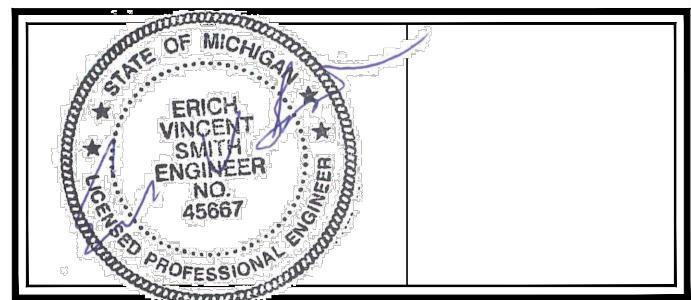
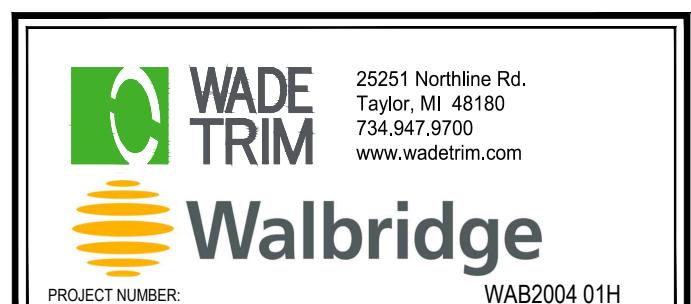
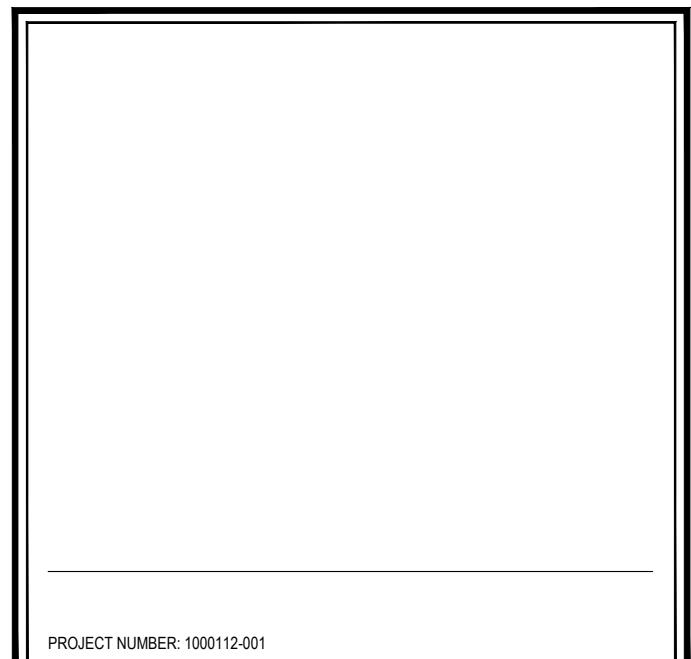
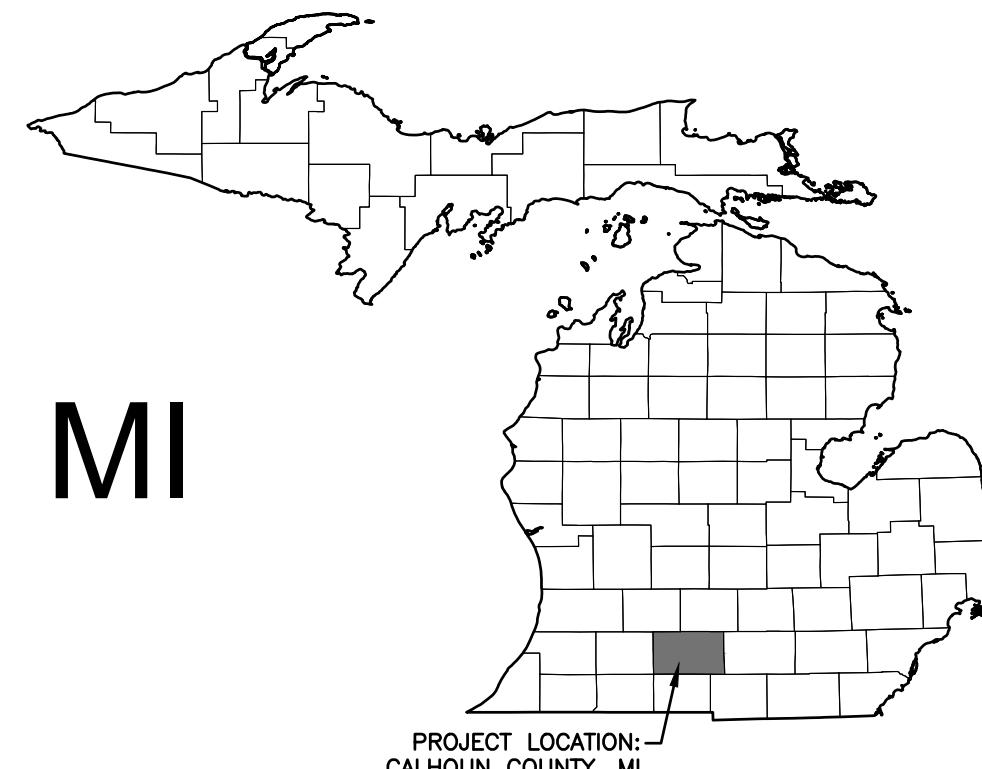


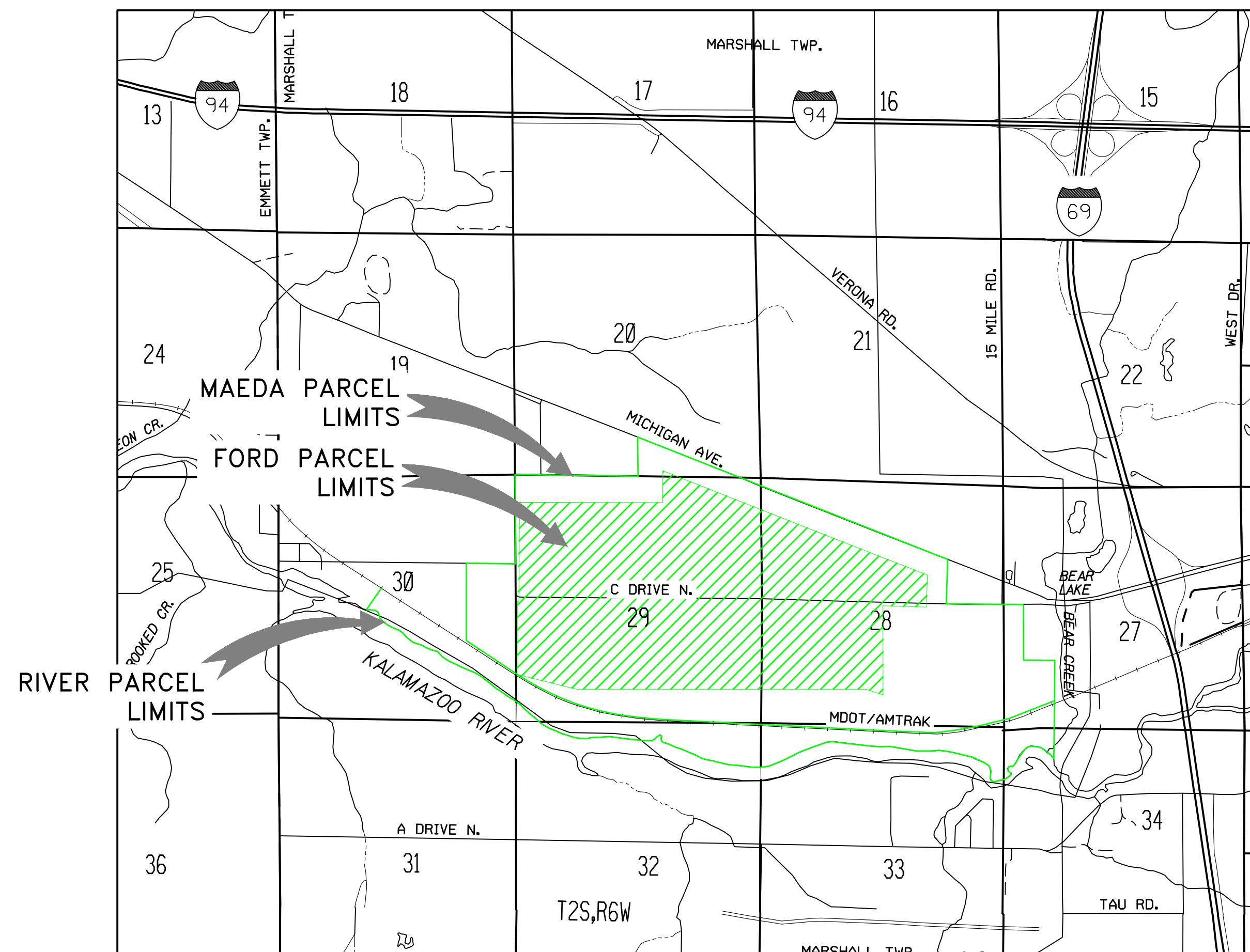
PERMANENT STORMWATER PLAN SET  
FOR  
MARSHALL AREA ECONOMIC DEVELOPMENT ALLIANCE  
MARSHALL MEGASITE  
13700 WEST MICHIGAN AVENUE  
SECTION 20,28,29, T2S, R6W, MARSHALL TWP., CALHOUN CO., MI



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11/10/23	• REVISION 7
11/03/23	• REVISION 6
10/12/23	• REVISION 5
10/05/23	• REVISION 4
09/27/23	• REVISION 3
09/11/23	• REVISION 2
06/28/23	• REVISION 1
06/09/23	• ISSUED FOR PERMITTING
05/23/23	• ISSUED FOR PERMITTING
05/16/23	• PERMANENT STORMWATER SET
DATE	ISSUED FOR

IN CHARGE	J CIESIELSKI
DRAWN BY	M TILLEY
DESIGNED BY	S DODSON
CHECKED BY	B NARTKER
APPROVED BY	E SMITH
SHEET TITLE	
<b>COVER SHEET</b>	
FOLD DWG NO.	REV #
SHEET NUMBER	C100.0

CONTACTS	
LAND OWNER	FORD MOTOR COMPANY 17000 ROTUNDA DR, 1ST FLOOR S. DEARBORN, MI 48120
OWNER	MAEDA
ARCHITECT	SSOE GROUP 1050 WILSHIRE DR. STE. 260, TROY, MI JOHN HEIDT JHEIDT@SSOE.COM
ELECTRIC	CONSUMERS ENERGY BRENDA BRACE BRENDA.BRACE@CMSENERGY.COM
SURFACE WATER MANAGEMENT	CITY OF MARSHALL - STORMWATER MARGUERITE DAVENPORT, PE 269-781-5183 MDAVENPORT@CITYOFMARSHALL.COM
SOIL EROSION CONTROL	CALHOUN COUNTY ROAD DEPARTMENT 13300 15 MILE RD., MARSHALL, MI 269-781-9841
MUNICIPALITY	CITY OF MARSHALL - PUBLIC SERVICES MARGUERITE DAVENPORT, PE 269-781-5183 MDAVENPORT@CITYOFMARSHALL.COM
RAILROAD	AMTRAK - UTILITIES DARRELL HORN & JOSEPH COMDEN 517-750-8547 DARRRELL.HORN@AMTRAK.COM JOSEPH.COMDEN@AMTRAK.COM



LOCATION MAP  
NOT TO SCALE

SHEET INDEX	
GENERAL SHEETS	SHEET NO.
COVER SHEET	C100.0
LEGEND	C0.1
BENCHMARK PLAN	C0.2
EXISTING CONDITIONS	C1.0
PRE-CONSTRUCTION DRAINAGE AREAS	C101.0
POST CONSTRUCTION DRAINAGE AREAS	C101.1
DEEP STORM DRAINAGE MAP 1 OF 2	C101.2
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OVERALL SITE PLAN	C102.0
INFILTRATION BASIN 1 PERMANENT CONDITION PLAN VIEW	C103.0
INFILTRATION BASIN #1 TO BEAR CREEK	C103.1
RAILROAD PROFILE 1 OF 5	C103.1A
INFILTRATION BASIN 1 SECTION VIEW	C103.2
TEMPORARY INFILTRATION BASIN 2 ENLARGED VIEW (BY SME)	C103.3
TEMPORARY INFILTRATION BASIN SECTION VIEW (BY SME)	C104.0
INFILTRATION BASIN 1 OUTLET & CULVERT 1 PLAN	C104.1
INFILTRATION BASIN 1 OUTLET & CULVERT 1 PROFILE	C104.2
TEMP. INFILTRATION BASIN 2 DETAILS (BY SME)	C104.3
CULVERT 2 PLAN	C105.0
CULVERT 2 PROFILE	C105.1
TRACK MONITORING PLAN	C105.2
STANDARD STORMWATER DETAILS	C106.0
HEADWALL DETAILS	C106.1
PLUNGE POOL DETAILS	C106.2
PROJECT SPECIFIC STORM DETAILS	C106.3
CULVERT PIPE DETAILS	C106.4
MDOT STORMWATER DETAILS	C106.5

FORD MOTOR COMPANY PARCEL, LEGAL DESCRIPTION OF LAND  
LOCATED IN SECTIONS 20, 28 & 29, T2S, R6W,  
MARSHALL TOWNSHIP, CALHOUN COUNTY, MICHIGAN

BEGINNING AT THE W 1/4 CORNER SECTION 29, T2S, R6W MARSHALL TOWNSHIP, CALHOUN COUNTY, MICHIGAN,

THENCE S 89°58'17" E 33.00 FEET ALONG THE E-W 1/4 LINE OF SAID SECTION 29 TO THE EAST RIGHT-OF-WAY LINE OF 13 MILE ROAD;  
THENCE N 00°22'04" E 2157.32 FEET ALONG SAID EAST RIGHT-OF-WAY;  
THENCE S 89°55'40" E 3122.60 FEET;  
THENCE N 00°25'58" E 695.21 FEET;  
THENCE S 68°23'07" E 3245.71 FEET;  
THENCE S 68°35'27" E 2960.81 FEET;  
THENCE S 01°39'06" W 699.63 FEET;  
THENCE N 88°20'54" W 954.00 FEET ALONG THE E-W 1/4 LINE OF SECTION 28, T2S, R6W, MARSHALL TOWNSHIP, CALHOUN COUNTY, MICHIGAN & THE CENTERLINE OF C DRIVE NORTH (66.00 FEET WIDE) TO THE CENTER OF SAID SECTION 28;  
THENCE S 00°08'50" E 1947.49 FEET ALONG THE N-S 1/4 LINE OF SAID SECTION 28;  
THENCE N 71°18'28" W 397.66 FEET;  
THENCE N 90°00'00" W 6312.27 FEET;  
THENCE N 76°09'31" W 1337.71 FEET;  
THENCE N 00°16'51" E 1599.81 FEET ALONG THE WEST LINE OF SAID SECTION 29 TO THE POINT OF BEGINNING, BEING A PART SECTIONS 20, 28 & 29, T2S, R6W, MARSHALL TOWNSHIP, CALHOUN COUNTY, MICHIGAN AND CONTAINING 731.40 ACRES OF LAND, MORE OR LESS, BEING SUBJECT TO THE RIGHTS OF THE PUBLIC OVER THAT PORTION OF LAND AS OCCUPIED BY C DRIVE NORTH (66.00 FEET WIDE), BEING SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

## EXISTING PROPOSED

## CABLE TV

CABLE TV POLE  
CABLE TV PEDESTAL  
OVERHEAD CABLE TELEVISION  
UNDERGROUND CABLE TELEVISION












## ELECTRICAL

CIRCUIT BREAKER PANEL  
HANDHOLE  
MANHOLE  
OUTLET  
PEDESTAL  
TRANSFORMER BOX  
METER  
POWER POLE  
TRANSFORMER TOWER  
OVERHEAD ELECTRIC  
UNDERGROUND ELECTRIC


























## GAS

VENT  
BLOW OFF  
FILLER PIPE  
MANHOLE  
METER  
STOP BOX  
SHUTOFF VALVE  
GAS




















## MONUMENTS

IRON (FOUND)  
IRON (SET)  
BENCH MARK  
BRASS PLATE  
CONCRETE NAIL  
DRILL HOLE  
GOVERNMENT CORNER  
GPS MONUMENT  
IRON PIPE  
MONUMENT BOX  
MONUMENT  
MERE STONE  
NGS MONUMENT  
NAIL & TAG  
PINCH IRON  
PK NAIL  
RAILROAD SPIKE  
RIGHT-OF-WAY MARKER  
SPIKE  
SHIPS SPIKE  
T-IRON  
USGS MONUMENT  
CROSS CUT  
CROSS CUT IN MONUMENT  
WOOD STAKE










































































## OVERHEAD UTILITIES

DEADMAN ANCHOR  
FLOOD LIGHT  
GUY WIRE ANCHOR  
GUY POLE  
LAMP POLE  
METAL LIGHT POLE  
ORNAMENTAL LIGHT  
POLE BOX  
POWER & LIGHT POLE  
POWER & TELEPHONE POLE  
TELE, CTV, PWR & LIGHT POLE  
TELE, CTV, & POWER POLE  
TELE, CTV, & LIGHT POLE  
TELE, & LIGHT POLE  
TELE, POWER, & LIGHT POLE  
UTILITY POLE  
OVERHEAD CABLE TV & TELEPHONE  
OVERHEAD ELECTRIC & CABLE TV  
OVERHEAD ELECTRIC, CABLE TV  
AND TELEPHONE























## SANITARY SEWER

CLEAN OUT  
PUMPSATION MANHOLE  
SANITARY MANHOLE  
COMBINED SEWER MANHOLE  
SEPTIC TANK  
SEWER VENT  
FORCERMEN  
SANITARY SEWER  
COMBINED SEWER














## EXISTING PROPOSED

## SITE (MISCELLANEOUS)

ABANDON ITEM  
ACCESSIBLE SYMBOL  
ADJUST ITEM  
FINISH GRADE  
FLOW ARROW  
PARKING COUNT  
RECONSTRUCT ITEM  
RELOCATE ITEM  
REMOVE ITEM  
SLOPE LABEL  
SPOT GRADE  
FLOOD LIGHT  
LAMP POLE  
LIGHT POLE (SINGLE LAMP)  
LIGHT POLE (DOUBLE LAMP 180°)  
LIGHT POLE (DOUBLE LAMP 90°)  
LIGHT POLE (THREE LAMP)  
LIGHT POLE (FOUR LAMP)  
ORNAMENTAL LIGHT POLE  
METAL LIGHT POLE  
TEST "H" PILE  
TEMP. SLOPE DRAIN







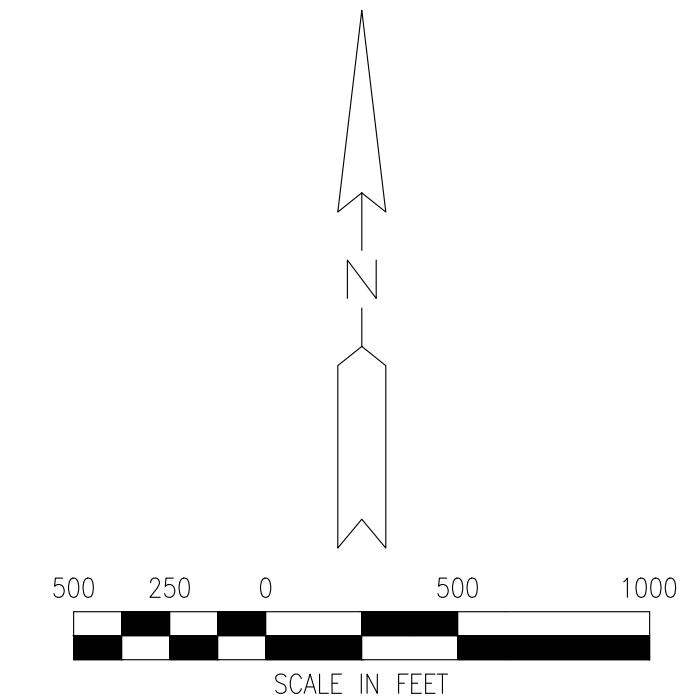








<img alt="Symbol for Light Pole (Double Lamp 180°): a circle with a dot and a horizontal line." data-bbox="275 210 2



**FORDLAND**

17000 ROTUNDA DR, 1ST FLOOR SOUTH  
DEARBORN, MICHIGAN 48120-1168  
USA



**CONTROL INFORMATION:**

**HORIZONTAL DATUM:**  
NAD83, MI STATE PLANE COORDINATES,  
SOUTH ZONE, 2113 INTERNATIONAL FEET.

**VERTICAL DATUM:**  
NAVD88 (2011)

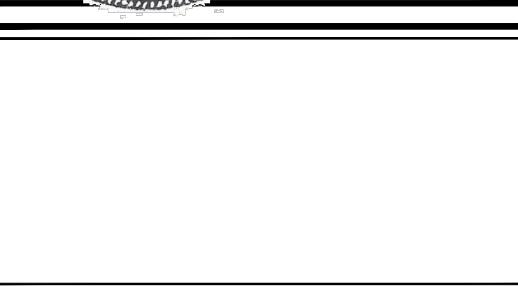
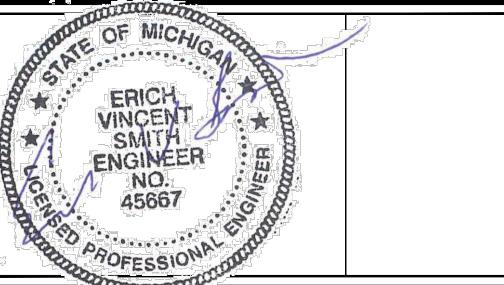
**NOTE:**  
COORDINATES SHOWN HEREON ARE GRID  
COORDINATES BASED ON THE ABOVE  
NOTED STATE PLANE COORDINATE  
SYSTEM.

CONTROL POINTS CONSIST OF A 3 FOOT  
LONG BY 5/8" IRON ROD WITH RED  
TRaverse CAP SET FLUSH TO THE  
GROUND SURFACE.

----- PROPERTY BOUNDARY

**WADE TRIM**  
Walbridge

25251 Northline Rd.  
Taylor, MI 48180  
734.947.9700  
www.wadetrim.com



06/09/23	• ISSUED FOR PERMITTING
05/23/23	• ISSUED FOR PERMITTING
05/16/23	PERMANENT STORMWATER SET
DATE ISSUED FOR	

IN CHARGE: J CIESIELSKI  
DRAWN BY: M TILLEY  
DESIGNED BY: S DODSON  
CHECKED BY: B NARTKER  
APPROVED BY: E SMITH

SHEET TITLE

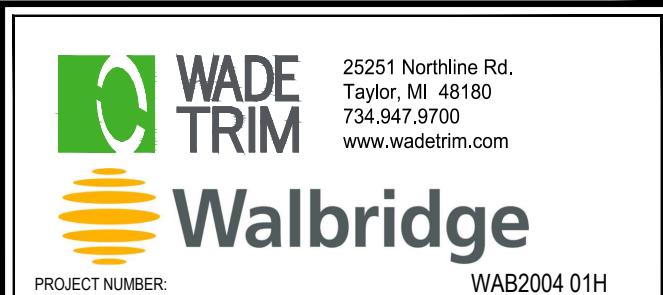
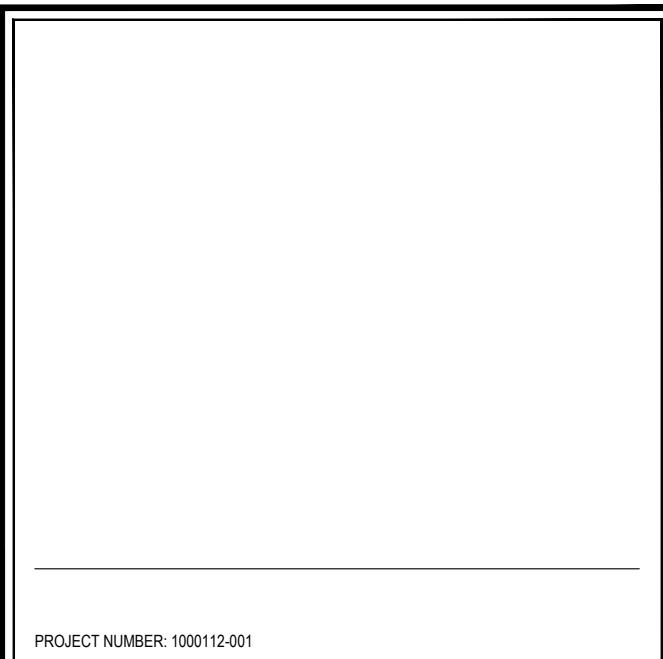
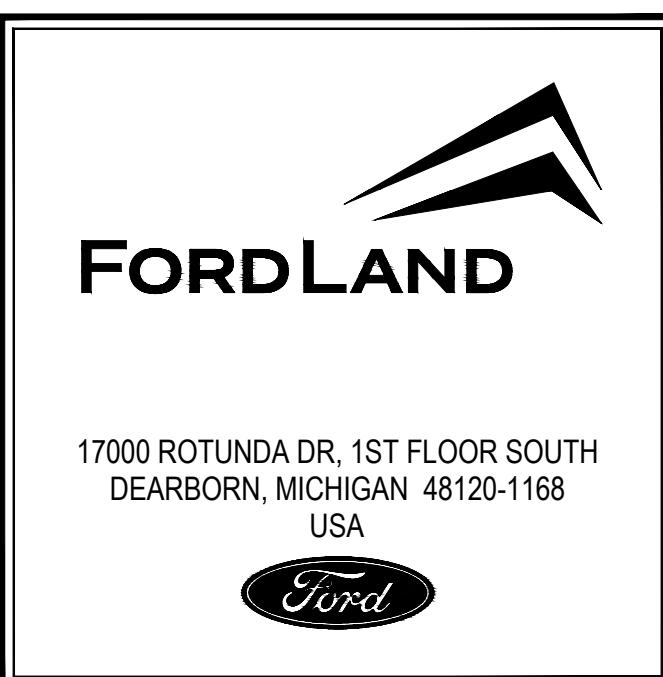
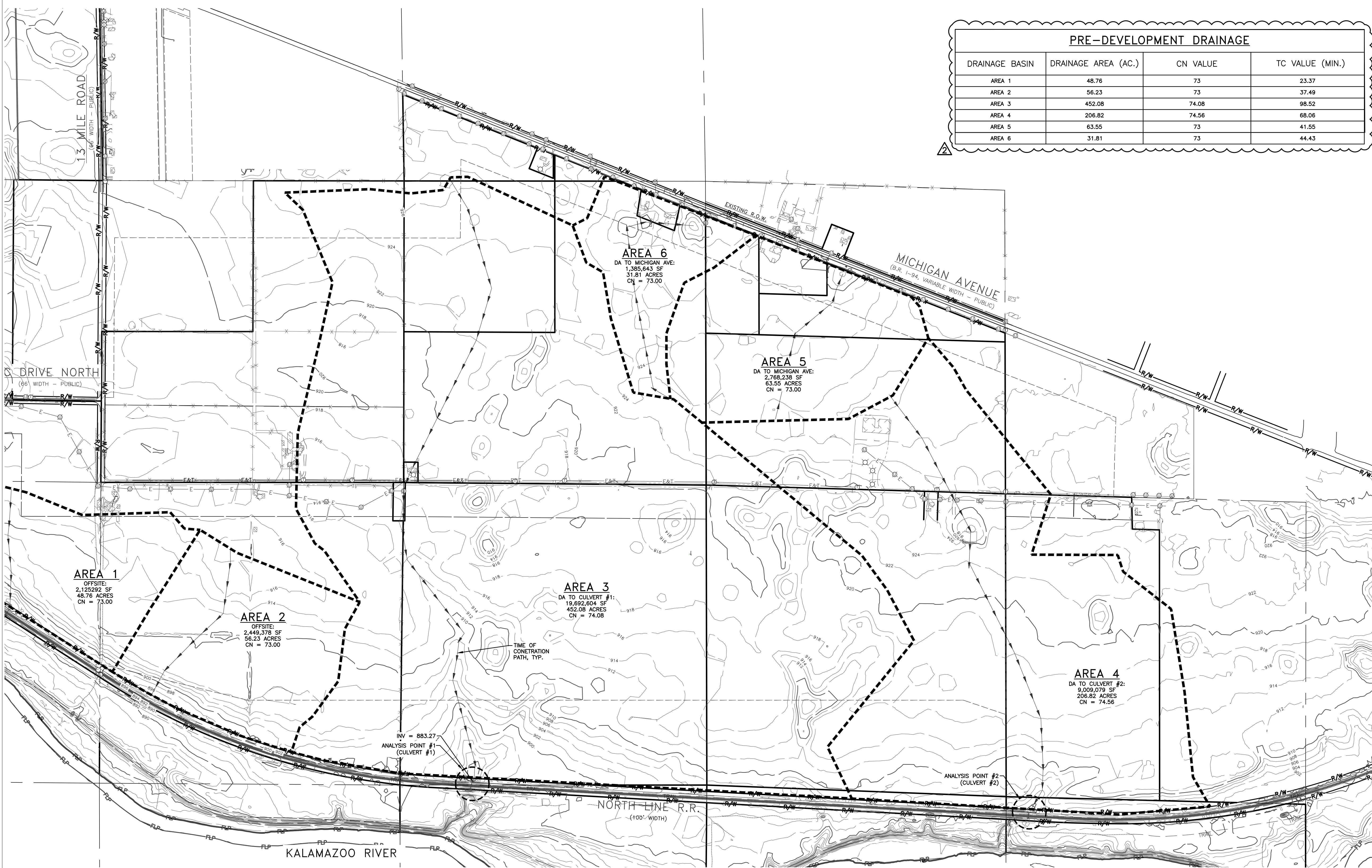
**BENCHMARK SURVEY**

FORD DWG NO. REV. #

SHEET NUMBER

**CO.2**



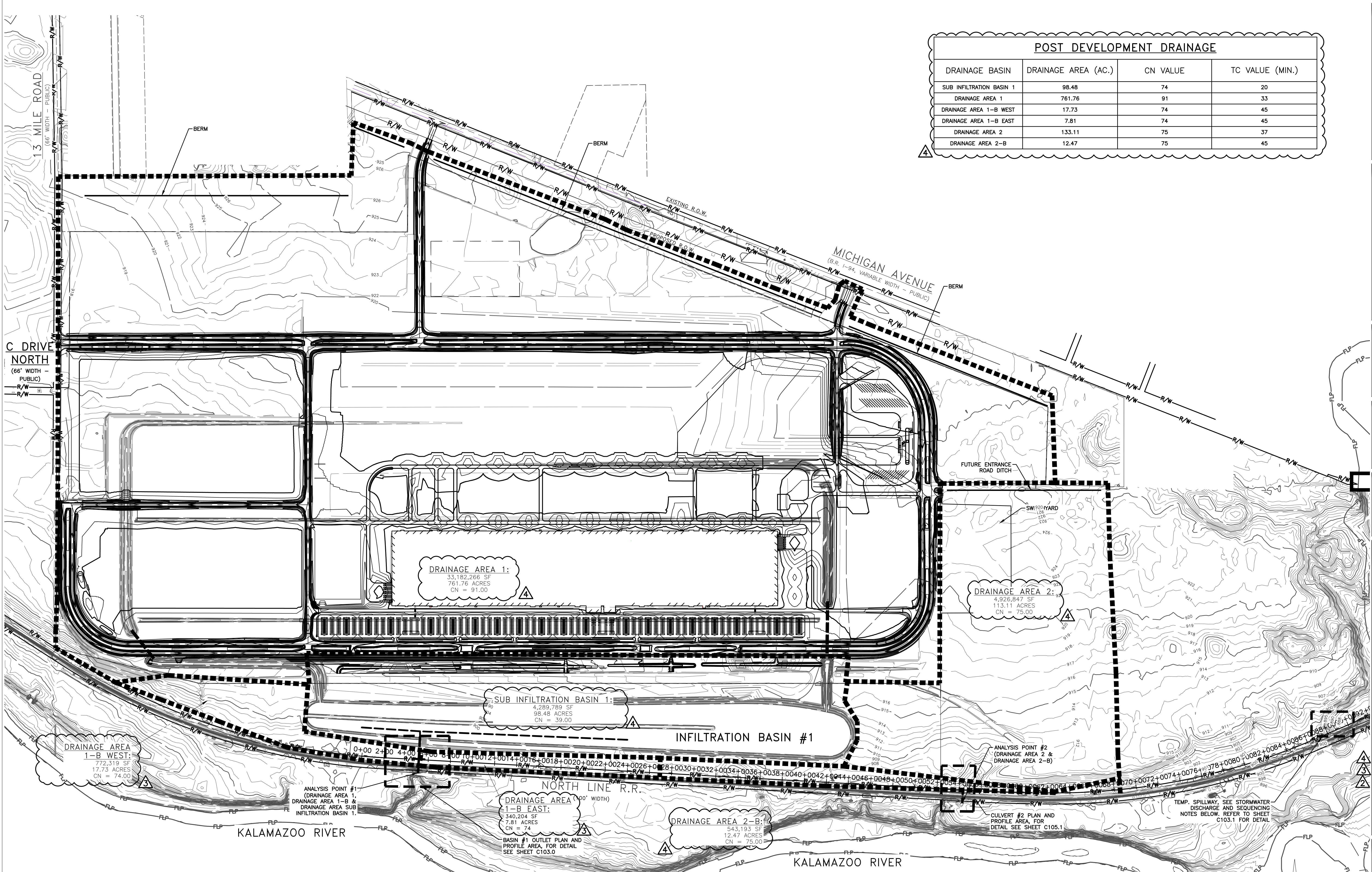


09/11/23	• REVISION 2
06/09/23	• ISSUED FOR PERMITTING
05/23/23	• ISSUED FOR PERMITTING
05/16/23	• PERMANENT STORMWATER SET
DATE	ISSUED FOR

IN CHARGE: J CIESIELSKI  
DRAWN BY: M TILLEY  
DESIGNED BY: S DODSON  
CHECKED BY: B NARTKER  
APPROVED BY: E SMITH

SHEET TITLE: **PRE-CONSTRUCTION DRAINAGE AREAS**  
FORD DWG NO. REV. #  
SHEET NUMBER: C101-0  
SCALE IN FEET





<u>POST DEVELOPMENT DRAINAGE</u>			
DRAINAGE BASIN	DRAINAGE AREA (AC.)	CN VALUE	TC VALUE (MIN.)
SUB INFILTRATION BASIN 1	98.48	74	20
DRAINAGE AREA 1	761.76	91	33
DRAINAGE AREA 1-B WEST	17.73	74	45
DRAINAGE AREA 1-B EAST	7.81	74	45
DRAINAGE AREA 2	133.11	75	37
DRAINAGE AREA 2-B	12.47	75	45



# FORDLAND

7000 ROTUNDA DR, 1ST FLOOR SOUTH  
DEARBORN, MICHIGAN 48120-1168  
USA



17000 ROTUNDA DR, 1ST FLOOR SOUTH  
DEARBORN, MICHIGAN 48120-1168  
USA

The logo for Wade Trim consists of a green square containing a white stylized 'C' shape. To the right of the square, the word 'WADE' is stacked above 'TRIM' in a large, bold, black, sans-serif font. Below the company name is a thin horizontal line, followed by the address '25251 Northline Rd.', 'Taylor, MI 48180', the phone number '734.947.9700', and the website 'www.wadetrim.com'.



