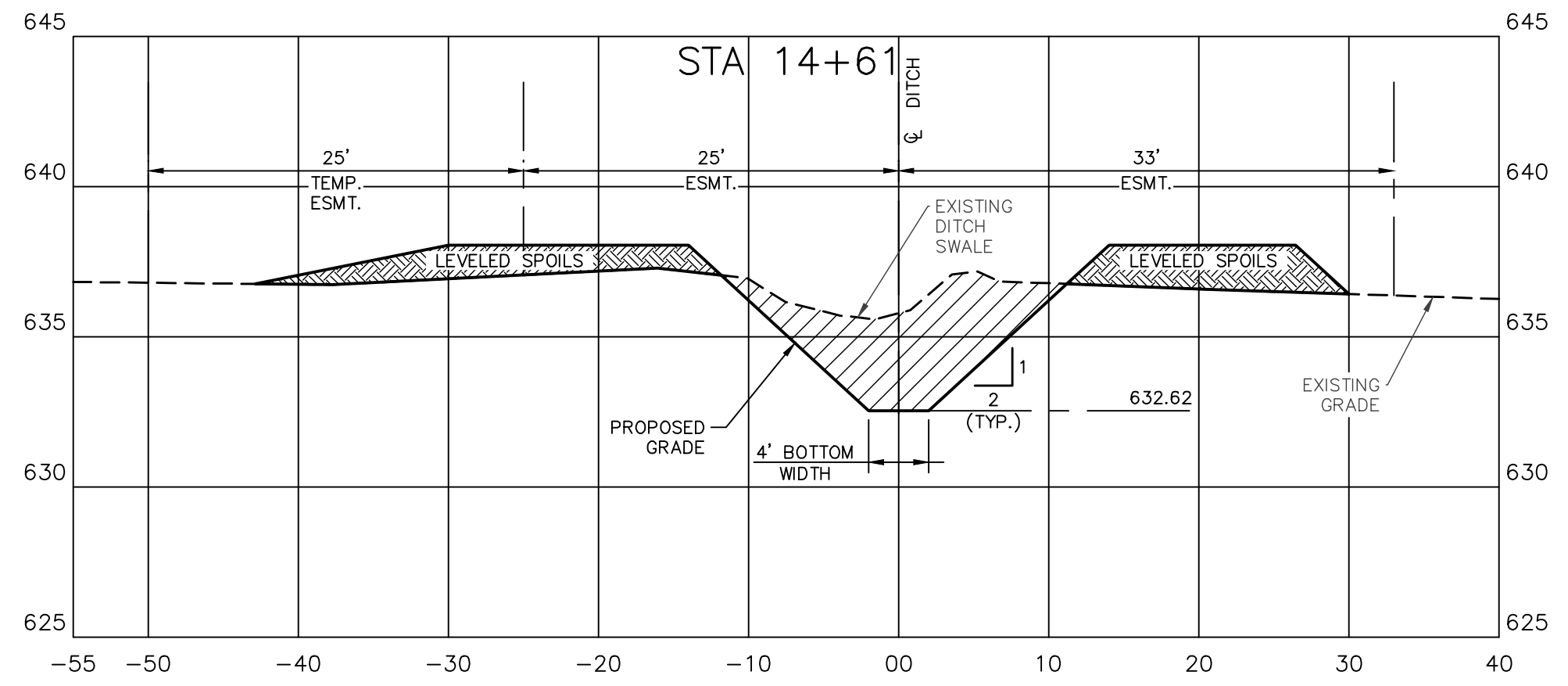
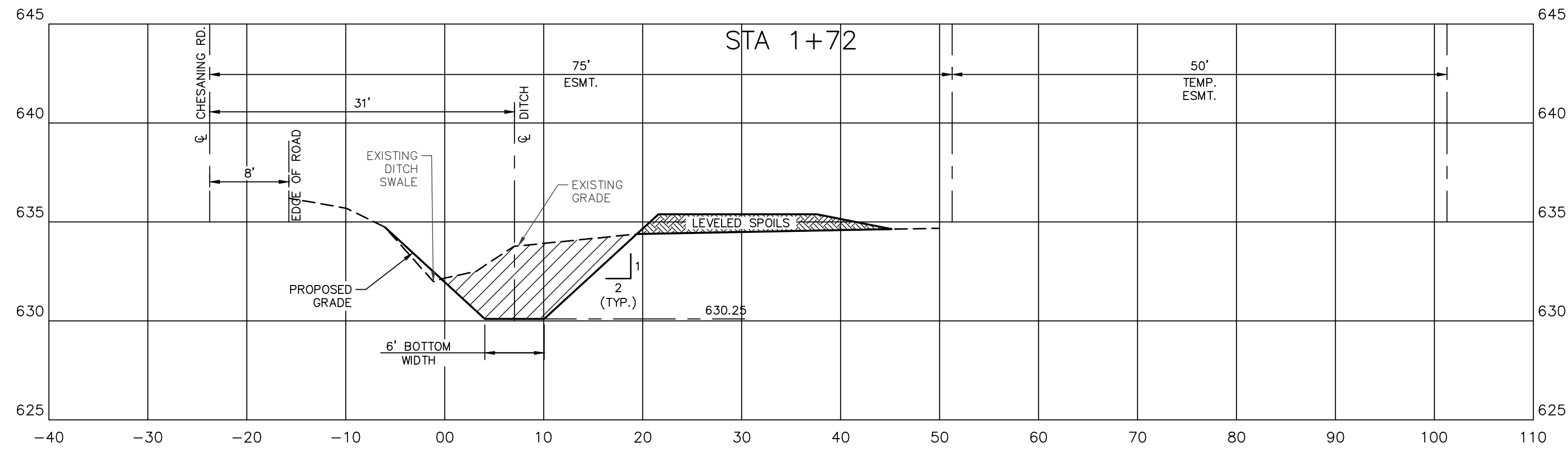
SESC LEGEND

26 REFERS TO THE APPROPRIATE S.E.S.C. KEYING SYSTEM DETAIL (SEE SHEET C5.0)
NRCS SOIL BOUNDARY
EASEMENT AREA
SEED MIX AS DESCRIBED IN SEEDING TABLE (SHEET C5.1)

TREE REMOVAL:
BETWEEN STA. 11+70 AND STA 14+50 THE CONTRACTOR SHALL REMOVE AND DISPOSE OF APPROXIMATELY 40 TREES RANGING IN SIZE FROM <6" TO 30" DBH TO FACILITATE CONSTRUCTION OF THE OPEN CHANNEL.
TREE REMOVAL IS PAID FOR AS A LUMP SUM FOR THE ENTIRE PROJECT. THE ABOVE INFORMATION IS PROVIDED TO AID THE CONTRACTOR IN UNDERSTANDING THE EXTENT OF THE TREE REMOVAL IN THIS AREA.



FILE: W:\LSG_PROJECTS\2409 [SOPW: BABCOCK DRAIN]\C\6 PLANS\C2-0.DWG - PLOT DATE: 4/6/2022 9:21 AM BY: Shannon Pugh SCALE: 1:1



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Call before you dig.

EGLE PERMIT NO.
WRP 026900 v.1

REVISIONS/SUBMITTALS		
DATE	FOR BIDS DESCRIPTION	BY
4/5/22		AJ

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SUITE D
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CROSS SECTIONS
FOR
BABCOCK DRAIN
MAPLE GROVE TOWNSHIP
SAGINAW COUNTY, MICHIGAN

FILE	C2-0.DWG
DESIGNED BY	ADB
DRAWN BY	SEP/AJL
CHECKED BY	ADB
DATE	JAN. 11, 2021
SCALE	
HOR.	1" = 10'
VERT.	1" = 5'
PROJECT NO.	2409
SHEET NO.	C2.0

FILE: W:\LSG PROJECTS\2409 (SPW) BABCOCK DRAIN\CS-6 PLANS\CS-0.DWG - PLOT DATE: 4/6/2022 9:21 AM BY: Shannon Pugh SCALE: 1:1

