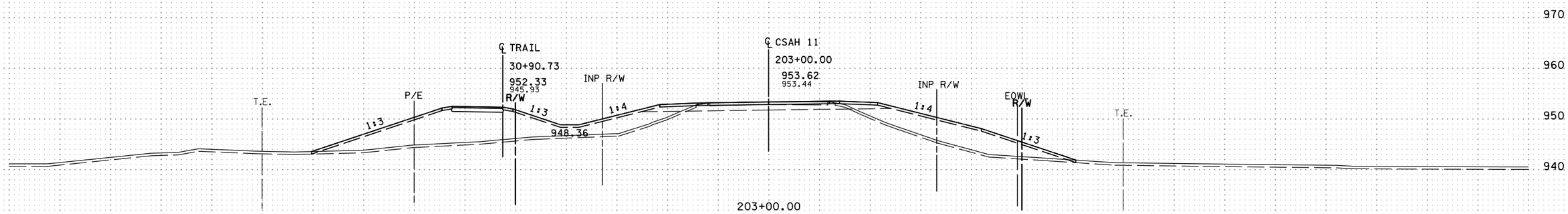

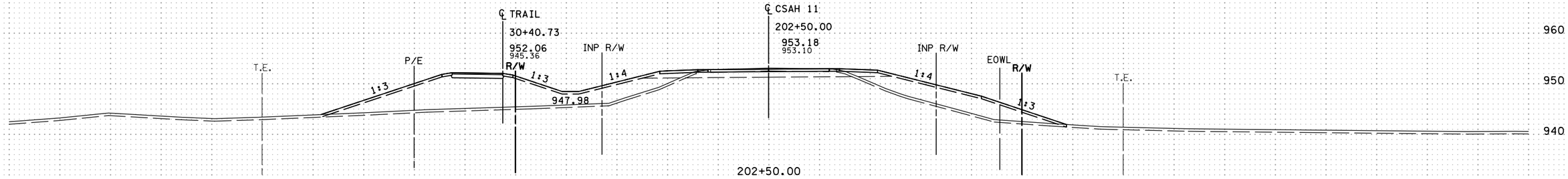

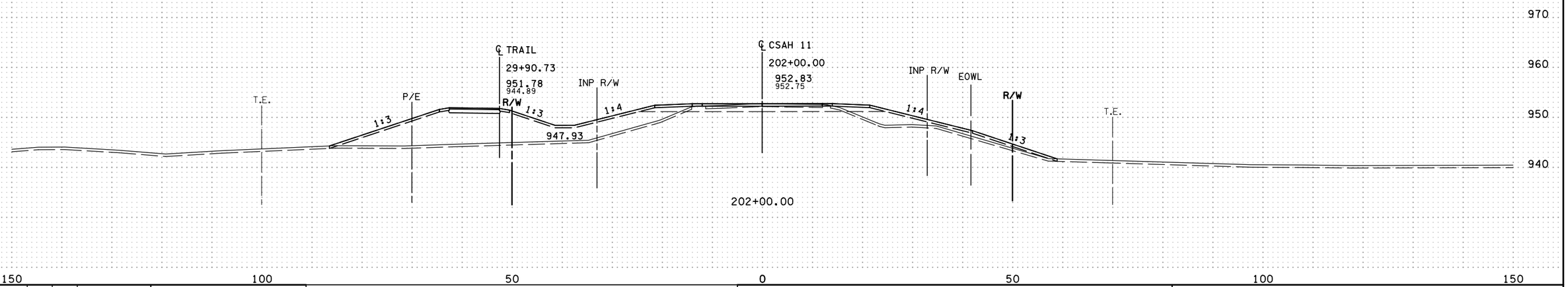

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ALLIANT

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SAP 010-611-027; CP 218931 (CSAH 11)
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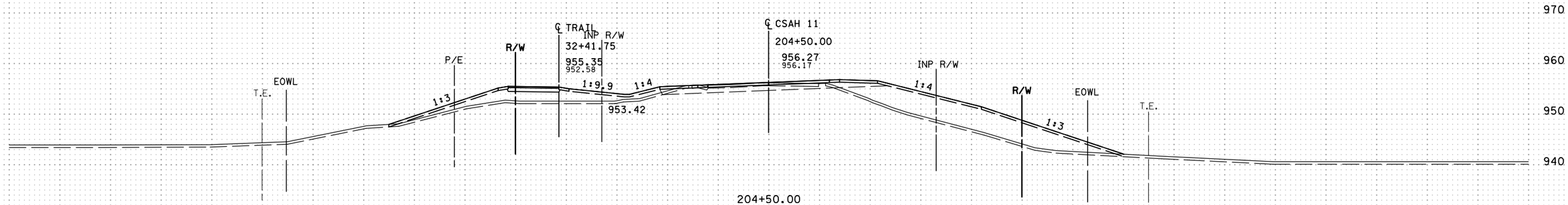

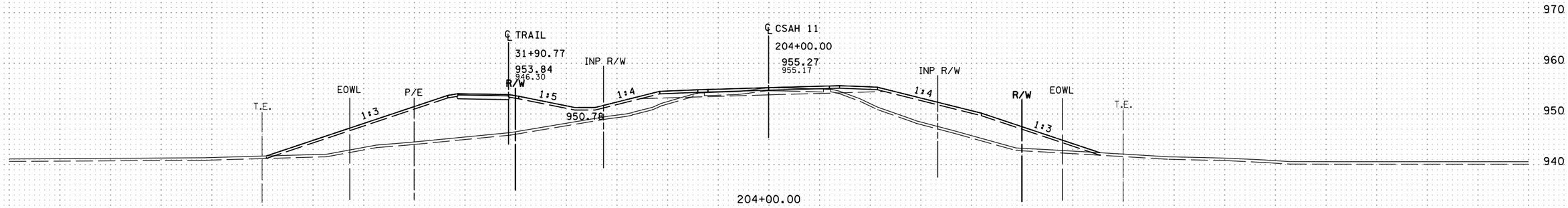

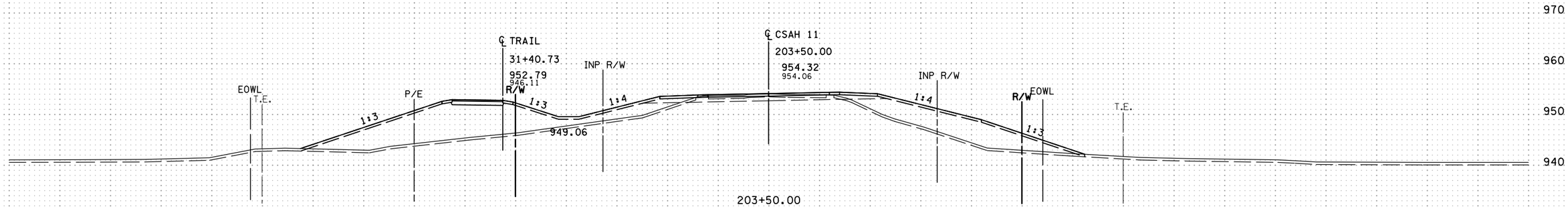

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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

CSAH 11 CROSS SECTIONS

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SAP 010-611-027; CP 218931 (CSAH 11)

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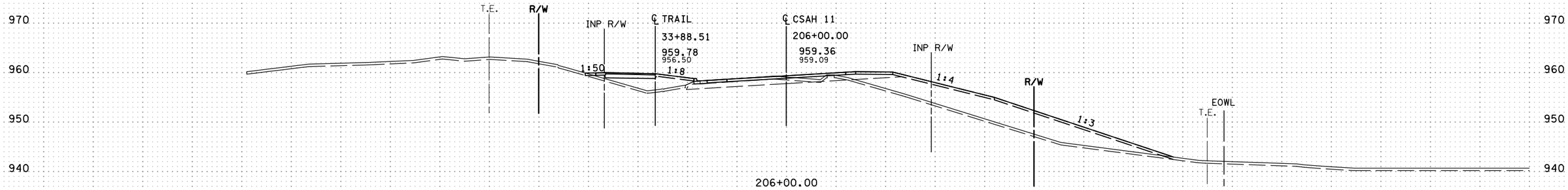

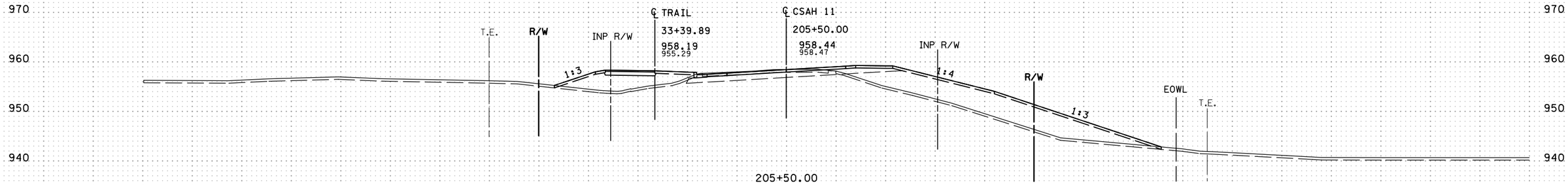

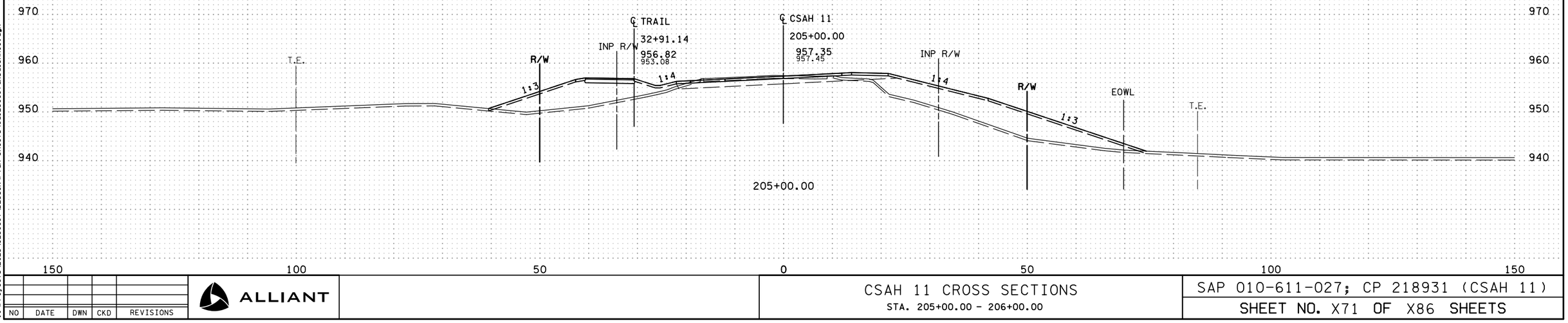

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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

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SAP 010-611-027; CP 218931 (CSAH 11)
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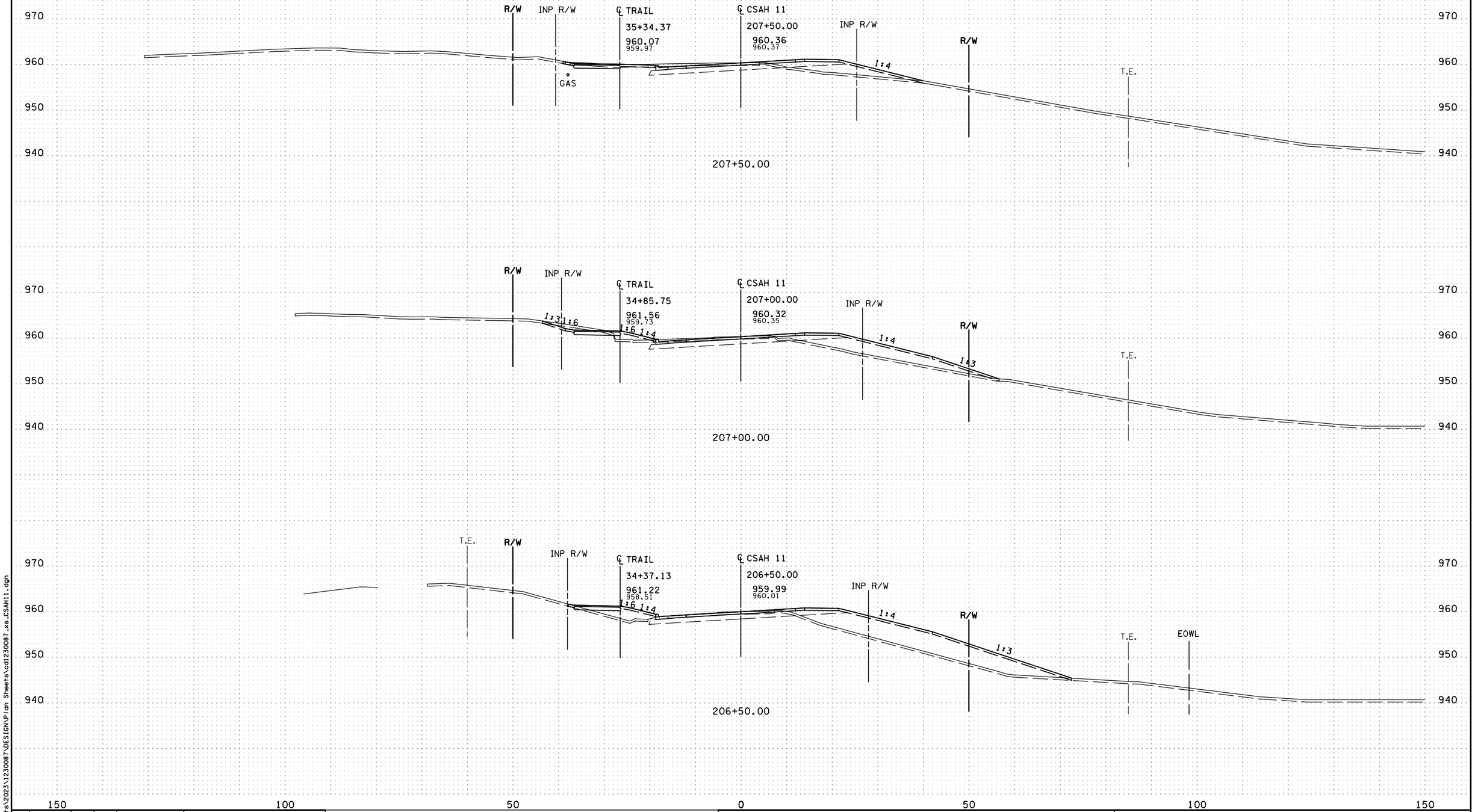