A circular stamp with a decorative border. The number '45667' is at the top. The words 'ERASED PROFESSIONAL ENGINEER' are curved along the bottom. The year '1988' is at the bottom right.

5/23	• REVISION 4
7/23	• REVISION 3
1/23	• REVISION 2
9/23	• ISSUED FOR PERMITTING
3/23	• ISSUED FOR PERMITTING
6/23	• PERMANENT STORMWATER SET

CHARGE:	J CIESIELSKI
WN BY:	M TILLEY
GNED BY:	S DODSON
CKED BY:	B NARTKER
ROVED BY:	E SMITH

## **POST CONSTRUCTION DRAINAGE AREA**

NET NUMBER

S181 1

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10 of 10 pages

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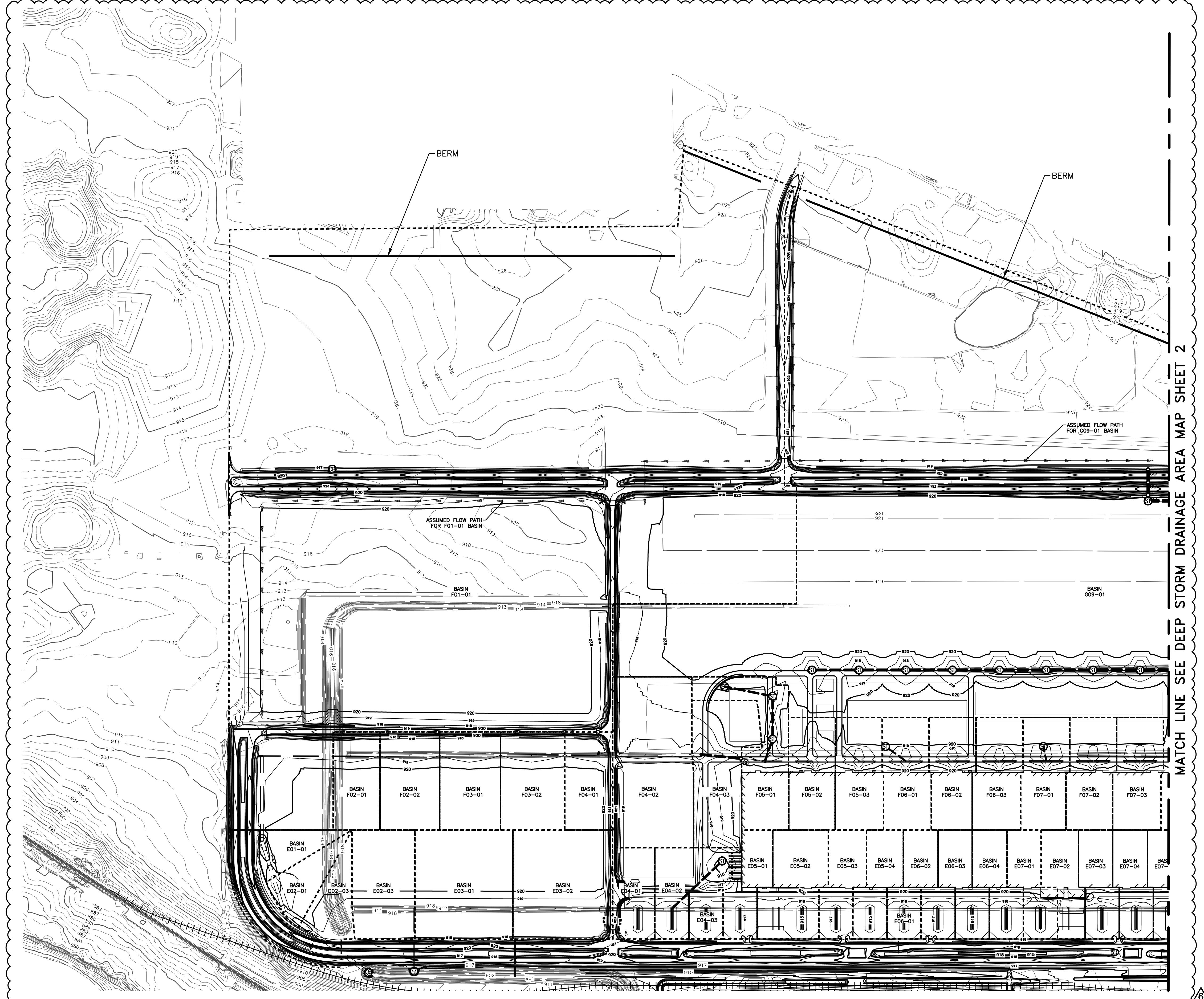
STORMWATER DISCHARGE AND SEQUENCING NOTES:

1. THE CONNECTING CHANNEL FROM INFILTRATION BASIN #1 TO #2 IS BEING PROVIDED ONLY DURING THE TEMPORARY GRADING CONDITION TO ALLOW EMERGENCY OVERFLOW BEYOND THE 100-YEAR STORM EVENT TO DISCHARGE TOWARDS BEAR CREEK
2. APPROVAL AND PERMITTING TO REPLACE TWO EXISTING CULVERTS WITHIN THE RAIL ROAD ROW AND INSTALL TWO NEW CULVERTS IS IN PROGRESS TO CONVEY STORMWATER RUNOFF TOWARDS KALAMAZOO RIVER.
3. ONCE CONSTRUCTION OF THE NEW CULVERTS #1 AND #2 IS COMPLETED, INSPECTED, AND APPROVED, THE TEMPORARY CONNECTING CHANNEL WILL BE REMOVED.
4. UPON REMOVAL OF THE TEMPORARY CONNECTING CHANNEL, AN EMERGENCY SPILLWAY AT INFILTRATION BASIN #1 WILL BE PROVIDED TO ALLOW FOR OVERFLOW DISCHARGE TO CULVERT #2. SEE PLANS FOR SPILLWAY LOCATION.
5. UPON REMOVAL OF THE TEMPORARY CONNECTING CHANNEL, A SPILLWAY AT INFILTRATION BASIN #2 WILL BE PROVIDED TO CONVEY OVERFLOW DISCHARGE TO CULVERT #2. THE TEMPORARY SPILLWAY AT INFILTRATION BASIN #2 WILL BE REMOVED AT THIS STAGE AND INFILTRATION BASIN #2 SHALL NO LONGER DISCHARGE STORMWATER RUNOFF TOWARDS BEAR CREEK

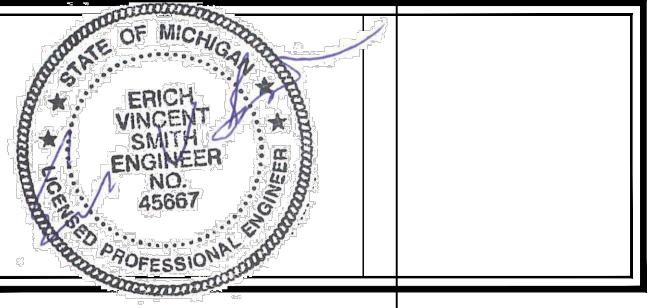
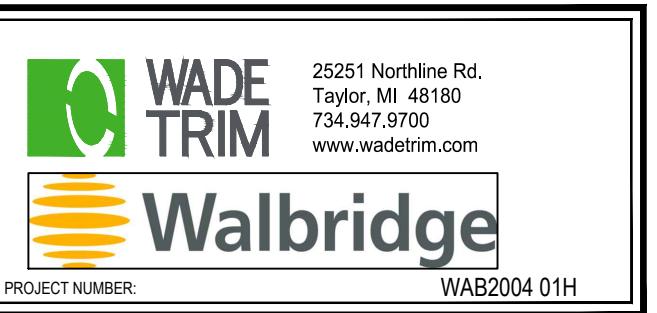
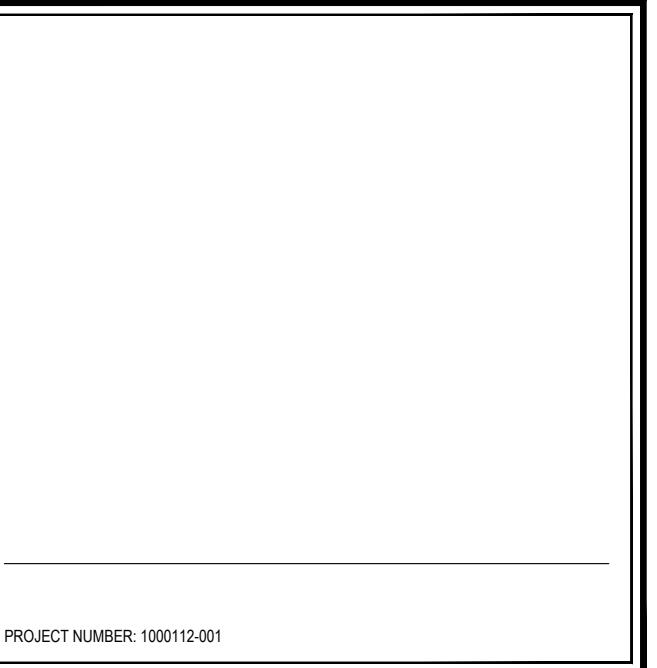


**Know what's below.  
Call before you dig.**

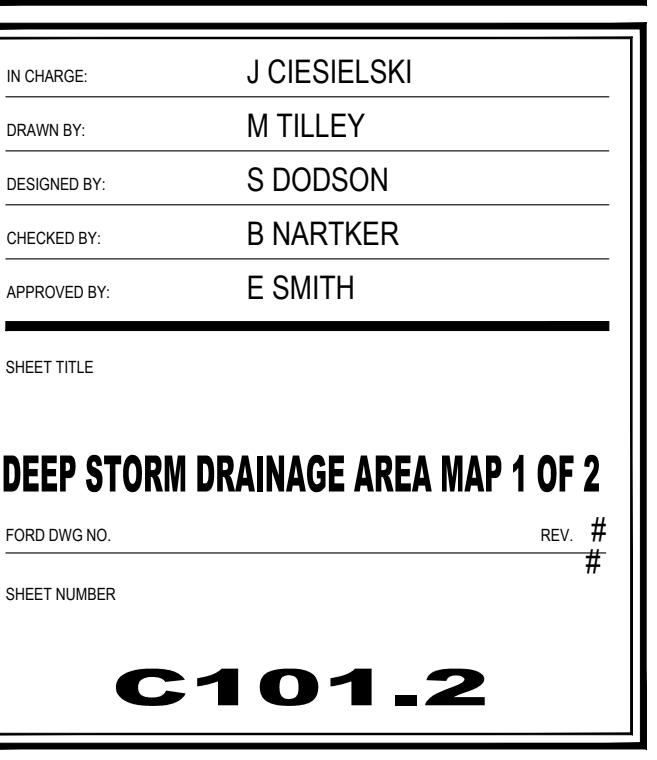
Border version 20



DRAINAGE BASIN	DRAINAGE AREA (AC.)	CN VALUE	TC VALUE (MIN.)
MH-E01-01	1.66	91	10
MH-E02-01	2.33	91	10
MH-D02-03	243	91	10
MH-E03-03	5.51	91	20
MH-E03-01	8.27	91	20
MH-E03-02	9.38	91	10
CB-E04-01	2.21	91	15
CB-E04-02	2.47	91	20
CB-E04-03	1.25	98	10
CB-E05-01	1.35	91	10
CB-E05-02	2.46	91	10
CB-E05-03	1.39	91	10
CB-E05-04	1.38	91	10
CB-E06-01	1.4	98	10
CB-E06-02	1.37	91	10
CB-E06-03	1.38	91	10
MH-F01-01	5.56	91	10
MH-F02-01	3.52	91	10
MH-F02-02	4.47	92	10
MH-F03-01	4.62	91	10
MH-F03-02	4.92	91	10
MH-F04-01	2.54	91	10
MH-F04-02	9.33	98	20
CB-F04-03	4.49	91	20
MH-F05-01	0.9	98	10
MH-F05-02	2.02	91	15
MH-F05-03	0.73	91	10
MH-F06-01	0.74	91	10
MH-F06-02	1.28	91	15

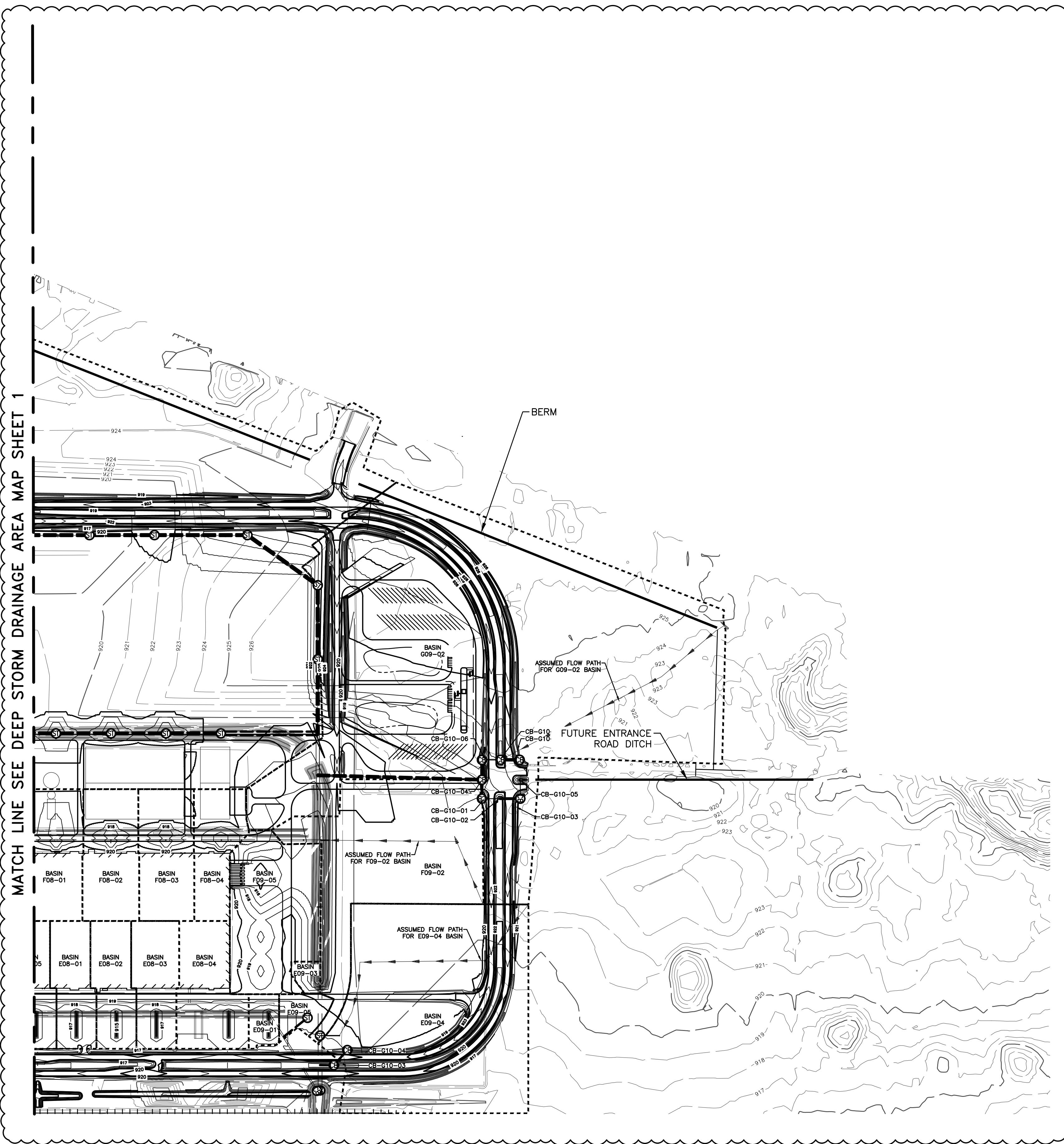


11/03/23	• REVISION 6
09/11/23	• REVISION 2
06/09/23	• ISSUED FOR PERMITTING
05/23/23	• ISSUED FOR PERMITTING
05/16/23	• PERMANENT STORMWATER SET
DATE ISSUED FOR	

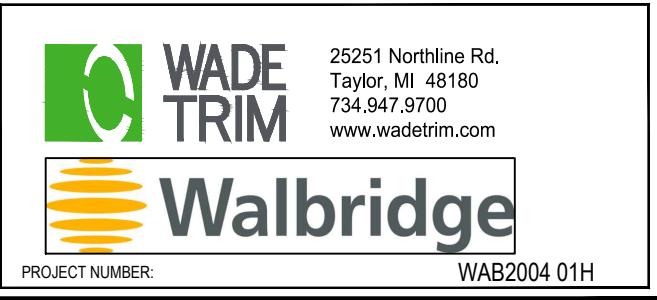
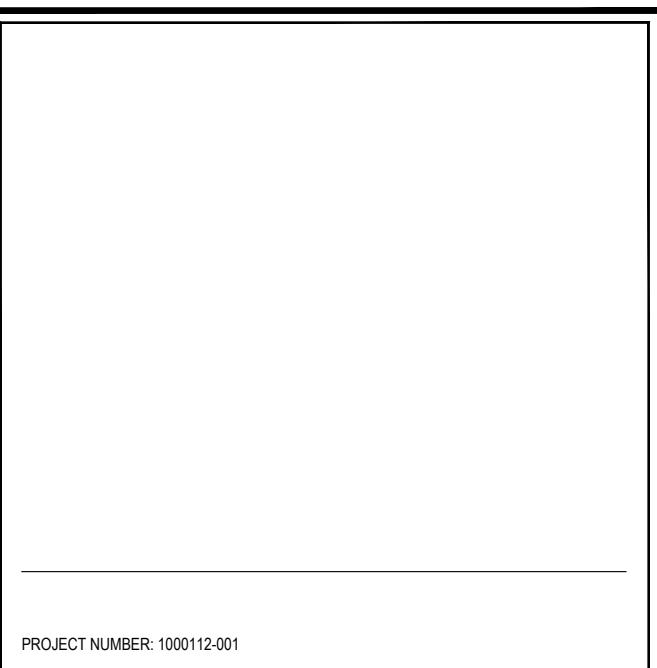


300 150 0 300 600  
SCALE IN FEET

# MATCH LINE SEE DEEP STORM DRAINAGE AREA MAP SHEET 1



DRAINAGE BASIN	DRAINAGE AREA (AC.)	CN VALUE	TC VALUE (MIN.)
CB-E06-04	1.38	91	10
CB-E07-01	1.39	91	10
CB-E07-02	1.1	91	10
CB-E07-03	1.38	91	10
CB-E07-04	1.49	91	10
CB-E07-05	1.38	91	10
CB-E08-01	1.39	91	10
CB-E08-02	1.4	91	10
CB-E08-03	1.39	91	10
CB-E08-04	2.42	91	10
CB-E09-01	0.92	91	20
MH-E09-03	8.4	91	20
MH-E09-04	3.88	91	20
MH-E09-05	1.66	91	20
MH-F06-03	1.29	91	15
MH-F07-01	0.75	91	10
MH-F07-02	0.73	91	10
MH-F07-03	0.73	91	10
MH-F08-01	1.28	91	15
MH-F08-02	1.28	91	15
MH-F08-03	1.27	91	15
MH-F08-04	3.01	91	15
MH-F09-02	10.22	91	20
MH-F09-05	2.21	92	10
MH-G09-01	57.92	91	20
CB-G09-02	36.19	91	10



11/03/23	• REVISION 6
09/11/23	• REVISION 2
06/09/23	• ISSUED FOR PERMITTING
05/23/23	• ISSUED FOR PERMITTING
05/16/23	• PERMANENT STORMWATER SET

IN CHARGE:	J CIESIELSKI
DRAWN BY:	M TILLEY
DESIGNED BY:	S DODSON
CHECKED BY:	B NARTKER
APPROVED BY:	E SMITH

DEEP STORM DRAINAGE AREA MAP 2 OF 2

DEEP STORM DRAINAGE AREA MAP 2 OF 2

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FORD DWG NO. \_\_\_\_\_ REV. # \_\_\_\_\_  
SHEET NUMBER \_\_\_\_\_ # \_\_\_\_\_

**C101.3**

11. **What is the primary purpose of the *Journal of Clinical Endocrinology and Metabolism*?**

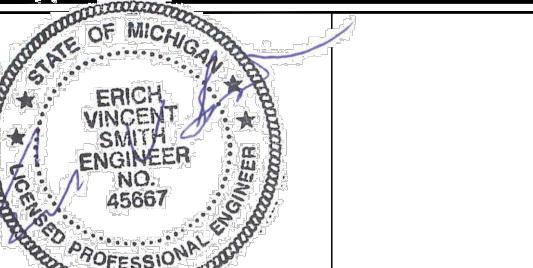
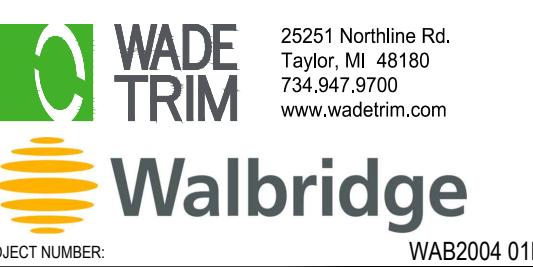
A scale bar diagram with a horizontal line. Above the line, the numbers 300, 150, 0, 300, and 6 are written. Below the line, there is a pattern of alternating black and white squares. The first 300 feet are represented by 3 black squares and 3 white squares. The next 150 feet are represented by 2 black squares and 2 white squares. The 0 feet mark is at the center. The next 300 feet are represented by 3 black squares and 3 white squares. The 600 feet mark is at the end of the line, indicated by a long black bar.

300 150 0 300 6

SCALE IN FEET

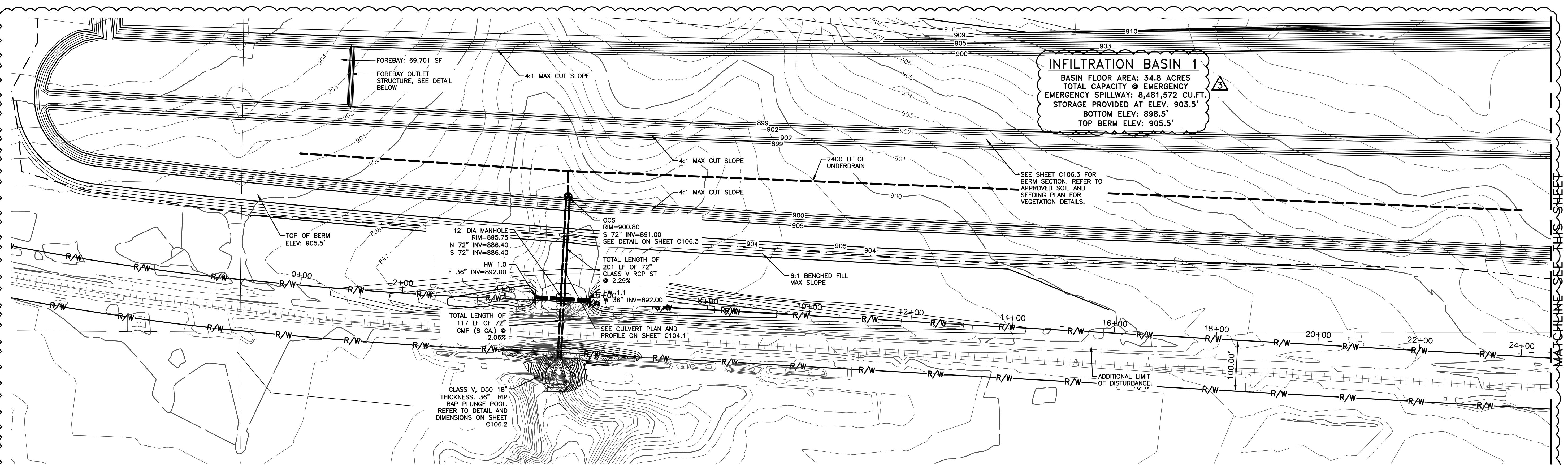
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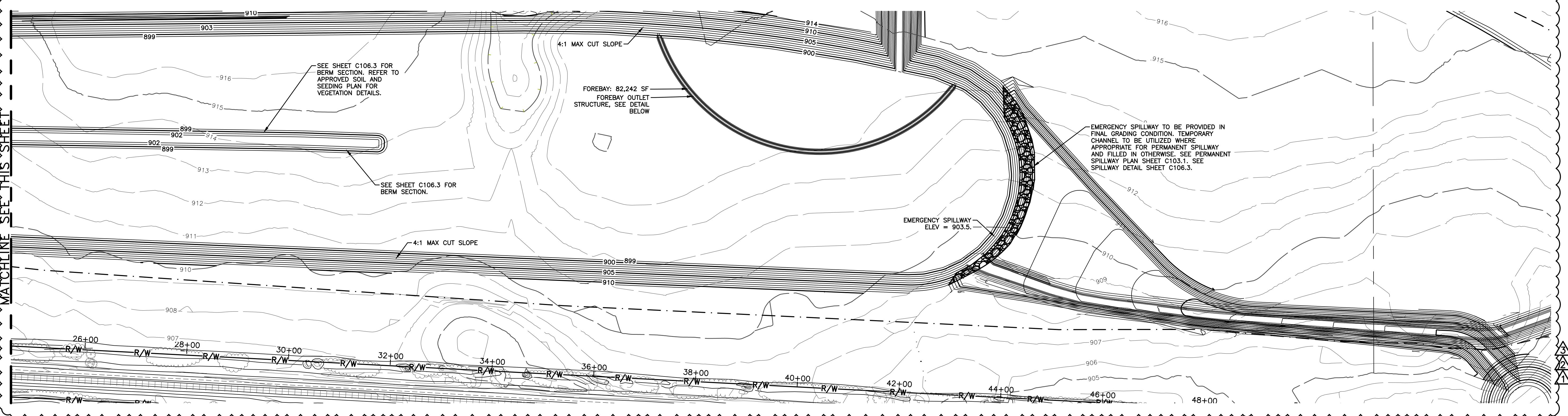


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09/27/23 • REVISION 3
09/11/23 • REVISION 2
06/28/23 • REVISION 1
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05/16/23 • PERMANENT STORMWATER SET
DATE ISSUED FOR

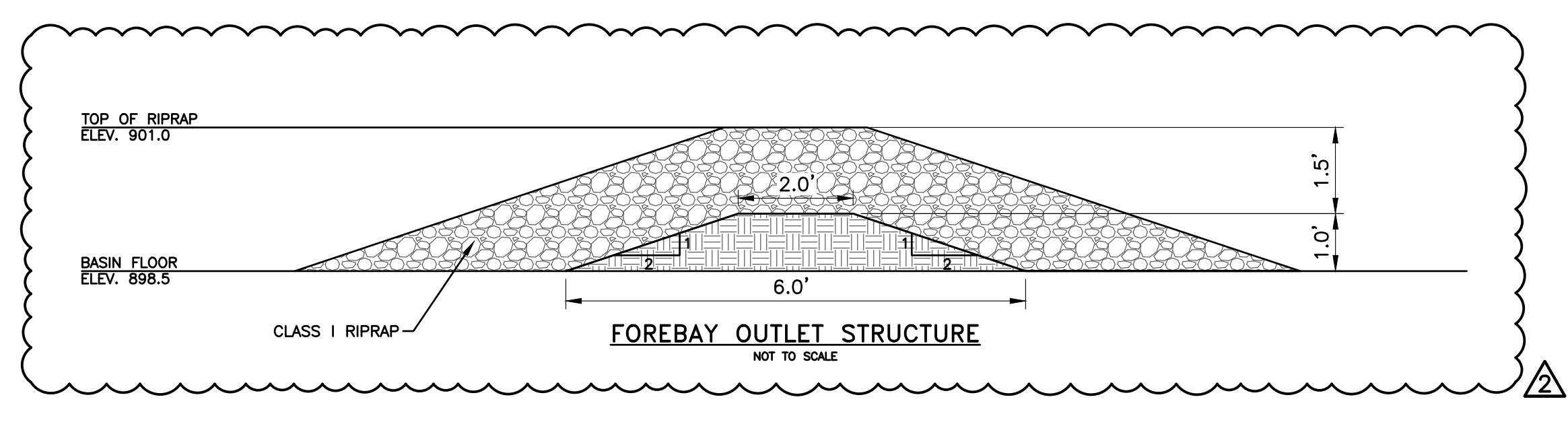
IN CHARGE:	J CIESIELSKI
DRAWN BY:	M TILLEY
DESIGNED BY:	S DODSON
CHECKED BY:	B NARTKER
APPROVED BY:	E SMITH
SHEET TITLE:	INFILTRATION BASIN 1 PERMANENT CONDITION PLAN VIEW
FORD DWG NO.	
SHEET NUMBER:	
REV. #	