LEGEND

(E) SPOT ELEVATION	(P) SPOT ELEVATION
(E) 1' CONTOURS	(P) 1' CONTOUR
(E) 5' CONTOURS	(P) 5' CONTOUR
(E) GAS LINE	(P) GAS LINE
(E) TELEPHONE LINE	(P) TELEPHONE LINE
(E) ELECTRIC LINE	(P) ELECTRIC LINE
(E) STORM DRAIN	(P) STORM DRAIN
(E) SANITARY SEWER	(P) SANITARY SEWER
(E) WATER MAIN	(P) WATER MAIN
(E) CHAIN LINK FENCE	(P) CHAIN LINK FENCE
(E) WOOD FENCE	(P) WOOD FENCE
(E) WATER WELL	(P) GUARD RAIL
(E) FIRE HYDRANT	(P) FIRE HYDRANT ASSEMBLY
(E) WATER VALVE	(P) WATER MAIN VALVE
(E) SANITARY MANHOLE	(P) WATER MAIN BEND
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(E) CATCHBASIN	(P) CURB INLET
(E) CULVERT	(P) CATCH BASIN
(E) LIGHT POLE	(P) TRENCH DRAIN
(E) UTILITY POLE	(P) FLARED END SECTION
(E) SIGN	(P) MANHOLE
(E) MAILBOX	(P) LIGHT POLE
(P) SIDE SLOPE	(P) SANITARY SEWER CLEANOUT
(P) DRAINAGE SWALE	(P) UTILITY CROSSING
(P) DRAINAGE FLOW ARROW	(P) BUILDING WALLPACK
(P) RIP RAP	(P) SIGN
LOW POINT	(P) PARKING COUNT
HIGH POINT	(P) HANDICAP PARKING
FINISH FLOOR	(P) HANDICAP VAN ACCESSIBLE
BENCHMARK	(P) TRAFFIC FLOW
WATER SURFACE	(P) MODIFIED CURB & GUTTER
GRADE BREAK	(P) REGULAR CURB & GUTTER
(P) HEAVY DUTY ASPHALT AREA	(P) SCREEN WALL OR RETAINING WALL
(P) LIGHT DUTY ASPHALT AREA	
(P) CONCRETE SURFACE	
(P) AGGREGATE SURFACE	
(P) DRAINAGE BASIN BOUNDARY	
(P) BASIN DESIGNATION	
(P) BASIN AREA IN ACRES	

E-1a
2.52

NOTE:
(E) - INDICATES EXISTING
(P) - INDICATES PROPOSED

ALL CLASSES (ORGANIC & UNSTABLE SOILS)

CLASS I (IF SPECIFIED)

CLASS II (HEAVY WOODED AREAS FOR TYPE B & F CLEARING)

SPOIL LEVELING DETAILS

CONSTRUCTION NOTES

- REFER TO THE CONSTRUCTION SPECIFICATIONS FOR THE DEFINITION OF WORK INVOLVED IN CLEARING, GRUBBING, SNAGGING, ETC.
- NO PILING OF DEBRIS WILL BE ALLOWED ON THIS PROJECT. DEBRIS SHALL BE BURNED, CHIPPED, OR HAULED AWAY.
- IN CLEAR AND SNAG AREAS ONLY, THE CONTRACTOR WILL BE REQUIRED TO CLEAR, SNAG AND REMOVE DEBRIS DAMS WITHIN TOP WIDTH OF DRAIN, CLEAR BOTH BANKS IN ORDER TO PERFORM REQUIRED WORK WITHIN A MIN. OF 12', IF ANY OLD SPOIL IS PRESENT, CLEAR AS NECESSARY TO ALLOW FOR LEVELING OF SPOIL TO A MINIMUM OF 16' TOP WIDTH, AND REMOVE AND DISPOSE OF ALL DEBRIS. NO GRUBBING WILL BE ALLOWED WITHIN TOP WIDTH OF DRAIN. IF SLOPES ARE DISTURBED WHEN TREES ARE CUT AND REMOVED FROM SLOPES, THE CONTRACTOR WILL PREPARE SEED BED, OR REPAIR IF NECESSARY, AND SEED AS DIRECTED BY THE ENGINEER.
- SPOIL LEVELING WILL BE CLASS I AS PER THE OPEN DRAIN SPECIFICATIONS AND DETAILS SHOWN ON THIS SHEET. SPOIL LEVELING IN HEAVY WOODS WILL BE CLASS II.
- FOR SPOIL DEPOSITING ON ONE SIDE ONLY (TYPE C AND G) THE 12 FOOT STRIP CALLED FOR IN THE OPEN DRAIN SPECIFICATIONS WILL BE REQUIRED ON THIS PROJECT.
- FIELD DIVERSION SWALES ARE INCIDENTAL TO THE CONSTRUCTION FOR SPOIL LEVELING (SEE DETAILS THIS SHEET). FIELD DIVERSIONS REQUIRED FOR SOIL EROSION CONTROL MEASURES WILL BE MEASURED BY LINEAR FOOT.
- A 15 FT. STAGING FROM THE TOP OF THE BANK TO THE SPOIL BANKS WILL BE REQUIRED WHEN UNSTABLE OR ORGANIC SOILS ARE ENCOUNTERED.
- A PILOT CHANNEL WILL NOT BE REQUIRED ON THIS PROJECT.
- SEDIMENT SUMPS WILL BE CONSTRUCTED ON THIS PROJECT AS PER THE OPEN DRAIN SPECIFICATIONS. ALL SUMPS ARE TO BE MAINTAINED REGULARLY THROUGHOUT CONSTRUCTION AND CLEANED OUT UPON COMPLETION OF THIS PROJECT.
- UPON COMPLETION OF THE PROJECT, ALL ROCK CHECK DAMS SHALL BE REMOVED INCIDENTAL TO CONSTRUCTION. ALL SEDIMENT THAT HAS BEEN ACCUMULATED BEHIND THE CHECK DAMS SHALL BE REMOVED FROM THE DRAIN AND LEVELED ACCORDING TO THE SPOIL LEVELING DETAILS.
- THE CENTERLINE OF THE DRAIN WILL BE SET BACK FROM ROADS AS SHOWN ON THE CROSS-SECTIONS IN THESE PLANS.
- FENCES ON PRIVATE PROPERTY DISTURBED BY THE CONTRACTOR ON THIS PROJECT WILL BE REPLACED AS PER GENERAL CONDITIONS.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR TURF ESTABLISHMENT ALONG DRAIN SIDE SLOPES, CULVERT END SLOPES AND OTHER AREAS DESIGNATED BY THE CONSTRUCTION PLANS OR BY THE ENGINEER AS PER THE OPEN DRAIN SPECIFICATIONS.
- DRAIN INSPECTION COST WILL BE PAID BY THE OWNER. INSPECTION CHARGES BY THE ROAD COMMISSION, RAILROADS AND THE M.D.O.T. WILL BE PAID BY THE CONTRACTOR, UNLESS OTHERWISE SPECIFIED.

REVISIONS/SUBMITTALS	DATE	DESCRIPTION	FOR BIDS	BY
	4/5/22			

LSG
Engineers
& Surveyors

3135 PINE TREE ROAD
SUITE D
LANSING, MI 48911
PH. (517) 393-2902
FAX (517) 393-2608
www.lsg-es.com

PREPARED FOR:
SAGINAW COUNTY PUBLIC WORKS COMMISSIONER
BRIAN J. WENDLING
111 S. MICHIGAN AVENUE
SAGINAW, MICHIGAN
PHONE: (989) 790-5258