NO	DATE	DWN	CKD	REVISIONS

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SAP 010-611-027; CP 218931 (CSAH 11)
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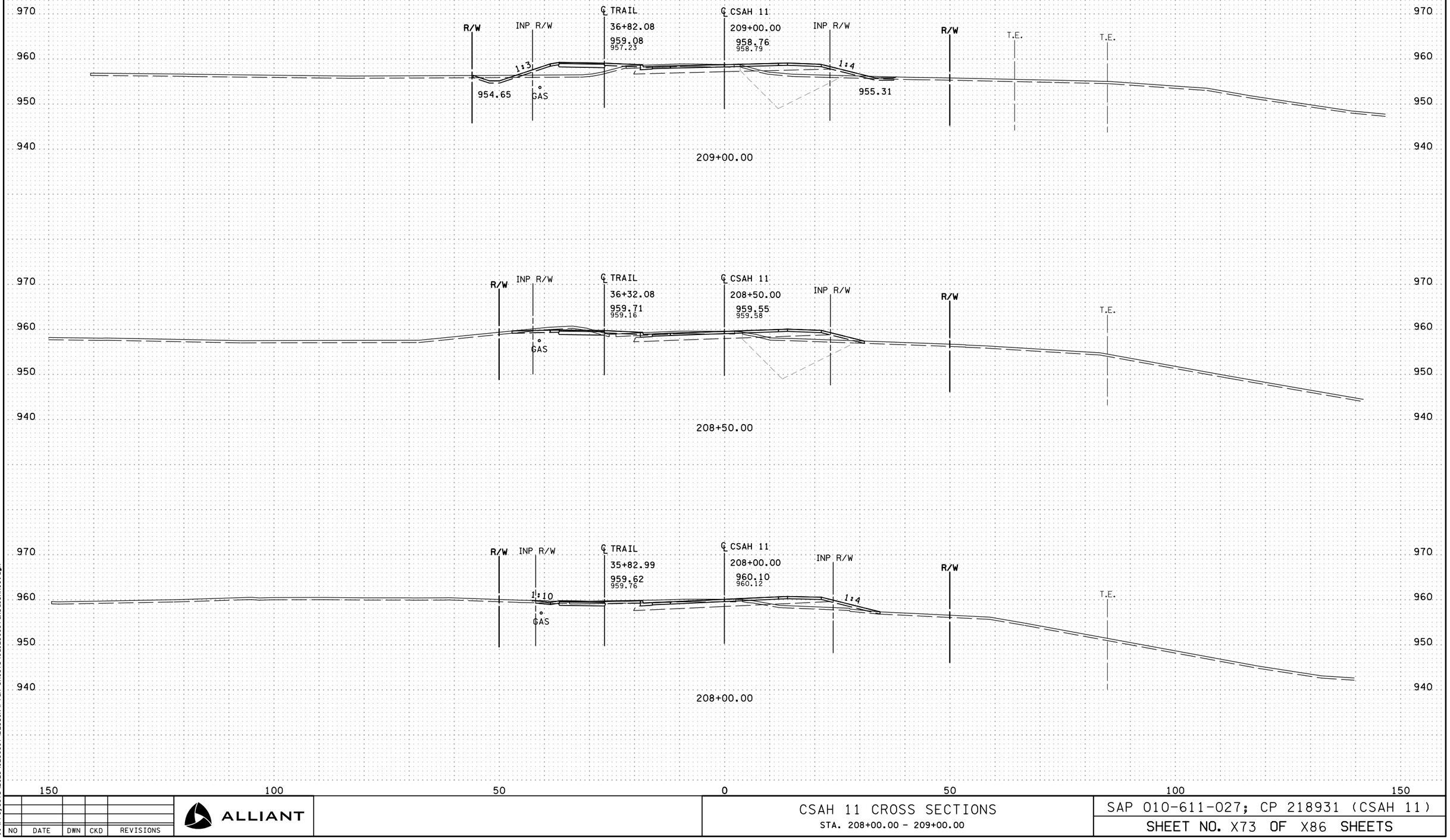

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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

CSAH 11 CROSS SECTIONS

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SAP 010-611-027; CP 218931 (CSAH 11)

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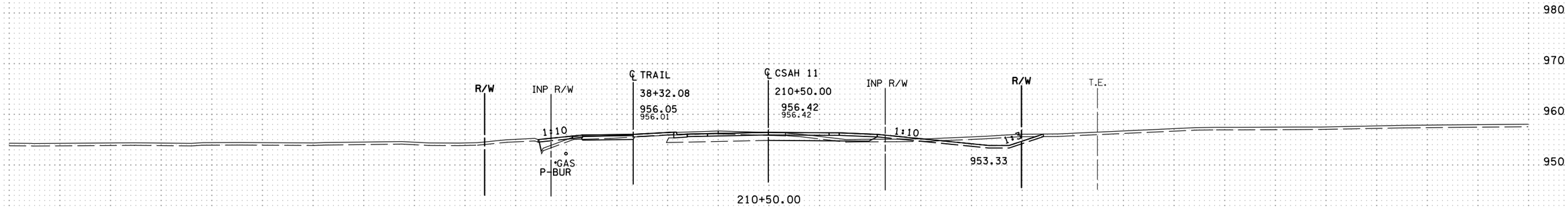

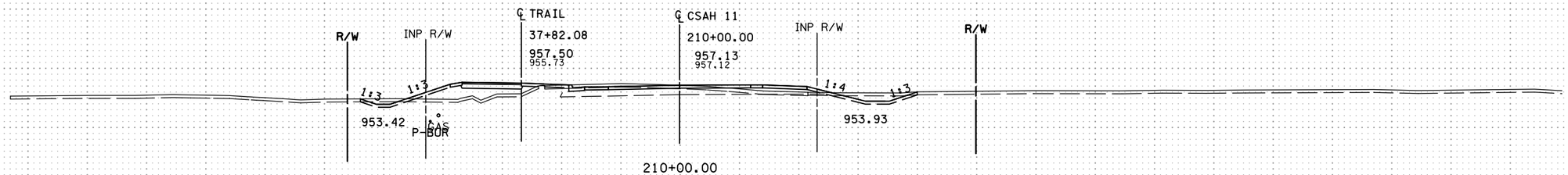

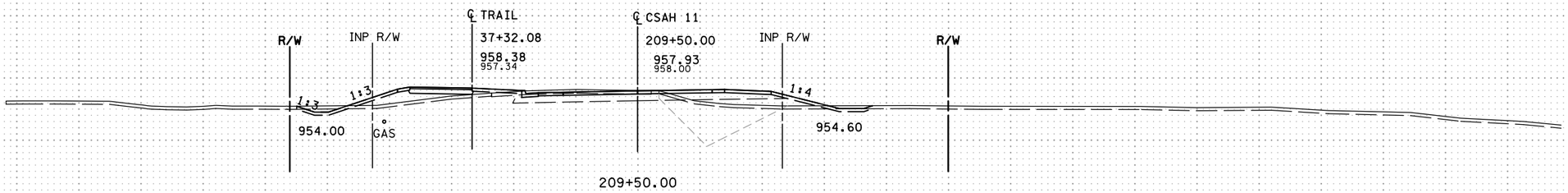

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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

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SAP 010-611-027; CP 218931 (CSAH 11)
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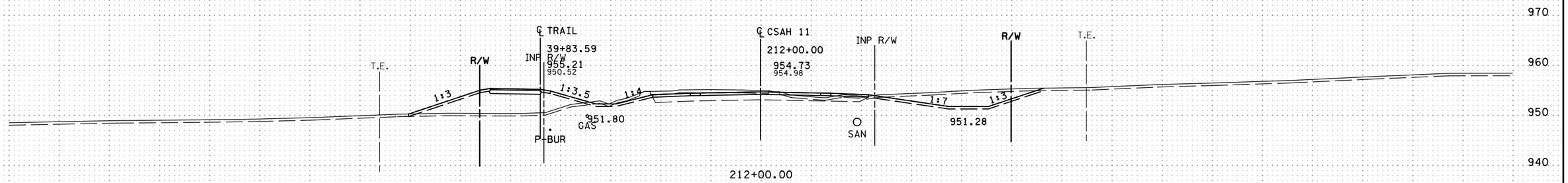

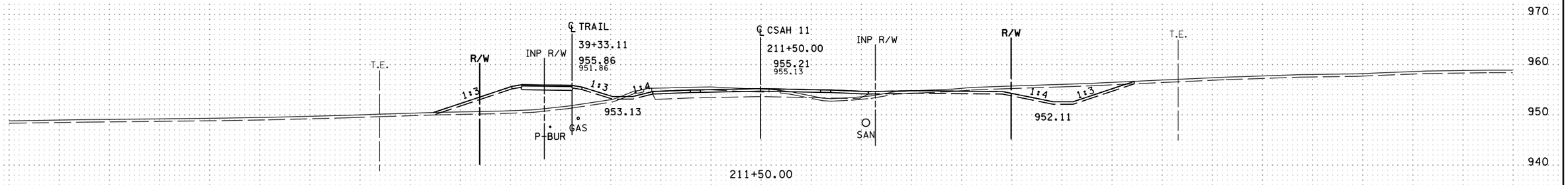

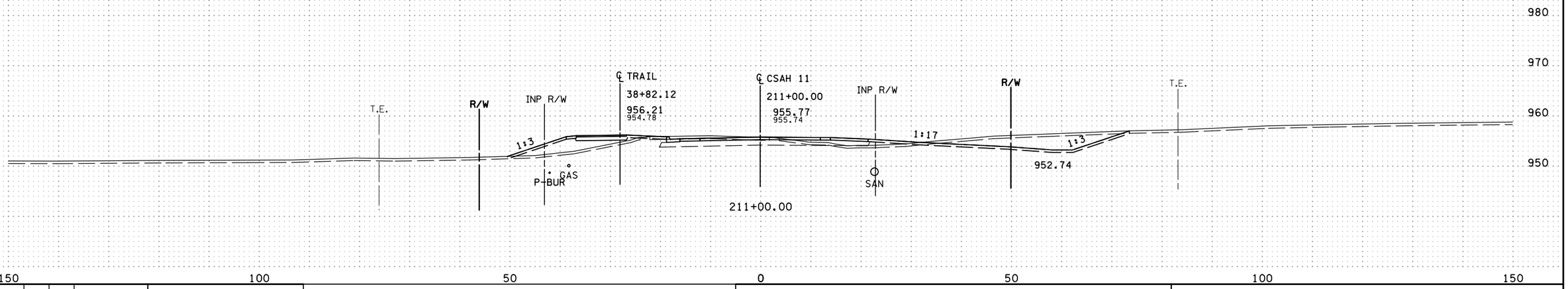

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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

CSAH 11 CROSS SECTIONS
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SHEET NO. X75 OF X86 SHEETS

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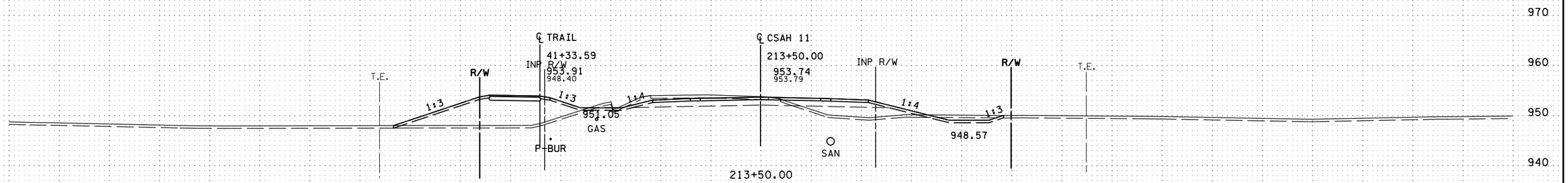

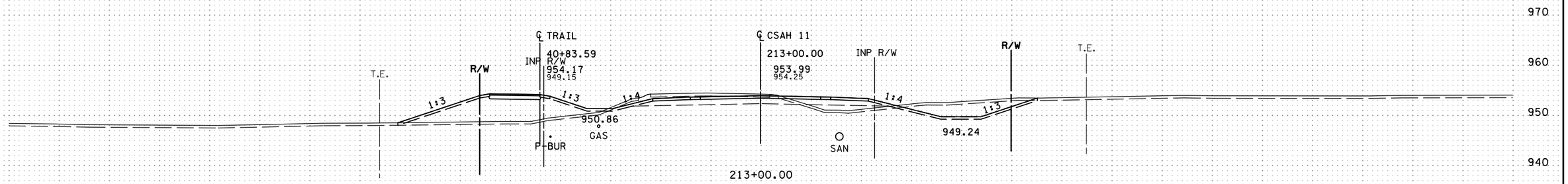

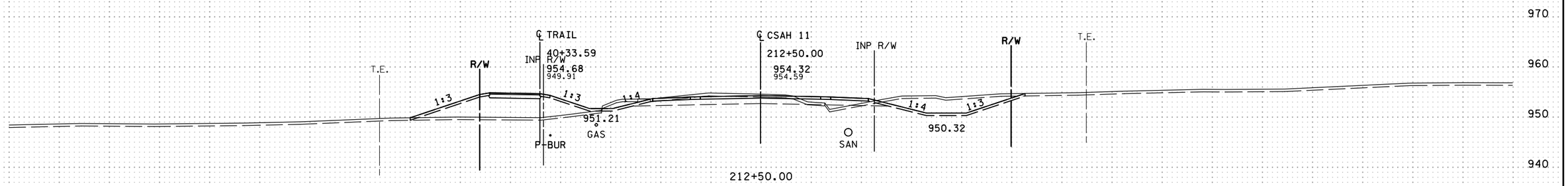

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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

CSAH 11 CROSS SECTIONS
STA. 212+50.00 - 213+50.00

SAP 010-611-027; CP 218931 (CSAH 11)
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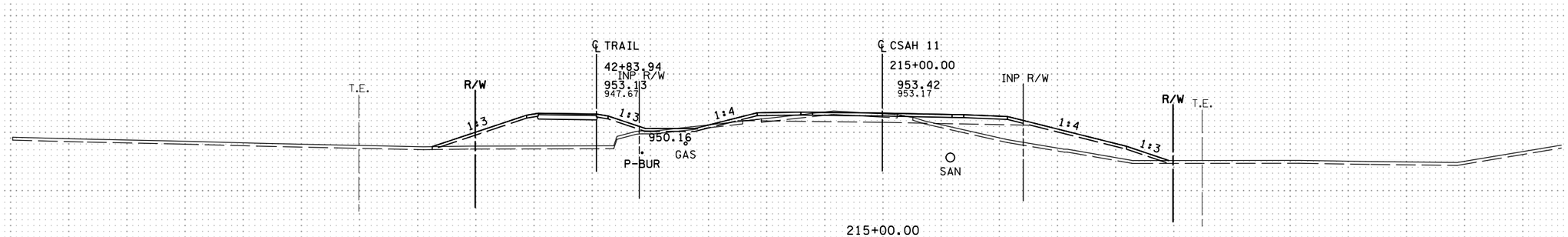