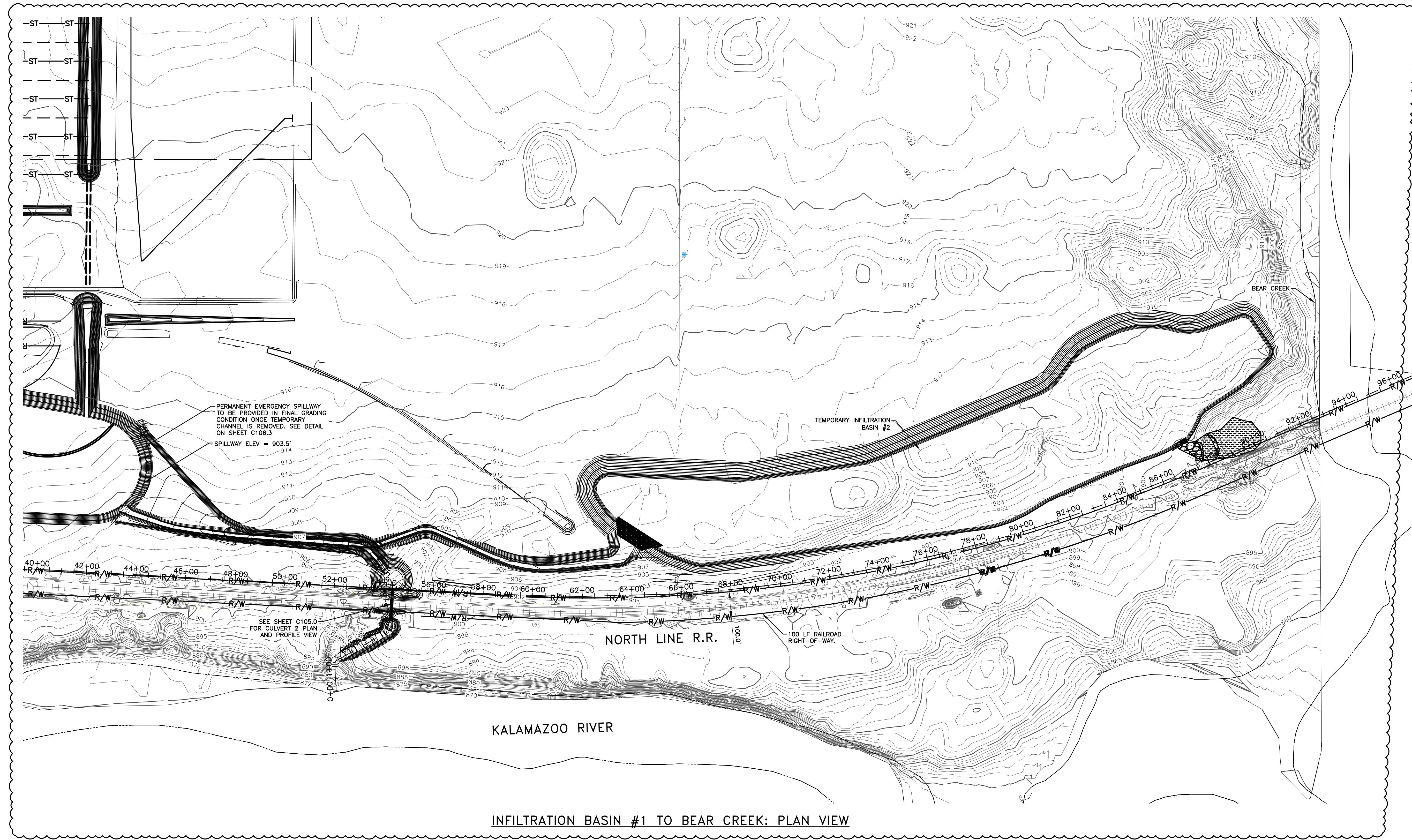


INFILTRATION BASIN #1 WEST SIDE

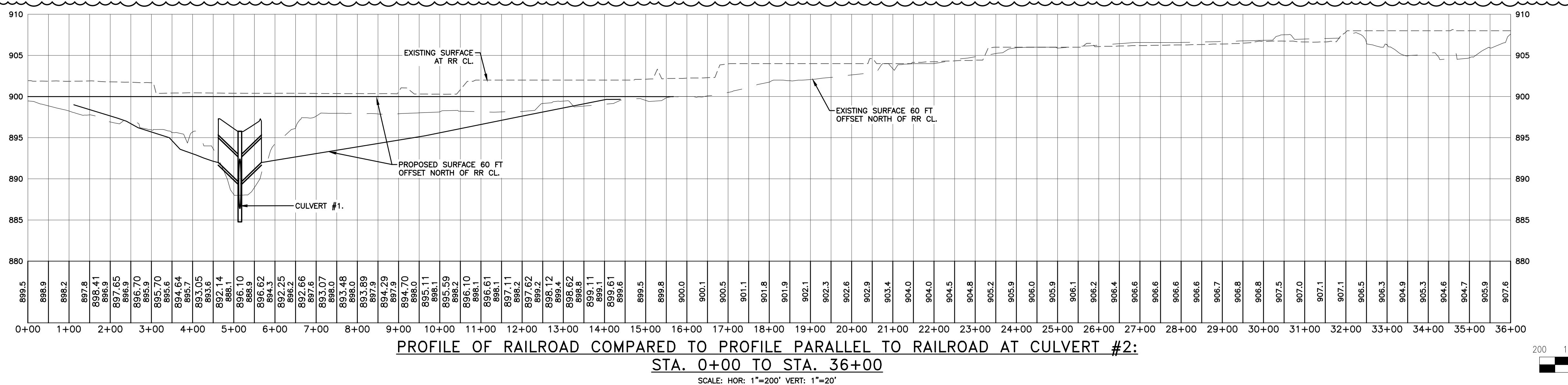
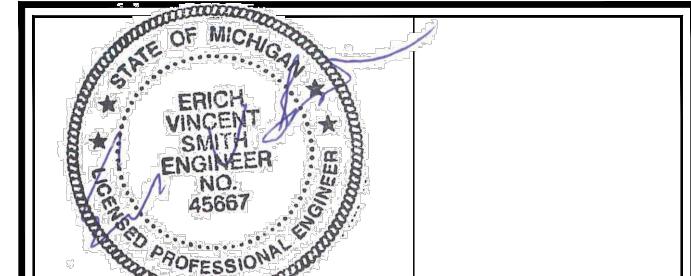
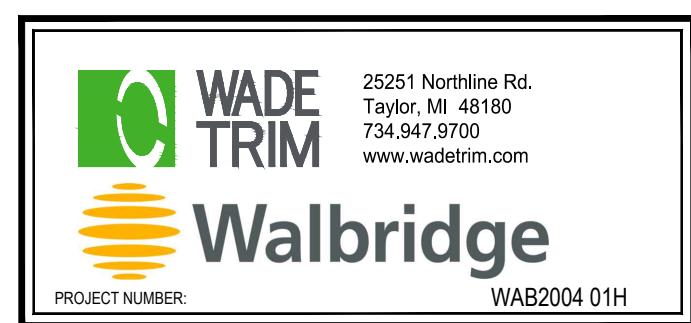
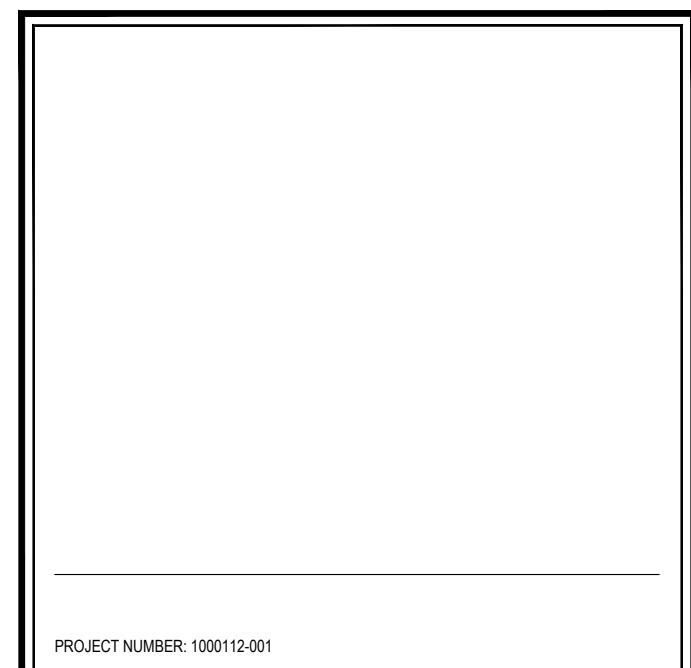


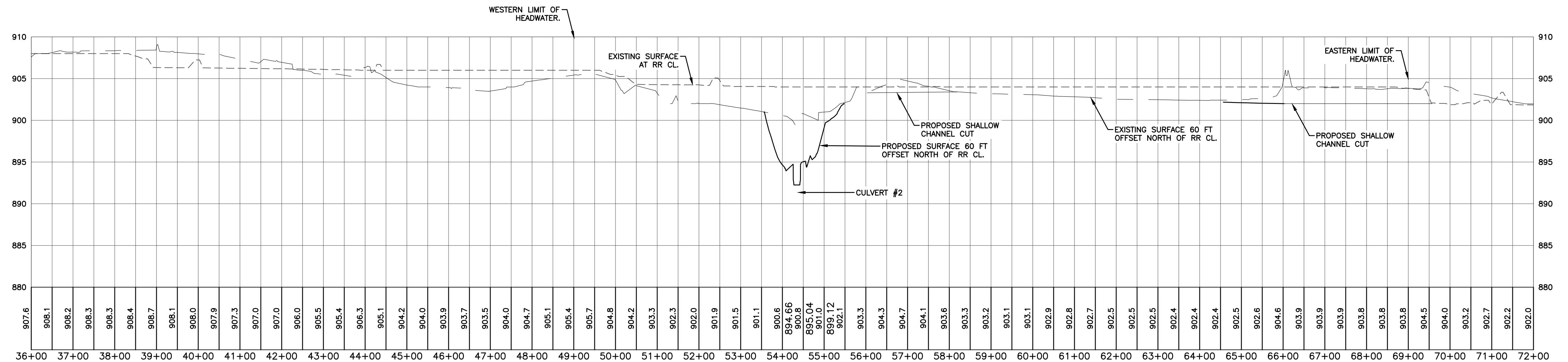
INFILTRATION BASIN #1 EAST SIDE





**Know what's below.  
Call before you dig.**





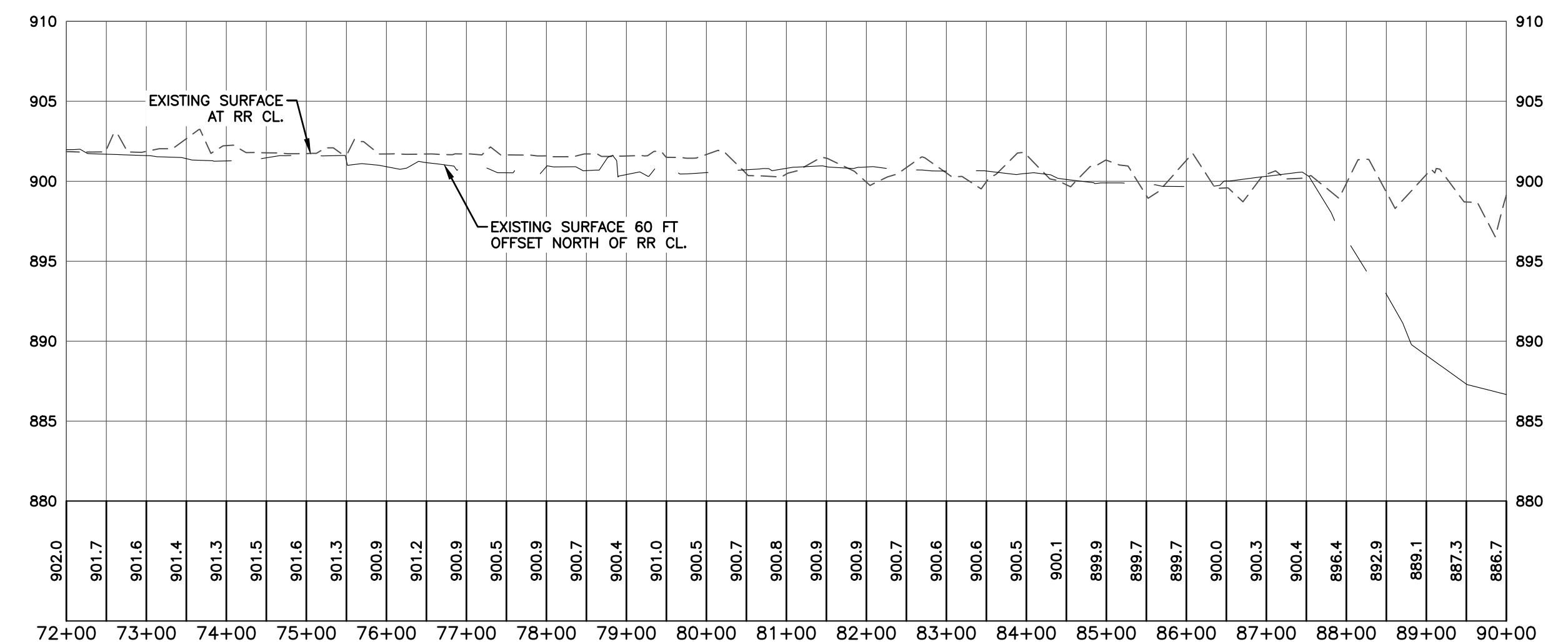
PROFILE OF RAILROAD COMPARED TO PROFILE PARALLEL TO RAILROAD AT CULVERT #2:  
STA. 36+00 TO STA. 72+00

SCALE: HOR: 1'=200' VERT: 1'=20'

17000 ROTUNDA DR, 1ST FLOOR SOUTH  
DEARBORN, MICHIGAN 48120-1168  
USA



PROJECT NUMBER: 1000112-001



PROFILE OF RAILROAD COMPARED TO PROFILE PARALLEL TO RAILROAD AT CULVERT #2:  
STA. 72+00 TO STA. 90+00

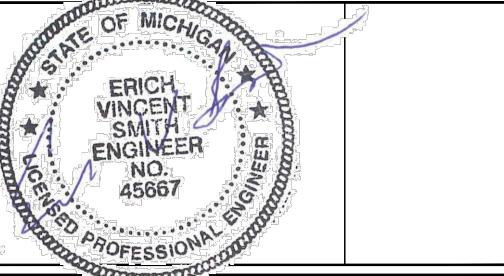
SCALE: HOR: 1'=200' VERT: 1'=20'

25251 Northline Rd.  
Taylor, MI 48180  
734.947.9700  
www.wadetrim.com

WADE TRIM  
Walbridge

PROJECT NUMBER

WAB2004 01H



11/10/23	• REVISION 7
11/03/23	• REVISION 6
09/27/23	• REVISION 3
9/11/23	• REVISION 2
06/28/23	• REVISION 1
06/09/23	• ISSUED FOR PERMITTING
05/23/23	• ISSUED FOR PERMITTING
05/16/23	• PERMANENT STORMWATER SET
DATE	ISSUED FOR

IN CHARGE:	J CIESIELSKI
DRAWN BY:	M TILLEY
DESIGNED BY:	S DODSON
CHECKED BY:	B NARTKER
APPROVED BY:	E SMITH

SHEET TITLE: RAILROAD PROFILE 1  
FORD DWG NO. REV. #  
SHEET NUMBER

**C103.1A**



Know what's below.  
Call before you dig.



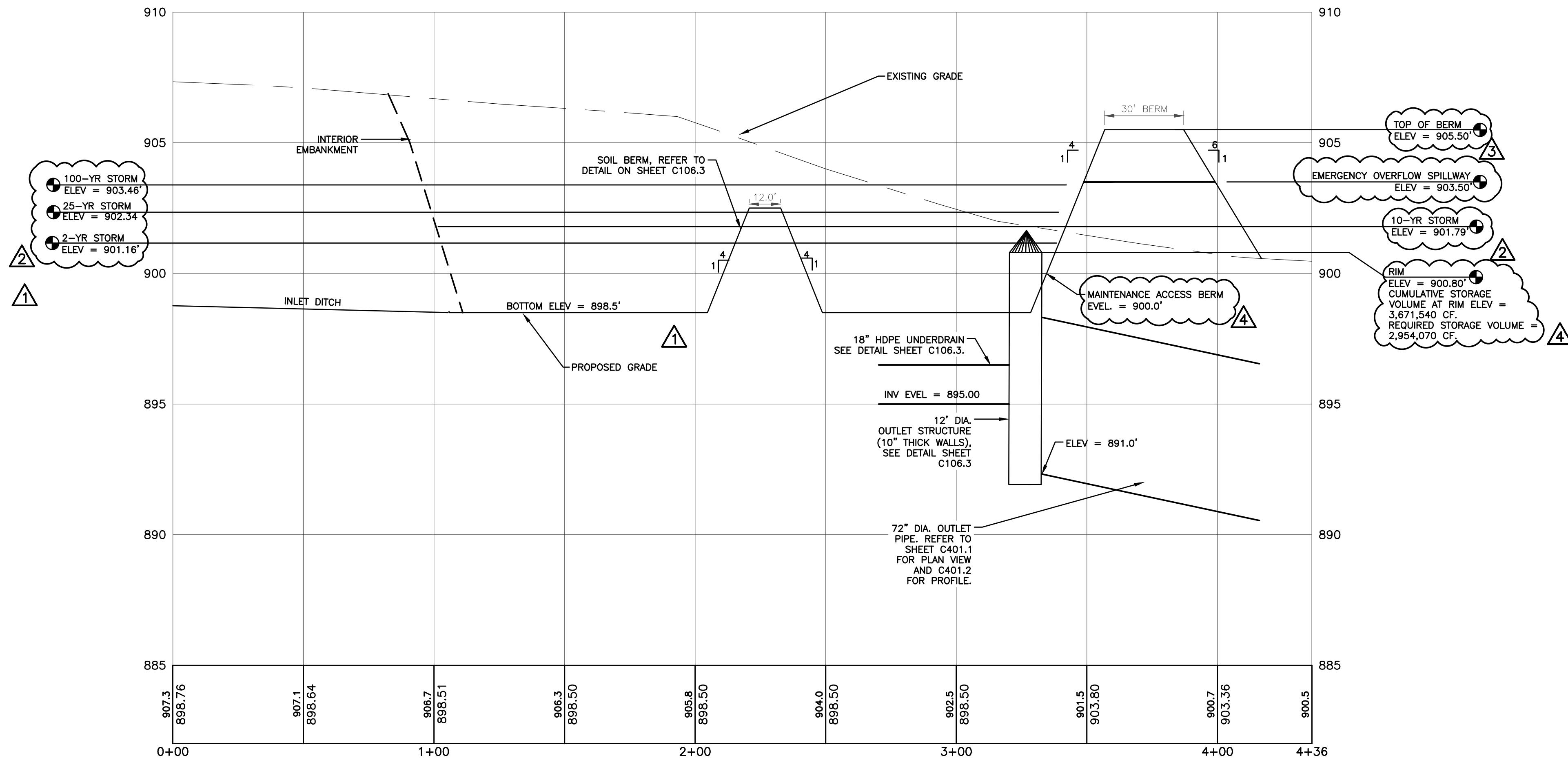
**INFILTRATION BASIN - CONTOURS AND VOLUMES**

CONTOUR (FT)	DEPTH (FT)	AREA (SF)	INCREMENTAL VOLUME (CF)	CUMULATIVE VOLUME (CF)
898.50	0.0	1,512,370	0	0
899.00	0.5	1,547,431	764,950.25	764,950.25
900.00	1.5	1,618,709	1,583,070.00	2,348,020.25
901.00	2.5	1,690,091	1,654,400.00	4,002,420.25
902.00	3.5	1,761,575	1,725,833.00	5,728,253.25
903.00	4.5	1,862,035	1,811,805.00	7,540,058.25
904.00	5.5	1,904,021	1,883,028.00	9,423,086.25
905.00	6.5	1,946,087	1,925,054.00	11,348,140.25
905.50	7.0	1,966,758	978,211.25	12,326,351.50

**STORM EVENT OUTFLOW DATA**

STORM EVENT (YR)	VOLUME (CF)	BASIN OUTFLOW (CFS)	CULVERT 1 OUTFLOW (CFS)
2	4,278,553.53	22.43	23.32
10	5,365,828.32	102.16	105.81
25	6,344,266.95	199.86	206.38
100	8,406,251.13	453.97	448.17

**GENERAL NOTES:**  
DRAINAGE AREA 1-B EAST AND DRAINAGE AREA 1-B WEST ARE INCLUDED IN THE CULVERT 1 OUTFLOW, BUT ARE EXCLUDED FROM THE BASIN OUTFLOW.



**INFILTRATION BASIN #1 SECTION VIEW**

HORZ:1"=30', VERT:1"=2"

**INFILTRATION BASIN MIX**

BOTANICAL NAME	COMMON NAME	LS LBS/ACRE
GRASSES		
BOUTELOUA HIRSUTA	BLUE GRAMA GRASS	1
FESTUCA OVINA	SHEEPS FESCUE	1
HELIOTRICHON SEMPERVIRENS	BLUE OAT GRASS	0.50
SCHIZACHYRUM SCOPARIUM	LITTLE BLUESTEM	1.50
SPOROBOLUS HETEROLEPIS	PRARIE DROPSDEED	2

**SLOPE STABILIZATION MIX**

BOTANICAL NAME	COMMON NAME	LS LBS/ACRE
GRASSES, SEDGES & RUSHES		
ANDROPOGON GERARDII	BIG BLUESTEM	12.00
BOUTELOUA CURTIPENDULA	SIDE-OATS GRAMA	12.00
CAREX MOLESTA	FIELD OVAL SEDGE	1.0
CAREX VULPINOIDEA	FOX SEDGE	1.0
DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	4.0
ELYMUS CANADENSIS	CANADA WILD RYE	16.0
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	16.0
JUNCUS TENUIS	PATH RUSH	5.0
CHIZACHYRUM SCOPARIUM	LITTLE BLUESTEM	1.0
SORGHASTRUM NUTANS	INDIAN GRASS	4.0
SPOROBOLUS CRYPTANDRUS	SAND DROPSDEED	4.0
TEMPORARY GRASS COVER		
LOLIUM MULTIFLORUM	ANNUAL RYEGRASS	128.0
AVENA SATIVA	SEED OATS	512.0

SOIL PREPARATION: ROUGH GRADED  
DISTRIBUTION TYPE: BROADCAST SEEDING  
COVER CROP: AVENA SATIVA - COMMON OATS AT 30 LBS/ACRE

**SEEDING NOTE:**

- 1) INFILTRATION BASIN #1 BOTTOM AND SIDE SLOPES TO BE HYDROSEEDED WITH PROGRANICS AND SPECIFIED SEED MIX.
- 2) AT THE DISCRETION AND DIRECTION OF THE CITY OF MARSHALL, THE SLOPE STABILIZATION SEED MIX APPLIED MAY BE REQUIRED AS AN ALTERNATIVE TO THE INFILTRATION BASIN SEED MIX. APPLICATION AND PERFORMANCE STANDARD SPECIFICATIONS FOR SEEDING SHALL APPLY.

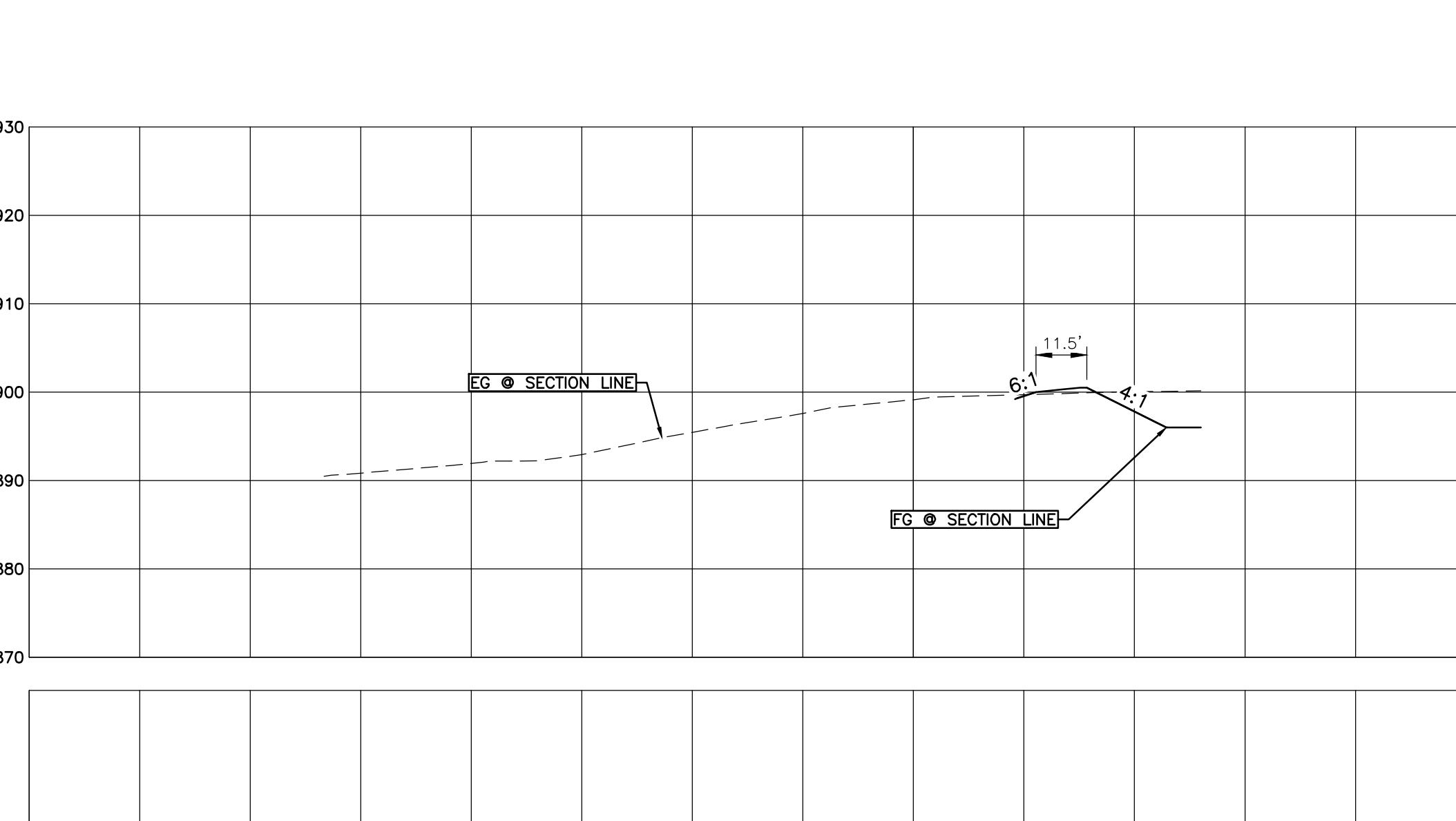
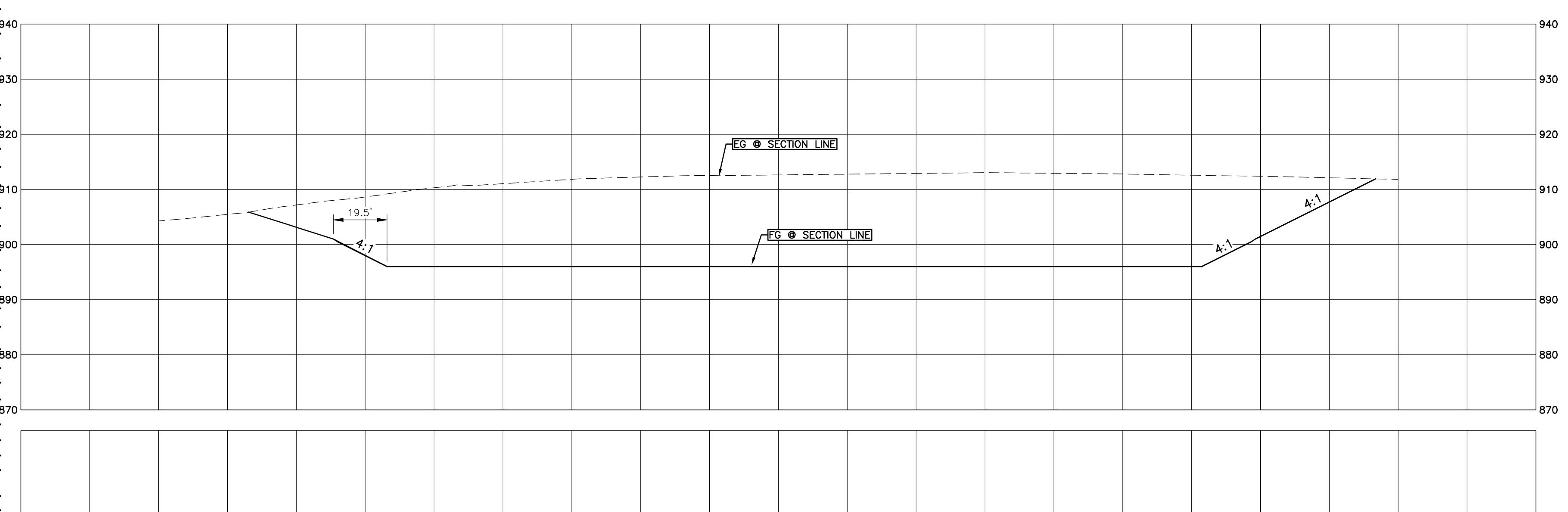
TOTAL SEEDING RATE: 49.69 LBS PER ACRE  
6.69 LBS GRASSES - 40 LBS NURSE CROP  
71 NATIVE SEEDS PER SQ FT.