DRAIN NOTES AND DETAILS
FOR
BABCOCK DRAIN
MAPLE GROVE TOWNSHIP
SAGINAW COUNTY, MICHIGAN

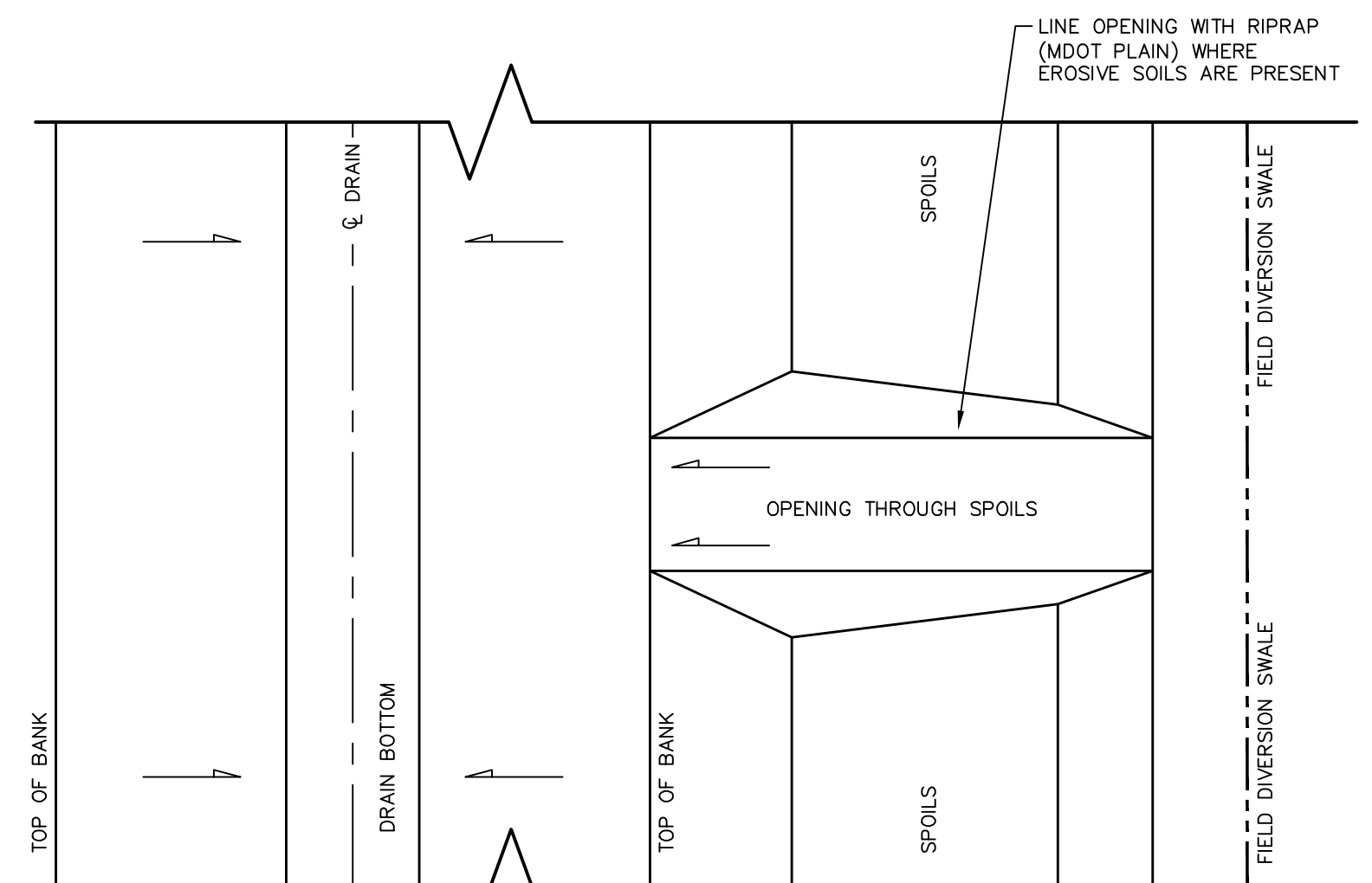
FILE	C3-0.DWG
DESIGNED BY	ADB
DRAWN BY	AJJ
CHECKED BY	ADB
DATE	JAN. 11, 2021
SCALE	
HOR.	N/A
VERT.	N/A
PROJECT NO.	2409
SHEET NO.	C3.0



Know what's below.
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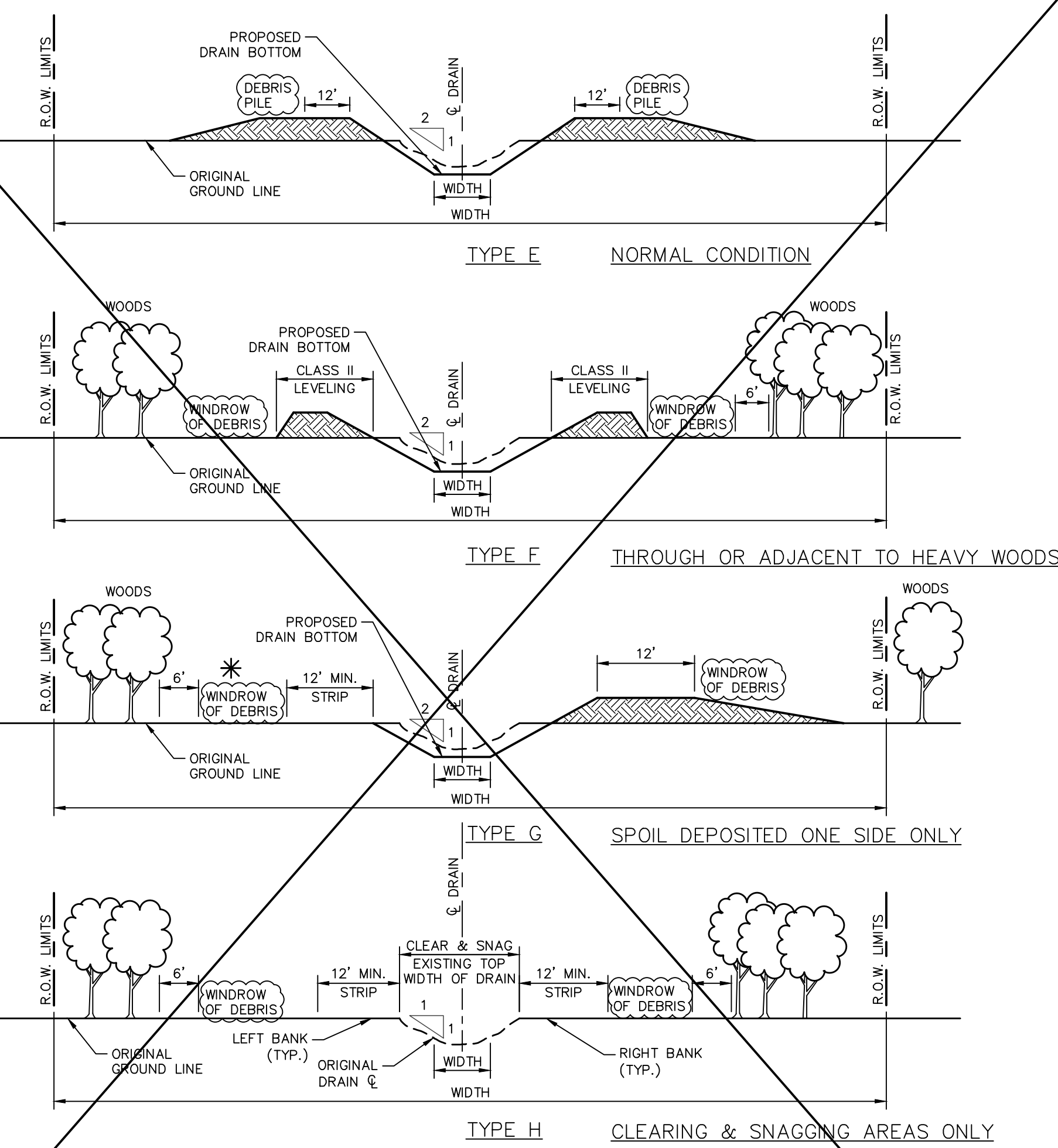
EGLE PERMIT NO.
WRP 026900 v.1