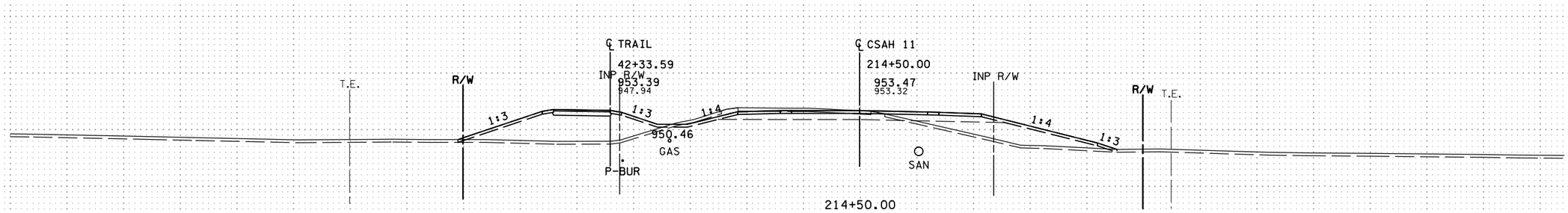

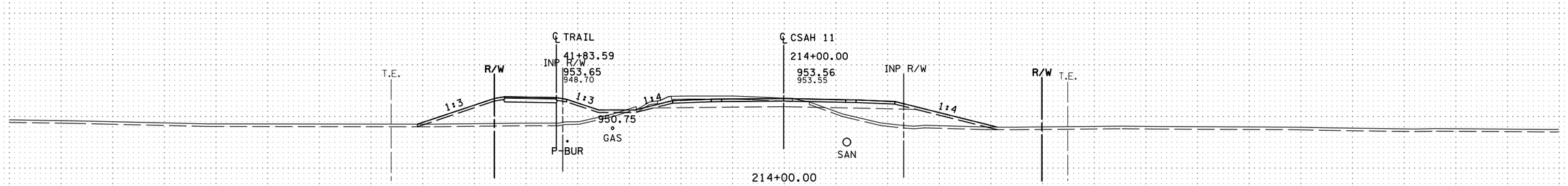

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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

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SAP 010-611-027; CP 218931 (CSAH 11)
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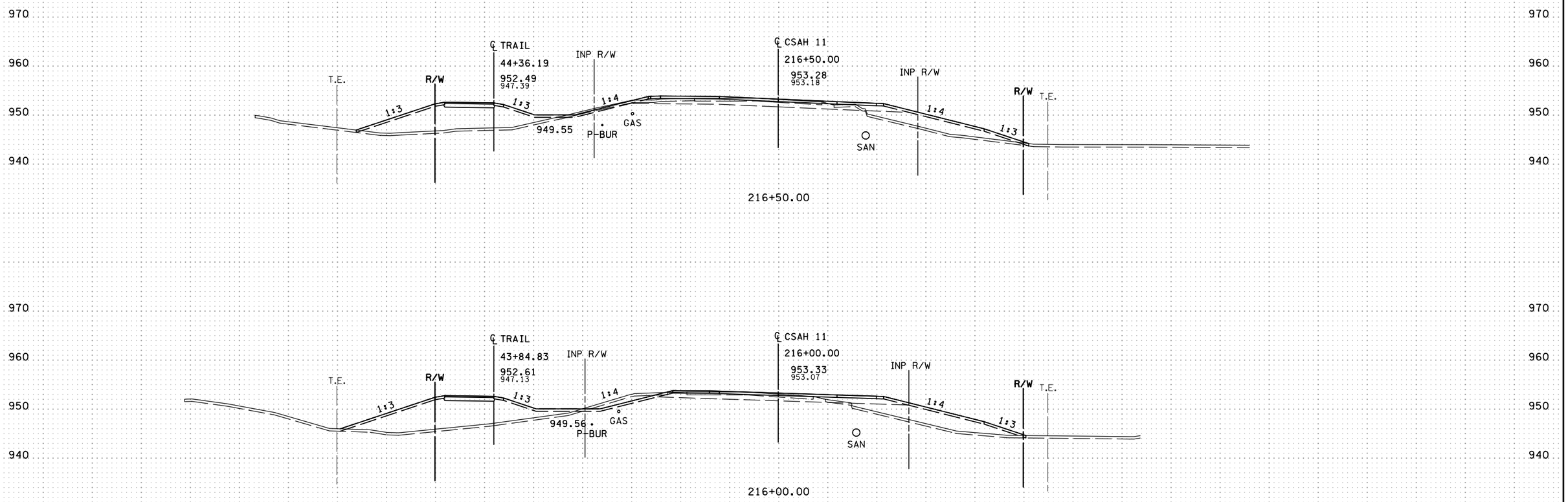

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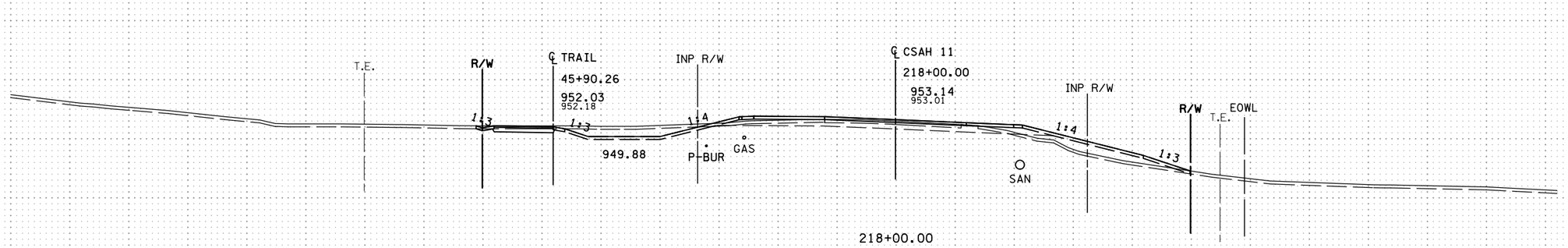

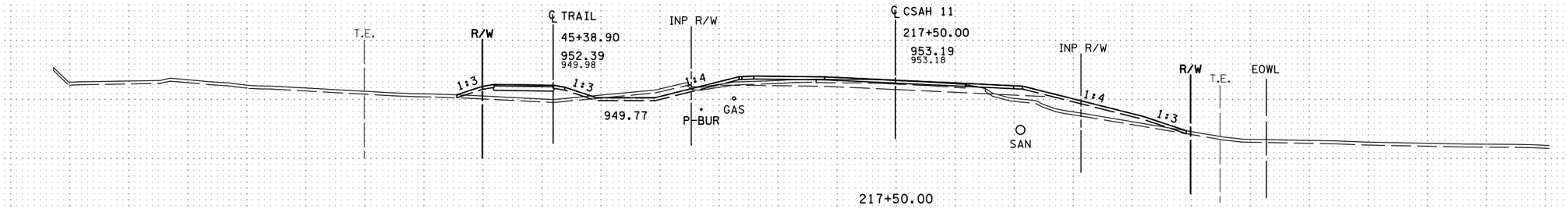

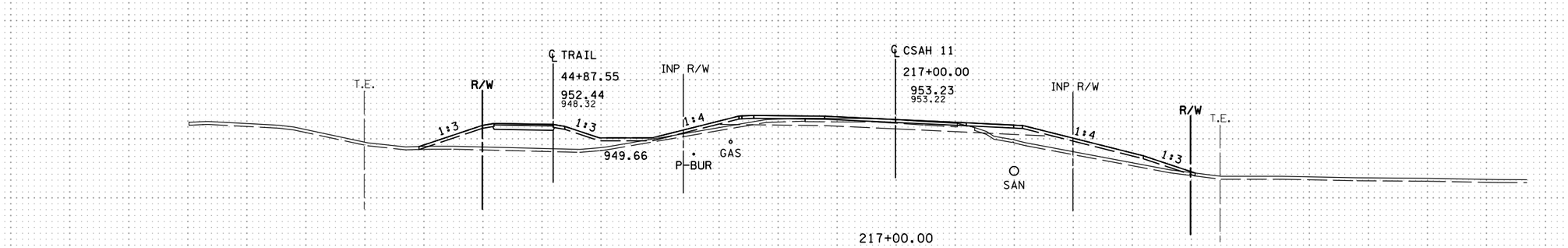

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NO	DATE	DWN	CKD	REVISIONS

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SAP 010-611-027; CP 218931 (CSAH 11)
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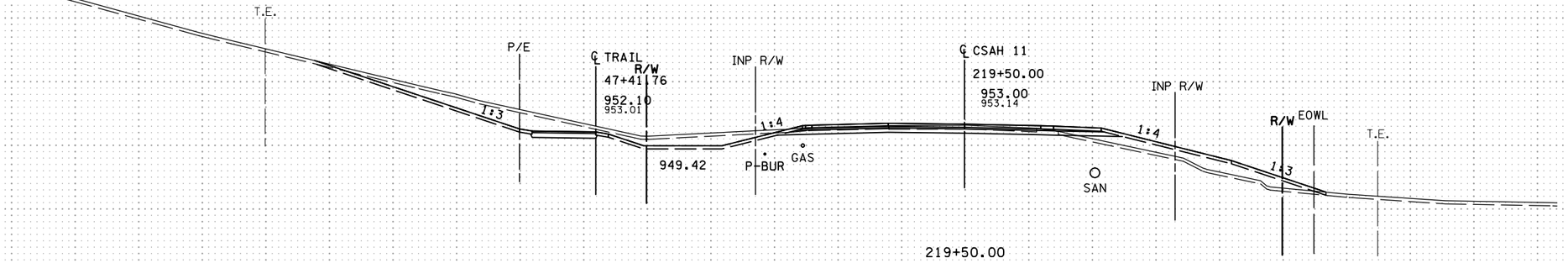

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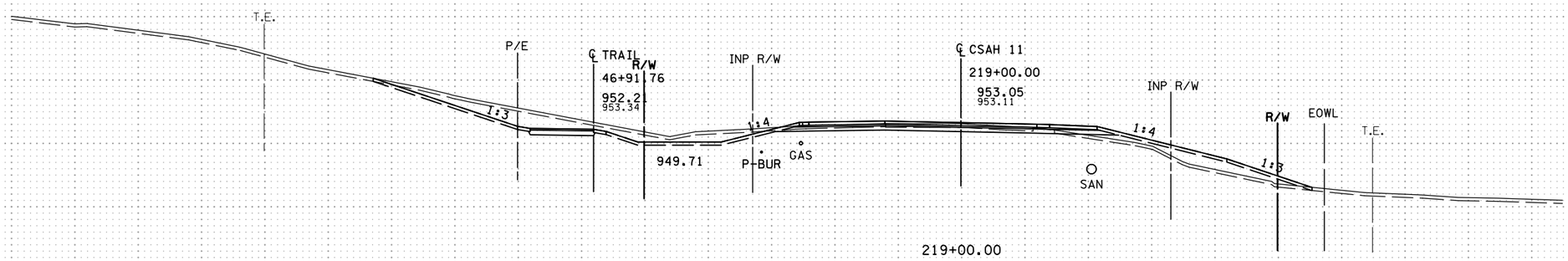

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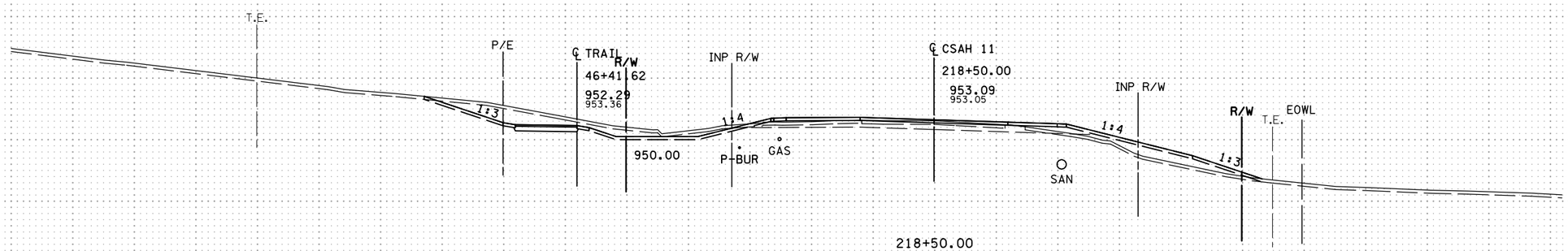

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NO	DATE	DWN	CKD	REVISIONS

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SAP 010-611-027; CP 218931 (CSAH 11)
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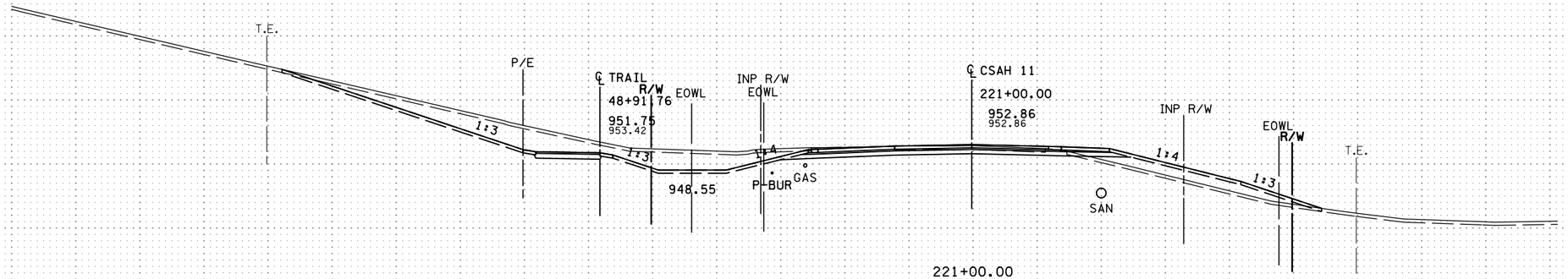

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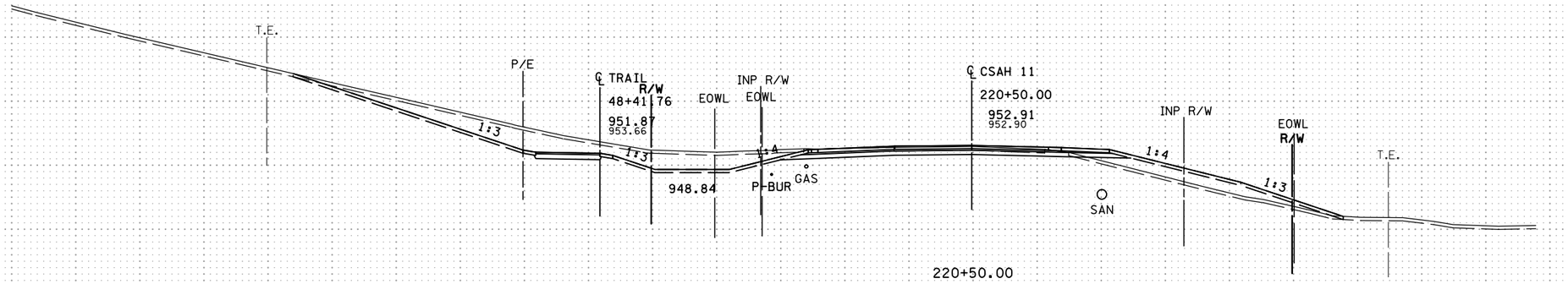