IN CHARGE: J CIESIELSKI  
DRAWN BY: M TILLEY  
DESIGNED BY: S DODSON  
CHECKED BY: B NARTKER  
APPROVED BY: E SMITH  
SHEET TITLE: **INFILTRATION BASIN 1 SECTION VIEW**

FORD DWG NO. **C103-2** REV. #  
SHEET NUMBER

811.0

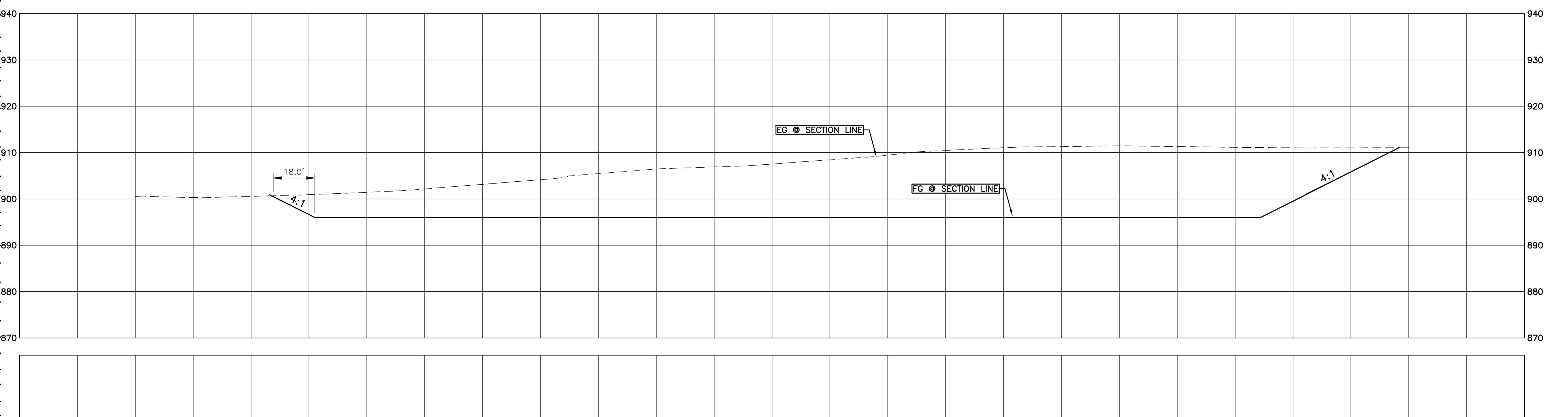




LDING SITE CODE:

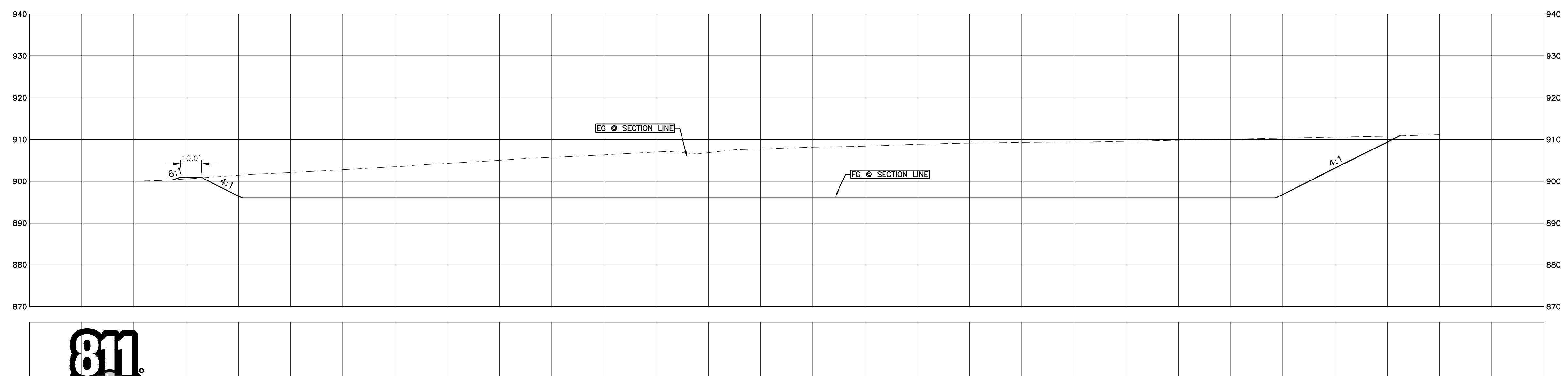
INFILTRATION BASIN #2 SECTION VIEW: A-A

HORZ:1"=30', VERT:1"=2'



## INFILTRATION BASIN #2 SECTION VIEW: B-B

HORZ:1"=30', VERT:1"=2'



**Know what's below.  
Call before you dig.**

## INFILTRATION BASIN #2 SECTION VIEW: C-C

HORZ:1"=30', VERT:1"=2'

SCALE IN FEET

IN CHARGE:	J CIESIELSKI
DRAWN BY:	M TILLEY
DESIGNED BY:	S DODSON
CHECKED BY:	B NARTKER
APPROVED BY:	E SMITH

SHEET TITLE

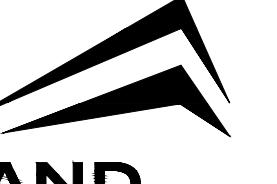
# TEMPORARY INFILTRATION BASIN SECTION VIEWS

FORD DWG NO. \_\_\_\_\_ REV. # \_\_\_\_\_  
SHEET NUMBER \_\_\_\_\_

## **S101.8**

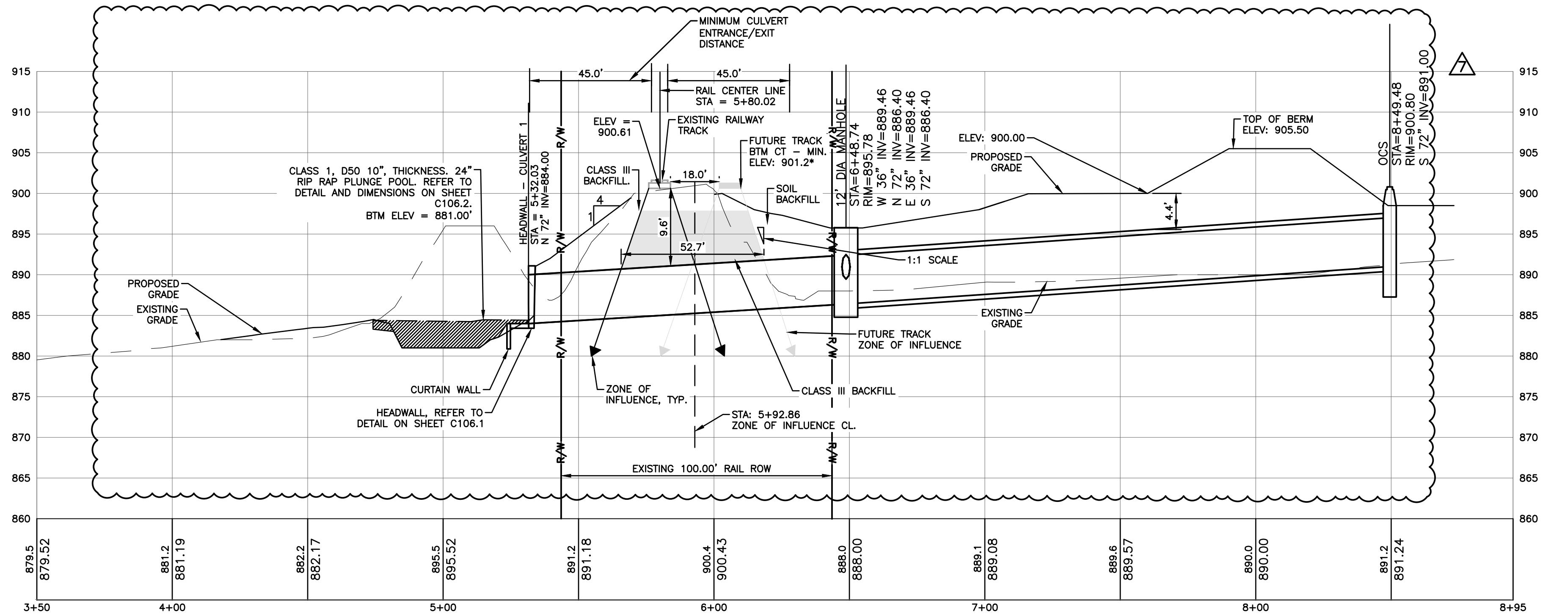
8184-8





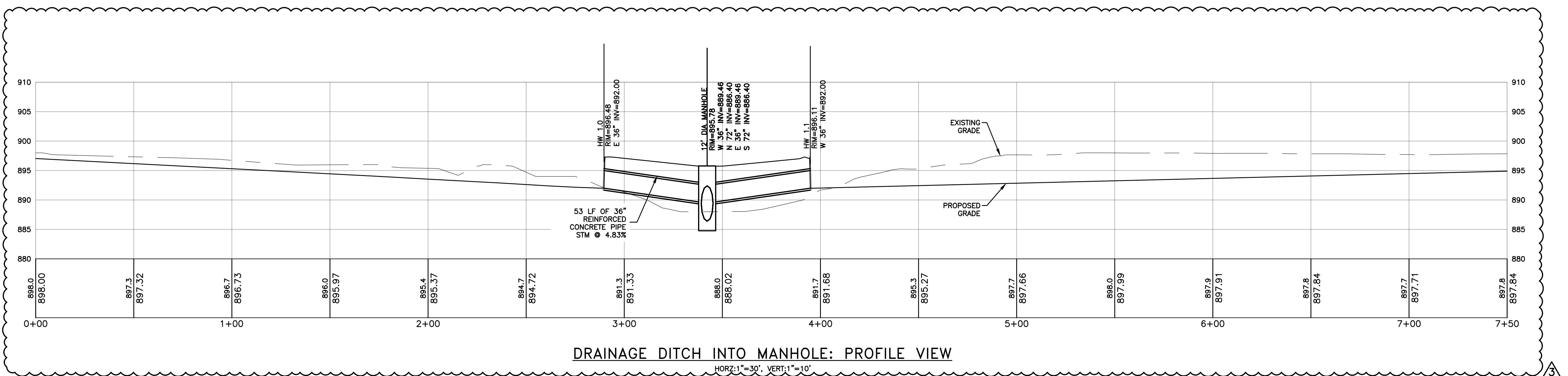
# **FORDLAND**

ROTUNDA DR, 1ST FLOOR SOUTH  
RBBORN, MICHIGAN 48120-1168  
USA



#### INFILTRATION BASIN #1 OUTLET AND CULVERT #1: PROFILE VIEW

HORZ:1"=30', VERT:1"=10'



## DRAINAGE DITCH INTO MANHOLE: PROFILE VIEW

HORZ:1"=30', VERT:1"=

IN CHARGE: **J CIESIELSKI**  
DRAWN BY: **M TILLEY**  
DESIGNED BY: **S DODSON**

---

APPROVED BY: E SMITH

SHEET TITLE

## INFILTRATION BASIN 1 OUTLET & CULVERT PROFILE

FORD DWG NO. \_\_\_\_\_ REV. #

S194-2

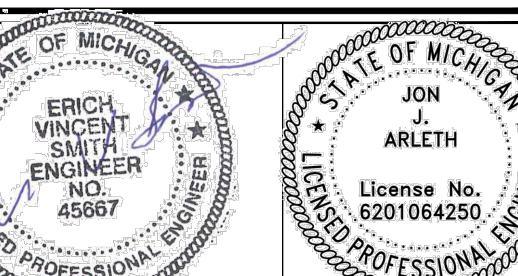
## ANSWER



**Know what's below.  
Call before you dig.**

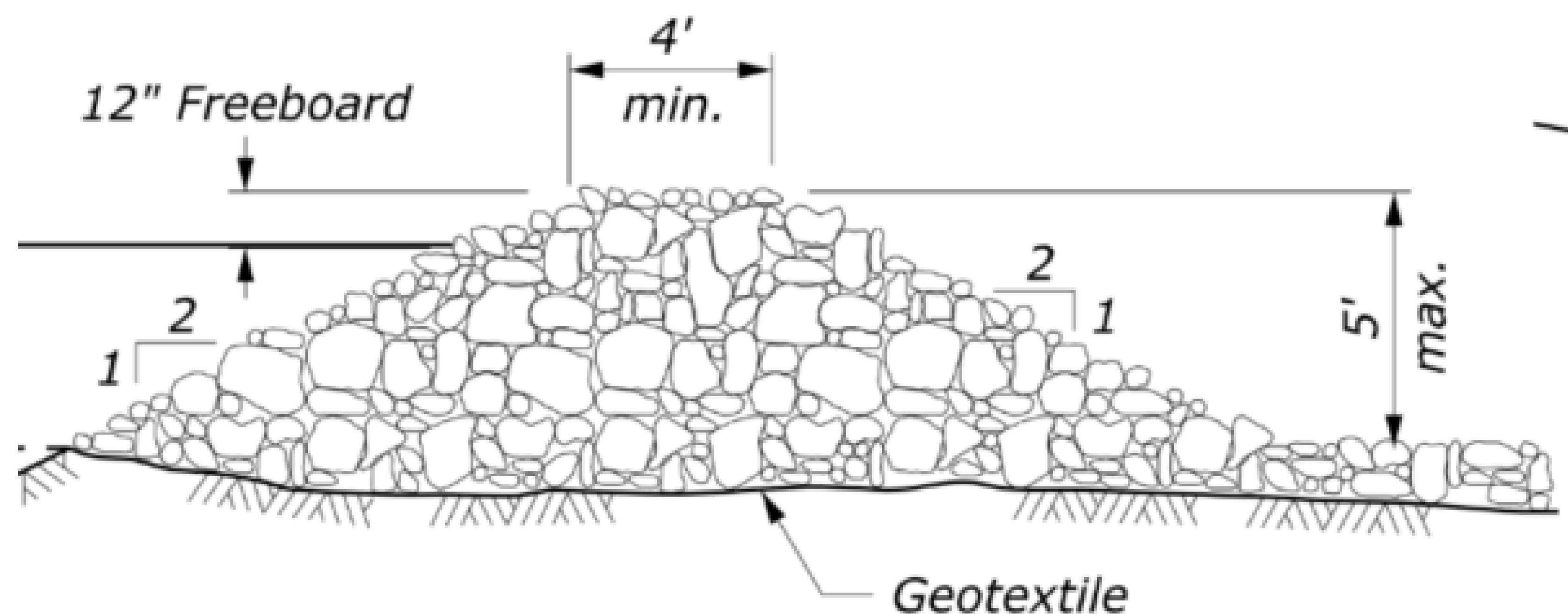
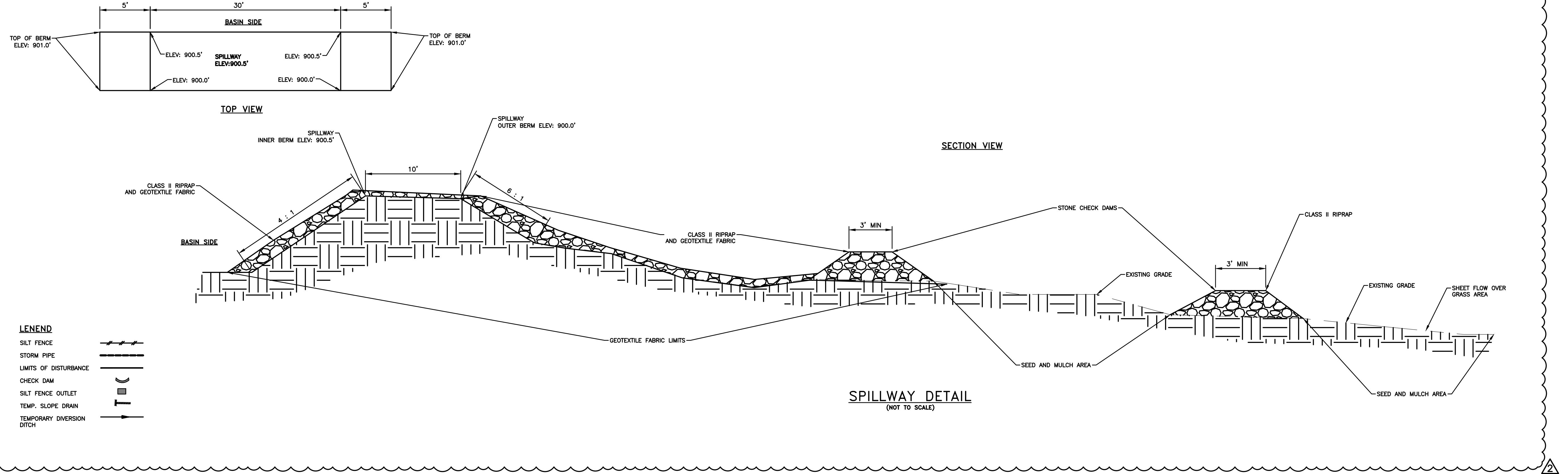
BUILDING SITE CODE:  
FORD PROJECT NUMBER:

**WADE TRIM** **SME**  
**Walbridge**  
PROJECT NUMBER  
WAB2004 01H



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**SPILLWAY CHECK  
DAM DETAIL**  
(NOT TO SCALE)



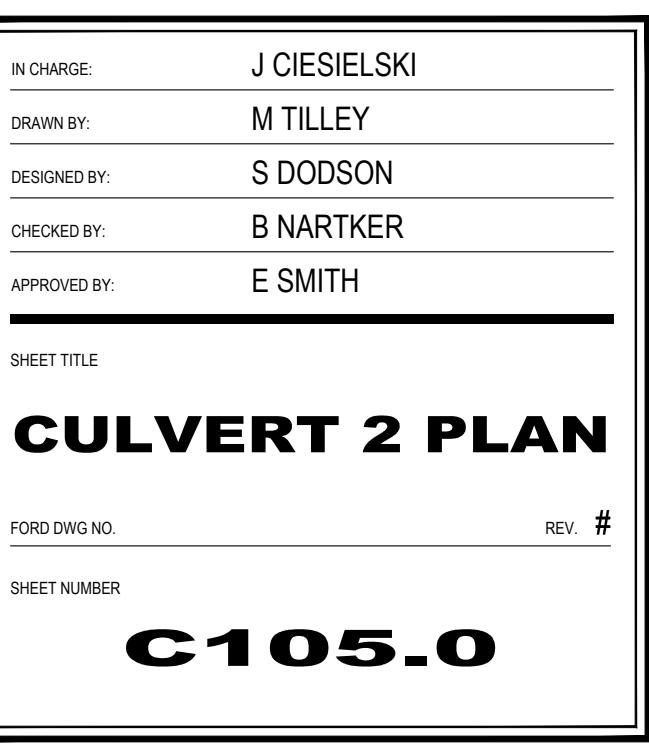
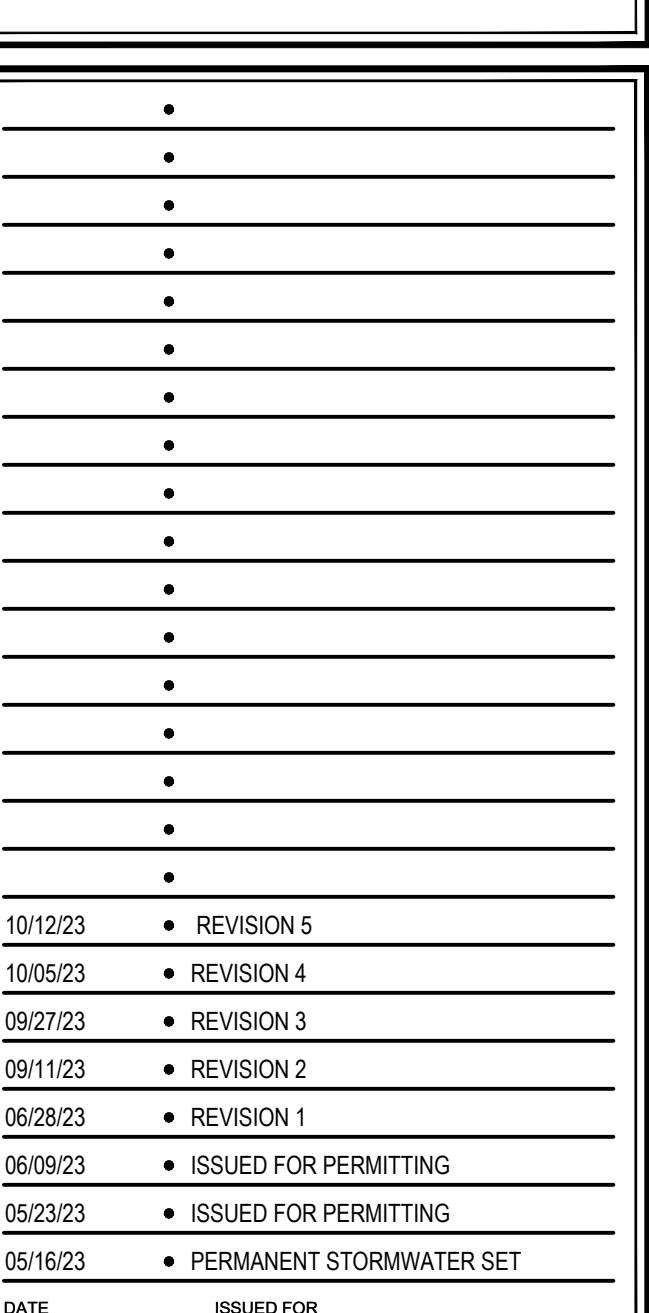
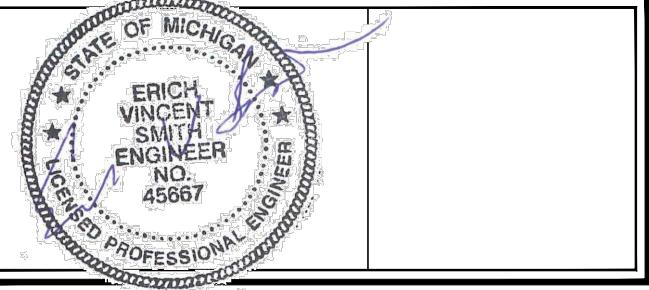
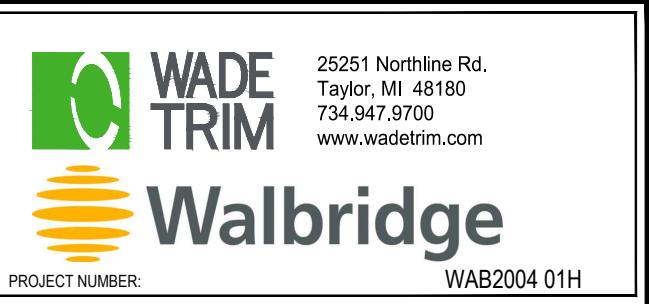
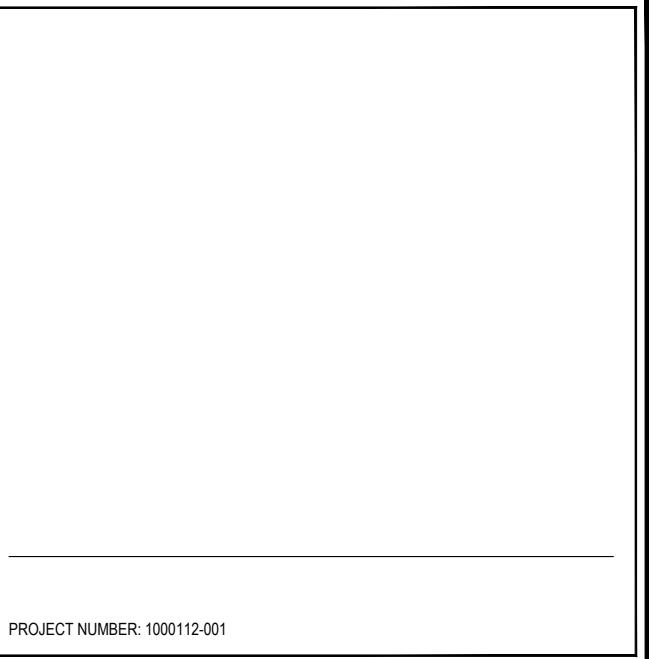
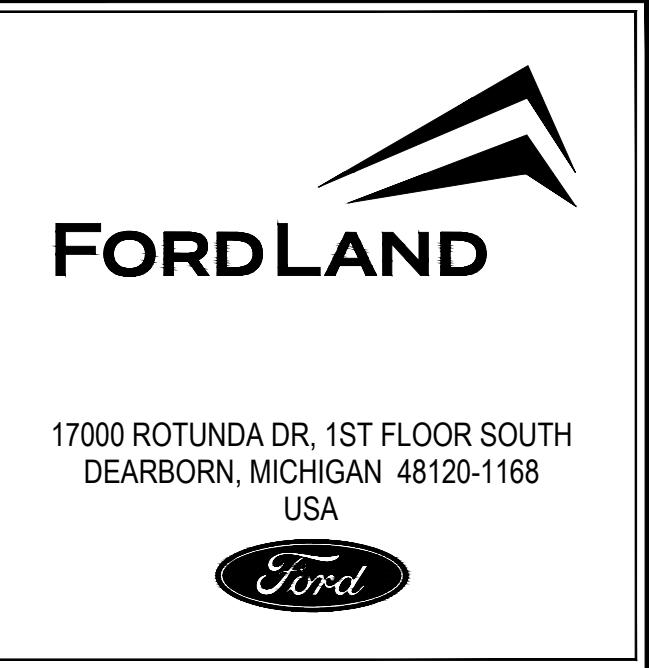
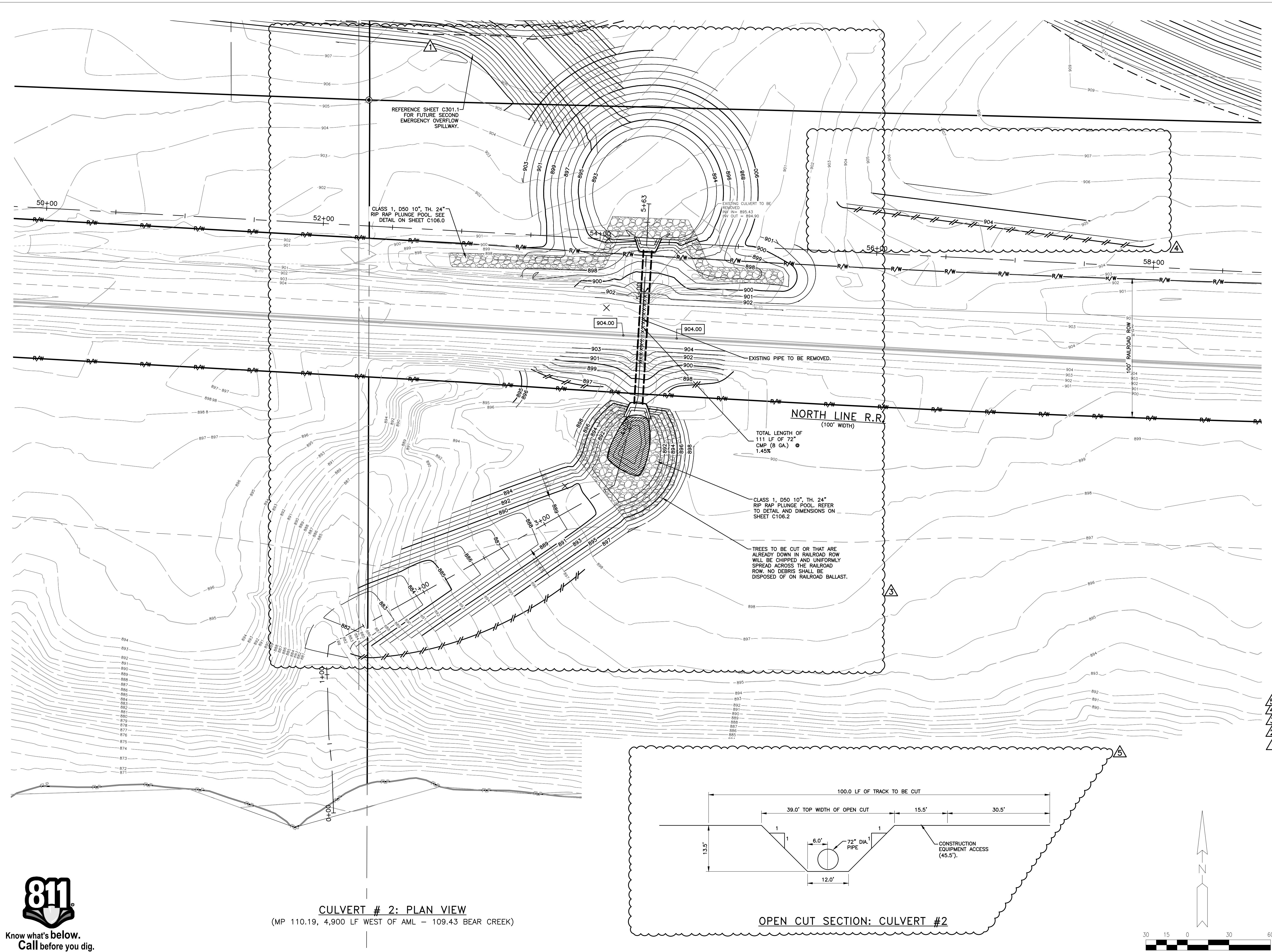
Know what's below.  
Call before you dig.