FOR BID PURPOSES ONLY



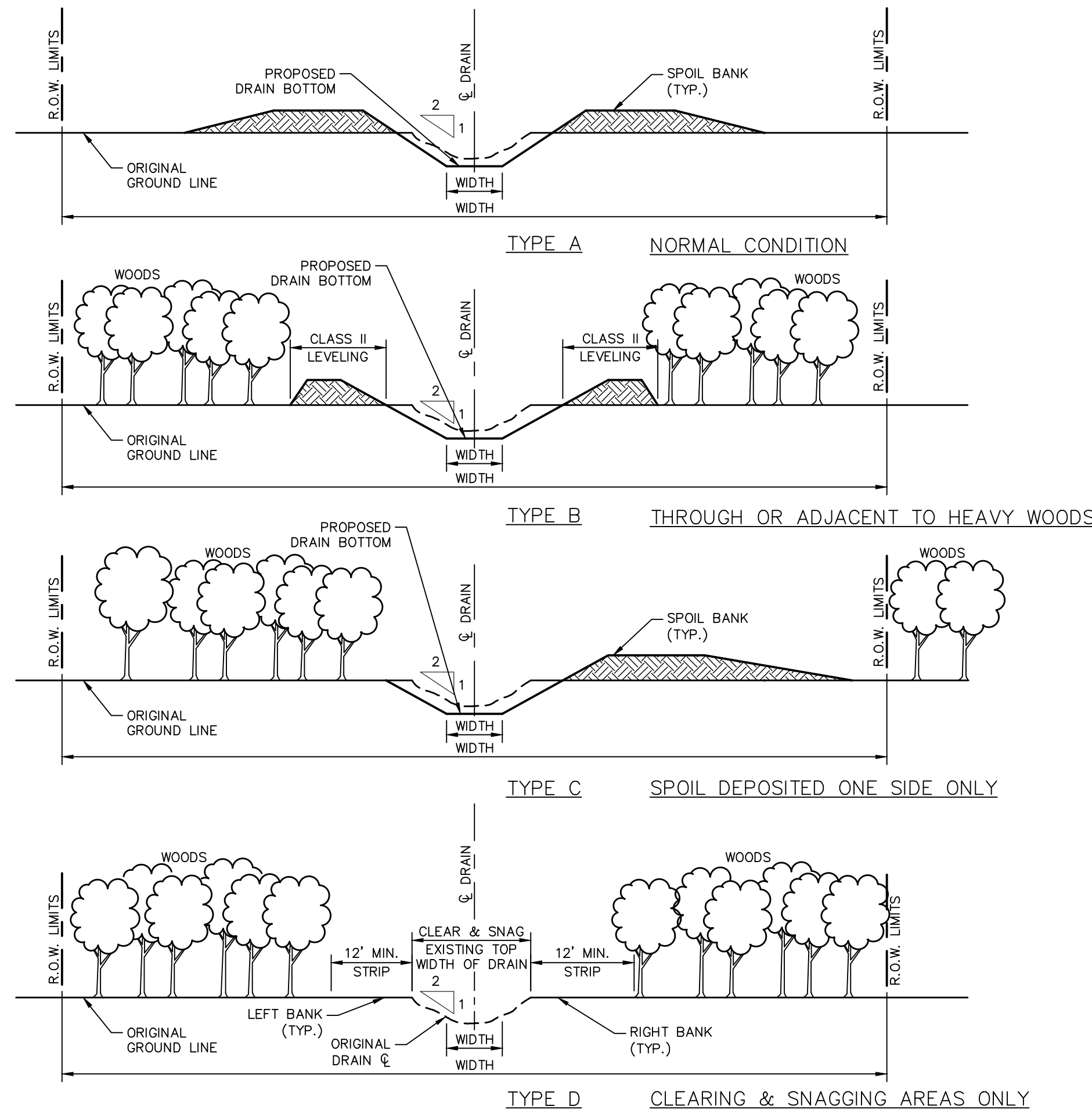
SPOIL OPENING FOR FIELD DIVERSIONS

A
C3.0



TYPICAL CLEARING & DEBRIS MANAGEMENT DETAILS WHERE PILING IS REQUIRED

* WHEN PARALLELING A ROAD, ALL DEBRIS BETWEEN THE CENTERLINE OF THE ROAD AND THE CENTERLINE OF THE DRAIN MUST BE DISPOSED.

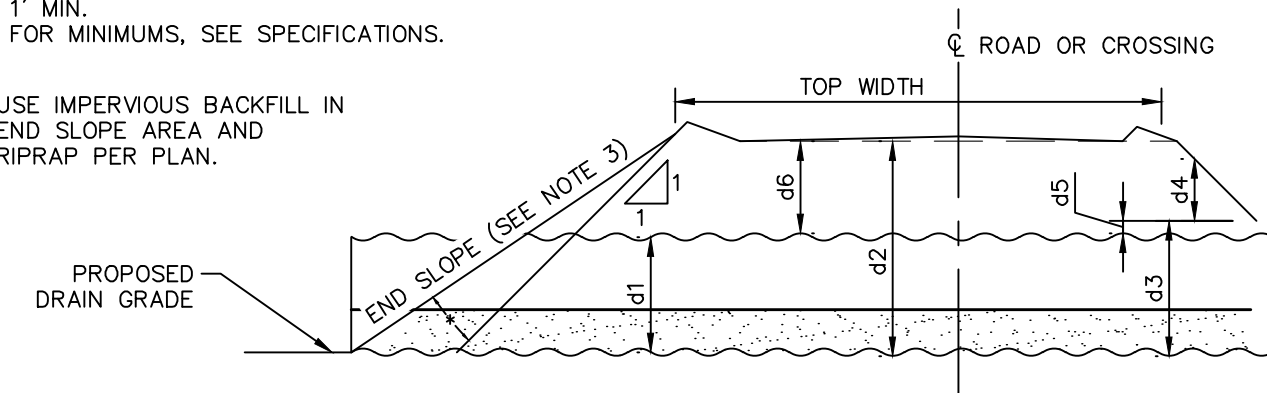


CLEARING & DEBRIS MANAGEMENT DETAILS WHERE BURNING OR DISPOSAL IS REQUIRED

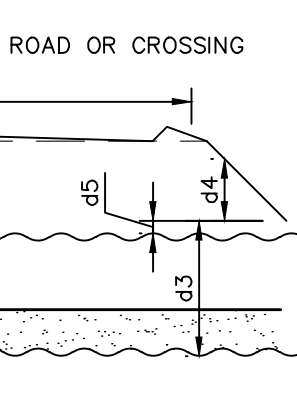
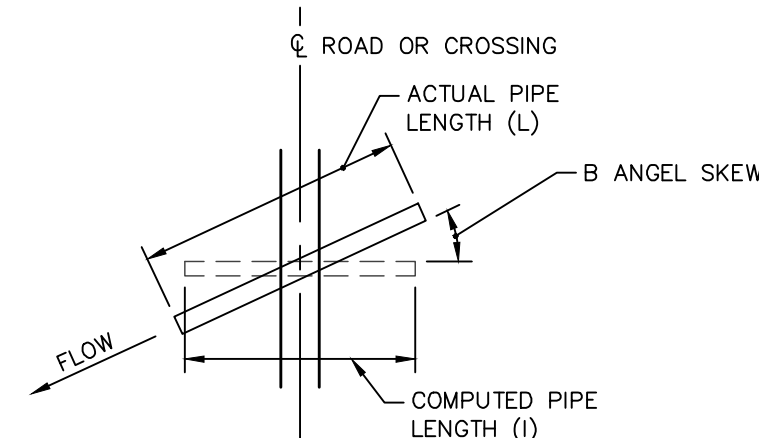
* TYPICAL W/ RIPRAP TYPICAL W/ BAG RIPRAP

d1 = RISE OF CULVERT
d2 = DEPTH TO INVERT
d3 = HEIGHT OF RIPRAP ABOVE INVERT
d4 = 3' MAX.
d5 = 1' MIN.
d6 = FOR MINIMUMS, SEE SPECIFICATIONS.

- * USE IMPERVIOUS BACKFILL IN
END SLOPE AREA AND
RIPRAP PER PLAN.