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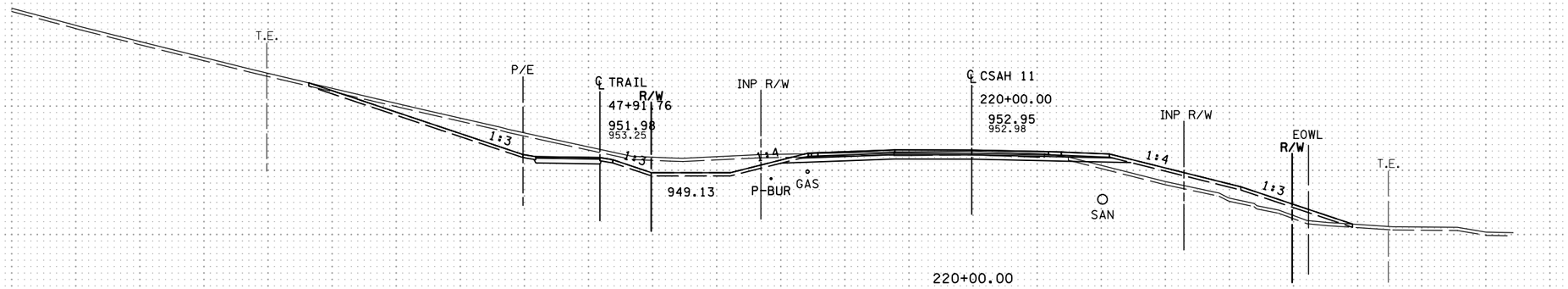

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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

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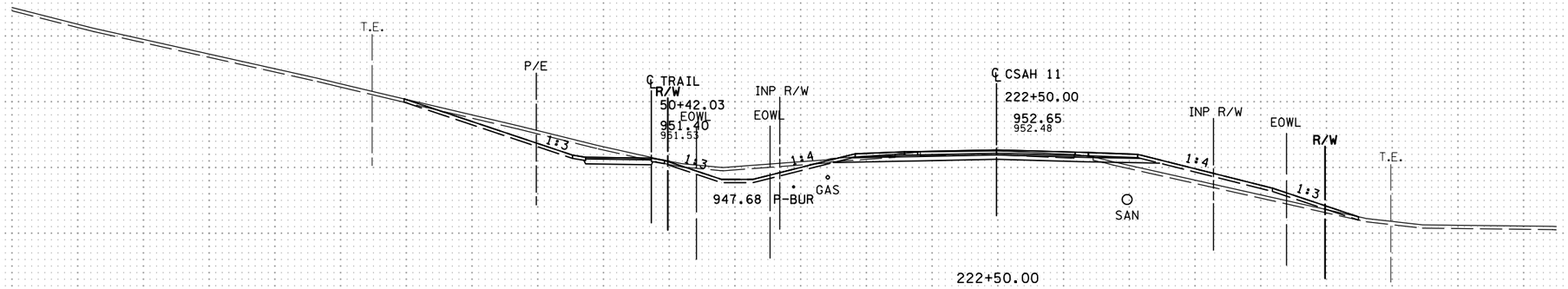
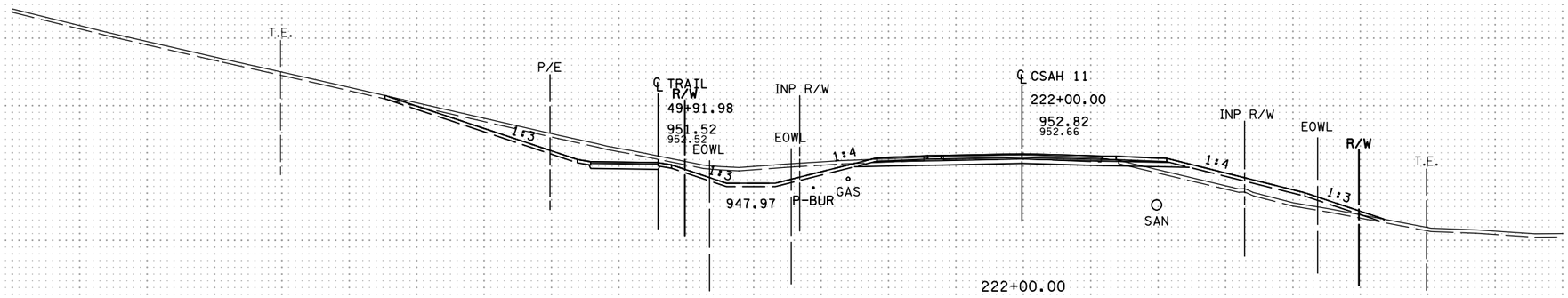
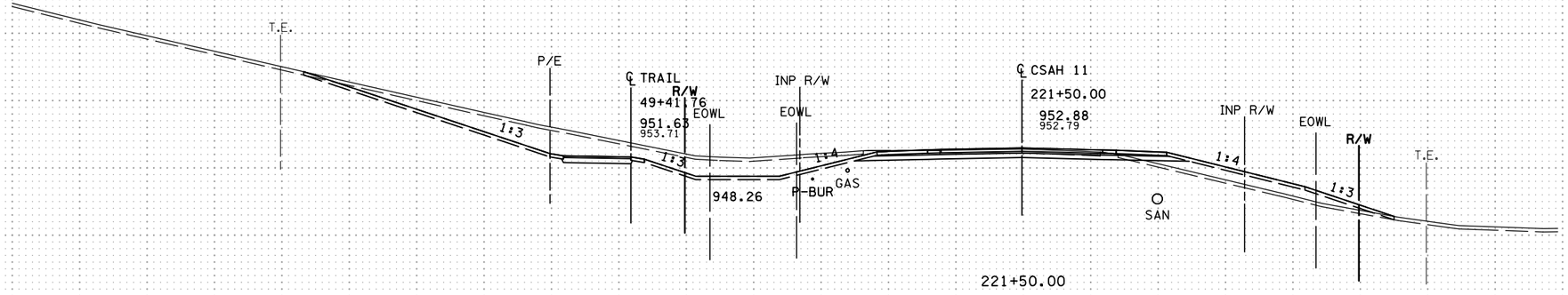
SAP 010-611-027; CP 218931 (CSAH 11)
SHEET NO. X81 OF X86 SHEETS







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NO	DATE	DWN	CKD	REVISIONS

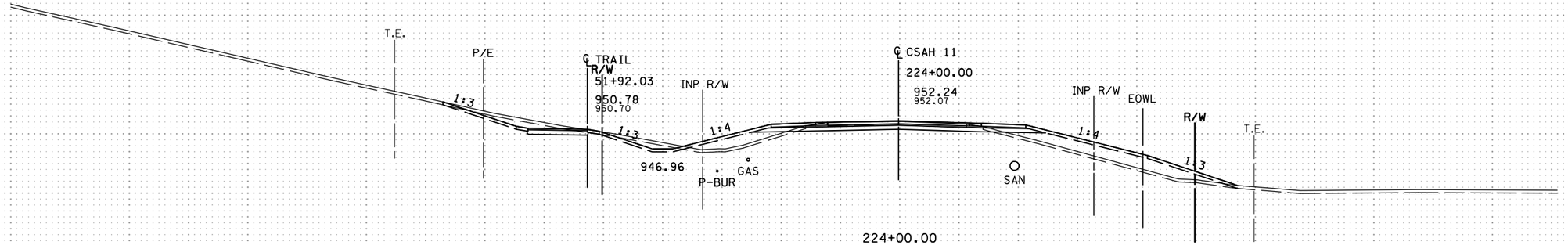
ALLIANT

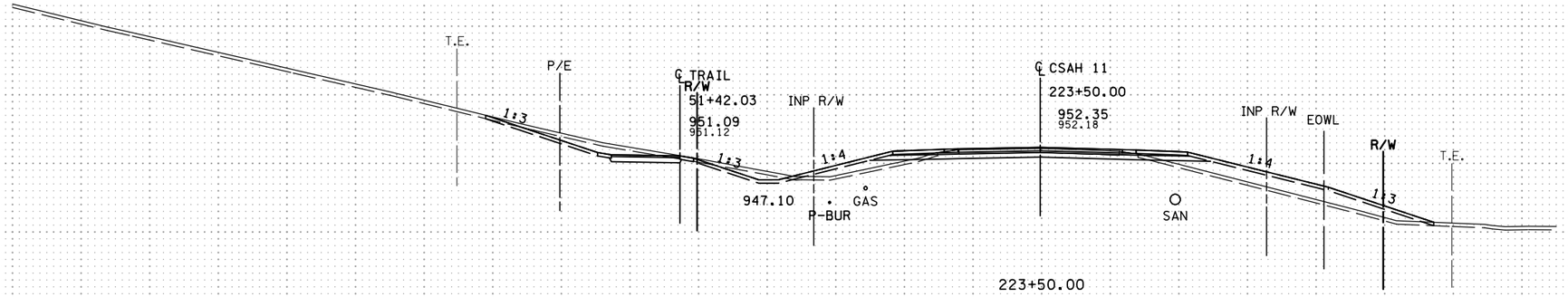
CSAH 11 CROSS SECTIONS

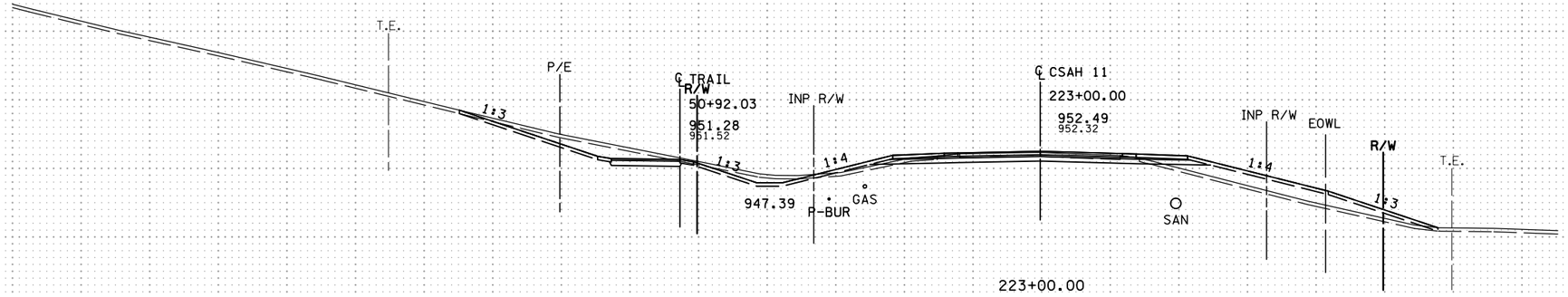
STA. 221+50.00 - 222+50.00

SAP 010-611-027; CP 218931 (CSAH 11)

SHEET NO. X82 OF X86 SHEETS







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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

CSAH 11 CROSS SECTIONS
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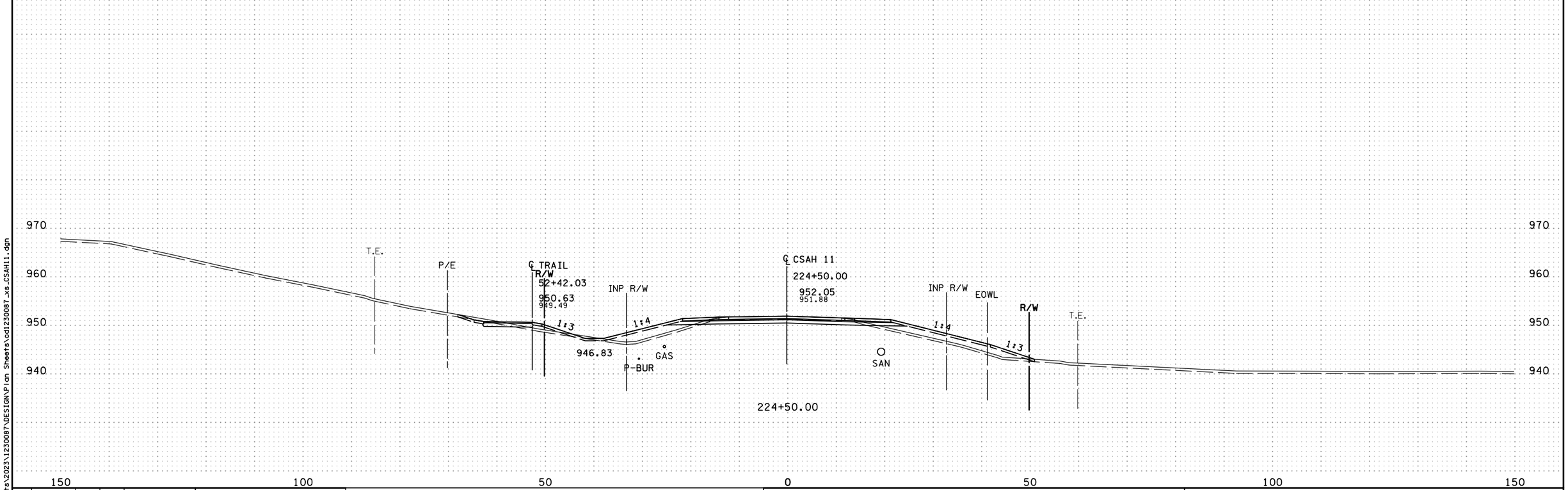
SAP 010-611-027; CP 218931 (CSAH 11)



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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

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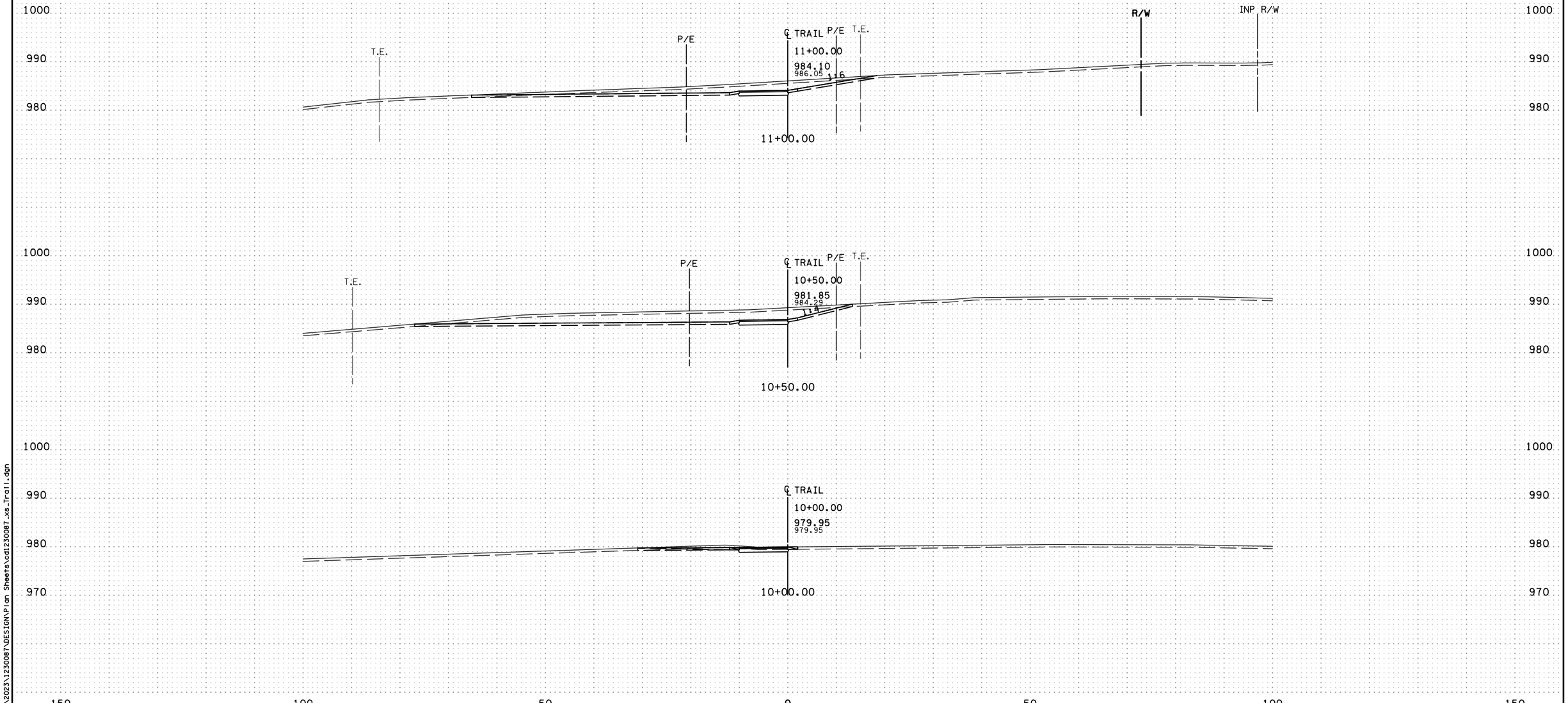
STA. 224+50.00 - 225+50.00