IN CHARGE: J CIESIELSKI  
DRAWN BY: M TILLEY  
DESIGNED BY: S DODSON  
CHECKED BY: B NARTKER  
APPROVED BY: E SMITH

SHEET TITLE: TEMP. INFILTRATION BASIN 2 DETAILS (BY SME)  
FORD DWG NO. REV. #  
SHEET NUMBER

**C104.3**

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**Know what's below.  
Call before you dig.**

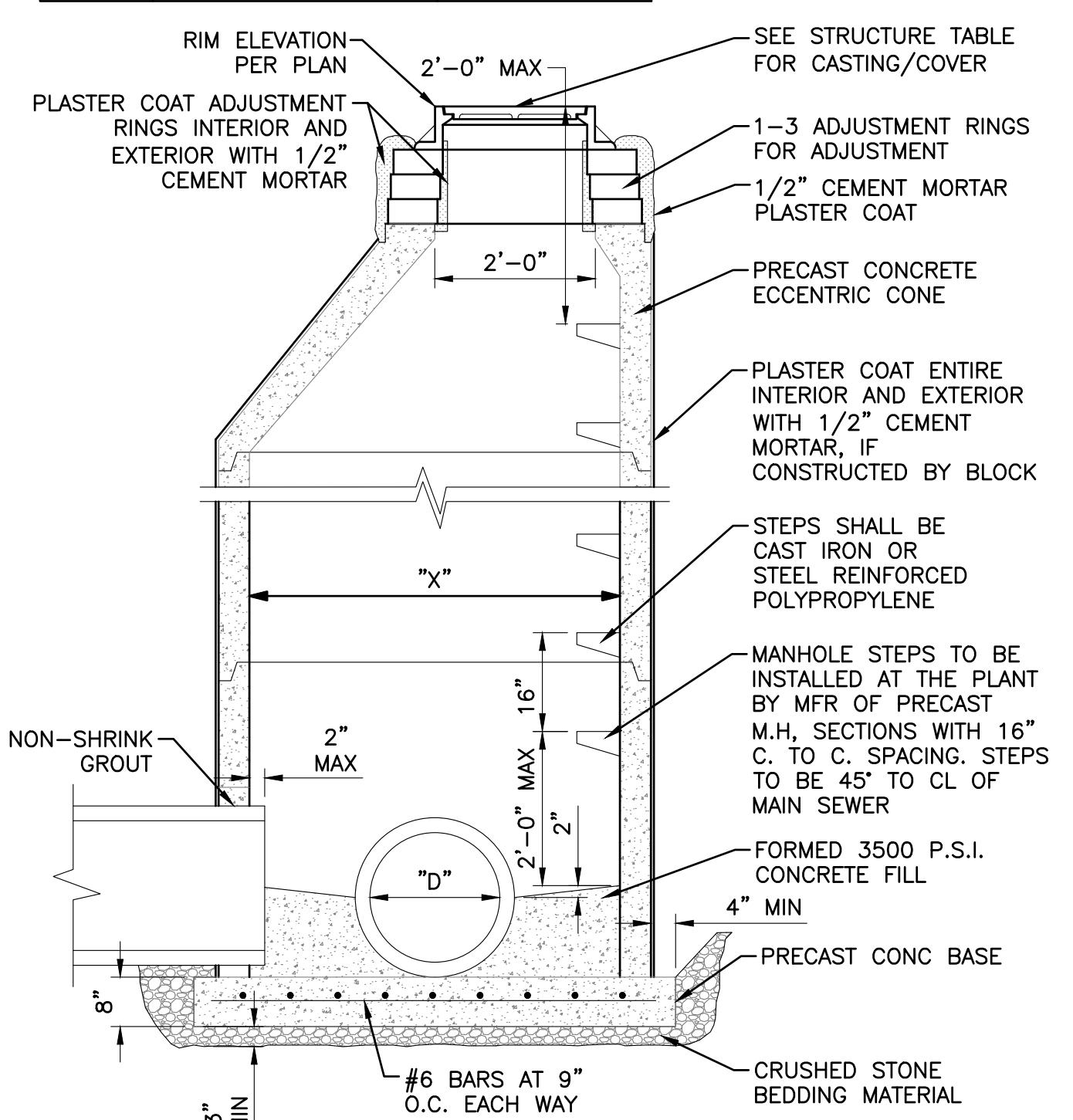
CULVERT # 2: PLAN VIEW  
(MP 110.19, 4,900 LF WEST OF AML - 109.43 BEAR CREEK)

## OPEN CUT SECTION: CULVERT #2

SCALE IN FEET

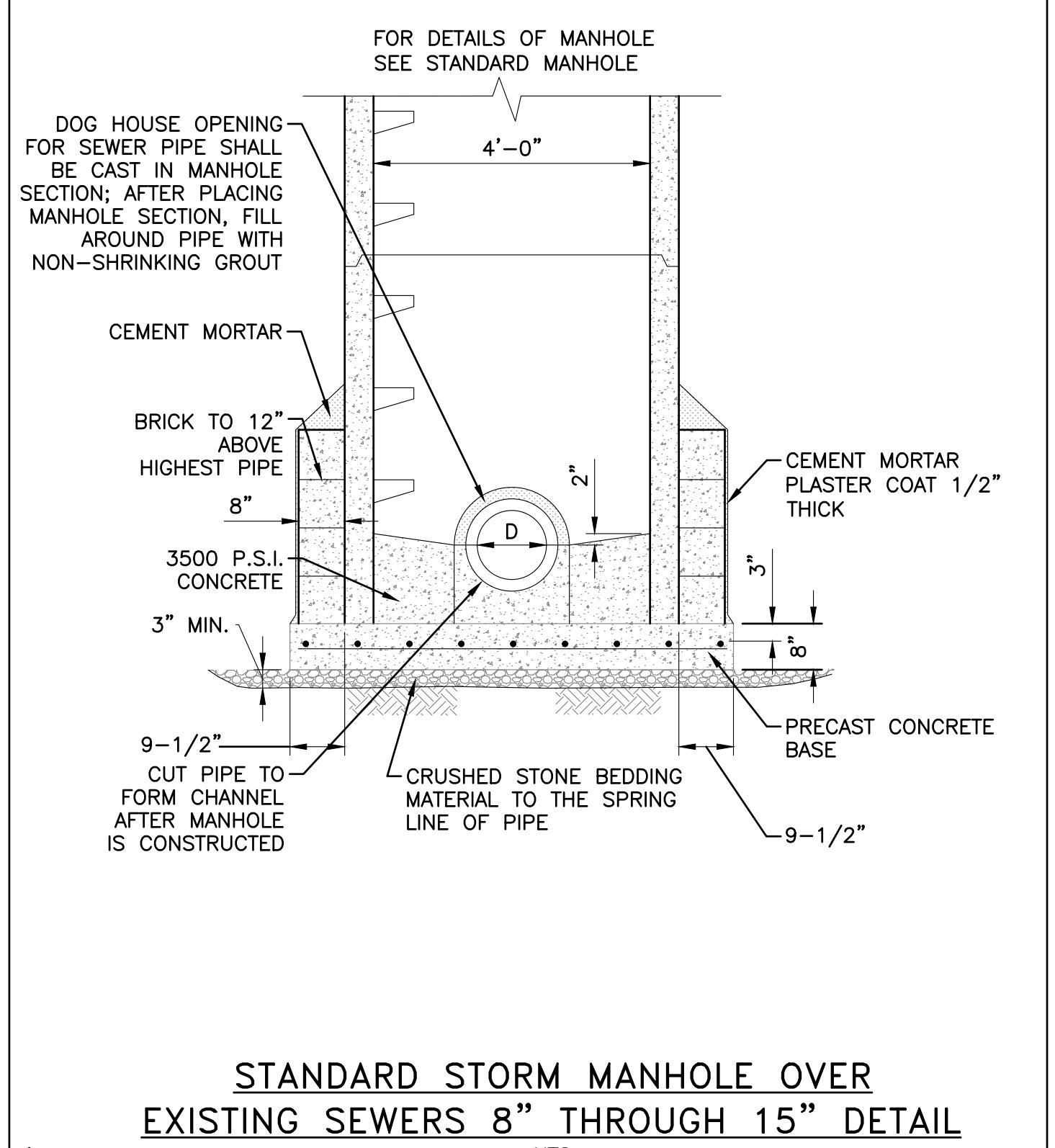


REQ'D MANHOLE DIAMETER		
"X"	MAX PIPE DIA. STRAIGHT THRU INSTALLATION	MAX PIPE DIA. RIGHT ANGLE INSTALLATION
4'	24"	18"
5'	36"	24"
6'	42"	36"
7'	60"	42"

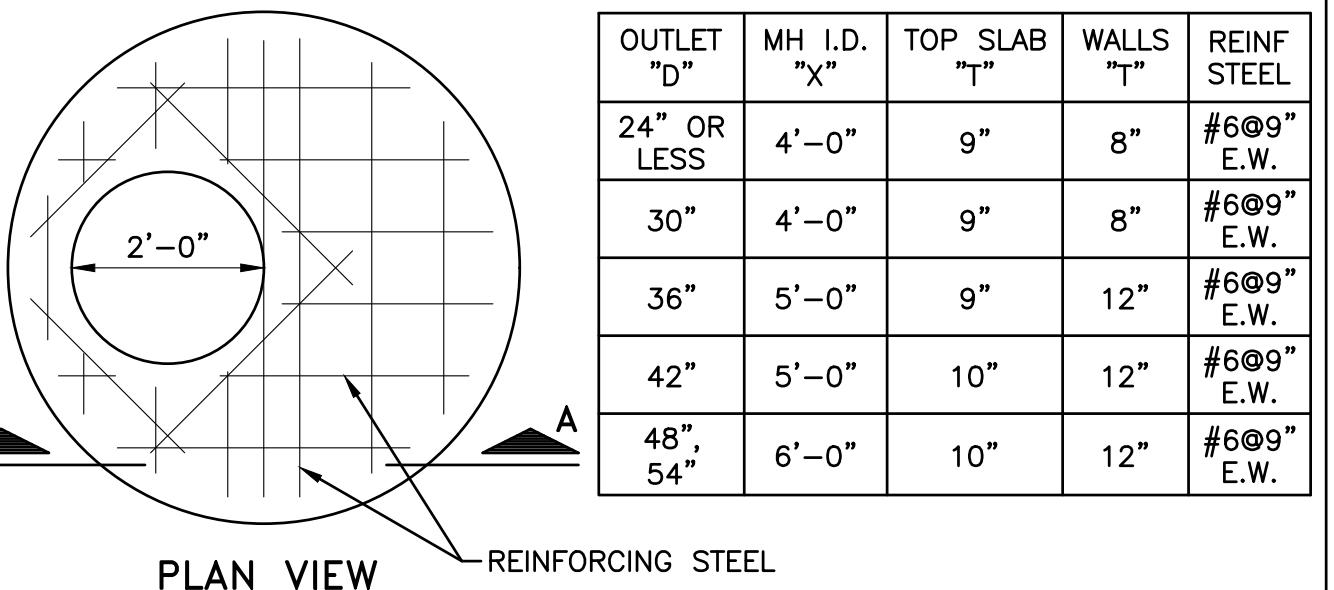


## STANDARD STORM MANHOLE DETAIL

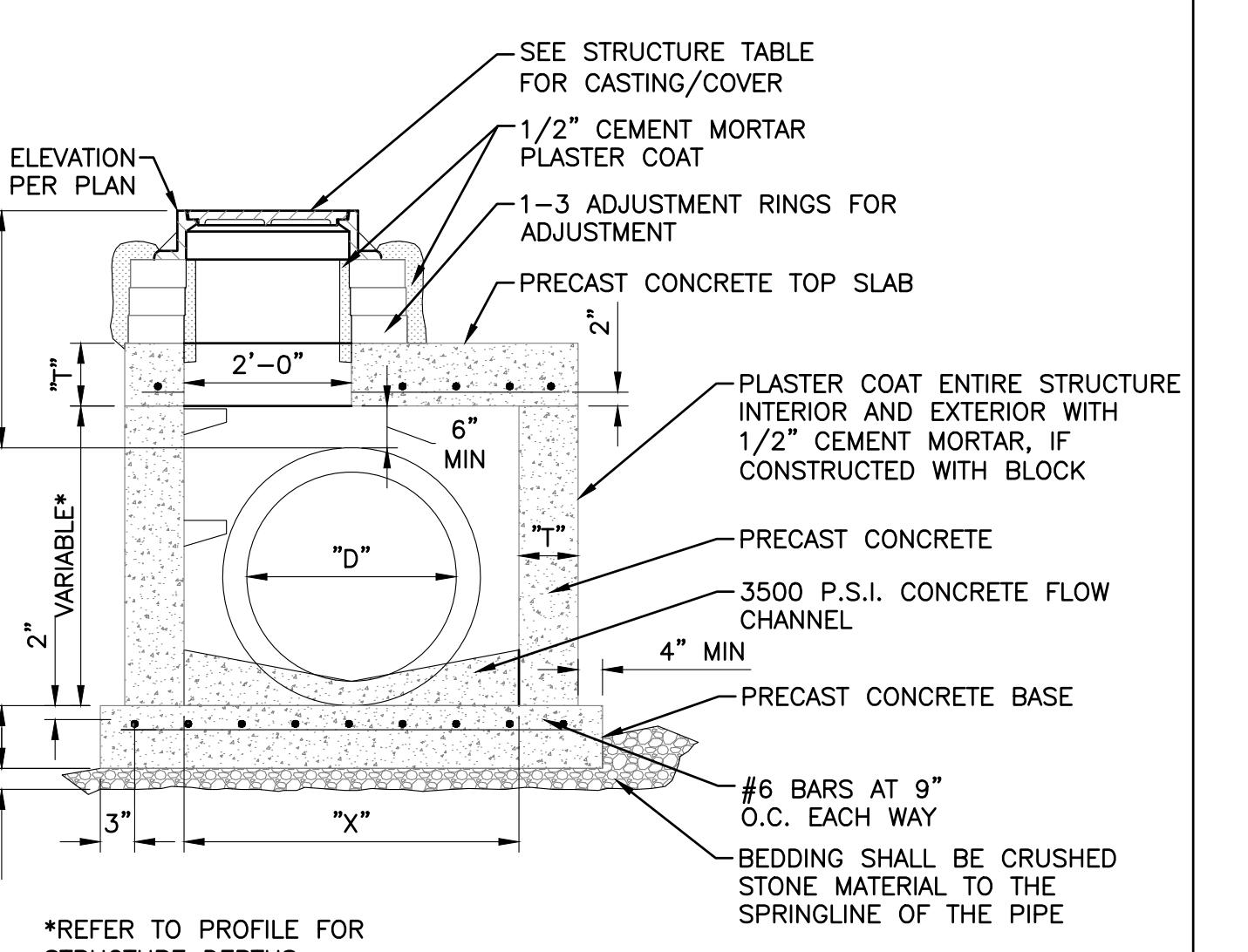
DOG HOUSE CUT OUT SIZES	
SEWER SIZE "D"	MAX CUT OUT SIZE
8" THRU 10"	17-1/2"
12" THRU 15"	20"



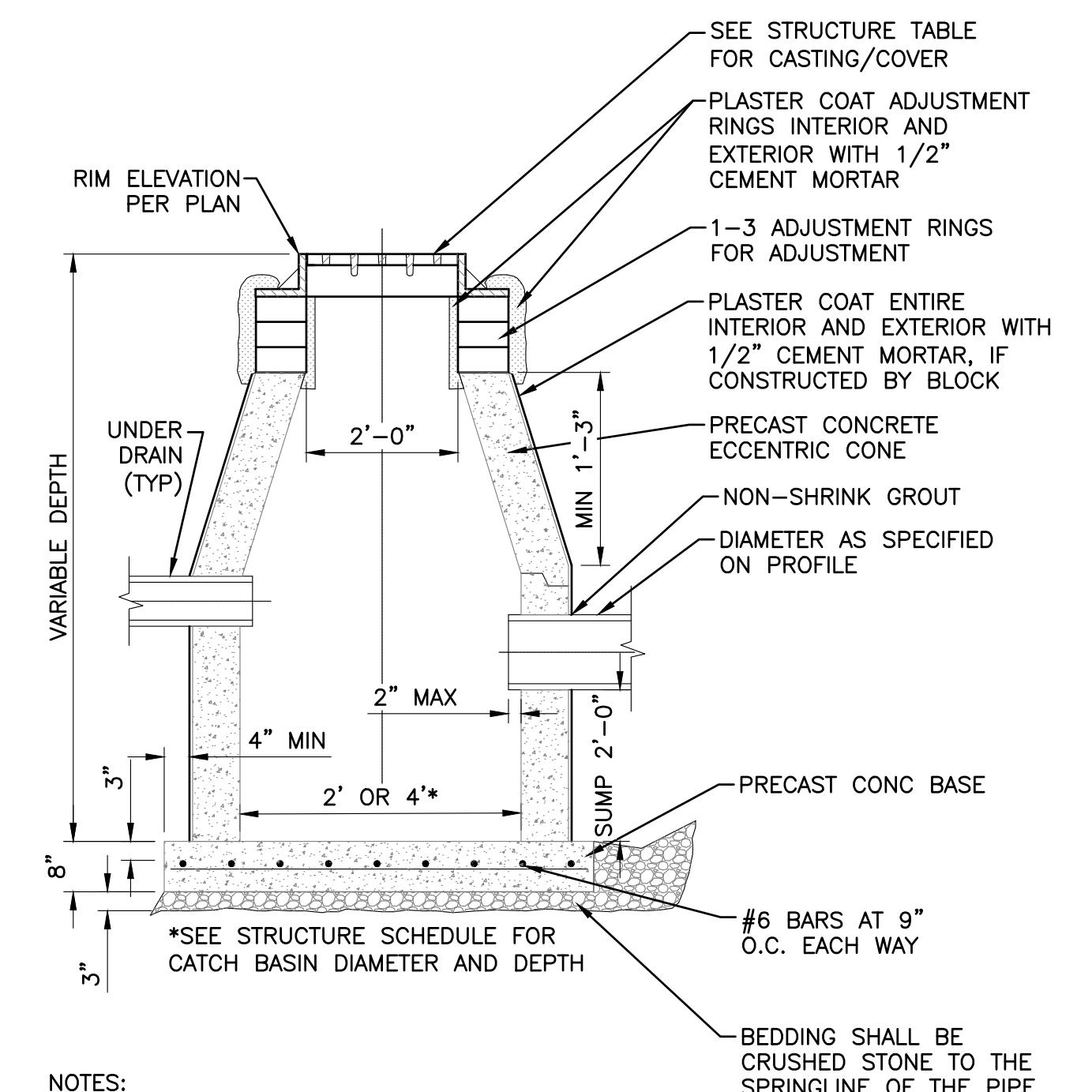
STANDARD STORM MANHOLE OVER  
EXISTING SEWERS 8" THROUGH 15" DETAIL



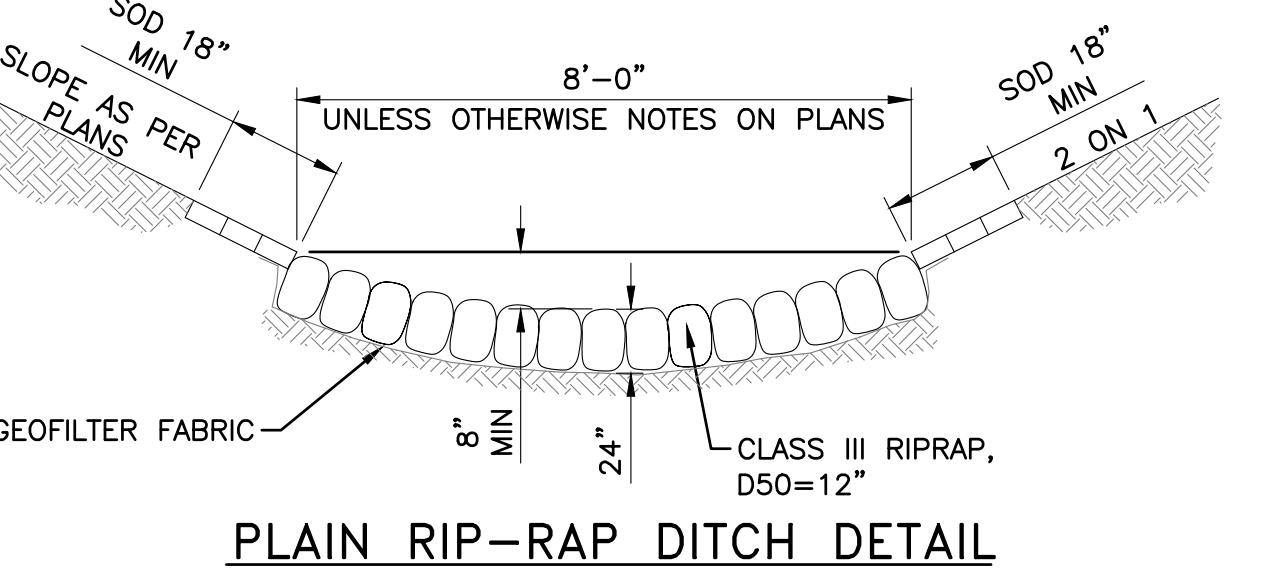
LTLET "D"	MH I.D. "X"	TOP SLAB "T"	WALLS "T"	REINF STEEL
" OR ESS	4'-0"	9"	8"	#6@9" E.W.
30"	4'-0"	9"	8"	#6@9" E.W.
36"	5'-0"	9"	12"	#6@9" E.W.
42"	5'-0"	10"	12"	#6@9" E.W.
8", 54"	6'-0"	10"	12"	#6@9" E.W.



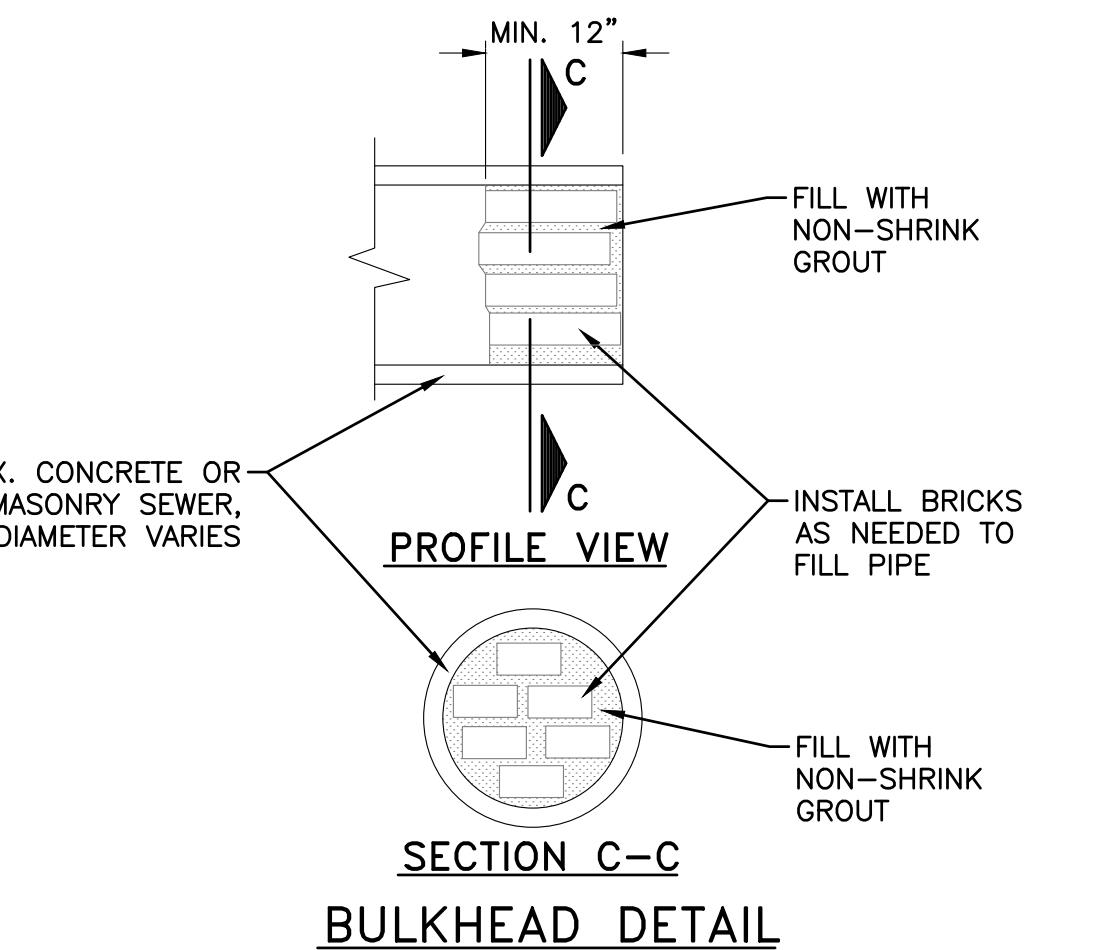
## ALLOW MANHOLE/CATCH BASIN "D" DETAIL



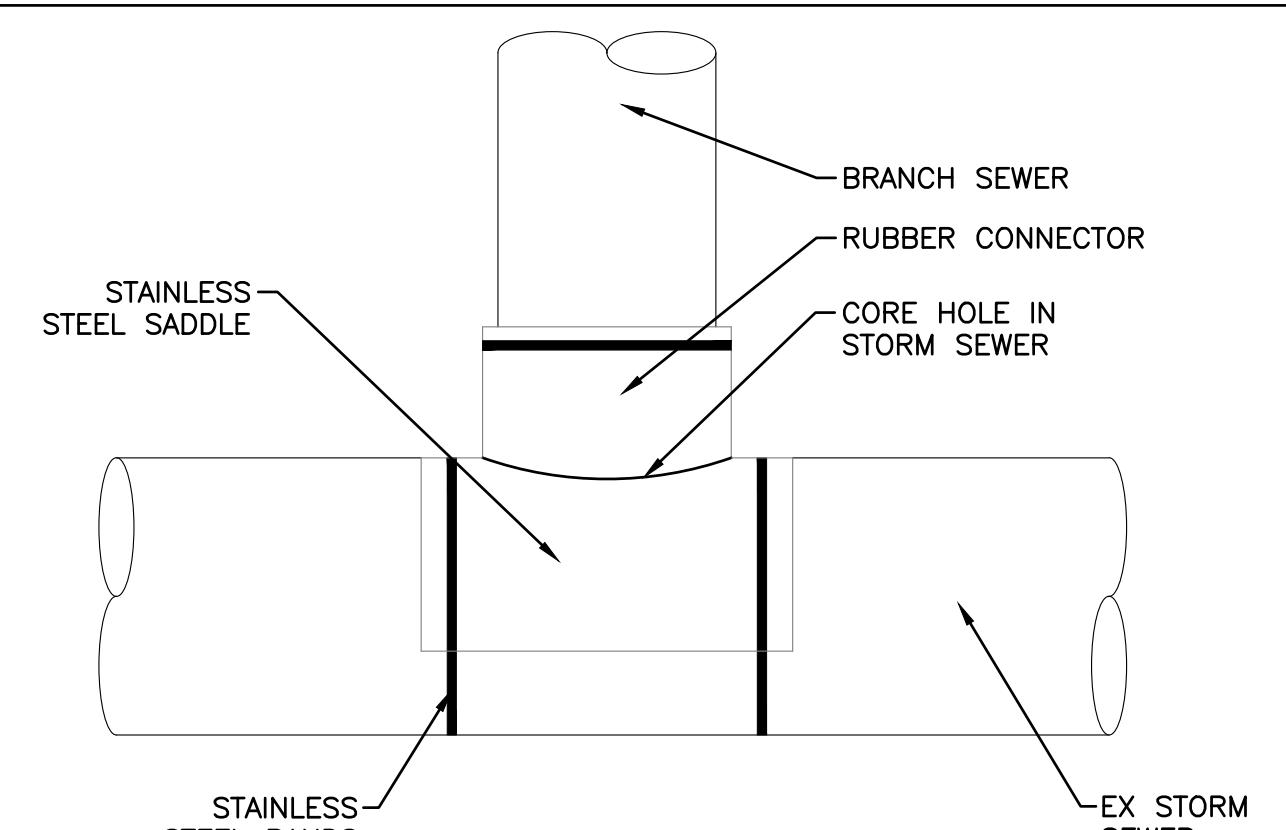
# 2' AND 4' DIAMETER STANDARD CATCH BASIN DETAIL



## PLAIN RIP-RAP DITCH DETAIL

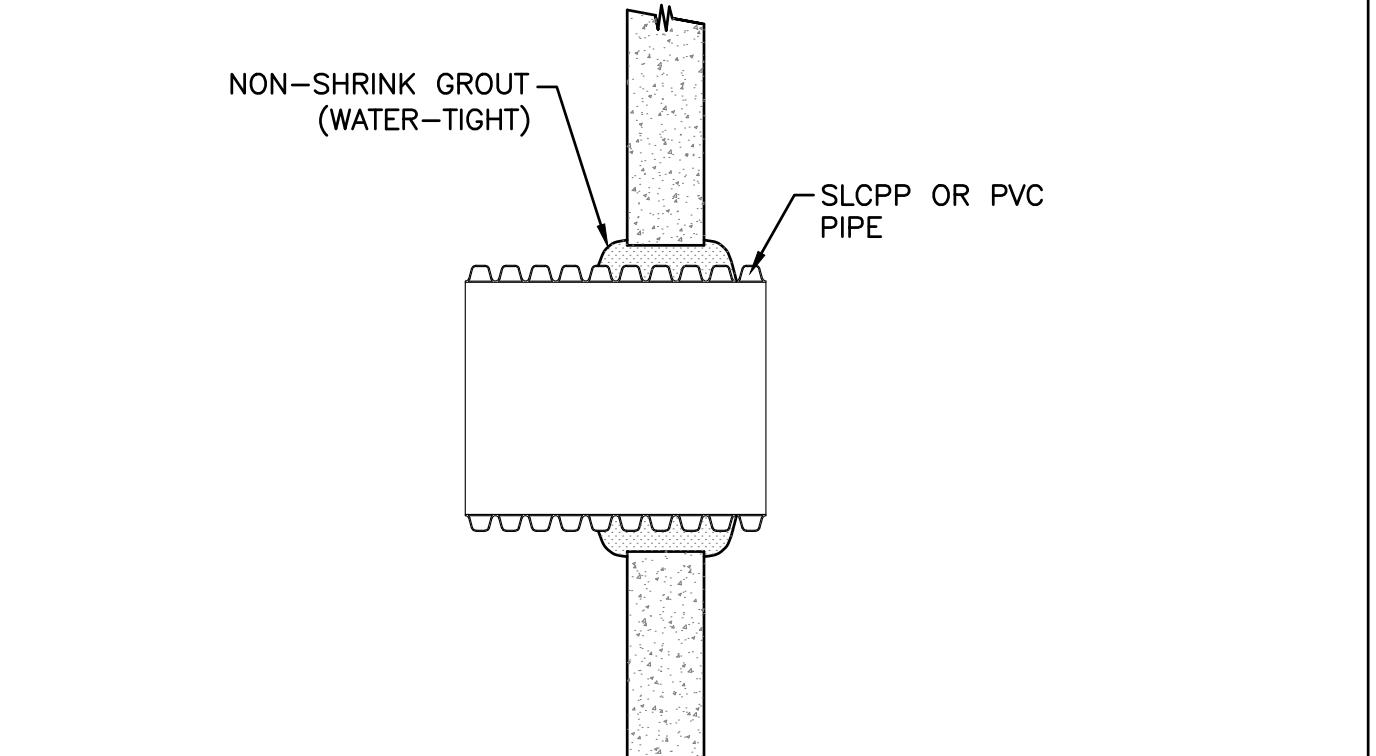


## LKHEAD DETAIL



# SADDLE CONNECTION DETAIL

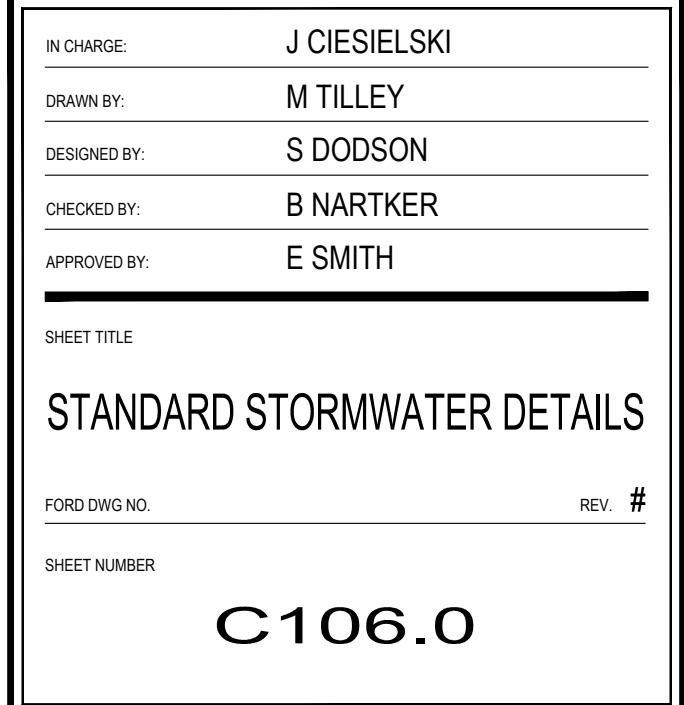
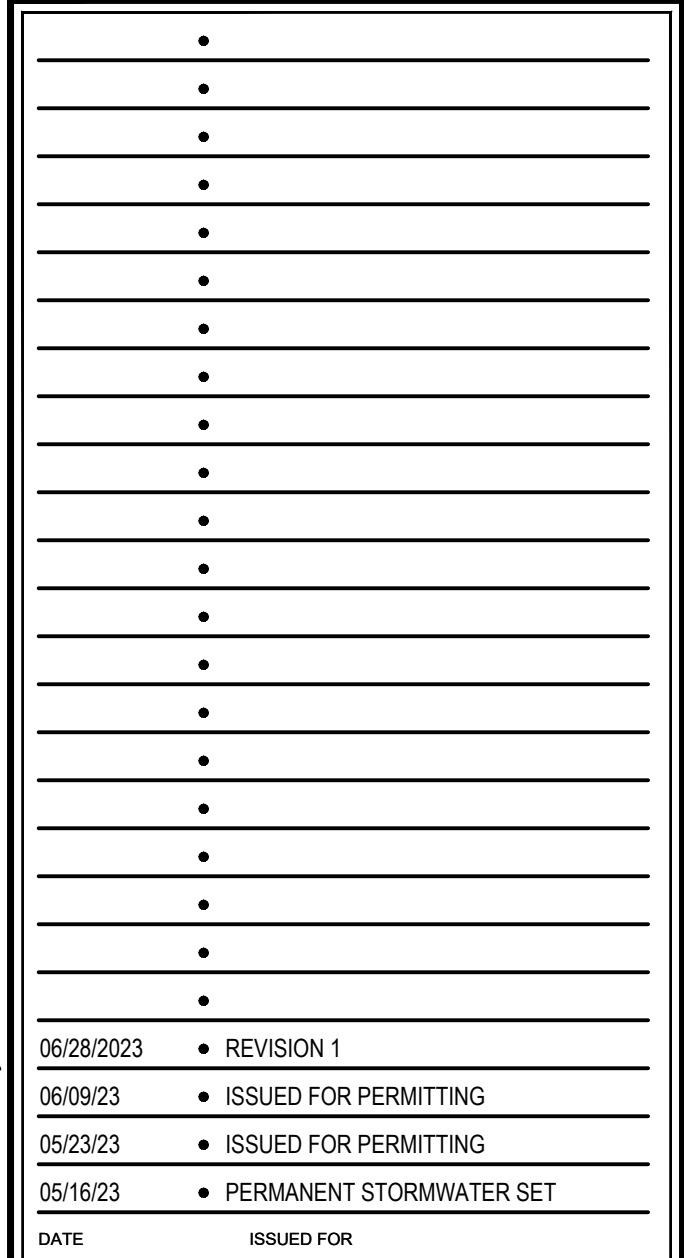
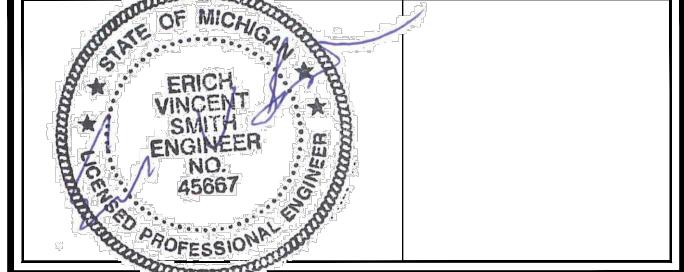
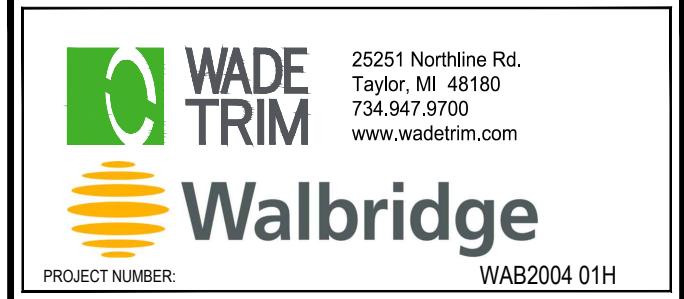
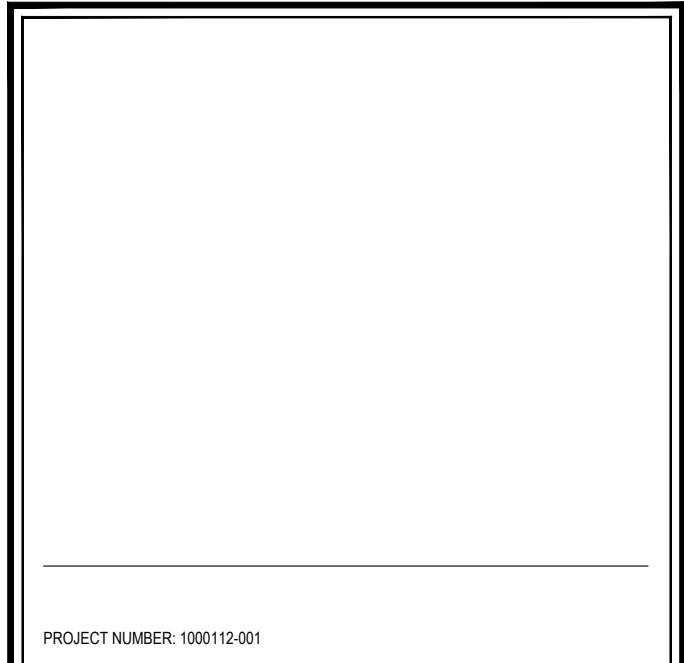
NTS