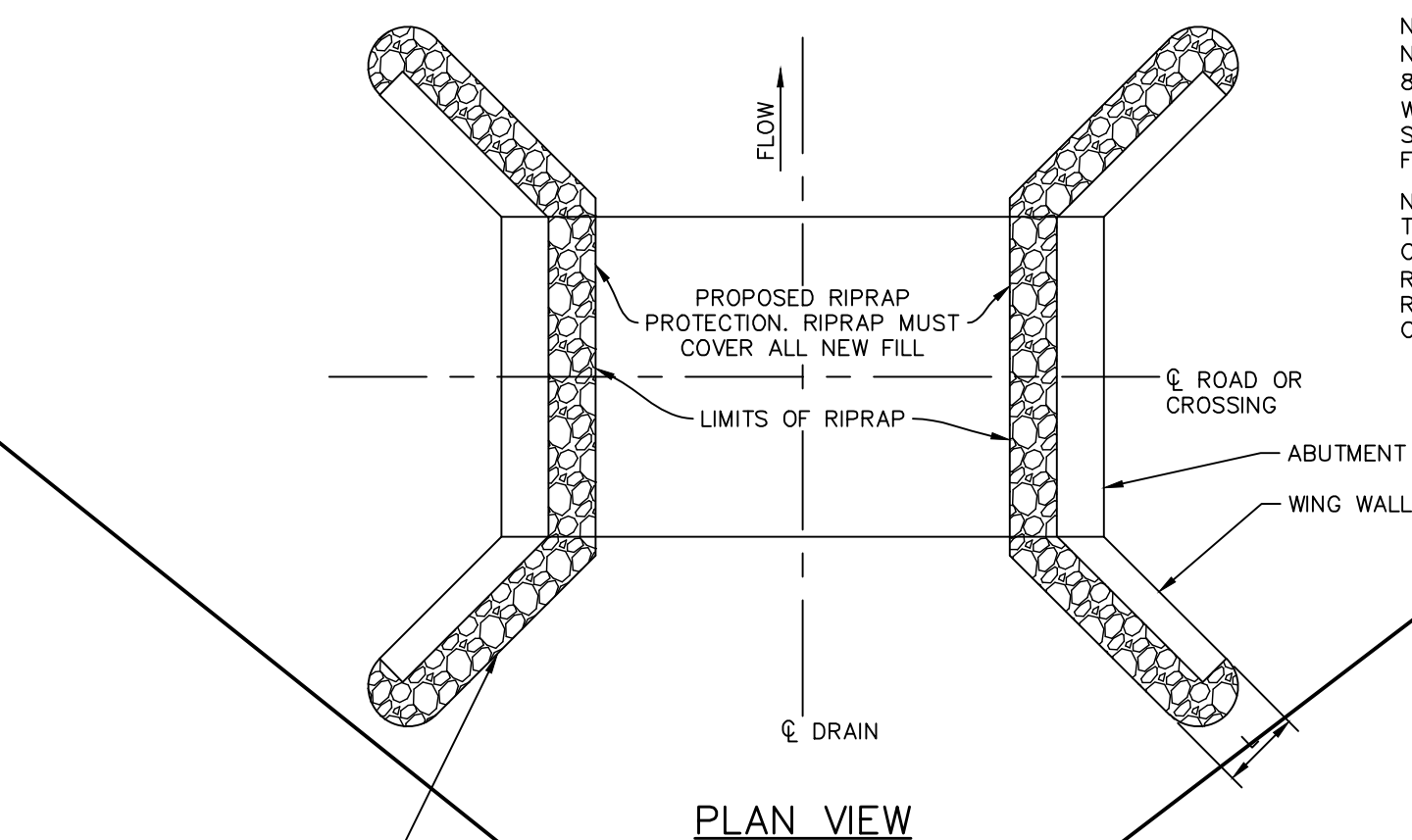


TYPICAL W/O RIPRAP

~~TYPICAL W/ BAG RIPRAP~~

$$L = \frac{1}{\cos B}$$

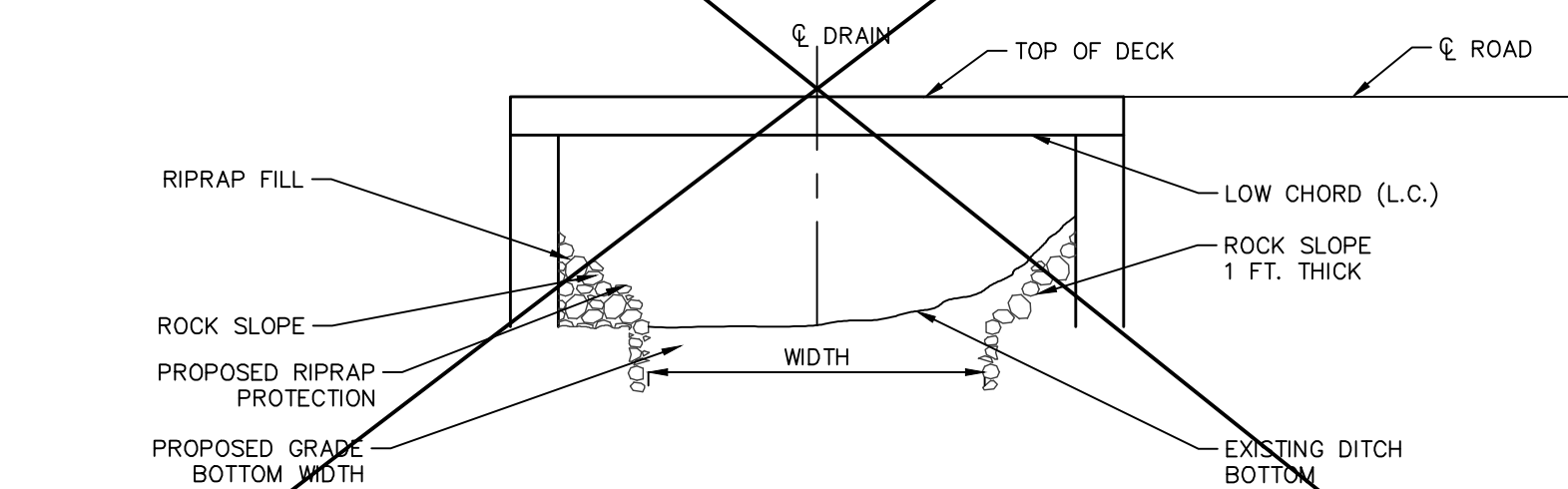
SKEWED CROSSING



PLAN VIEW

NOTE:
NO. 1 ROCK RIPRAP WHICH IS 3" TO
8" CRUSHED LIMESTONE 50% OF
WHICH IS 6" OR LARGER & IS TO BE
SOUND, TOUGH, DURABLE & FREE
FROM STRUCTURE DEFECT.

NOTE:
THE CONTRACTOR MUST DIKE THE
CHANNEL & PLACE THE CLAY OR
ROCK FILL (IF NECESSARY) &
RIPRAP PROTECTION IN DRY
CONDITIONS



END VIEW

BRIDGE PROTECTION CHART

[illegible]

ROCK RIPRAP BRIDGE PROTECTION

GAGE V.S. THICKNESS

GAGE	GALVANIZED THICKNESS
1	.280"
3	.249"
5	.218"
7	.188"
8	.168"
10	.138"
12	.109"
14	.079"
16	.064"

CLASS VS. DEPTH OF COVER

CLASS OF PIPE	DEPTH OF COVER (FT)
CLASS A	0 – 10
CLASS B	10 – 16
CLASS C	16 – 23
CLASS D	23 – 33

EQUIVALENT FOR CORRUGATED STEEL PIPE

D.I.A. OF PIPE OF EQUAL PERIPHERY (INCHES)	2 3/4" x 4" CORRUGATIONS		3" x 1" CORRUGATIONS	
	SPAN, IN.	RISE, IN.	SPAN, IN.	RISE, IN.
15	17	13	— — —	— — —
18	21	15	— — —	— — —
21	24	18	— — —	— — —
24	28	20	— — —	— — —
30	35	24	— — —	— — —
36	42	29	43	27
42	49	33	50	31
48	57	38	58	36
54	64	43	60	46
60	71	47	66	51
66	77	52	73	55
72	83	57	81	59
78	— — —	— — —	87	63
84	— — —	— — —	95	67
90	— — —	— — —	103	71
96	— — —	— — —	112	75
102	— — —	— — —	117	79
108	— — —	— — —	128	83
114	— — —	— — —	137	87
120	— — —	— — —	142	91

SOURCE: HANDBOOK OF STEEL DRAINAGE & HIGHWAY CONSTRUCTION PRODUCTS 1983 ED.

SOURCE: HANDBOOK OF STEEL DRAINAGE & HIGHWAY CONSTRUCTION PRODUCTS 1983 ED.

CULVERT DETAILS A
C3.1

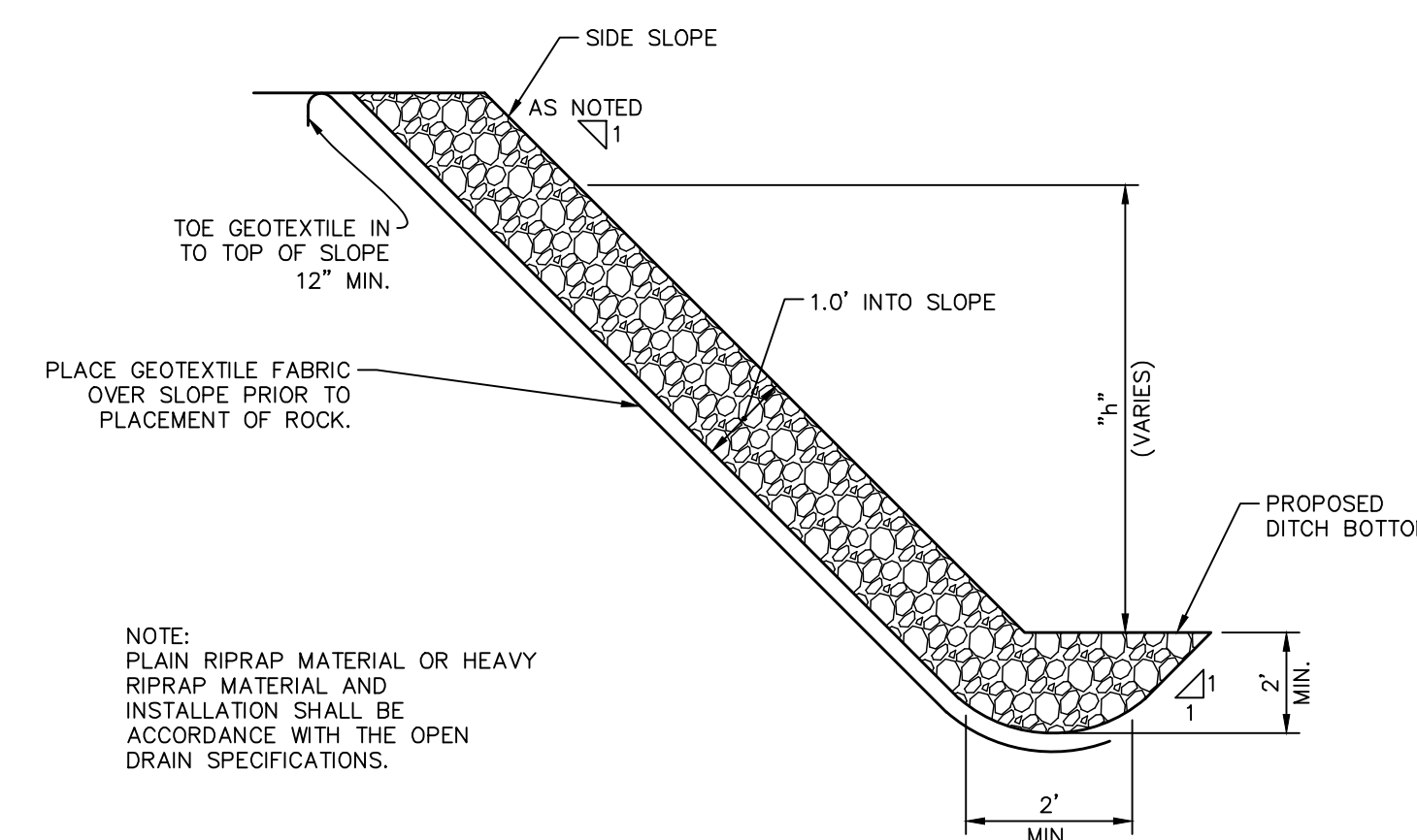
M.D.O.T. 4AA AGGREGATE SIEVE ANALYSIS	
SIZE	% PASSING
2 1/2"	100
2"	95 - 100
1 1/2"	35 - 70
3/4"	0 - 12

ROCK FORDS

1. ROCK FORDS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE OPEN DRAIN SPECIFICATIONS.
2. THE ROCK FORD SHALL HAVE A ROADWAY WIDTH OF 24 FEET.