SAP 010-611-027; CP 218931 (CSAH 11)
SHEET NO. X84 OF X86 SHEETS



NO	DATE	DWN	CKD	REVISIONS

ALLIANT

TRAIL CROSS SECTIONS

STA. 10+00.00 - 11+00.00

SAP 010-611-027; CP 218931 (CSAH 11)

SHEET NO. X85 OF X86 SHEETS

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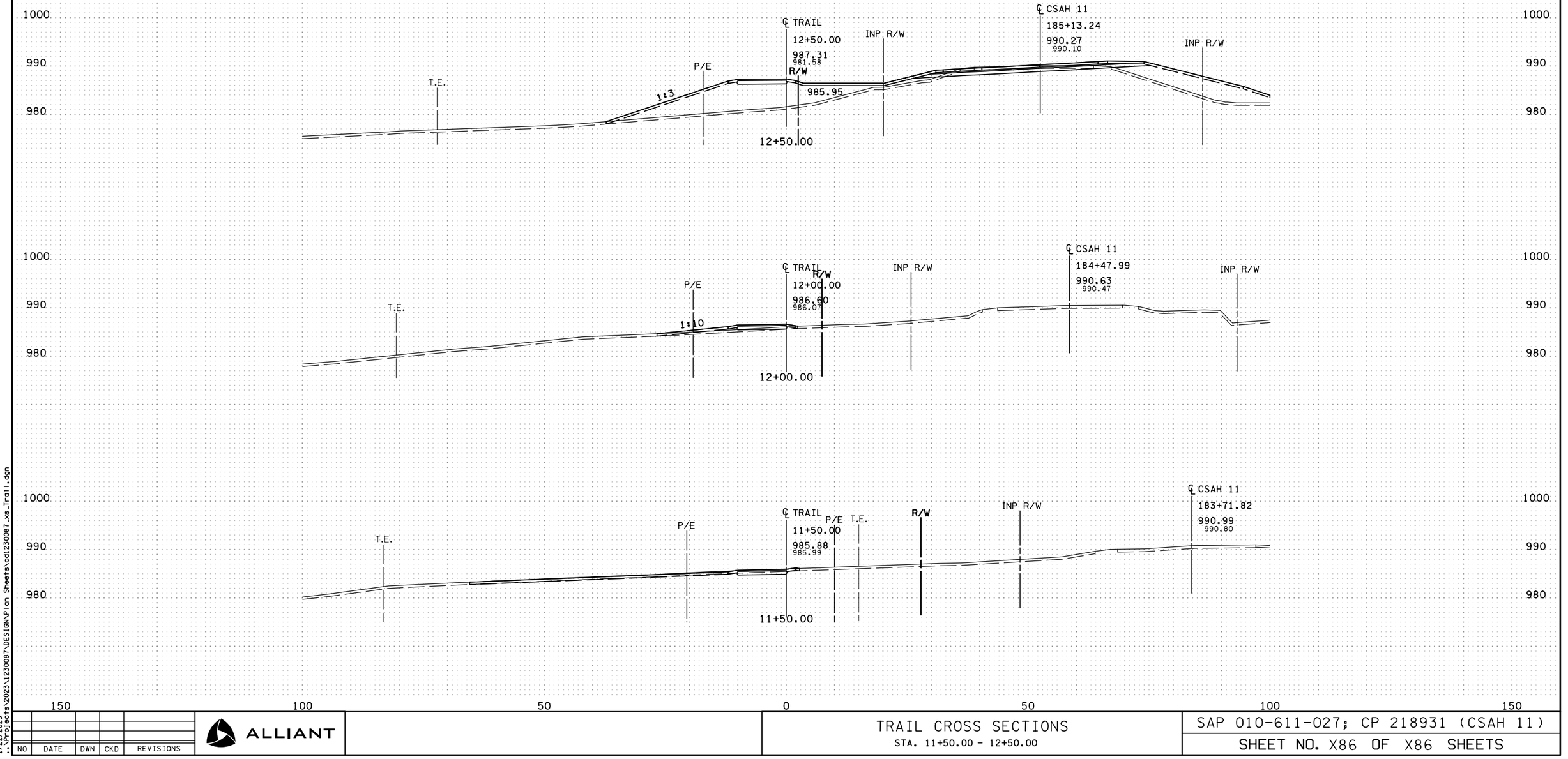

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NO	DATE	DWN	CKD	REVISIONS

ALLIANT

TRAIL CROSS SECTIONS

STA. 11+50.00 - 12+50.00

SAP 010-611-027; CP 218931 (CSAH 11)

SHEET NO. X86 OF X86 SHEETS

RELOCATE POWER POLE (BY OTHERS)

PROPOSED TRAIL ALIGNMENT

EX. FM TO BE REMOVED AFTER CONSTRUCTION OF NEW 4" FM AND LS 11

PROPOSED CSAH 11 CL

EXISTING CSAH 11 CL

RELOCATE POWER POLE FOR COUNTY ROAD 11 WIDENING PROJECT (BY OTHERS)

1 EA ABANDON LIFT STATION SEE SHEET C3.01 FOR DETAILS

TEMPORARY CONVEYANCE (SANITARY FORCEMAIN)

RELOCATE POWER POLE FOR CSAH 11 WIDENING PROJECT (BY OTHERS)

PROPOSED FORCEMAIN ALIGNMENT

TEMPORARY CONVEYANCE (SANITARY FORCEMAIN)

EXISTING UTILITY ALIGNMENT

CONSTRUCTION NOTES:

1) THE EXISTING LIFT STATION 11 AND FORCEMAIN SHALL REMAIN IN SERVICE UNTIL NEWLY CONSTRUCTED LS AND FORCEMAIN HAS BEEN INSTALLED TO M. MH 105.
2) THE CONTRACTOR SHALL COORDINATE SCHEDULING OF TEMPORARY CONVEYANCE WITH THE TH 5 - CSAH 11 RECONSTRUCTION PROJECT CONTRACTOR. TEMPORARY CONVEYANCE MAY NOT BE DISCONTINUED UNTIL THE NEW 4" FORCEMAIN IS INSTALLED FROM THE FINAL DISCHARGE MH TO M. MH 105 WITH THE TH 5 - CSAH 11 RECONSTRUCTION PROJECT.

REMOVAL LEGEND

- CLEAR & GRUB TREE
- REMOVE STORM SEWER
- ABANDON SANITARY FORCEMAIN/ SANITARY SEWER

MATCHLINE STA 207+50 SEE ABOVE

MATCHLINE STA 207+50 SEE SHEET C0.02

EXISTING CR 11 CL

EXISTING UTILITY ALIGNMENT

EX. FM TO BE REMOVED AFTER CONSTRUCTION OF NEW 4" FM AND LS 11

PROPOSED CR 11 CL

PROPOSED FORCEMAIN ALIGNMENT

RELOCATE POWER POLE (BY OTHERS)

RELOCATE POWER POLE (BY OTHERS)

TEMPORARY CONVEYANCE (SANITARY FORCEMAIN)

MATCHLINE STA 215+00 SEE SHEET C0.02

HORZ. SCALE 0 25 50 FEET

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS S. VIDMAR JR.
LIC. NO. 61498 DATE 01/10/2025

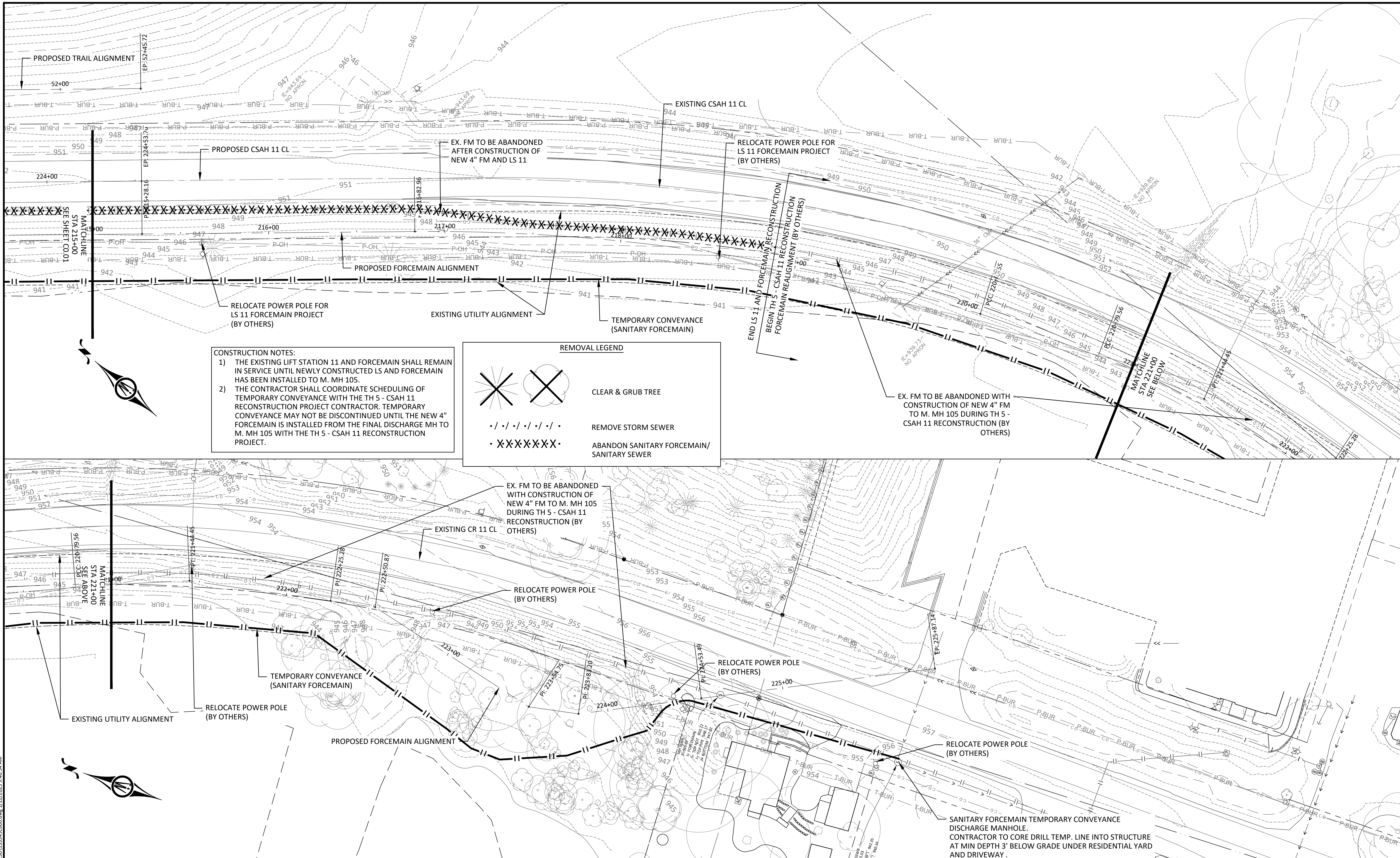
BOLTON & MENK
2638 SHADOW LANE, SUITE 200
CHASKA, MN 55318
Phone: (952) 448-8838
Email: Chaska@bolton-menk.com
www.bolton-menk.com

DESIGNED	NO.	ISSUED FOR	DATE
TSV			
DRAWN RAN			
CHECKED JZE / TSV			
CLIENT PROJ. NO. 0C1.133345			

CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
LS 11 FORCEMAIN
EXISTING CONDITIONS & REMOVALS

SHEET C0.01

H:\VICTOC\133345\CAD\C3D\133345C000.dwg 1/22/2025 9:46:51 AM



CONSTRUCTION NOTES:

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REMOVAL LEGEND

Symbol	Description
(tree symbols)	CLEAR & GRUB TREE
·/·/·/·/·/·/·	REMOVE STORM SEWER
·XXXXXXX·	ABANDON SANITARY FORCEMAIN/ SANITARY SEWER

HORZ. SCALE 0 25 50 FEET

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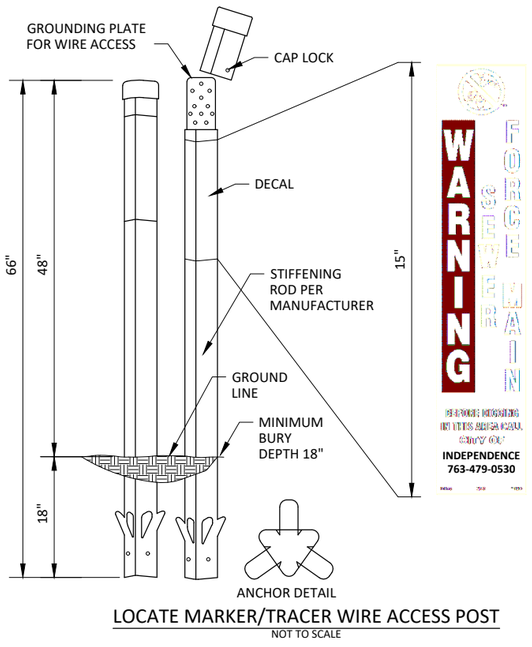
DESIGNED TSV
DRAWN RAN
CHECKED JZE / TSV
CLIENT PROJ. NO. 0C1.133345

NO.	ISSUED FOR	DATE

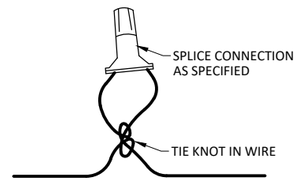
CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
LS 11 FORCEMAIN
EXISTING CONDITIONS & REMOVALS

SHEET C0.02



LOCATE MARKER/TRACER WIRE ACCESS POST

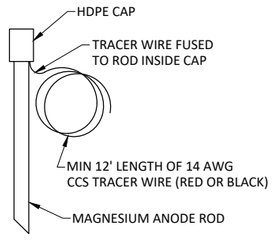
NOT TO SCALE



WHERE IN-LINE SPLICES ARE REQUIRED ALONG PIPES, THE TRACER WIRE SHALL BE KNOTTED PRIOR TO INSERTION INTO THE SPLICE CONNECTION.