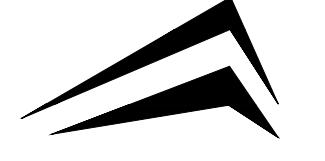


# WATER-TIGHT GROUTED MANHOLE CONNECTION DETAIL



**Know what's below.  
Call before you dig.**





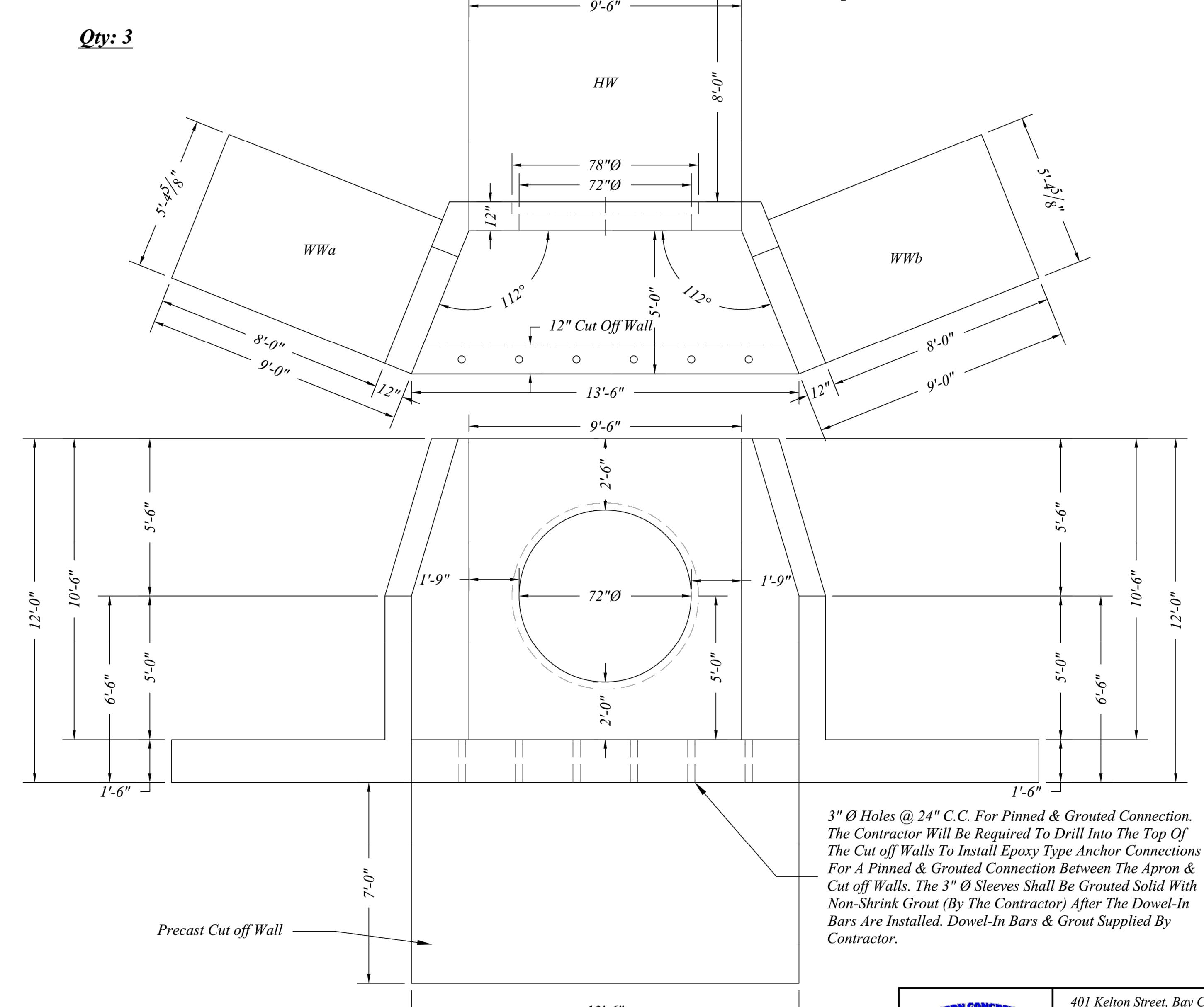
# FORDLAND

00 ROTUNDA DR, 1ST FLOOR SOUTH  
EARBORN, MICHIGAN 48120-1168  
USA



## *Maeda Marshall Mega Site Permanent Stormwater - 72" Ø CMP Headwall*

Qty: 3



*3" Ø Holes @ 24" C.C. For Pinned & Grouted Connection.  
The Contractor Will Be Required To Drill Into The Top Of  
The Cut off Walls To Install Epoxy Type Anchor Connections  
For A Pinned & Grouted Connection Between The Apron &  
Cut off Walls. The 3" Ø Sleeves Shall Be Grouted Solid With  
Non-Shrink Grout (By The Contractor) After The Dowel-In  
Bars Are Installed. Dowel-In Bars & Grout Supplied By  
Contractor.*



1100

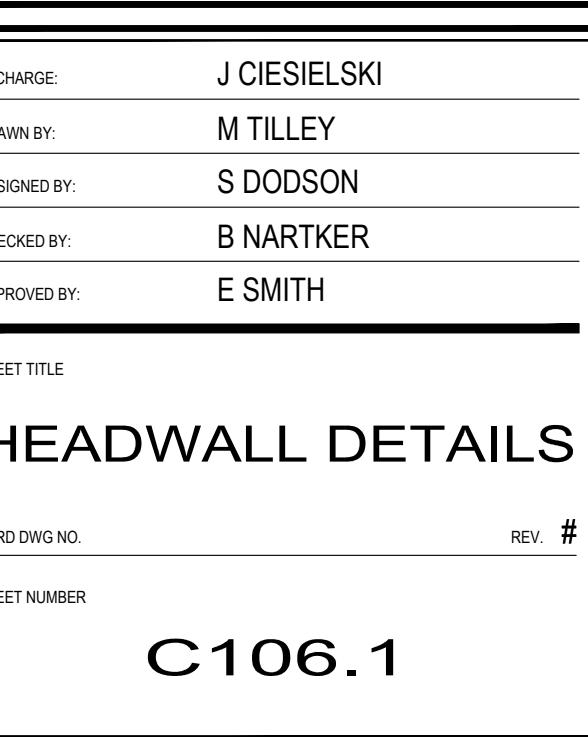
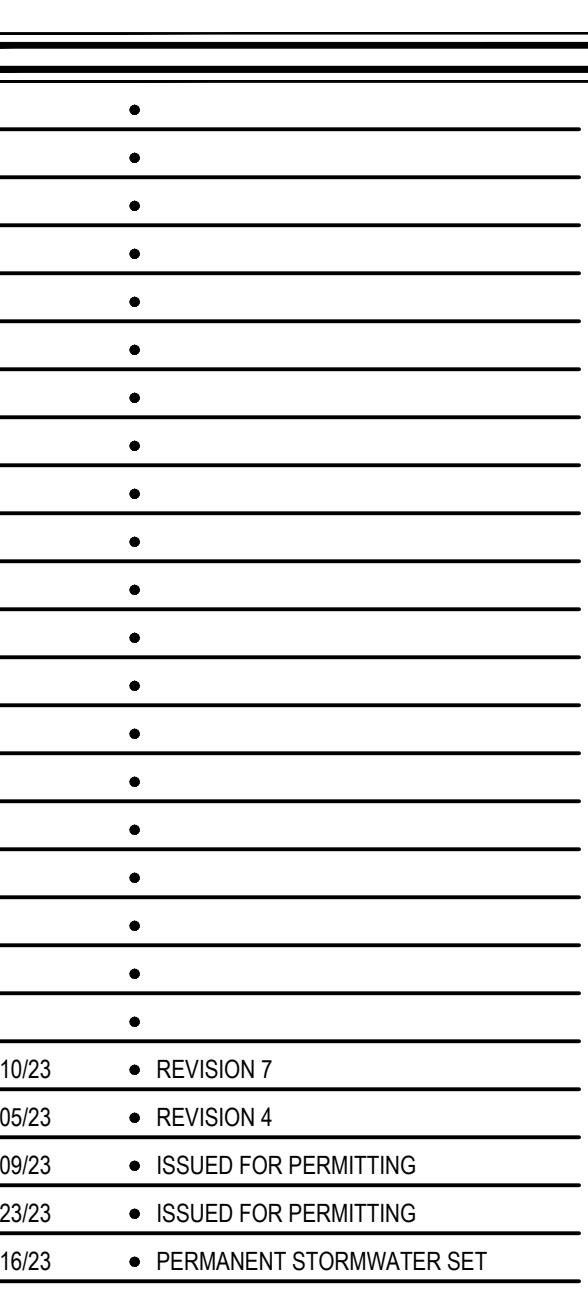
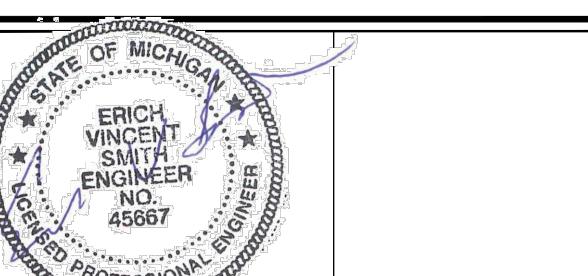
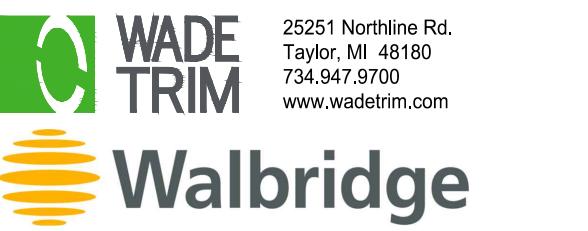
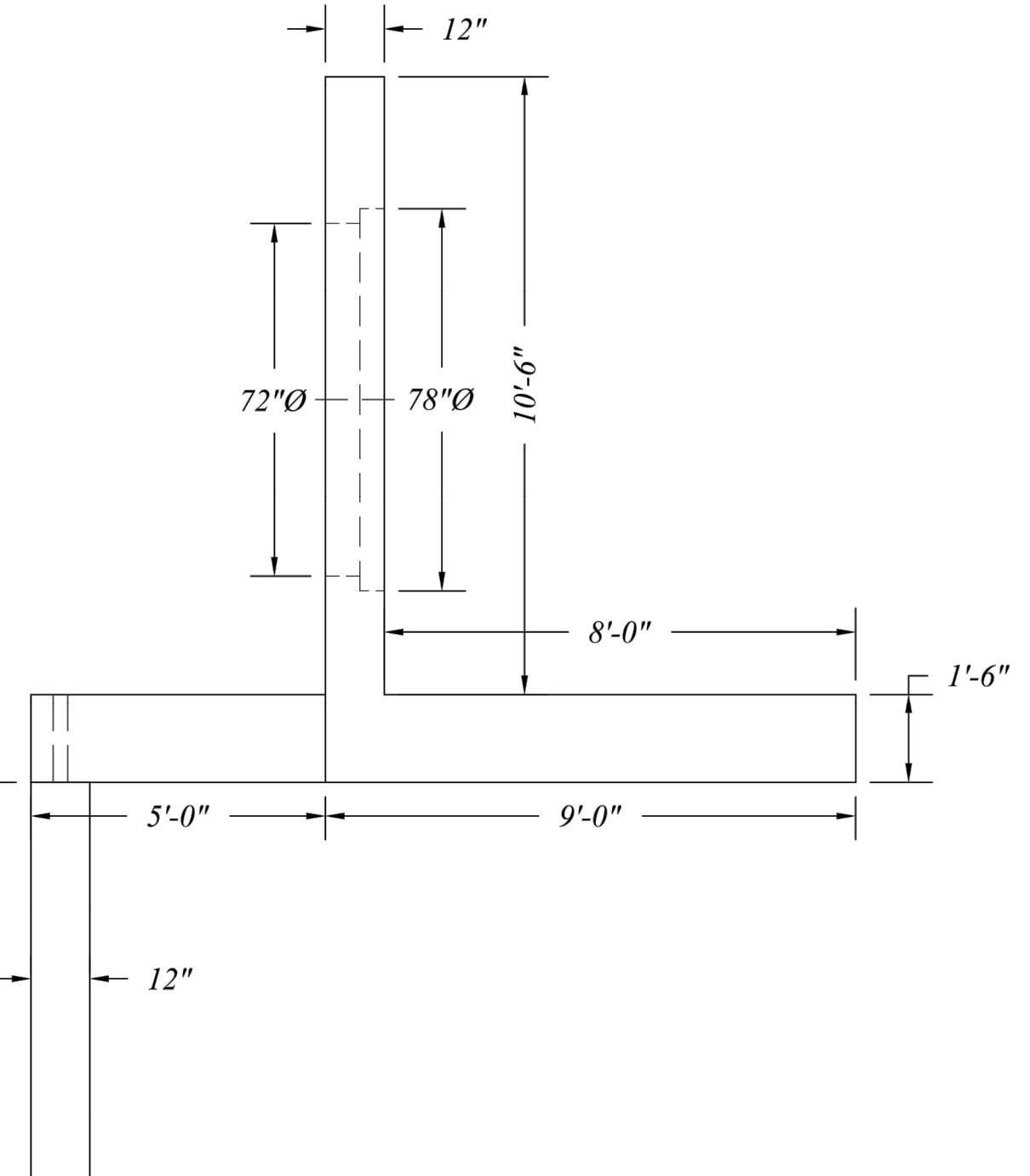
 <b>NORTHERN CONCRETE PIPE</b> <a href="http://www.ncp-inc.com/">www.ncp-inc.com/</a>	<i>401 Kelton Street, Bay City, MI 48706</i>	<i>Proposed - 72" CMP Headwall</i>					
	<i>5281 Lansing Road Charlotte, MI 48813</i>	<i>2701 Chicago Dr. SW Wyoming, MI 49519</i>	<i>Iafrate Construction Warren, MI</i>			<i>Maeda Marshall Megasite Marshall, MI</i>	
	<i>4950 White Lake Rd. Clarkston, MI 48346</i>	<i>3756 Centennial Rd. Sylvania, OH 43560</i>	<i>Date 2<sup>nd</sup> Oct., 2023</i>	<i>Revised 6<sup>th</sup> Nov., 2023</i>	<i>Rev. No. 4</i>	<i>Drawn By MRZ</i>	<i>Scale <math>\frac{1}{4}</math>" = 1'</i>

*Wingwall Reinforcing Design Completed By Delta Engineers,  
Binghamton, NY. Wingwalls Are Designed To Be  
Free-Standing w/No Ties To Each Piece.*

*The Engineer For This Project To Verify The Following Assumptions Are Adequate For This Specific Site.*

### *Design Assumptions:*

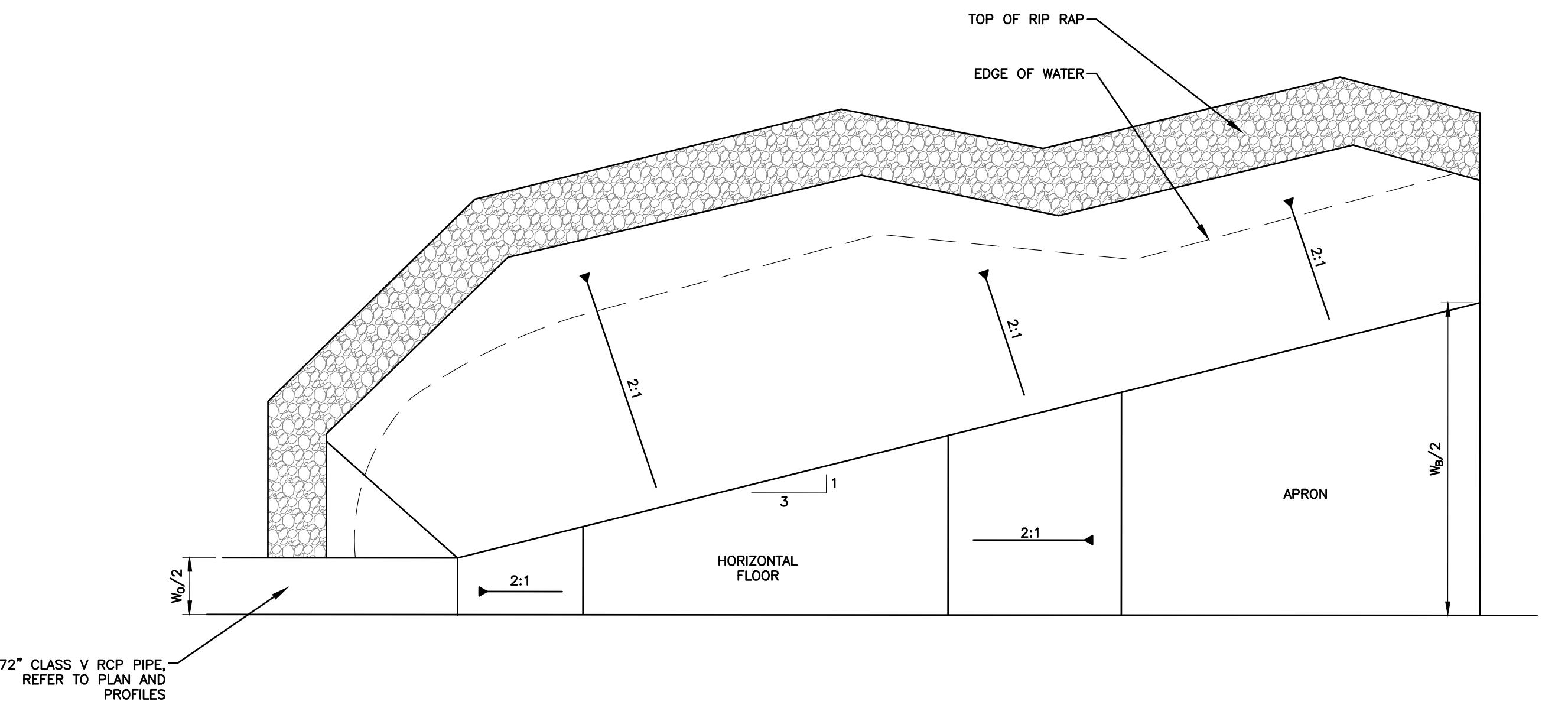
1. *Design per AASHTO LRFD Specifications 9th Ed.*
2. *Soil Friction Angle:*  
 $30^\circ$  (Retained),  $32^\circ$  (Foundation)  
*Unit Weight = 120pcf*  
*3:1 Backslope, No Surcharge*
3. *Service Soil Bearing Pressure = 2,453 psf*  
*Strength Soil Bearing Pressure = 3,573 psf*
4. *Bar Cover =  $1\frac{1}{2}$ " U.N.O.*
5. *f'c @ 28 Days = 5,000psi (min) With  $6\frac{3}{4}\%$   $\pm 1\frac{1}{4}\%$  Entrained Air.*
6. *Reinforcement = ASTM A-615 Grade 60 Bar.*



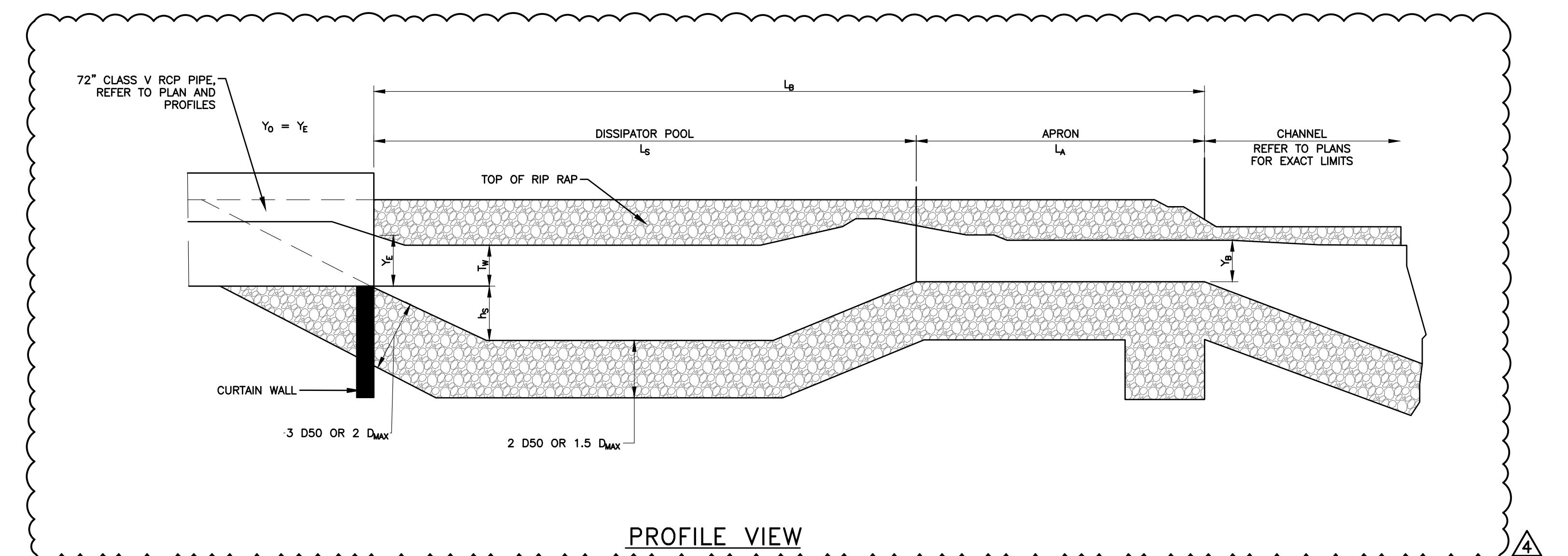
**Know what's below.  
Call before you dig.**



17000 ROTUNDA DR, 1ST FLOOR SOUTH  
DEARBORN, MICHIGAN 48120-1168  
USA



HALF PLAN VIEW



PROFILE VIEW

PLUNGE POOL DIMENSIONS								
LOCATION	D	h_s	D50	W_0	L_s	L_A	L_B	W_B
CULVERT 1	6	4	18	6	35	18	53	41
CULVERT 2	6	3	18	6	25	13	38	31

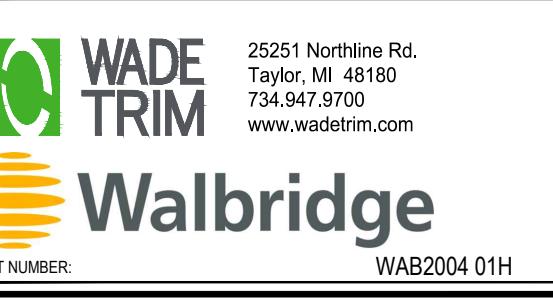
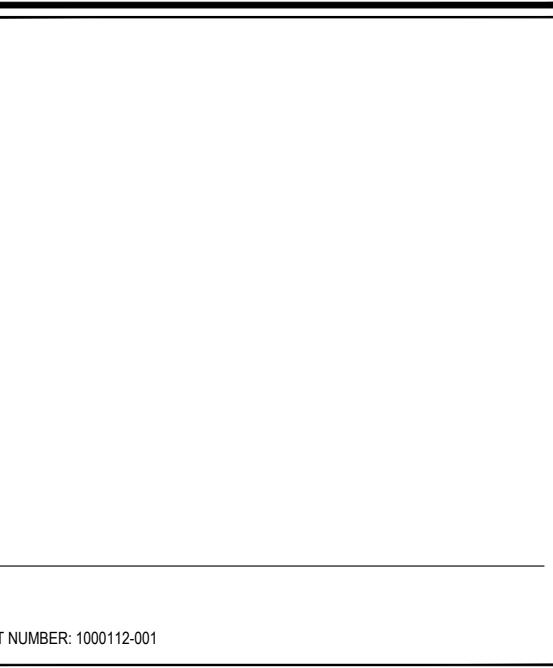
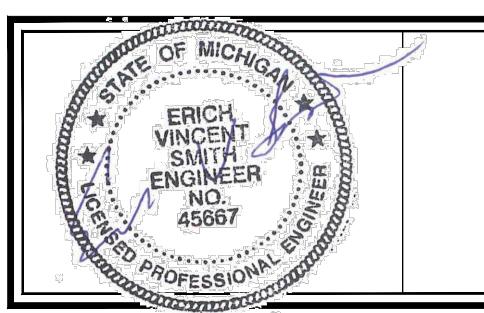
RIP RAP PLUNGE POOL

NOT TO SCALE

IN CHARGE:	J CIESIELSKI
DRAWN BY:	M TILLEY
DESIGNED BY:	S DODSON
CHECKED BY:	B NARTKER
APPROVED BY:	E SMITH
SHEET TITLE:	
PLUNGE POOL DETAILS	
FORD DWG NO.:	REV. #:
SHEET NUMBER:	
C106.2	

PRINT DATE: 11/14/2023 8:59 AM  
SAVE DATE: 11/13/2023 3:03:39 PM  
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PROJECT NUMBER: WAB2004 01H