ROCK FORD CROSSING CHART[illegible][illegible]

ROCK FORD CROSSING DETAIL



NOTE:
PLAIN RIPRAP MATERIAL OR HEAVY
RIPRAP MATERIAL AND
INSTALLATION SHALL BE
ACCORDANCE WITH THE OPEN
DRAIN SPECIFICATIONS.

ROCK RIPRAP SLOPE PROTECTION

[illegible]

7 SLOPE PROTECTION B
C3.1

The diagram illustrates the placement of signs for a bid. A rectangular sign with the text "FOR BID PURPOSES ONLY" is placed diagonally over the "TYPE" label and the first two rows of the table. A square sign with the text "MISS DIG 811" is placed over the bottom right corner of the table.

MISS
DIG
811

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DRAIN DETAILS
FOR
BABCOCK DRAIN
MAPLE GROVE TOWNSHIP
SAGINAW COUNTY, MICHIGAN

FILE	C3-1.DWG
DESIGNED BY	ADB
DRAWN BY	AJL
CHECKED BY	ADB
DATE	JAN. 11, 2021
SCALE	
HOR.	N/A
VERT.	N/A
PROJECT NO.	
2409	
SHEET NO.	
C3.1	

SECTIONAL VIEW

CROSS SECTION

WATERCOURSES (WILL) BE GRADED OUT AT LOCATIONS SHOWN ON THE PLANS AS PER THE
OPEN DRAIN SPECIFICATIONS AND DETAILS SHOWN ON THIS SHEET.

WATERCOURSE GRADE-OUT DETAIL

SECTIONAL VIEW

PLAN VIEW

NEW C.S.P. TILE OUTLETS WILL BE INSTALLED AT LOCATIONS
SHOWN ON THE PLANS AS PER THE OPEN DRAIN
SPECIFICATIONS AND DETAILS SHOWN ON THIS SHEET.

TILE OUTLET DETAIL

SECTIONAL VIEW

SIDE DRAIN ROCK CHUTE DETAIL

ON DRAINS WHERE SMALL AMOUNTS OF OLD SPOIL ARE FOUND; USING 12" LEVELED OLD SPOIL,

EXAMPLE—

EXAMPLE-

$$\frac{30'' + 12''}{12''} \times 3' + 16' + (0.5 \times 3') + \frac{24'' + 12''}{12''} \times 3' = 37'$$

$$L = (2D - 6) + 37'$$

ON DRAINS WHERE LARGE AMOUNTS OF OLD SPOIL ARE FOUND USING 36" LEVELED OLD SPOIL

~~EXAMPLE—~~

EXAMPLE -

$$\frac{30'' + 36''}{12''} \times 3' + 16' + (0.5 \times 3') + \frac{24'' + 36''}{12''} \times 3' = 49'$$

$$L = (2D - 6) + 37'$$

SECTIONAL VIEW
W/ E.S.

NOTE:
WHEN PLASTIC E.C.S. PIPE IS
SPECIFIED THE FOLLOWING
SPECIFICATION NUMBER APPLIES:
AASHTO M-294, 12" THRU 24"

EROSION CONTROL STRUCTURE – TYPE 1

PLAN VIEW

VARIOUS CONDITIONS SHOWN SEE
PLAN SHEETS FOR SPECIFICS

SECTIONAL VIEW

EROSION CONTROL STRUCTURE – TYPE 2

CONNECTION PETAL

[illegible]

PLAN VIEW

PROFILE VIEW

CROSS SECTION

VIEW LOOKING UPSTREAM

NOTE:
KEY STONE INTO THE DITCH BANKS AND EXTEND
IT BEYOND THE ABUTMENTS A MINIMUM OF 18"
TO PREVENT OVER FLOW AROUND DAM.

SEDIMENT SUMP w/ ROCK WEIR

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WRP 026900 v.1

EGLE PERMIT NO.
WRP 026900 v.1



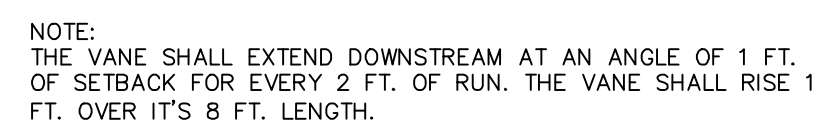
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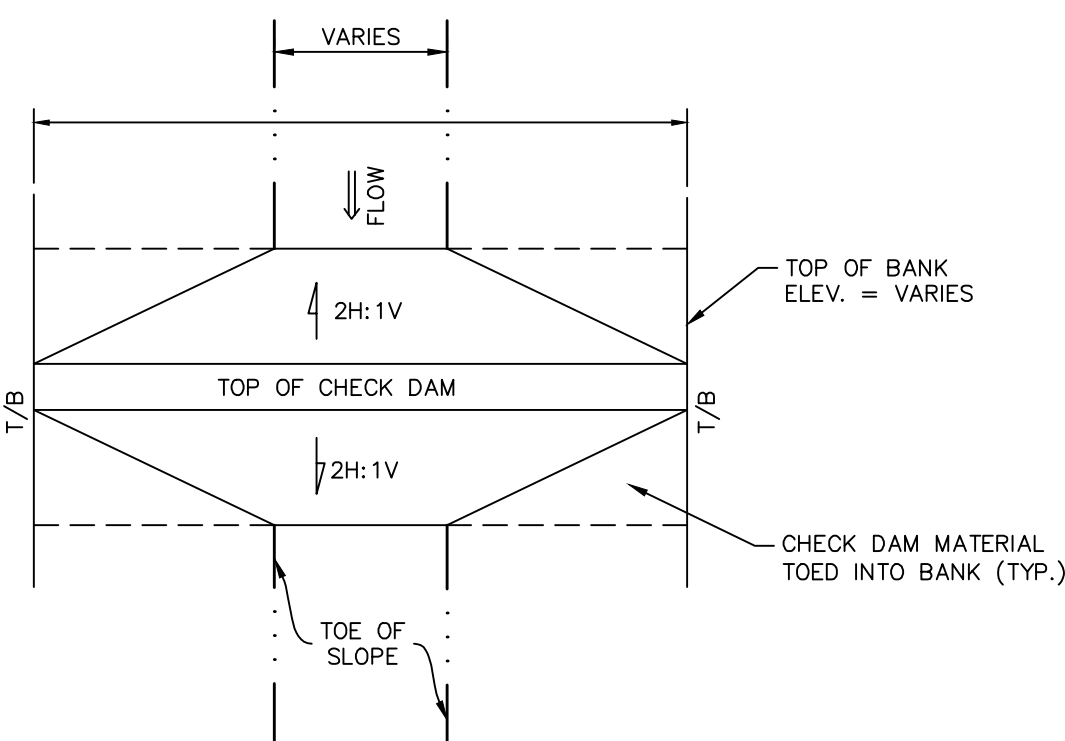
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DRAIN DETAILS
FOR
BABCOCK DRAIN
MAPLE GROVE TOWNSHIP
SAGINAW COUNTY, MICHIGAN