IN-LINE TRACER WIRE SPLICE

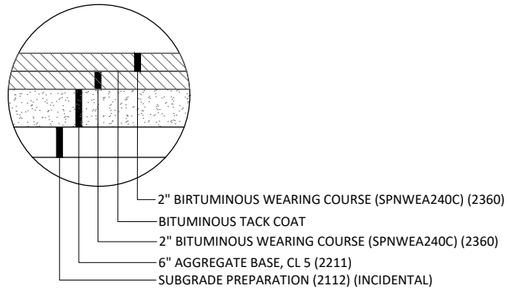
NOT TO SCALE



NOTE: MAGNESIUM ROD DIMENSIONS SHALL BE APPROX 18" LONG BY 1.3" DIA, AND APPROX 1 LB IN WEIGHT.

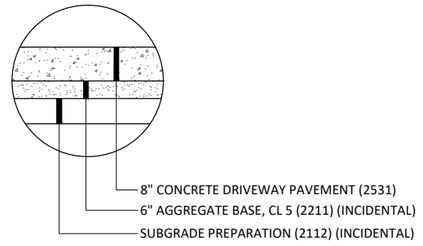
GROUNDING ELECTRODE

NOT TO SCALE



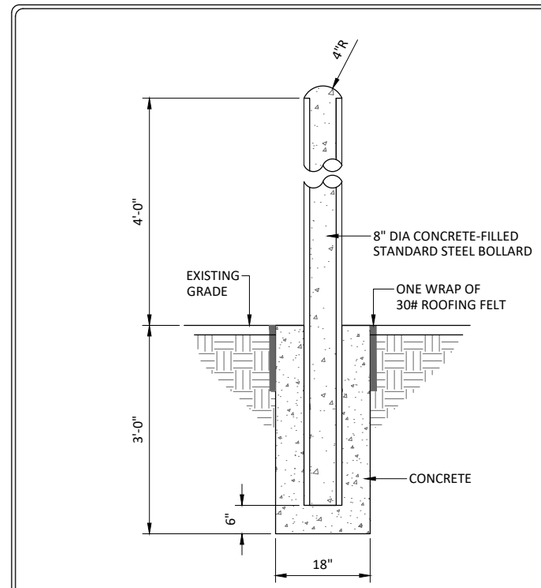
BITUMINOUS DRIVEWAY

NOT TO SCALE



CONCRETE PAVEMENT - LIFT STATION

NOT TO SCALE



BOLLARD GUARD POST

NOT TO SCALE

LAST REVISION: 04-2021

PLATE NO. 9-300

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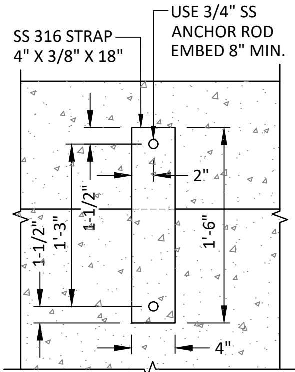
DRAWN RAN			
CHECKED JZE / TSV			
CLIENT PROJ. NO. 0C1.133345			

CITY OF VICTORIA, MINNESOTA

CR 11 UTILITY IMPROVEMENTS

DETAILS

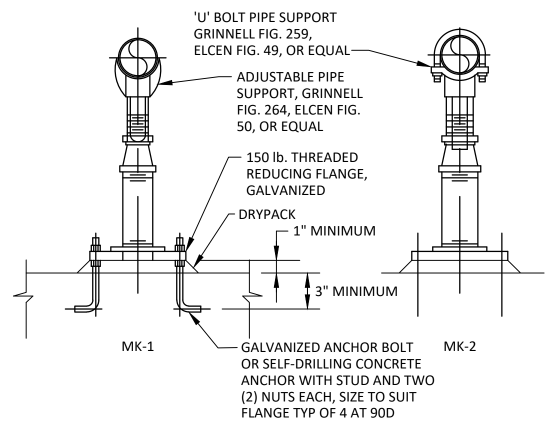
SHEET C1.01



NOTE:
CENTER STRAP ON WET WELL JOINTS

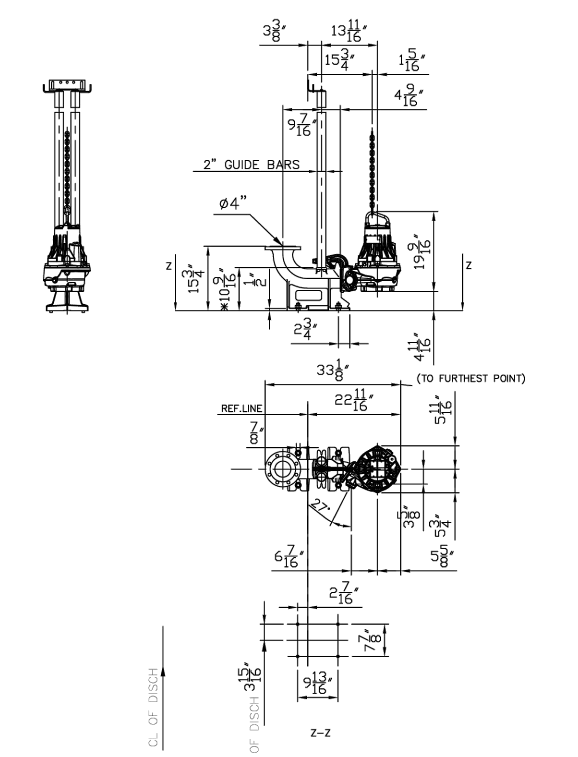
ANCHOR STRAP

NOT TO SCALE



ADJUSTABLE PIPE SUPPORT

NOT TO SCALE



*DIMENSION TO ENDS OF GUIDE BARS

Weight	Pump	Stand
kg	68	35
lbs	150	80

NP	3085	SH	
Discharge outlet DN 100	Pump outlet DN 80	Pump inlet	Suction inlet
Scale NA	Date 050718	Drawing number CUSTOM	Revision 2

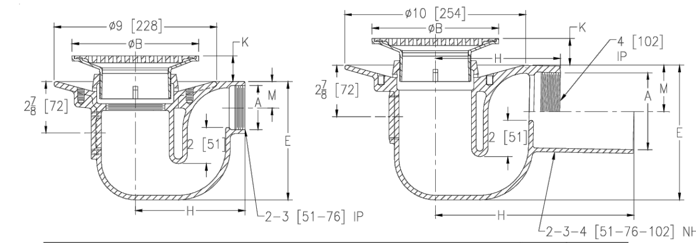
ZURN Z450B

DRUM TRAP DRAIN W/ "TYPE B" STRAINER

SPECIFICATION SHEET

TAG ________

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Dimensions In Inches								Approx Wt	Strainer Open Area
A	ØB	H		K		M			
Pipe Size	Strainer	IP	NH	Min.	Max.	IP	NH	Lbs. [kg]	Sq. In. [cm²]
2 [51] 3 [76] 4 [102]	5 [127]	6-1/16 [154] 6-7/16 [164] 6-7/8 [175]	11 [279]	7/8 [22]	2 [51]	1-15/32 [37] 2-3/32 [53] 2-19/32 [66]	2 [51] 2-9/16 [65] 2-19/32 [66]	18 [8]	8 [52]
2 [51] 3 [76] 4 [102]	6 [152]	6-1/16 [154] 6-7/16 [164] 6-7/8 [175]	11 [279]	1-1/8 [29]	2-1/4 [57]	1-15/32 [37] 2-3/32 [53] 2-19/32 [66]	2 [51] 2-9/16 [65] 2-19/32 [66]	19 [9]	9 [58]
2 [51] 3 [76] 4 [102]	7 [178]	6-1/16 [154] 6-7/16 [164] 6-7/8 [175]	11 [279]	1-1/2 [38]	2-5/8 [67]	1-15/32 [37] 2-3/32 [53] 2-19/32 [66]	2 [51] 2-9/16 [65] 2-19/32 [66]	33 [15]	12 [77]
2 [51] 3 [76] 4 [102]	8 [203]	6-1/16 [154] 6-7/16 [164] 6-7/8 [175]	11 [279]	1-1/2 [38]	2-5/8 [67]	1-15/32 [37] 2-3/32 [53] 2-19/32 [66]	2 [51] 2-9/16 [65] 2-19/32 [66]	33 [15]	18 [116]
4 [102]	10 [254]	6-7/8 [175]	11 [279]	2 [51]	3 [76]	2-19/32 [66]	2-19/32 [66]	33 [15]	26 [168]

ENGINEERING SPECIFICATION: ZURN ZN450B
Drum trap floor and shower drain, Dura-Coated cast iron body with integral trap, side outlet, seepage pan, and adjustable "TYPE B" polished, nickel bronze strainer.

OPTIONS (Check/specify appropriate options)

PIPE SIZE
2-3 [51-76]
4 [102]
2-3-4 [51-76-102]

(Specify size/type) **OUTLET**
_____ IP Threaded
_____ IP Threaded
_____ NH No-Hub

'E' BODY HT. DIM.
6-17/32 [166]
7-7/16 [189]
7-7/16 [189]

PREFIXES
____ ZB D.C.C.I. Body Assembly w/Polished Bronze Top
____ ZN D.C.C.I. Body Assembly w/Polished Nickel Bronze Top*

SUFFIXES
____ -C Clamping Collar
____ -DC Debris Cover
____ -G Galvanized Cast Iron
____ -J Auxiliary Inlet (Specify 1-1/2 [38] or 2 [51])
____ -P Trap Primer Connection (Specify 1/2 [13] or 3/4 [19])
____ -PC Protective Cover
____ -U 1-3 [25-76] High Extension Adapter
____ -V Backwater Valve (Ball Float Type)
____ -VP Vandal-Proof Secured Top
____ -Y Sediment Bucket

* Regularly furnished unless otherwise specified.

Zurn Industries, LLC | **Specification Drainage Operation**
1801 Pittsburgh Avenue, Erie, PA U.S.A. 16502 · Ph. 855-663-9876, Fax 814-454-7929
In Canada | **Zurn Industries Limited**
3544 Nashua Drive, Mississauga, Ontario L4V 1L2 · Ph. 905-405-8272, Fax 905-405-1292
www.zurn.com

Rev. H
Date: 5/23/14
C.N. No. 131017
Prod. | Dwg. No. Z450B

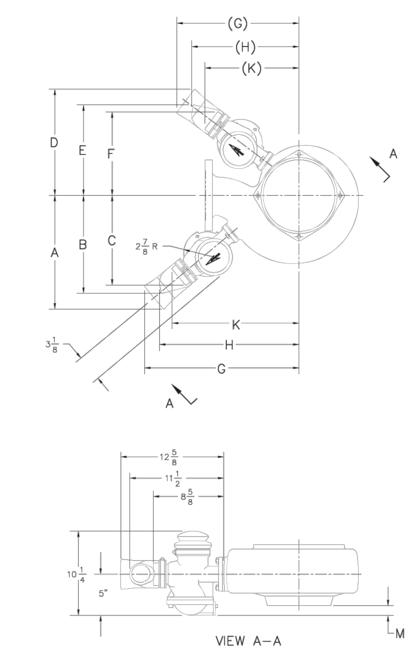
FLYGT a xylem brand

Issued: 7/11 Supersedes: 6/02

Flygt Mix-Flush System

Mix-Flush Model 4901, With 90° Discharge Elbow

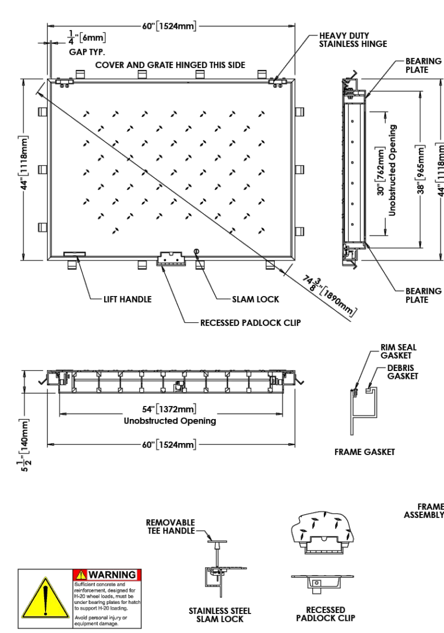
Standard Version, P/N 556 51 01 (Head must be above 10 feet, see individual curve)



* **Flush Valve for Low Head Version, P/N 556 51 02** (Head must be above 7.5 feet and below 10 feet, see individual curve)

Note: Add 2" to Dimensions A & D and 2-3/8" to B & C when using valve with straight outlet pipe.

CHS1 Heavy Duty H-20 Rated SAFE HATCH®



STYLE "CHS1" ACCESS HATCH, AS MANUFACTURED BY EJ.

MATERIAL SHALL BE 6061-T6 ALUMINUM FOR BARS, ANGLES, AND EXTRUSIONS. 1/4" DIAMOND PLATE SHALL BE 5086 ALUMINUM.

UNIT DESIGNED HEAVY DUTY, FOR 16,000 LBS + 30% IMPACT H-20 WHEEL LOADS, OVER A 10" X 20" CONTACT AREA. FRAME AND BEARING PLATE MUST BE CAST INTO AND SUPPORTED BY CONCRETE DESIGNED FOR H-20 WHEEL LOADS.

UNIT NOT SUITABLE FOR WHEEL LINE PLACEMENT.

UNIT SUPPLIED WITH A HEAVY DUTY STAINLESS STEEL PNEUMATIC SPRING, FOR EASE OF OPERATION WHEN OPENING SAFETY GRATE. GRATE SHALL BE COUNTERBALANCED, SO ONE PERSON CAN EASILY OPEN THE SAFETY GRATE.

FRAME SHALL BE OF EXTRUDED ALUMINUM. A DOVETAIL GROOVE SHALL BE EXTRUDED INTO THE SEAT OF THE FRAME FOR A 1/8" SILICONE GASKET.

EACH HATCH SHALL BE EQUIPPED WITH A STAINLESS STEEL HOLD OPEN ARM. DOOR SHALL LOCK OPEN IN THE 90 DEGREE POSITION. HOLD OPEN ARM SHALL BE FASTENED TO THE FRAME WITH A 1/2" GRADE 316 STAINLESS STEEL BOLT.

HINGES SHALL BE OF HEAVY DUTY DESIGN. MATERIAL SHALL BE GRADE 316 STAINLESS STEEL. EACH HINGE SHALL HAVE A GRADE 316 STAINLESS STEEL, 3/8" DIAMETER HINGE PIN. HINGE SHALL BE FASTENED TO THE CHANNEL FRAME AND DIAMOND PLATE WITH GRADE 316 STAINLESS STEEL BOLTS AND NY-LOCK NUTS.