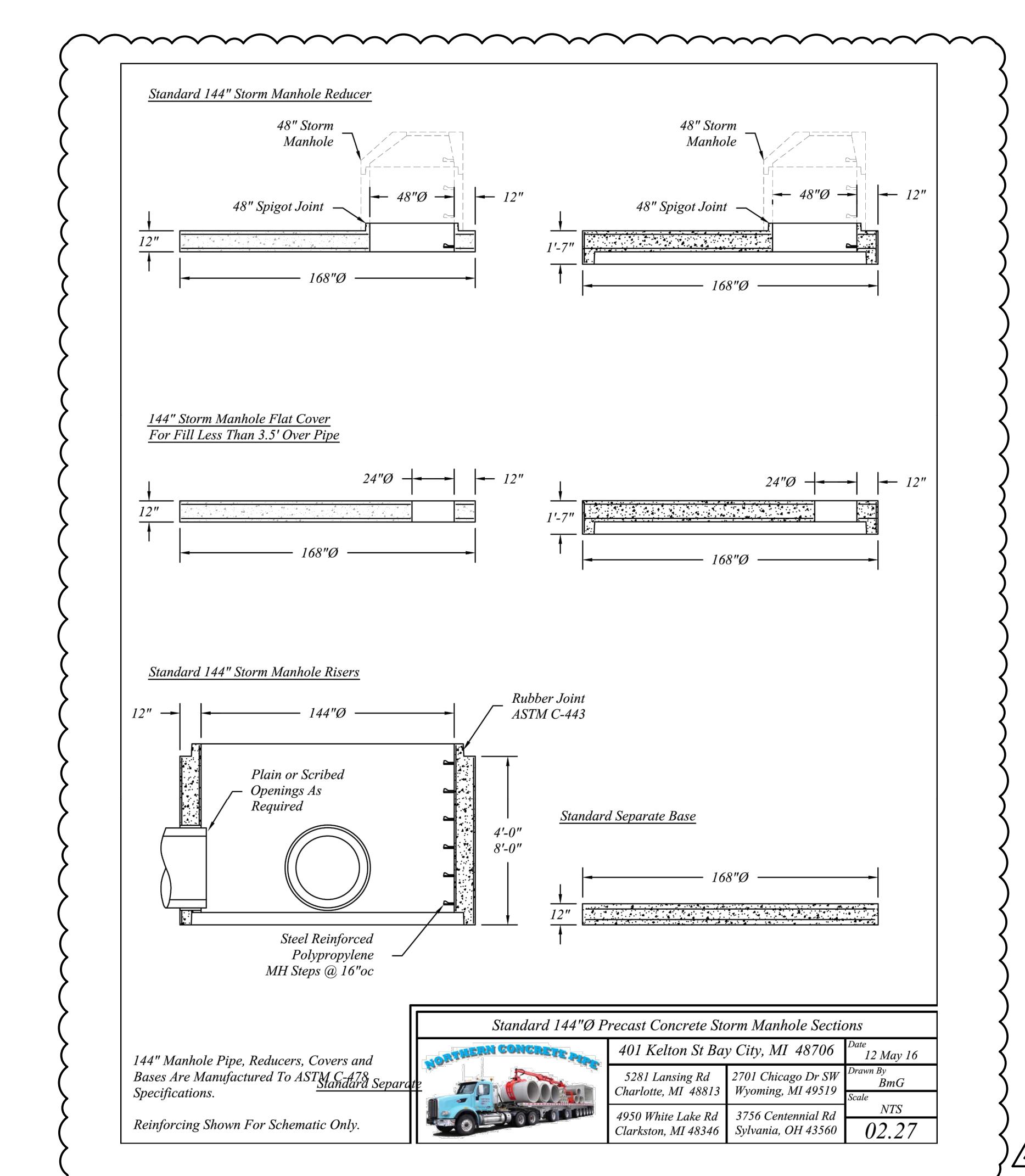


10/05/23	• REVISION 4
06/28/23	• REVISION 1
06/09/23	• ISSUED FOR PERMITTING
05/23/23	• ISSUED FOR PERMITTING
05/16/23	• PERMANENT STORMWATER SET
DATE	ISSUED FOR

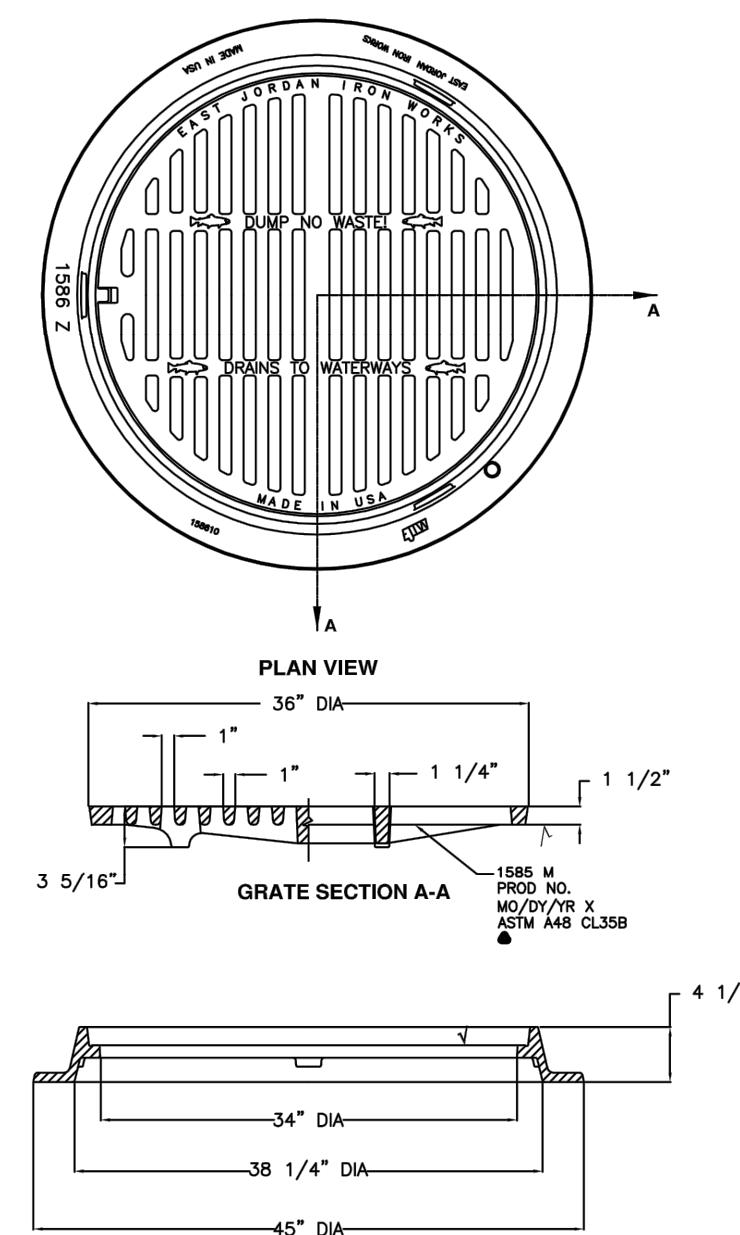


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Border version 2014.0



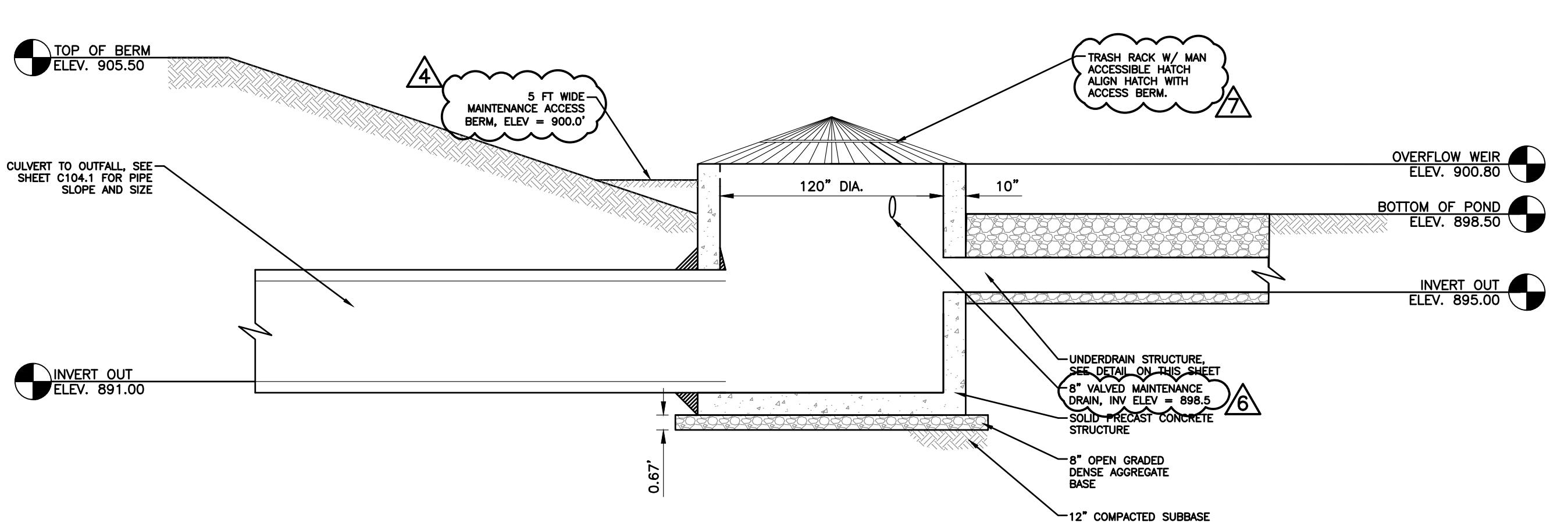
1586Z 1585M Set



## FRAME AND GRATE DETAIL

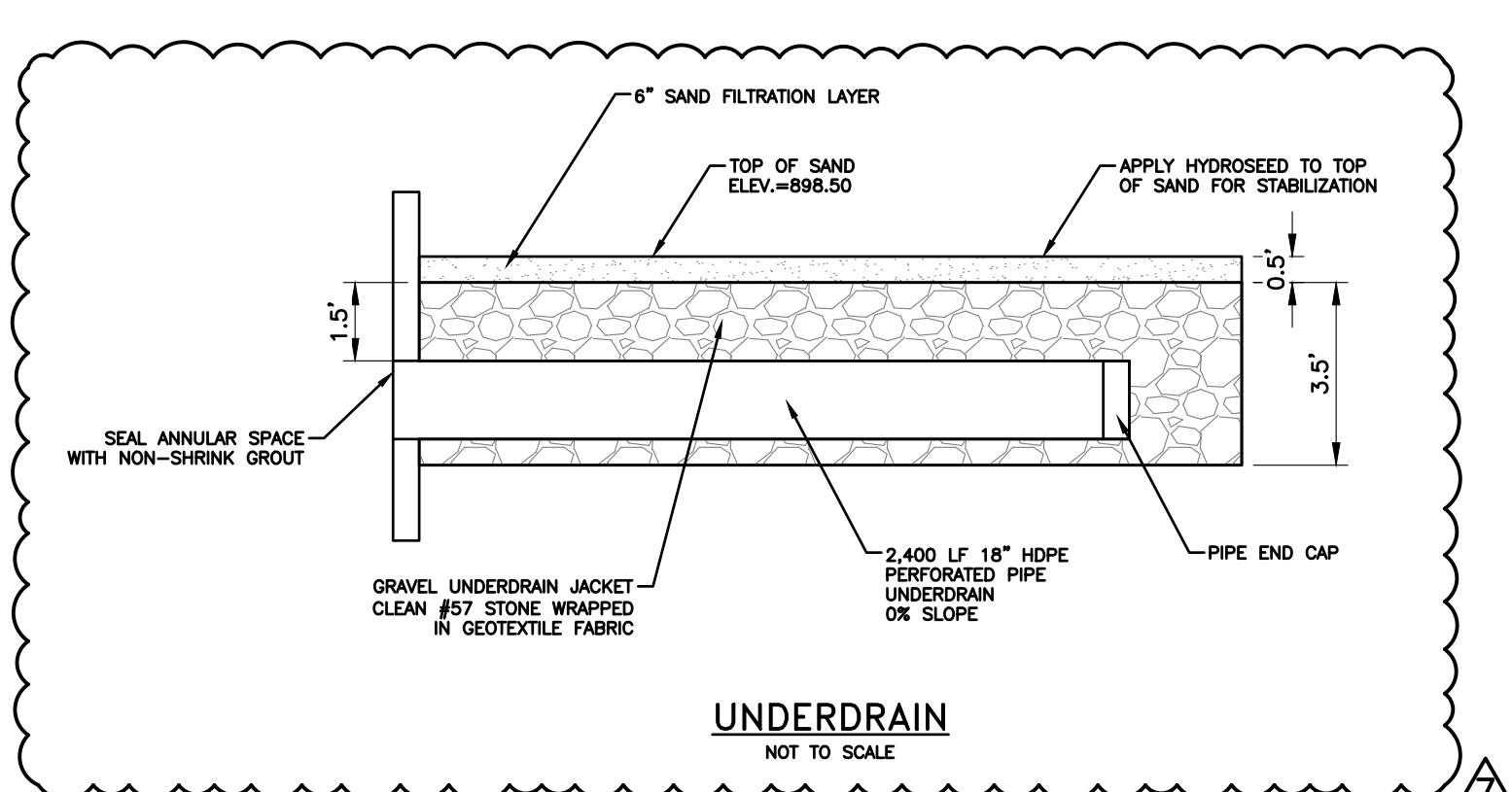


**Know what's below.  
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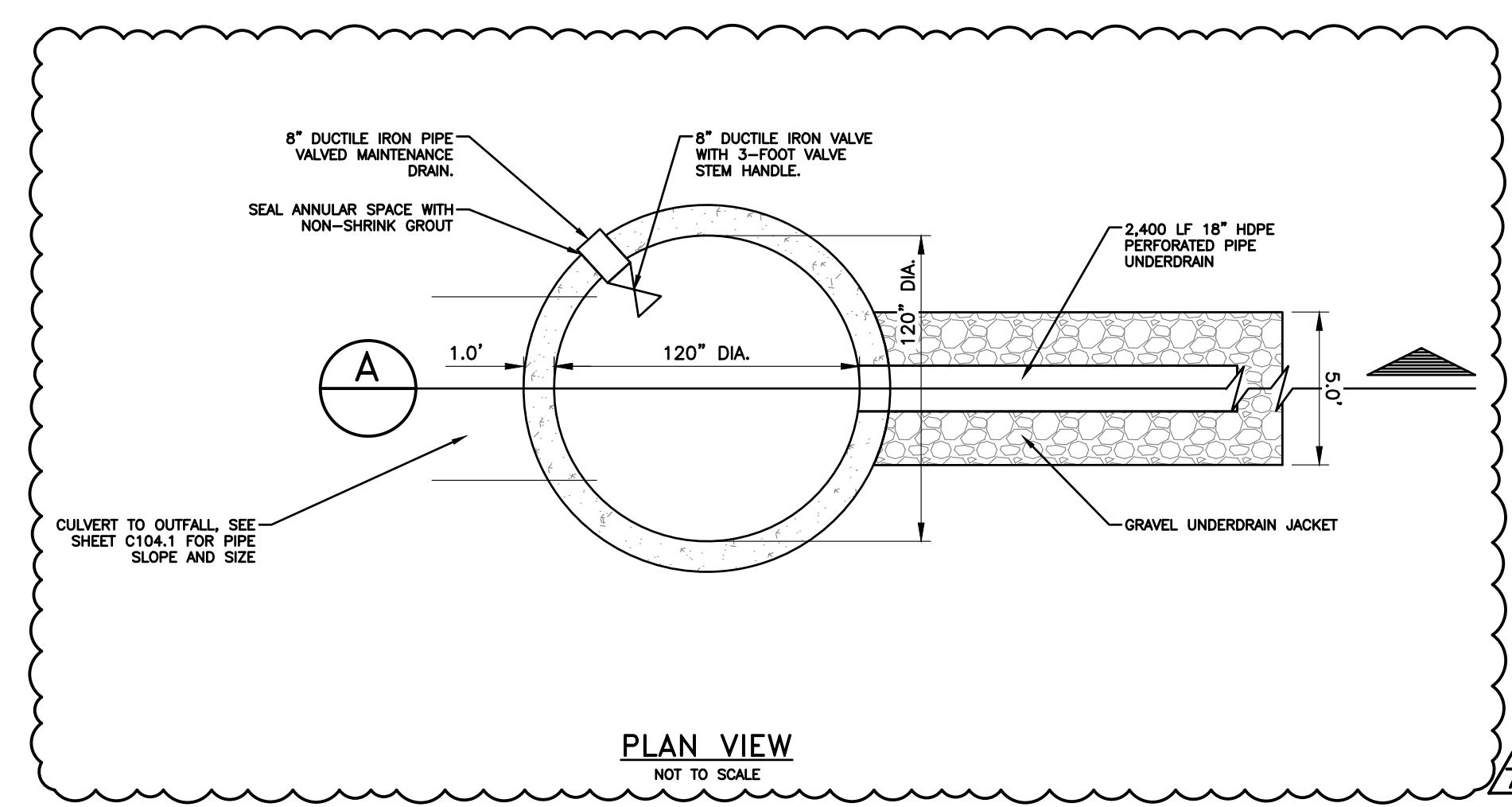


## SECTION A

# OUTLET CONTROL STRUCTURE w/ OVERFLOW



## PLAN VIEW



3'

350.0'

8.0'

TOP OF BERM  
ELEV. 905.50

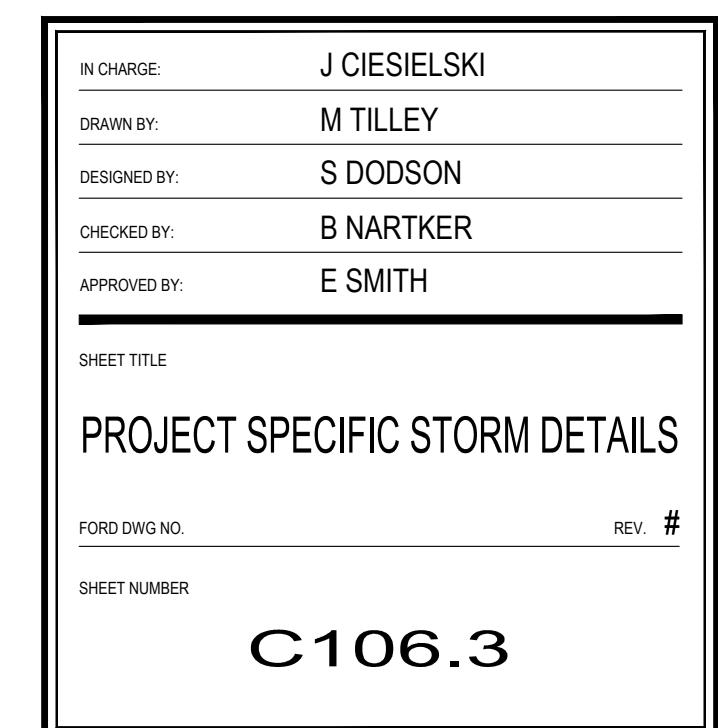
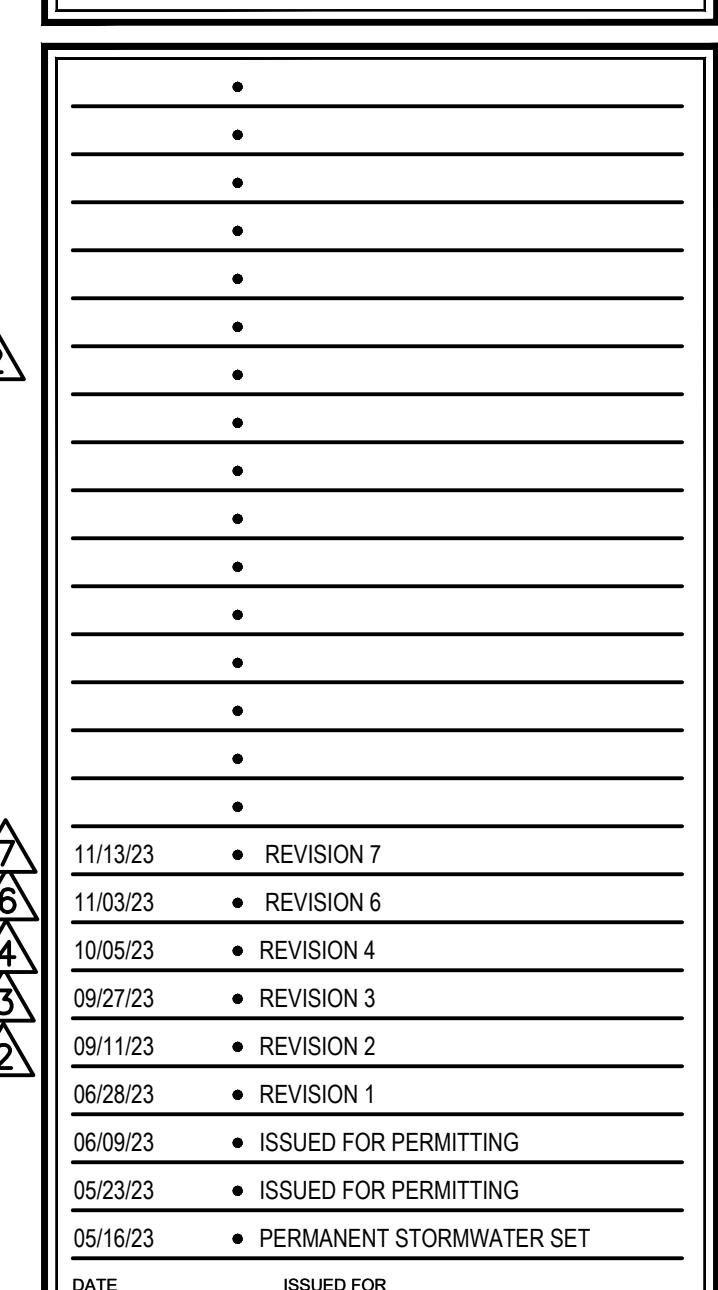
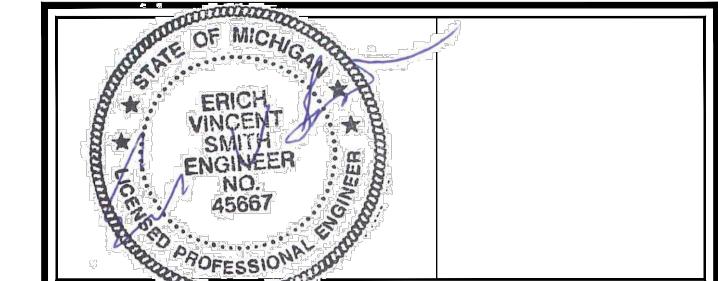
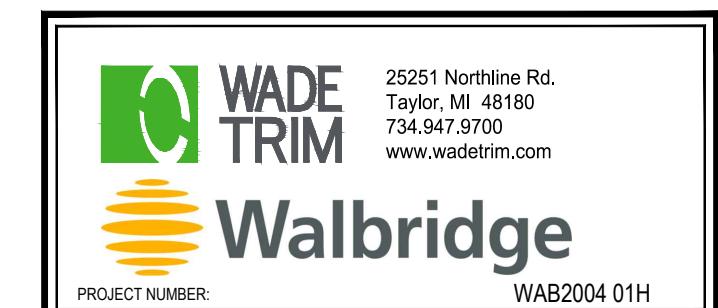
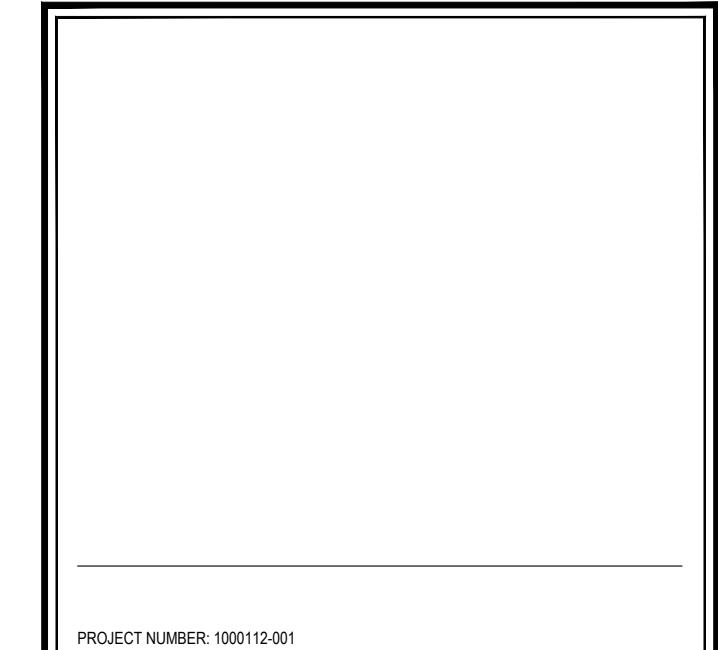
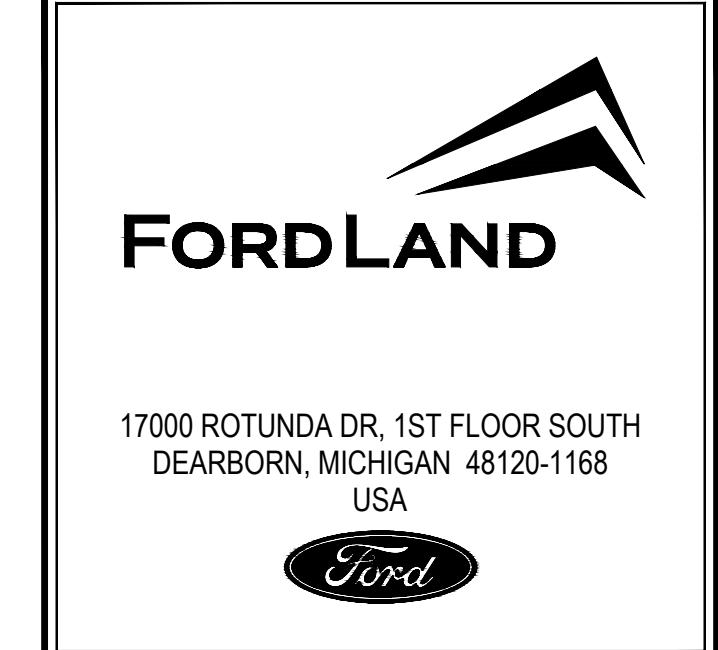
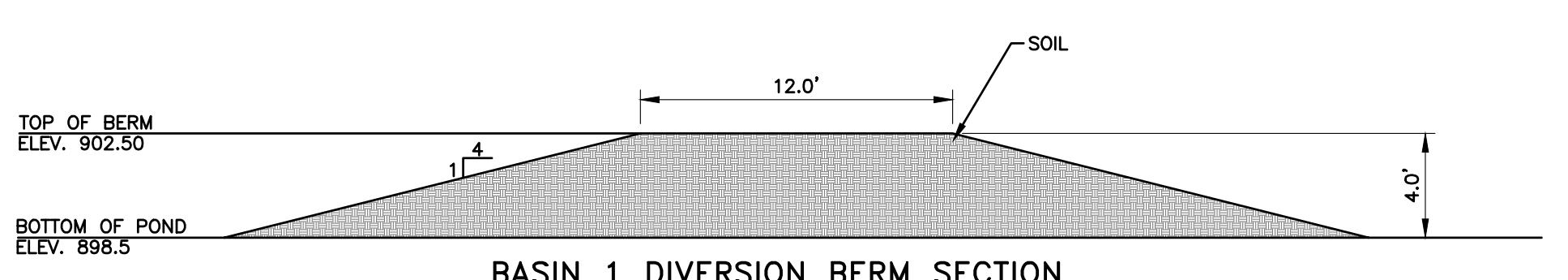
EMERGENCY SPILLWAY  
ELEV. 903.50

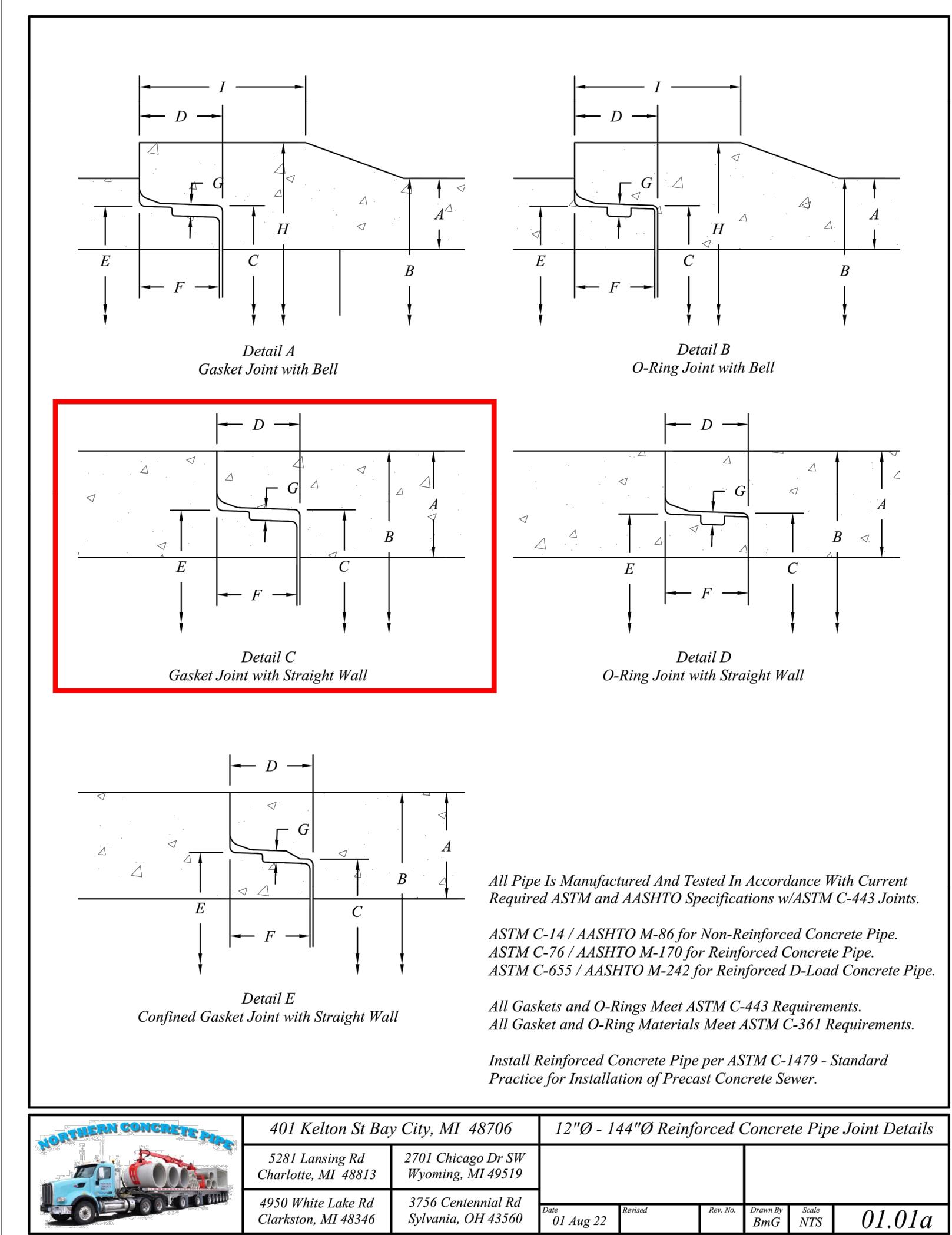
2'

PROVIDE MINIMUM 2-Ft KEY TEXTILE INTO TOP OF BERM, BEYOND EDGE OF SPILLWAY (TYP. BOTH SIDES)

EMERGENCY SPILLWAY DETAIL

CLASS 1 RIP-RAP  
D50 = 10'  
Th. = 18"  
W/ 6 OZ. NON-WOVEN





401 Kelton St Bay City, MI 48706	12"Ø - 144"Ø Reinforced Concrete Pipe Joint Details
5281 Lansing Rd Charlotte, MI 48813	2701 Chicago Dr SW Wyoming, MI 49519
4950 White Lake Rd Clarkston, MI 48346	3756 Centennial Rd Sylvania, OH 43560

#### GENERAL NOTES:

- 1) CULVERT 1 WILL UTILIZE REINFORCED CONCRETE PIPE FROM STA 8+49.48 TO 6+48.74. SEE SHEETS C104.1 AND C104.2 FOR PLAN AND PROFILE VIEWS.
- 2) CULVERT 2 WILL ONLY UTILIZE CORRUGATED STEEL PIPE.