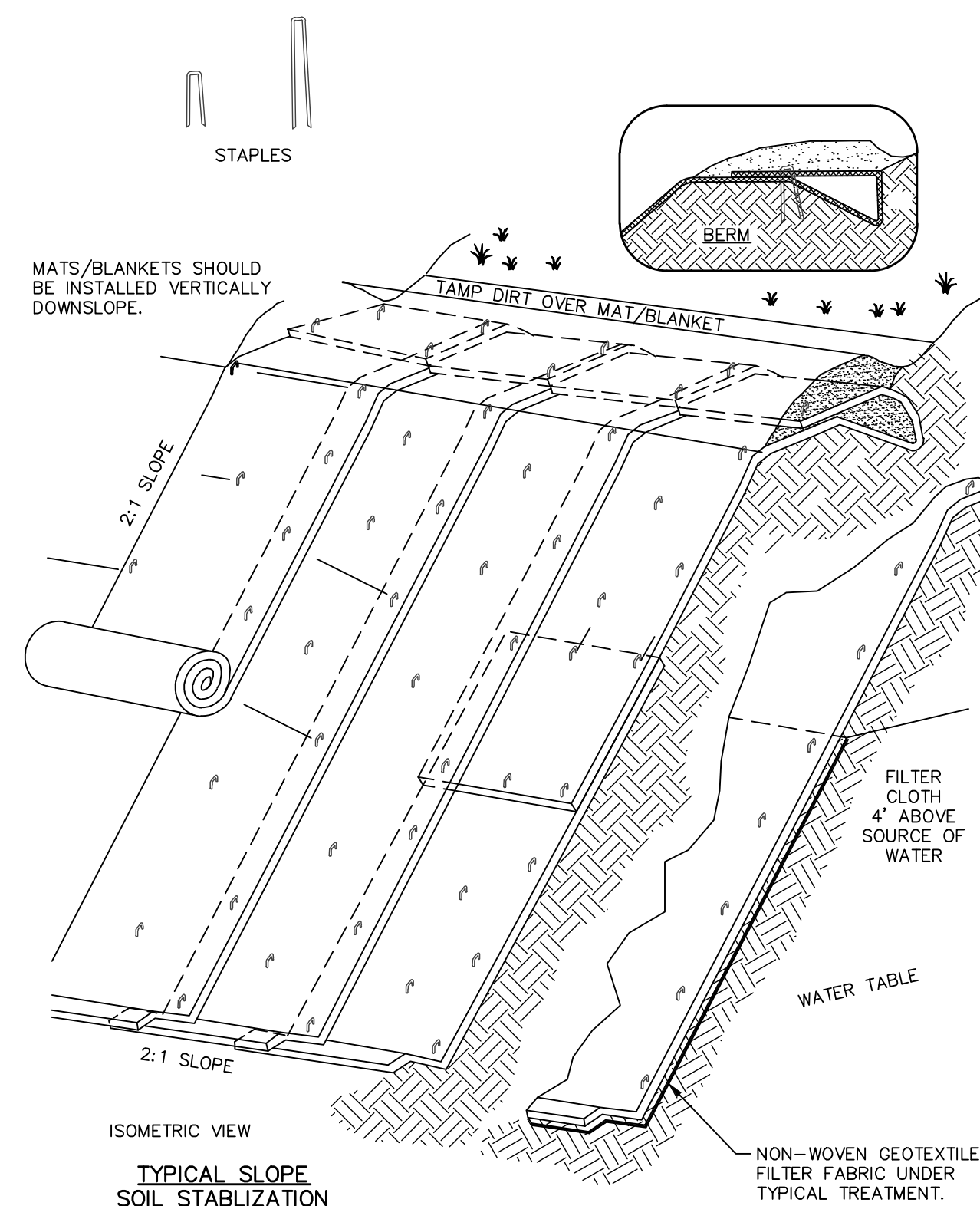
FILE	C3-2.DWG
DESIGNED BY	ADB
DRAWN BY	AJI
CHECKED BY	ADB
DATE	JAN. 11, 2021
SCALE	
HOR.	N/A
VERT.	N/A
PROJECT NO.	
2409	
SHEET NO.	
C3.2	



CROSS VANE DETAIL



CHECK DAM G
C4.1 P
40



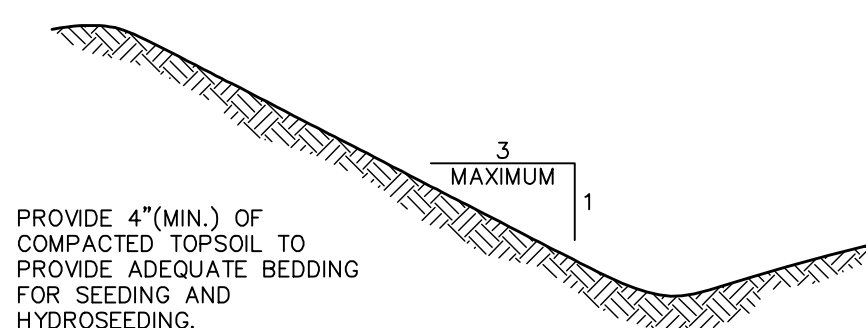
- NOTES: WET SLOPE
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
 2. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

EROSION BLANKETS & TURF REINFORCEMENT

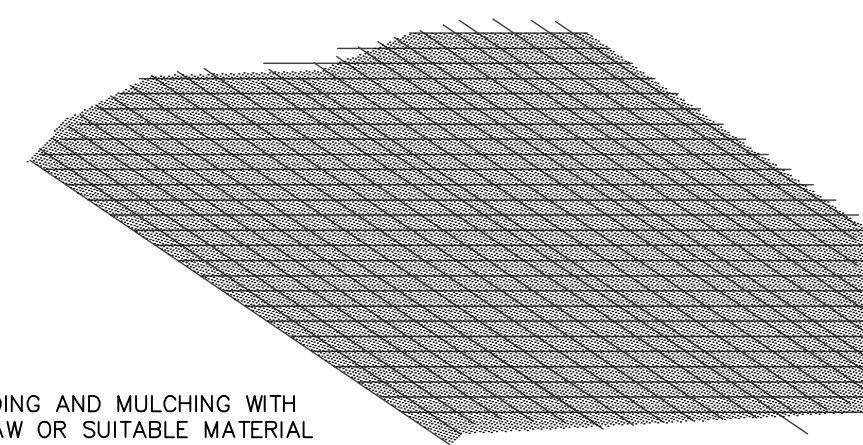
2A MATS SLOPE INSTALLATION B

© 1994 JOHN McCULLAH C4.1

NOTE:
USE WHERE DIRECTED BY ENGINEER.