ALUMINUM SHALL BE SUPPLIED WITH MILL FINISH. EXTERIOR OF FRAME WHICH COMES IN CONTACT WITH CONCRETE SHALL HAVE ONE COAT BLACK PRIMER.

EACH HATCH SHALL BE EQUIPPED WITH A STAINLESS STEEL LIFT HANDLE. LIFT HANDLE SHALL BE FLUSH WITH TOP OF 1/4" DIAMOND PLATE.

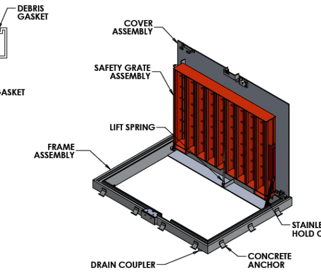
EACH "CHS1" STYLE HATCH IS SUPPLIED WITH A 1-1/2" THREADED DRAIN COUPLER ON UNDERSIDE OF CHANNEL FRAME FOR PIPE CONNECTION.

EACH HATCH SHALL BE SUPPLIED WITH A GRADE 316 STAINLESS STEEL SLAM LOCK, WITH KEY WAY PROTECTED BY A THREADED PLUG. PLUG SHALL BE FLUSH WITH THE TOP OF THE 1/4" DIAMOND PLATE. SLAM LOCK SHALL BE FASTENED WITH FOUR GRADE 316 STAINLESS STEEL BOLTS.

EACH HATCH SHALL BE SUPPLIED WITH AN RECESSED PADLOCK CLIP (PADLOCK BY OTHERS).

EACH HATCH SHALL BE EQUIPPED WITH A RIMSEAL GASKET.

EACH HATCH SHALL BE EQUIPPED WITH A DEBRIS GASKET.



Product Number
H30541893

Design Features
-Materials
Aluminum
-Design Load
Heavy Duty (Not in Driving Lane)
-Open Area

-Coating
Mill Finish
-√ Designates Machined Surface

Certification
- NPR24-001526
- 202403-03099
- Estimated Weight: 256 LBS
- Country of Origin: USA
- Revision Level: +

Drawing Revision
6/26/2024 Designer: GD
Revised By:

Disclaimer
Weights (lbs/kg), dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.

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Contact
800 626 4653
ejco.com

FLYGT a xylem brand

Issued: 7/11 Supersedes: 11/10

Flygt Mix-Flush System

Mix-Flush Model 4901, With 90° Discharge Elbow

Standard Version, P/N 556 51 01 (Head must be above 10 feet, see individual curve)

Model	Pump Housing	Pressure	A	B	C	D	E	F	G	H	K	M
3085	37975xx	LT	15 1/4	13 5/8	11 1/2				15	16 5/8	12 7/8	3/4
	38399xx	LT	13 7/8	11 7/8	11				18 7/8	17 1/8	15 5/8	1 1/4
	39890xx	MT	15	13 1/4	11 5/8				15 1/2	14	13	1 3/4
	40844xx	HT	15 3/8	13 7/8	11 1/2				12 3/8	11 1/8	10 1/2	2 5/8
	43534xx	LT	14 3/4	13	11 5/8				16 3/8	14 5/8	13 3/8	1/2
	52147xx	MT	14	12	11				15 3/4	13 7/8	12 3/8	7/8
	69328xx	MT	15	13 1/4	11 5/8				15 5/8	14	12 7/8	1 3/4
	71937xx	SH	6 5/8	5 3/4	5 1/2				19 5/8	18 1/4	15 5/8	1 3/8
	72455xx	MT	20 1/8	19	16 1/8				4 3/8	4 1/8	3 7/8	1 3/4
3102	30324xx	MT	13	11 1/8	10 3/8				18 1/4	16 3/8	14 3/4	7/8
	30335xx	LT	15 3/8	13 3/8	12 1/8				17 5/8	15 7/8	14 1/2	1 1/8
	38399xx	LT	13 7/8	11 7/8	11				18 7/8	17	15 1/2	1 1/8
	38732xx	HT/SH	14 3/4	13 5/8	10 3/4				11 5/8	11 5/8	11 5/8	1 3/4
	42962xx	MT	14 1/2	12 5/8	11 3/8				16 5/8	14 3/4	13 1/2	
	43534xx	LT	14 7/8	13	11 5/8				16 1/8	14 3/8	13 1/8	1/2
3127	30925xx	MT	15 5/8	13 5/8	12 5/8				18 7/8	17	15 5/8	1/8
	30926xx	HT/SH	15	13 3/8	11 1/8				14 7/8	13 3/4	13 1/8	1 3/8
	30927xx	LT				14 1/4	12 3/8	11 3/8	15 5/8	13 3/4	12 3/8	3/8
	30959xx	HT	14 1/4	12 3/8	11 1/8				18 3/4	16 7/8	15 1/2	2 1/4
	42644xx	MT	14 1/2	12 1/2	11 1/2				18 1/4	16 3/8	15	1/4
	43532xx	LT	16	14 1/8	12 7/8				18 3/8	16 1/2	15 1/4	
	46514xx	HT	16 1/4	14 1/4	13 1/4				17 3/4	16	14 1/2	1/2
	42960xx	MT				15 5/8	13 3/4	12 5/8	17 1/8	15 3/8	13 7/8	
3140	38105xx	LT				15	13 1/8	12 3/8	17 3/4	15 7/8	14 1/4	
	41209xx	MT	15 1/2	13 5/8	12 7/8				21 5/8	19 5/8	18 1/8	
	42961xx	MT				15 5/8	13 3/4	12 5/8	17 1/8	15 3/8	13 7/8	2 3/8
	55601xx	HT	15 3/4	13 7/8	12 3/4				18 1/4	16 3/8	14 7/8	1/2
	55601xx	HT	16 1/4	14 1/2	13 1/4				17 3/4	15 7/8	14 3/8	
3152	39101xx	HT	14	12	11 3/8				20 3/4	18 7/8	17 1/8	1/4
	40851xx	HT/SH	15 1/4	13 1/4	12 1/4				19 1/4	17 1/2	16	1/2
	41209xx	MT	15 1/2	13 5/8	12 7/8				21 5/8	19 5/8	18 1/8	
	43796xx	LT				17	15 1/8	13 7/8	17	15 1/4	13 7/8	3
	42961xx	MT				15 5/8	13 3/4	12 5/8	17 1/8	15 3/8	13 7/8	2 3/8
	55601x	HT	15 3/4	13 7/8	12 3/4				18 1/4	16 3/8	14 7/8	1/2
	60650xx	MT	15 1/2	13 5/8	12 7/8				21 5/8	19 5/8	18 1/8	1 3/4
3153	64362xx	HT				14 1/2	12 5/8	11 3/4	16 3/4	14 7/8	13 1/2	3/4
	64363xx	MT				14 1/2	12 5/8	11 3/4	16 3/4	14 7/8	13 1/2	3/4
	64364xx	LT				14 1/2	12 5/8	11 3/4	16 3/4	14 7/8	13 1/2	3/4
	65478xx	LT				16 7/8	14 7/8	13 3/4	16 7/8	15	13 3/4	
	68127xx	SH				15 3/4	13 7/8	12 1/2	15 3/4	13 7/8	12 1/2	1 1/8
	70227xx	MT				14 5/8	12 5/8	11 3/4	16 7/8	15	13 5/8	1/4
	70281xx	HT				14 5/8	12 5/8	11 3/4	16 7/8	15	13 5/8	7/8
	70284xx	SHT				15 3/4	13 7/8	12 5/8	15 3/4	13 7/8	12 5/8	7/8
	70287xx	LT 4pol				12 1/2	14 5/8	13 3/8	16 1/2	14 5/8	13 3/8	1 3/8
	70465xx	LT 6pol				17	15	13 7/8	17	15 1/8	13 7/8	2
3170	52121xx	LT	17 5/8	15 5/8	15				26 3/8	24 1/2	22 7/8	
	53523xx	MT				17	15 1/8	14	18 1/8	16 1/4	14 7/8	
	53530xx	HT				17 1/2	15 5/8	14 3/8	17 1/2	15 5/8	14 3/8	
	64915xx	MT				17	15 1/8	14	18 1/8	16 1/4	14 7/8	

* **Flush Valve for Low Head Version, P/N 556 51 02** (Head must be above 7.5 feet and below 10 feet, see individual curve).
Note: Add 2" to Dimensions A & D and 2-3/8" to B & C when using valve with straight outlet pipe.

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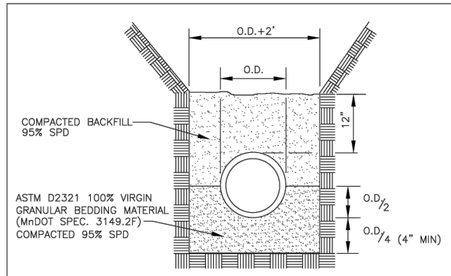
CITY OF VICTORIA, MINNESOTA

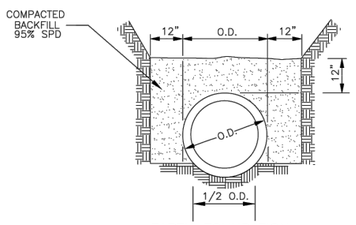
CR 11 UTILITY IMPROVEMENTS

DETAILS

SHEET C1.02



GRANULAR MATERIAL BEDDING
(TO BE USED WHERE, IN THE OPINION OF THE ENGINEER, UNSTABLE MATERIAL PREVENTS USE OF THE "EARTH FOUNDATION" DETAIL)



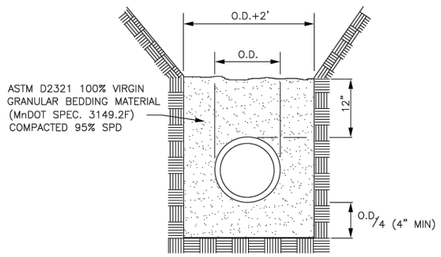
EARTH FOUNDATION
(EXCEPT PLASTIC PIPE)

PIPE FOUNDATION DETAILS

FEBRUARY 2022

CITY OF VICTORIA

STANDARD DRAWING NO. 101 Victoria



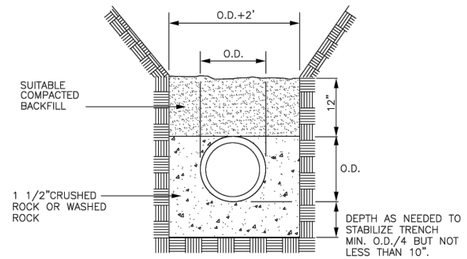
NOTE: PIPE ZONE COMPACTION PER MNDOT 2105.3F1 SPECIFIED DENSITY METHOD. 95% SPD MINIMUM.

GRANULAR MATERIAL BEDDING METHOD
(FOR PLASTIC PIPE)

FEBRUARY 2022

CITY OF VICTORIA

STANDARD DRAWING NO. 103 Victoria

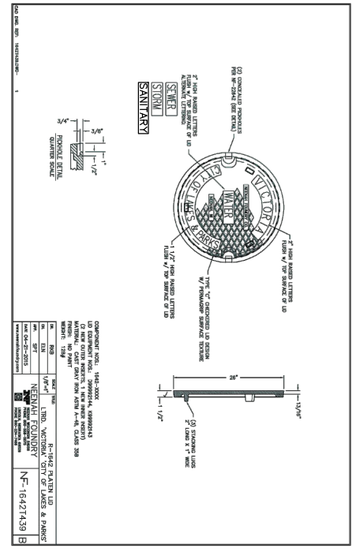


SPECIAL FOUNDATION FOR
STABILIZING OF TRENCH
(AS DIRECTED BY ENGINEER)

FEBRUARY 2022

CITY OF VICTORIA

STANDARD DRAWING NO. 105 Victoria

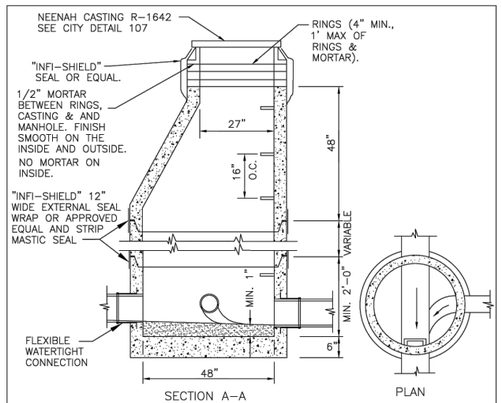


R-1642 SPECIALIZED MANHOLE COVER

FEBRUARY 2022

CITY OF VICTORIA

STANDARD DRAWING NO. 107 Victoria



NO WOOD SHALL BE USED FOR ADJUSTING CASTING; CEMENT MORTAR ONLY.

CAST IRON MANHOLE FRAME & COVER AS PER SPECIFICATIONS.

MANHOLE STEPS SHALL BE CAST IRON, ALUMINUM OR STEEL REINFORCED PLASTIC, PER ASTM C478. STEP LOCATION SHALL BE AS NOTED IN THE SPECIFICATIONS.

PRECAST REINFORCED CONCRETE MANHOLE SECTIONS PER ASTM C478, FURNISHED WITH O-RING GASKETS AND LUBRICANT EXCEPT AS OTHERWISE SPECIFIED. A 12" OR 18" BARREL SECTION SHALL BE INSTALLED UNDER THE CONE WHENEVER POSSIBLE.

PIPE CONNECTIONS TO MANHOLE SHALL BE MADE WITH A FLEXIBLE WATER TIGHT CONNECTION AND CEMENT MORTAR. INSIDE SURFACE SHALL BE FINISHED SMOOTH.

COPPERHEAD LD14GTP-ADJ SNAKE PIT SHALL BE USED FOR OFF ROAD STRUCTURES.