Pipe I.D. (in) (mm)	Joint Detail	Graded Type	Wall Class	A Pipe (in)	B Bell I.D.	C Bell Depth	D Spiral Length	E Annular Space	F Bell O.D.	G Joint Type	H Bell Length	I Lbs/ Section	Joint Style
54 1350 C 288-4G	B	5.50	65.00	58.727	4.25	58.844	4.125	0.500	.....	2°	8.2"	8781	H
54 1350 D O-Ring	R	5.50	65.00	58.727	4.25	58.844	4.125	0.470	.....	2°	8.2"	8781	O
54 1350 C 288-4G	C	6.25	66.50	58.727	4.25	58.844	4.125	0.500	.....	2°	8.2"	10105	H
24 1320 D O-Ring	C	6.25	66.20	58.727	4.25	58.844	4.125	0.470	.....	2°	8.2"	10102	Q
54 1350 B O-Ring	C	6.25	66.50	58.727	4.25	58.844	4.125	0.500	67.50	7.594	1.83"	9858	G
60 1500 C 288-4G	B	6.00	72.00	64.875	4.75	64.914	4.625	0.500	.....	2°	8.2"	10626	H
60 1500 D O-Ring	C	6.75	73.50	64.875	4.75	64.914	4.625	0.500	.....	2°	8.2"	12094	Q
60 1500 D O-Ring	C	6.75	73.50	67.314	5.00	67.460	3.394	0.500	.....	1.83"	8.0"	11796	G
66 1650 D O-Ring	C	7.25	80.50	71.375	5.0	71.482	5.0	0.558	.....	2°	8.2"	14250	Q
66 1650 D O-Ring	C	7.25	80.50	71.688	5.0	71.850	5.0	0.492	.....	2°	8.0"	13903	G
72 1800 D O-Ring	C	7.75	87.50	77.983	5.0	78.058	5.0	0.558	.....	2°	8.2"	16385	O
72 1800 C 288-4G	C	7.75	87.50	77.875	5.0	77.932	4.875	0.500	.....	2°	8.2"	16385	H
72 1800 D O-Ring	C	7.75	87.50	77.928	5.394	78.084	5.394	0.500	.....	1.83"	8.0"	16181	G
78 1950 D O-Ring	C	8.25	94.50	84.470	5.0	84.577	5.0	0.602	.....	2°	8.0"	18629	Q
78 1950 D O-Ring	C	8.25	94.50	84.470	5.0	84.652	5.0	0.492	.....	2°	8.0"	18629	G
84 2100 D O-Ring	C	8.75	101.50	90.875	5.0	90.982	5.0	0.558	.....	2°	8.2"	21778	Q
84 2100 D O-Ring	C	8.75	101.50	90.970	5.0	91.132	5.0	0.492	.....	2°	8.0"	21247	G
90 2250 D O-Ring	C	9.25	108.50	97.500	5.0	97.599	5.0	0.562	.....	2°	8.0"	24035	Q
90 2250 D O-Ring	C	9.25	108.50	97.470	5.0	97.652	5.0	0.492	.....	2°	8.0"	24035	G
96 2400 C O-Ring	B	9.00	114.00	103.875	5.0	104.070	4.875	0.558	.....	2°	8.0"	24740	Q
96 2400 C O-Ring	C	9.75	115.50	103.970	5.0	104.132	5.0	0.492	.....	2°	8.0"	26993	G
102 2550 D O-Ring	B	9.50	121.50	110.470	5.0	110.632	4.875	0.602	.....	2°	8.0"	27731	Q
108 2700 D O-Ring	B	10.00	128.00	116.875	5.0	116.975	4.875	0.622	.....	2°	8.0"	30892	Q
114 2850 D O-Ring	A	9.50	133.00	122.721	6.0	122.890	5.813	0.622	.....	2°	8.0"	30716	Q
120 3000 D O-Ring	A	10.00	140.00	128.721	6.0	128.890	5.813	0.622	.....	2°	8.0"	34034	V
120 3000 D O-Ring	A	10.00	140.00	129.234	6.0	129.398	6.0	0.494	.....	1.83"	8.0"	34034	G
120 3000 E 288-4G	C	11.75	TBD	TBD	6.0	TBD	6.0	0.500	.....	2°	8.0"	43374	G
126 3150 D O-Ring	A	10.50	147.00	135.734	6.0	135.898	6.0	0.494	.....	1.83"	8.0"	37522	Q
132 3300 E 288-4G	C	12.75	157.50	140.889	6.0	141.649	6.0	0.500	.....	2°	8.0"	48317	Q
132 3300 D O-Ring	A	11.00	154.00	141.471	6.0	141.641	5.813	0.622	.....	2°	8.0"	41181	Q
132 3300 D O-Ring	A	11.00	154.00	142.234	6.0	142.398	6.0	0.494	.....	1.83"	8.0"	41181	G
132 3300 D O-Ring	A	11.00	154.00	142.170	7.0	142.000	7.0	0.749	.....	1.83"	8.0"	41181	V
144 3600 D O-Ring	A	12.00	168.00	154.625	8.25	155.228	8.125	0.632	.....	2°	8.0"	49069	C
144 3600 D O-Ring	A	12.00	168.00	155.290	7.0	155.487	7.0	0.500	.....	2°	8.0"	49069	Q

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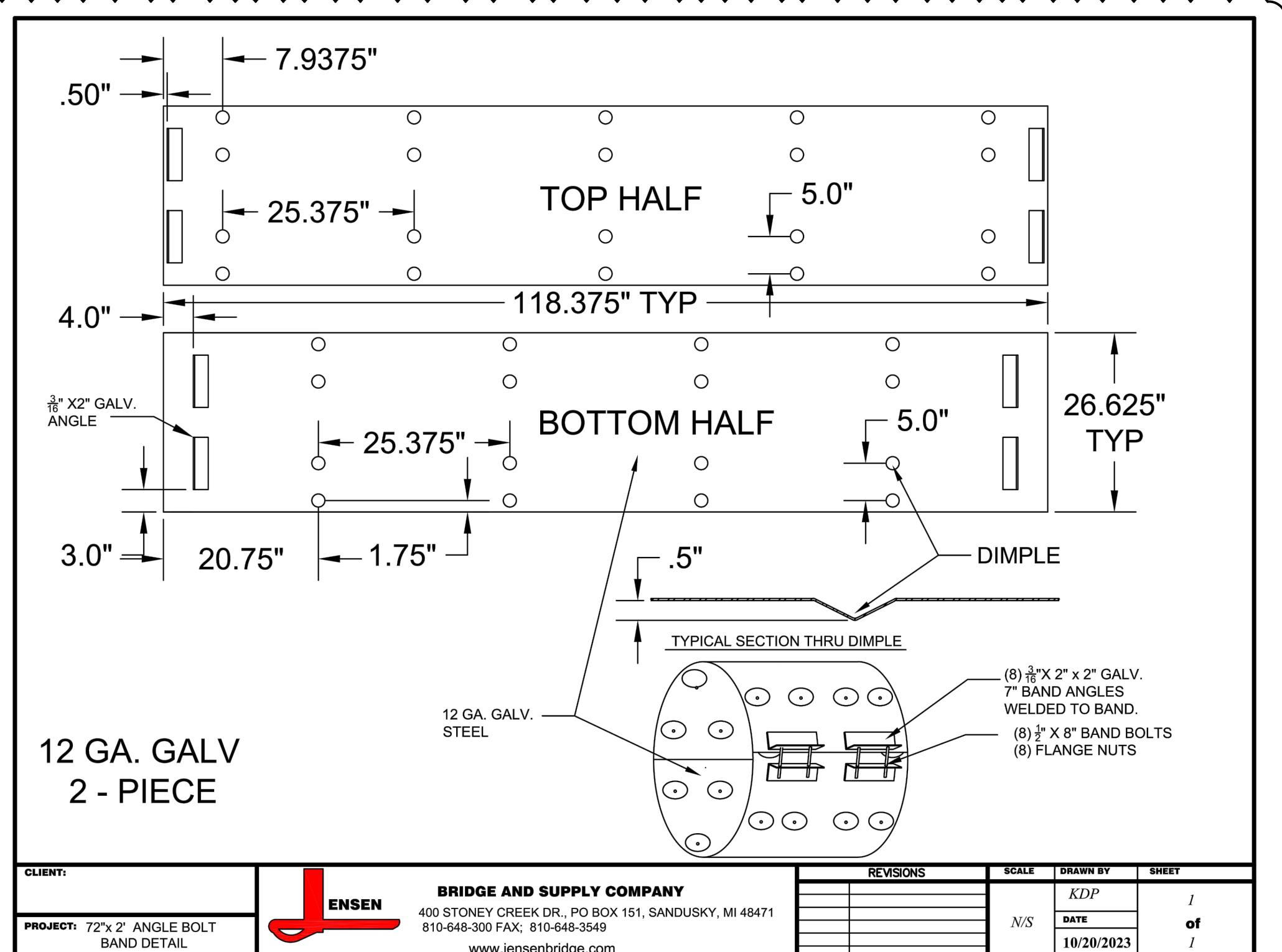
01 Aug 22      Revised      Rev. No.      Drawn By      Scale      NTS

01.01a

401 Kelton St Bay City, MI 48706	12"Ø - 144"Ø Reinforced Concrete Pipe Joint Details
5281 Lansing Rd Charlotte, MI 48813	2701 Chicago Dr SW Wyoming, MI 49519
4950 White Lake Rd Clarkston, MI 48346	3756 Centennial Rd Sylvania, OH 43560

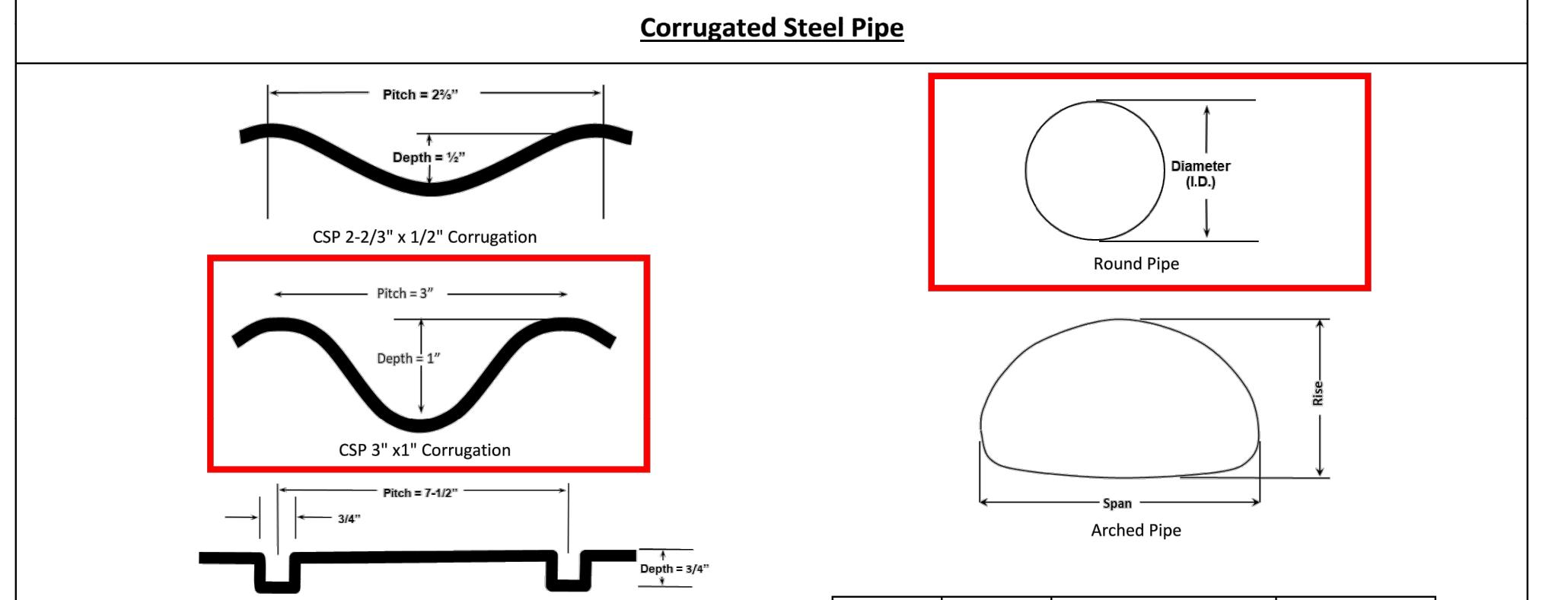
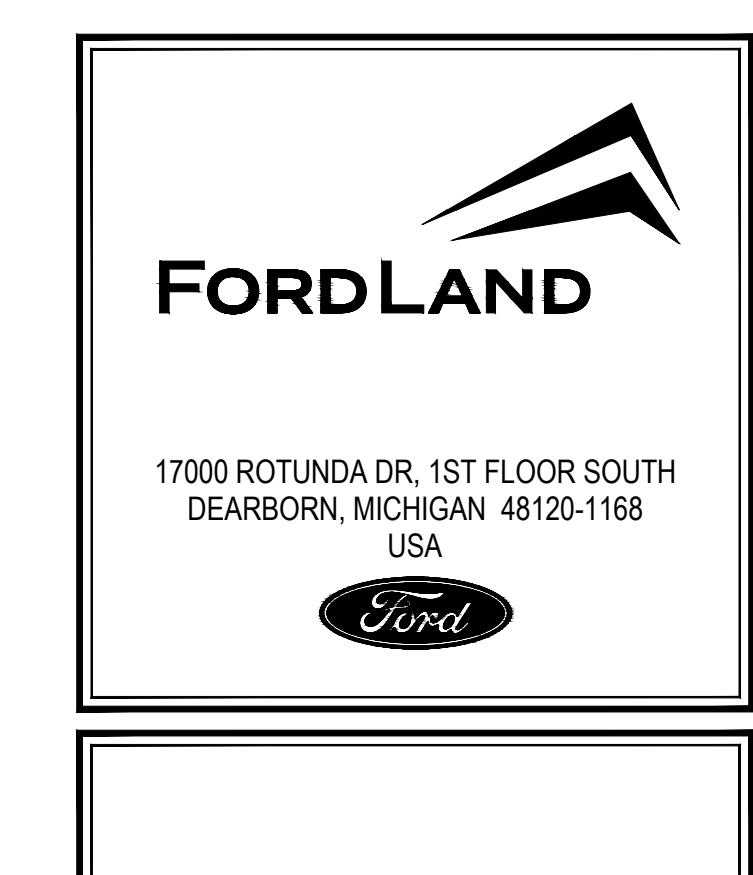
01 Aug 22      Revised      Rev. No.      Drawn By      Scale      NTS

01.01c



12 GA. GALV  
2 - PIECE

CLIENT: JENSEN  
PROJECT: 72" X 2" ANGLE BOLT BAND DETAIL  
REVISIONS: N/S  
SCALE: KDP  
DRAWN BY: I  
SHEET: of 1  
DATE: 10/20/2023



Diameter or Arch Dimension	Gauge	Corrugation		Coating Type
2-1/2" x 1/2"	3" x 1"	7-1/2" x 1/2"		




<tbl\_r cells="5" ix="4" maxcspan="1" max



Know what's below.  
Call before you dig.

#### AMTRAK NOTES AND SPECIFICATIONS:

- 1) BEFORE ENTRY OF PERMITTEE AND/OR CONTRACTORS ONTO RAILROAD'S PROPERTY, A PRE-ENTRY MEETING SHALL BE HELD AT WHICH TIME PERMITTEE AND/OR CONTRACTORS SHALL SUBMIT FOR WRITTEN APPROVAL OF THE CHIEF ENGINEER, PLANS, COMPUTATIONS, AND A DETAILED DESCRIPTION OF PROPOSED METHODS FOR ACCOMPLISHING THE WORK, INCLUDING METHODS FOR PROTECTING RAILROAD'S TRAFFIC. ANY SUCH WRITTEN APPROVAL SHALL NOT RELIEVE PERMITTEE AND/OR CONTRACTOR OF THEIR COMPLETE RESPONSIBILITY FOR THE ADEQUACY AND SAFETY OF THEIR OPERATIONS.
- 2) PRIOR TO ANY CONSTRUCTION PERSONNEL ENTERING OR PERFORMING WORK IN THE RAILROAD RIGHT-OF-WAY, ALL INDIVIDUALS MUST SUCCESSFULLY COMPLETE THE AMTRAK CONTRACTOR TRAINING. THIS REQUIRED TRAINING CAN BE ACCESSED AT [WWW.AMTRAKCONTRACTOR.COM](http://WWW.AMTRAKCONTRACTOR.COM).
- 3) SAFETY AND PROTECTION MEASURES FOR ALL CONSTRUCTION ACTIVITY WITHIN RAILROAD RIGHT-OF-WAY SHALL BE EXECUTED IN ACCORDANCE TO AMTRAK ENGINEERING PRACTICES SECTION 01141a - SAFETY AND PROTECTION OF RAILROAD TRAFFIC AND PROPERTY.
- 4) ALL OCCUPANCIES AND WORK TO BE PERFORMED WITHIN THE RAIL RIGHT-OF-WAY SHALL IN ACCORDANCE WITH THE LATEST VERSION OF AMTRAK'S UTILITY AND RIGHT-OF-WAY OCCUPATIONS, POLICIES, AND PROCEDURES DOCUMENTATION.
- 5) ANY SUPPORT AND STABILIZATION NEEDED FOR AMTRAK TRACKS DURING CONSTRUCTION AND EXCAVATION SHALL BE PROVIDED IN ACCORDANCE TO SECTION 02261a - REQUIREMENTS FOR TEMPORARY SHEETING AND SHORING TO SUPPORT AMTRAK TRACKS.
- 6) MATERIAL USED FOR SUB-BALLAST SHALL MEET AMTRAK ENGINEERING SPEC. NO. 57
- 7) ALL MATERIAL SPECS AND PIPE COATINGS SHALL BE IN ACCORDANCE WITH AREMA CHAPTER 1 PART 4.
- 8) ALL DESIGN AND CONSTRUCTION MUST BE IN ACCORDANCE WITH AMTRAK EP3014 - MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC DURING CONTRACTOR OPERATIONS AND EP3016 - STORM WATER DRAINAGE AND DISCHARGE FROM ADJACENT PROPERTY ONTO AMTRAK RIGHT-OF-WAY.
- 9) ALL UNDERGROUND UTILITIES, CABLE, AND FACILITIES MUST BE LOCATED AND PROTECTED BEFORE ANY EXCAVATING, DRILLING, BORING/DIRECTIONAL DRILLING, GROUND PENETRATING ACTIVITIES OR CONSTRUCTION TAKES PLACE. THIS INCLUDES RAILROAD AND COMMERCIAL UTILITIES, CABLES, DUCT LINES, AND FACILITIES. THESE ACTIVITIES WILL NOT BE PERFORMED IN CLOSE PROXIMITY TO THE RAILROAD DUCT LINES UNLESS MONITORED BY ON-SITE AMTRAK COMMUNICATIONS AND SIGNAL (C&S) DEPARTMENT PERSONNEL. HAND DIGGING MAY BE REQUIRED, AS DIRECTED BY THROUGH THE ON-SITE AMTRAK C&S SUPPORT PERSONNEL. AMTRAK MAINTAINS THE RIGHT TO ACCESS ALL EXISTING CABLES AND CONDUITS THROUGHOUT CONSTRUCTION. AMTRAK ALSO RESERVES THE RIGHT TO UPGRADE AND INSTALL NEW CABLES AND CONDUITS IN THE AFFECTED AREA. THE "MISS DIG" PROCESS MUST BE FOLLOWED. PLEASE NOTE THAT AMTRAK IS NOT A PART OF THE MISS DIG PROCESS. CONTACT AMTRAK ENGINEERING TO HAVE ALL RAILROAD UNDERGROUND UTILITIES AND ASSETS LOCATED. IF REQUESTED BY AMTRAK, EXISTING DEPTHS OF UTILITIES BEING CROSSED MUST BE VERIFIED THROUGH TEST PITS PERFORMED BY THE CONTRACTOR AS DIRECTED BY AND UNDER THE DIRECT SUPERVISION OF AMTRAK C&S SUPPORT PERSONNEL. PRECAUTIONS MUST BE TAKEN TO PREVENT ANY INTERRUPTION TO MDOT MICHIGAN LINE OPERATION.
- 10) AMTRAK C&S DEPARTMENT MUST MAINTAIN ACCESS TO THE RAILROAD RIGHT-OF-WAY AND HAVE EXISTING GATE ACCESS TO REMOTE LOCATION TO PERFORM MAINTENANCE.
- 11) THE AMTRAK C&S DEPARTMENT MUST MAINTAIN ACCESS TO THE RAILROAD RIGHT-OF-WAY AND HAVE EXISTING GATE ACCESS TO REMOTE LOCATIONS TO PERFORM MAINTENANCE.
- 12) IF WORK SHALL BE DONE ON AMTRAK PROPERTY THAT INVOLVES HEAVY TRUCKS, EQUIPMENT, OR MACHINERY ALONG THE RIGHT-OF-WAY, DUCT LINES AND PULL BOXES SHALL BE INSPECTED IN INSURE THEY CAN WITHHOLD THE APPROPRIATE WEIGHT. REFER TO TIER TABLE DOCUMENT.
- 13) ANY DAMAGE TO PULL BOXES, HAND HOLES, JUNCTION BOXES, OR OTHER APPURTENANCES IN THE COURSE OF THIS WORK SHALL BE REPAIRED BY AMTRAK C&S, AT THE COST OF THE CONTRACTOR.

#### GENERAL NOTES:

- 1) WORK SHALL BE DONE IN ACCORDANCE WITH MDOT 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION, AMTRAK STANDARD SPECIFICATIONS, AND MDOT RR TYPICAL PLANS.
- 2) CONTRACTOR SHALL COORDINATE, LOCATE, PROTECT, AND SUPPORT ALL UNDERGROUND FIBER OPTIC LINES AND RAILROAD SIGNAL CABLES PRIOR TO ANY EARTH EXCAVATION ACTIVITIES.
- 3) ALL EXCAVATED SOIL FROM RAILROAD PROPERTY SHALL NOT BE REMOVED FROM THE PROPERTY AND DOCUMENTATION BE PROVIDED TO MDOT. ALL DISTURBED EARTH SHALL RECEIVE 4 INCHES OF TOPSOIL WITH SEED, FERTILIZER, AND MULCH BLANKET. CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING A VIGOROUS GRASS GROWTH AS APPROVED BY MDOT. IF GRASS IS NOT INITIALLY ESTABLISHED OR DUE TO EROSION, CONTRACTOR SHALL CONDUCT NECESSARY ACTIVITIES TO ESTABLISH VIGOROUS GRASS GROWTH.
- 4) ALL RAIL REMOVAL WORK SHALL BE COORDINATED AND CONDUCTED BY AMTRAK.
- 5) TREE CUTTING ON MDOT PROPERTY SHALL BE RESTRICTED TO THE CURRENT TIME WINDOW (OCTOBER 1 THROUGH MARCH 31) FOR THE INDIANA BAT AND NORTHERN LONG EAR BAT.
- 6) CONTRACTOR SHALL NOT FOUL RAILROAD BALLAST. IF CONTRACTOR FOULS RAILROAD BALLAST, THE BALLAST SECTION SHALL BE REMOVED BY RAILROAD FORCES AND ALL COSTS ASSOCIATED WITH REMOVAL AND RE-ESTABLISHMENT OF RAILROAD BALLAST SHALL BE PAID FOR BY CONTRACTOR.
- 7) TO CROSS TRACKS, CONTRACTOR SHALL INSTALL TIMBER CRANES MATS, AS APPROVED BY RAILROAD.
- 8) TREES TO BE CUT OR THAT ARE ALREADY DOWN IN THE RAILROAD RIGHT-OF-WAY, SHALL BE CHIPPED AND UNIFORMLY SPREAD ACROSS THE RAILROAD RIGHT-OF-WAY. NO DEBRIS SHALL BE DISPOSED OF ON RAILROAD BALLAST.

TABLE 902-3:  
GRADING REQUIREMENTS FOR GRANULAR MATERIALS  
SIEVE ANALYSIS (MTM 109), TOTAL % PASSING (%)

MATERIAL	LBW % PASSING NO. 200(a)(b)									
	6 INCH	3 INCH	2 INCH	1 INCH	1/2 INCH	1/4 INCH	NO. 4	NO. 30	NO. 100	
CLASS I	-	-	100	-	45-85	-	20-85	5-30	-	0-5
CLASS II(c)	-	100	-	60-100	-	-	50-100	-	0-30	0-7
CLASS IIa(c)	-	100	-	60-100	-	-	50-100	-	0-35	0-10
CLASS IIaA	-	100-95	-	60-100	-	-	50-100	-	0-20	0-5
CLASS III	100	100	-	-	-	-	50-100	-	-	0-15
CLASS IIIA	-	-	-	-	-	100	50-100	-	0-30	0-15

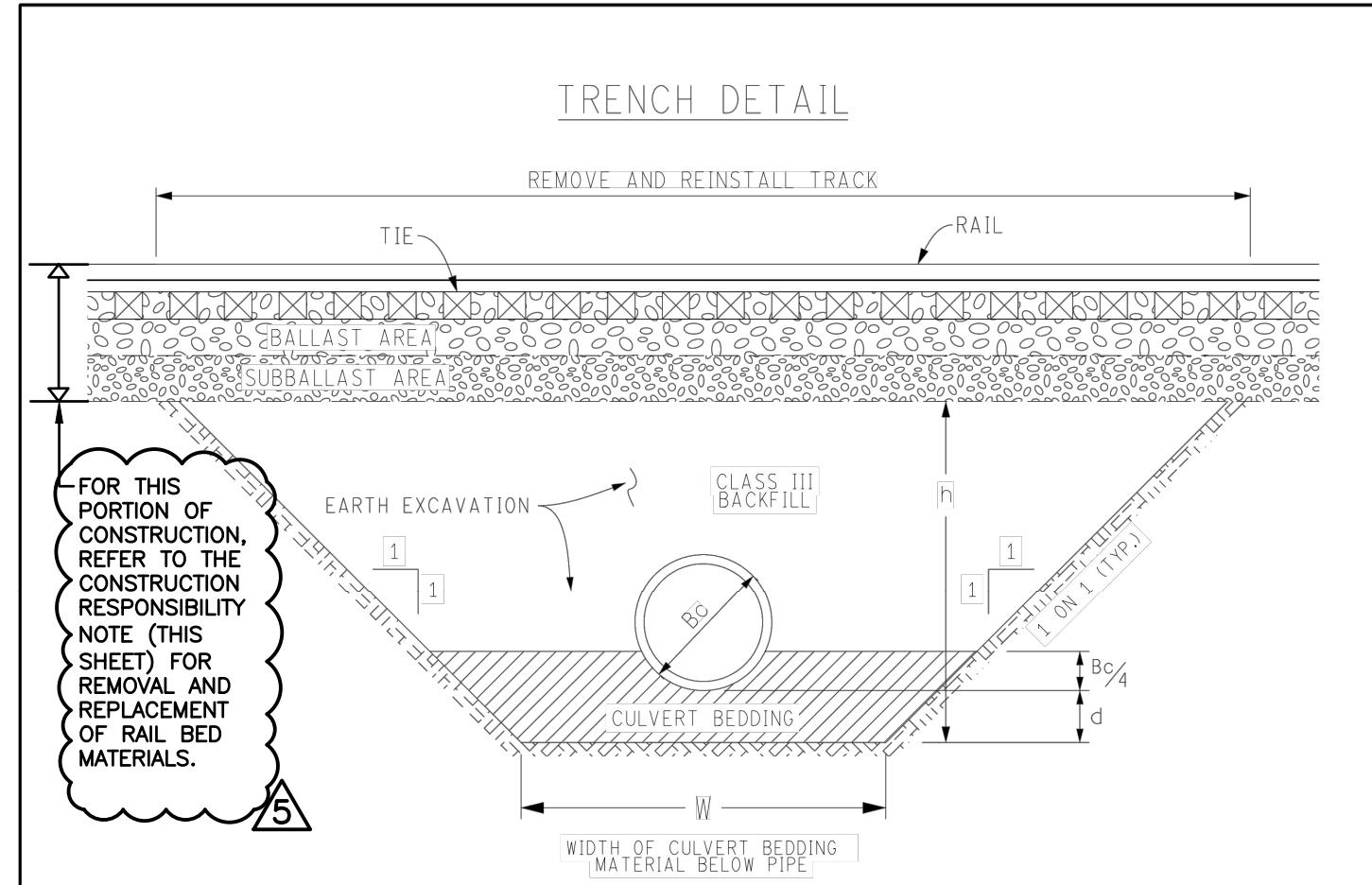
(a) TEST RESULTS BASED ON DRY WEIGHTS.

(b) USE TEST METHOD MTM 108 FOR LBW.

(c) EXPECT FOR USE IN GRANULAR BLANKETS, CLASS IIa GRANULAR MATERIAL MAY BE SUBSTITUTED FOR CLASS II GRANULAR MATERIAL FOR PROJECTS IN THE FOLLOWING COUNTIES: ARENAC, BAY, GENESSEE, GLADWIN, HURON, LAPEER, MACOMB, MIDLAND, MONROE, OAKLAND, SAGINAW, SANILAC, SHIAWASSEE, ST. CLAIR, TUSCOLA, AND WAYNE.

#### RESPONSIBILITIES FOR RAIL BED CONSTRUCTION:

- 1) AMTRAK SHALL BE RESPONSIBLE FOR THE FOLLOWING PORTIONS OF CONSTRUCTION:
  - REMOVAL OF THE TRACKS
  - REMOVAL OF THE CROSS-TIES
  - PROVISION AND REPLACEMENT OF BALLAST
  - REPLACEMENT OF THE TRACKS
  - REPLACEMENT OF THE CROSS-TIES
- 2) CONTRACTOR SHALL BE RESPONSIBLE FOR THE FOLLOWING PORTIONS OF CONSTRUCTION:
  - REMOVAL OF BALLAST
  - REMOVAL OF SUB-BALLAST
  - REPLACEMENT OF SUB-BALLAST



D	d
27" & SMALLER	6"
30" TO 60"	9"
60" & LARGER	12"

bc = OUTSIDE DIAMETER  
w = bc + 8" OR 1 1/2 x bc  
d = DEPTH OF BEDDING  
D = INSIDE DIAMETER  
h = DEPTH OF EXCAVATION  
below ballast

NOTE: PLACE AND COMPACT CULVERT BEDDING TO THE LEVEL OF THE PIPE. THE OUTSIDE DIAMETER OF THE PIPE CULVERT (d+bc/4) AND THEN EXCAVATE AND SHAPE A TRENCH TO FIT THE PIPE. AFTER PLACING CULVERT, CONTINUE FILLING WITH CLASS III BACKFILL.

CULVERT BEDDING SHALL BE CLASS III BACKFILL EXCEPT WHEN CLASS II CULVERT BEDDING IS NOTED ON THE PLANS.

CLASS II CULVERT BEDDING AND CLASS III BACKFILL SHALL BE PLACED AND COMPACTED IN 9" MAXIMUM LAYERS, UNLESS OTHERWISE NOTED. COMPACTION SHALL REACH A MINIMUM DENSITY OF 95% OF THE MAXIMUM UNIT WEIGHT OF THE MATERIAL BEING COMPACTED.

MDOT  
OFFICE OF RAIL

MICHIGAN DEPARTMENT OF TRANSPORTATION  
RAILROAD TYPICAL PLAN FOR  
CULVERT INSTALLATION  
UNDER RAILROAD TRACK

APPROVED BY:  
JIM D'LAMATER  
RAILROAD INFRASTRUCTURE ENGINEER MANAGER  
REVISION DATE: 4/19/2016  
RR-50 SHEET 1 OF 1



IN CHARGE: J CIESIELSKI  
DRAWN BY: M TILLEY  
DESIGNED BY: S DODSON  
CHECKED BY: B NARTKER  
APPROVED BY: E SMITH

SHEET TITLE: MDOT & AMTRAK  
STORMWATER DETAILS & SPECIFICATIONS

FWD DWG NO. \_\_\_\_\_  
SHEET NUMBER: \_\_\_\_\_

REV # \_\_\_\_\_  
C106.5