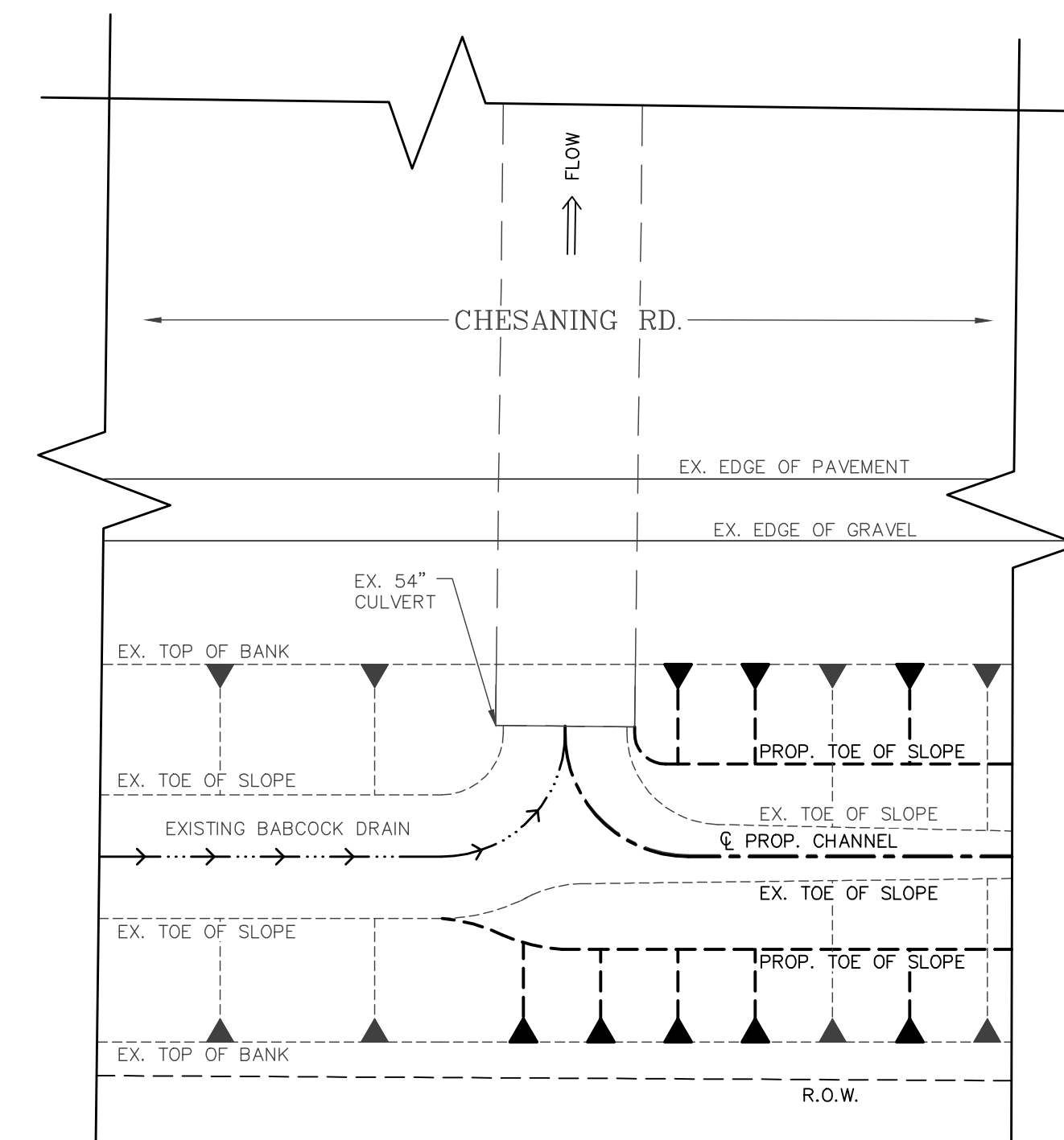
TOPSOILING



SEEDING AND MULCHING WITH STRAW OR SUITABLE MATERIAL TO STABILIZE SOIL, PROTECT FROM RAINFALL, AND FOSTER GROWTH OF VEGETATION.

SEEDING & MULCHING

1 2 SEEDING C
C4.1



PROPOSED
CHANNEL DETAIL (F
C4.1

1	SEEDING				
TEMPORARY					
SEED MIX	SEASONAL LIMITATIONS	APPLICATION RATE, LBS PER		SPECIES	% BY WEIGHT
		1000 SY	ACRE		
CEREA RYE	MAR 15 TO OCT 15	15	70	CEREA RYE	100
PERMANENT					
SEED MIX	SEASONAL LIMITATIONS	APPLICATION RATE, LBS PER		SPECIES	% BY WEIGHT
		1000 SY	ACRE		
ROADSIDE R.O.W. (MDOT, TUF)	MAR 15 TO JUN 1 —OR— AUG 1 TO OCT 15	45	220	CREEPING RED FESCUE	40
				PERENNIAL RYEGRASS	20
				HARD FESCUE	20
				KENTUCKY BLUEGRASS	10
				FULTS SALT GRASS	10
RESIDENTIAL/ COMMERCIAL LAWN (MDOT, THM)		45	220	KENTUCKY BLUEGRASS	30
				PERENNIAL RYEGRASS	20
				CREEPING RED FESCUE	50
GRASSSED WATERWAY (GW)		6	30	TALL FESCUE	60
				PERENNIAL RYEGRASS	24
				ANNUAL RYEGRASS	13
				OTHER	3
UPLANDS (MDOT, ES)		11	54	TIMOTHY	44
				PERENNIAL RYEGRASS	20
				BIG BLUESTEM	17
				SWITCHGRASS	7
				INDIANGRASS	6
				LITTLE BLUESTEM	6
WETLANDS, ETC.		SEE TABLE ON SHEET CX.X, AND SECTION 02937 "SEEDING OF NATIVE PLANTS" IN PROJECT MANUAL.			
SUPPLEMENTS					
ITEM	DESCRIPTION	APPLICATION RATE, LBS PER			
		1000 SY	ACRE		
FERTILIZER	12-12-12	80	400		
MULCH	HAY OR STRAW	1,200	6,000		
NOTES:					
1. APPLICATION RATES AND PERCENT BY WEIGHT ARE BASED ON AMOUNT OF PURE LIVE SEED (PLS).					
2. AT THE DISCRETION OF THE ENGINEER, DORMANT SEEDING MAY BE MADE IN LATE FALL TO GERMINATE IN SPRING. DORMANT SEEDINGS MUST BE MULCHED. DO NOT SEED WHEN GROUND IS FROZEN OR SNOW COVERED. DO NOT USE DORMANT SEEDING ON GRASSSED WATERWAYS.					

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WRP 026900 v.1

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811[®]

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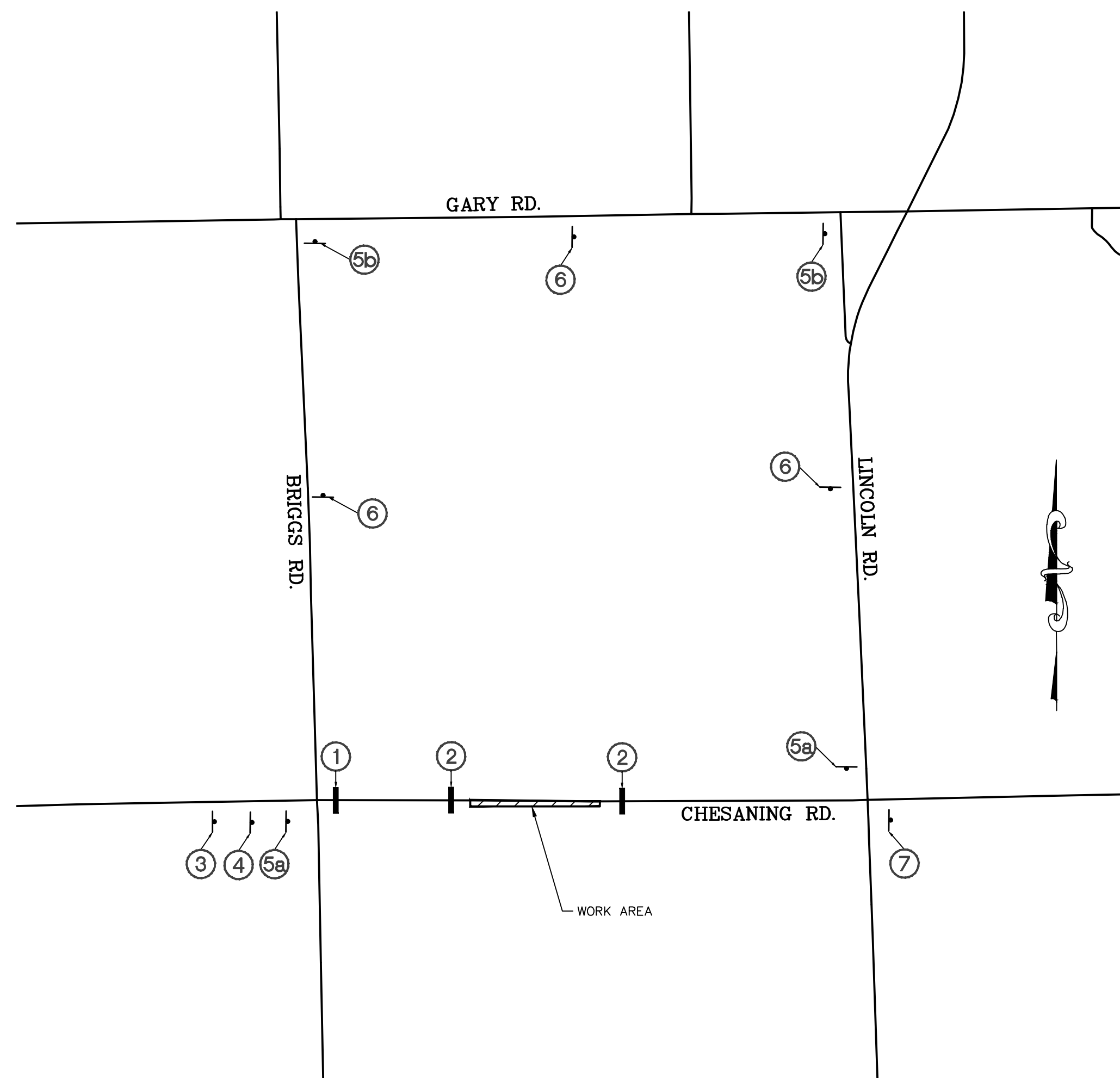
SOIL EROSION CONTROL DETAILS
FOR
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[illegible]



TYPICAL SIGN ASSEMBLIES

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DIG
911



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WRP 026900 v.1

REVISIONS/SUBMITTALS		
DATE	DESCRIPTION	BY
4/5/22	FOR BIDS	AJ

LSG
Engineers
& Surveyors

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TRAFFIC DETOUR PLAN
FOR
BABCOCK DRAIN
MAPLE GROVE TOWNSHIP
SAGINAW COUNTY, MICHIGAN

C5-0.DWG
 DESIGNED BY GKL
 DRAWN BY GKL
 CHECKED BY ADB
 DATE MARCH 18, 2022
 SCALE
 1" = 1000'
 T. N/A
 PROJECT NO.
 2409
 SHEET NO.
 C5.0