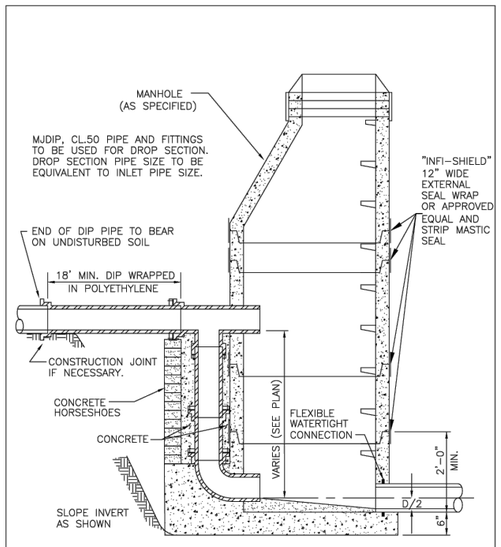
ANY UTILITY MORTAR SHALL MEET ASTM C270 AND C1714. SPEC MIX UNDERGROUND UTILITY MORTAR OR APPROVED EQUAL

SANITARY SEWER MANHOLE, TYPE 301
(PIPES 27" OR LESS)

FEBRUARY 2022

CITY OF VICTORIA

STANDARD DRAWING NO. 301 Victoria

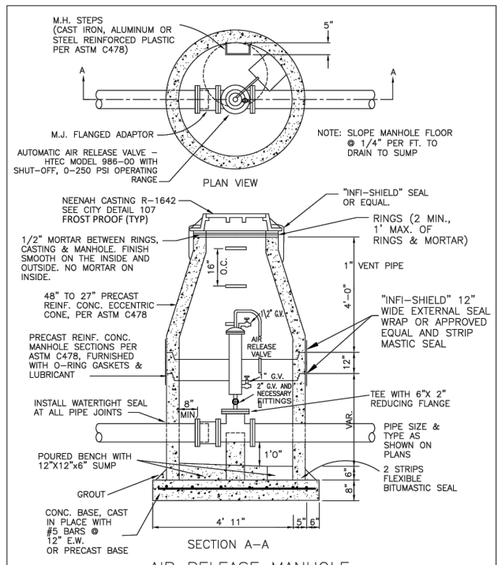


SANITARY SEWER OUTSIDE DROP

FEBRUARY 2022

CITY OF VICTORIA

STANDARD DRAWING NO. 306 Victoria

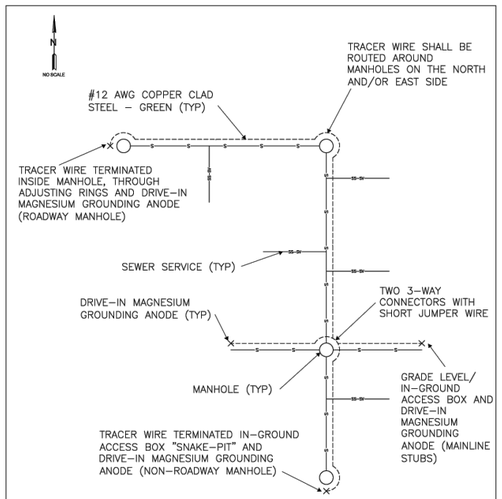


AIR RELEASE MANHOLE
(FOR SEWAGE FORCEMAINS)

FEBRUARY 2022

CITY OF VICTORIA

STANDARD DRAWING NO. 314 Victoria



NOTES:
1. WIRE SHOWN AWAY FROM PIPE FOR CLARITY. WIRE SHALL BE INSTALLED ON THE BOTTOM SIDE OF THE PIPE BELOW THE SPRING LINE. THE WIRE SHALL BE FASTENED TO THE PIPE WITH TAPE OR PLASTIC TIES AT 5' INTERVALS.

TRACER WIRE PLAN (SEWER)

FEBRUARY 2022

CITY OF VICTORIA

STANDARD DRAWING NO. 315 Victoria

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THOMAS S. VIDMAR JR.
LIC. NO. 61498 DATE 01/10/2025

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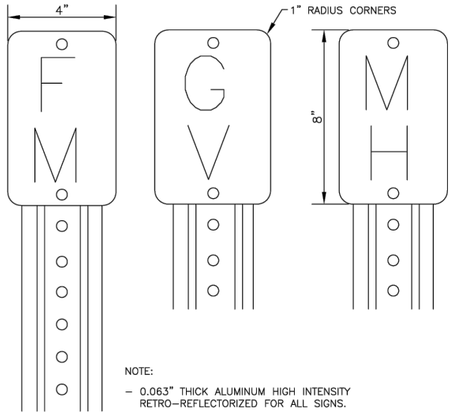
CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
MANHOLES

SHEET C1.03



NOTE:

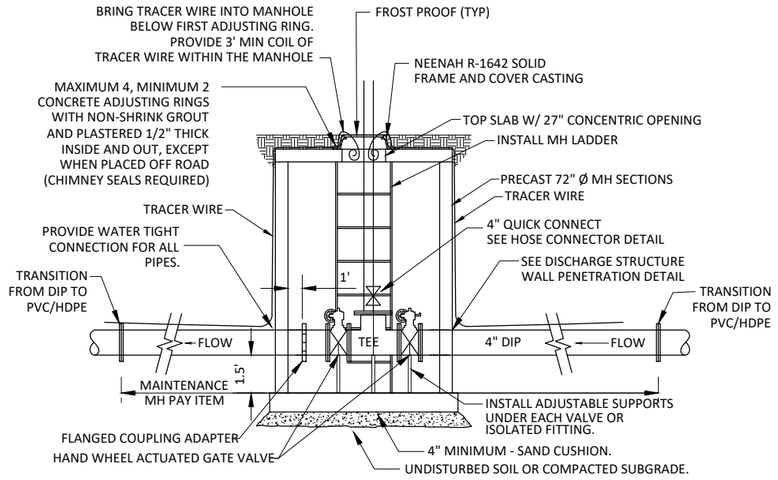
- 0.063" THICK ALUMINUM HIGH INTENSITY RETRO-REFLECTORIZED FOR ALL SIGNS.
- BLACK LETTERS ON WHITE BACKGROUND FOR MANHOLE.
- WHITE LETTERS ON BLUE BACKGROUND FOR GATE VALVE.
- WHITE LETTERS ON GREEN BACKGROUND FOR FORCEMAIN – "FM".
- U-CHANNEL POST, MINIMUM 3.0 LB./FT., 7.5' LONG, GALVANIZED & BURIED 2.5'.
- PLACE MARKERS AT ALL OFF ROAD MANHOLES AND GATE VALVES.

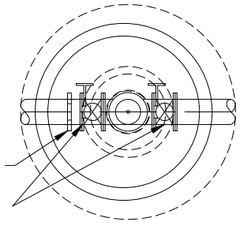
OFF ROAD
STRUCTURE MARKERS

FEBRUARY 2022

CITY OF VICTORIA

STANDARD DRAWING NO.
705
Victoria

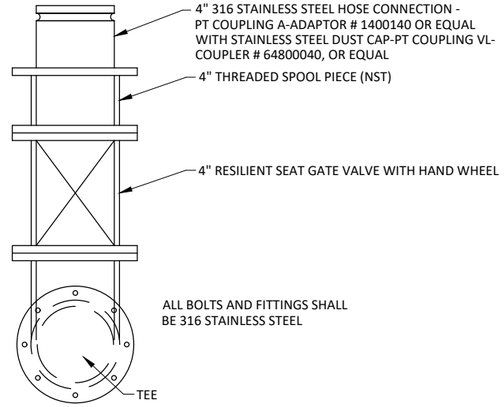




NOTE:

1. EXTEND DUCTILE IRON PIPE (CL.52) TO UNDISTURBED SOIL EACH SIDE OF STRUCTURE USE TRANSITION FITTINGS AS REQUIRED. ALL DIP PIPE & FITTINGS SHALL BE WRAPPED WITH POLYETHYLENE ENCASEMENT MATERIAL (INCIDENTAL)
2. DIP & TRANSITION FITTINGS SHALL BE INCLUDED IN UNIT COST FOR MAINTENANCE MANHOLE

MAINTENANCE MANHOLE
NOT TO SCALE



HOSE CONNECTOR DETAIL

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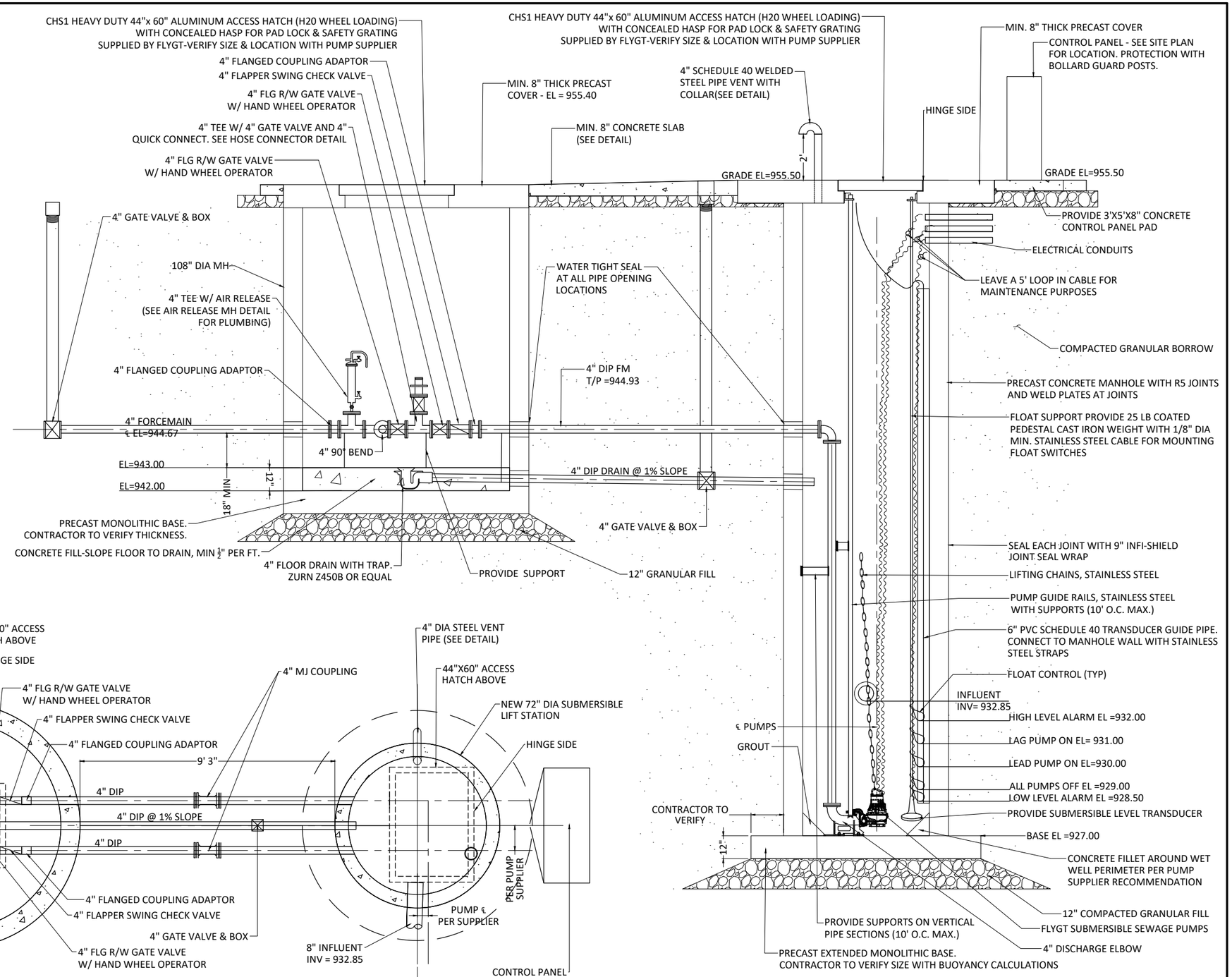
CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
MANHOLES

SHEET
C1.04

GENERAL NOTES:

1. SEE CITY OF VICTORIA LIFT STATION STANDARDIZATION POLICY FOR DETAILS ON LIFT STATION AND VALVE MANHOLE STRUCTURES AND EQUIPMENT.
2. VERIFY SUBMERSIBLE PUMP PLACEMENT AND ALIGNMENT WITH PUMP SUPPLIER.
3. CONTRACTOR TO VERIFY ORIENTATION OF LIFT STATION AND PIPING PRIOR TO INSTALLATION OF LIFT STATION.
4. ACCESS HATCH SIZE AND LOCATION SHALL BE VERIFIED WITH PUMP SUPPLIER.
5. ALL BOLTS AND HARDWARE INSIDE WET WELL AND VALVE MANHOLE SHALL BE STAINLESS STEEL.
6. ALL PRECAST SECTIONS SHALL BE JOINED WITH WELD PLATES AT EACH JOINT-4 AT 90° SPACING. PLATES MAY BE INTERIOR OR EXTERIOR. INTERIOR PLATES SHALL BE STAINLESS STEEL. EXTERIOR PLATES SHALL BE GALVANIZED OR STAINLESS STEEL.
7. PROVIDE EXTERNAL JOINT SEAL, INFRASHIELD OR EQUAL, ON ALL STRUCTURE JOINTS.
8. CONTRACTOR SHALL SUBMIT BUOYANCY CALCULATIONS DETERMINING DIAMETER OF EXTENDED MONOLITHIC LIFT STATION BASE OR THE DEPTH OF THE CONCRETE BALLAST FOR THE BASE OPTION SHOWN ON THIS SHEET.
9. THIS STANDARD PLAN IS BASED ON 4" DIAMETER PUMP DISCHARGE PIPING AND FORCEMAIN. VALVE MANHOLE DIAMETER MAY NEED TO INCREASE FOR LARGER DIAMETER PIPING.



NOTE:
SEE PLAN DRAWING FOR CONTINUATION

PLAN
NOT TO SCALE

SECTION

DUPLEX PUMP LIFT STATION
NOT TO SCALE

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CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
LIFT STATION

SHEET C1.05

1 EA REMOVE LIFT STATION
(REMOVAL OF MANHOLE STRUCTURES, BACKFILL VOID FROM STRUCTURES, REMOVAL OF LIFT STATION PLUMBING, PUMPS, APPURTENANT ELECTRICAL COMPONENTS, & CABINETS SHALL BE CONSIDERED INCIDENTAL TO REMOVE LIFT STATION.)

LEGEND

- CONCRETE PAVEMENT
- BITUMINOUS PAVEMENT
- BOLLARD

CONSTRUCTION NOTES:

1) THE CITY OF VICTORIA PUBLIC WORKS WILL VERIFY EXISTING LIFT STATION EQUIPMENT THAT WILL BE SALVAGE BY THE CONTRACTOR AND RETAINED BY THE CITY.
2) ALL EXISTING LIFT STATION EQUIPMENT NOT RETAINED BY THE CITY SHALL BE CONTRACTORS RESPONSIBILITY TO DISPOSE OF.
3) SEE DETAIL SHEETS C4.01 FOR SITE INFORMATION AND SHEET C1.05 FOR LIFT STATION INFORMATION.
4) ANY TRENCHLESS PIPE SHALL BE INSTALLED WITH A MIN. OF (2) 10# AUG. TRACER WIRES.
5) GROUNDING ANODES SHALL BE INSTALLED AT ALL TRACER WIRE TERMINATION POINTS AND/OR WHERE ALL LOCATE MARKER POSTS ARE INSTALLED.
6) SEE SHEET C1.01 FOR BOLLARD DETAILS.
7) THE EXISTING LIFT STATION 11 AND FORCEMAIN SHALL REMAIN IN SERVICE UNTIL NEWLY CONSTRUCTED LS AND FORCEMAIN HAS BEEN INSTALLED TO M. MH 105.
8) THE CONTRACTOR SHALL COORDINATE SCHEDULING OF TEMPORARY CONVEYANCE WITH THE TH 5 - CSAH 11 RECONSTRUCTION PROJECT CONTRACTOR. TEMPORARY CONVEYANCE SHALL NOT BE DISCONTINUED UNTIL THE NEW 4" FORCEMAIN IS INSTALLED FROM THE FINAL DISCHARGE MH TO M. MH 105 WITH THE TH 5 - CSAH 11 RECONSTRUCTION PROJECT.

CSAH 11

8" PVC SAN

T-BUR

H

M

CP

955.20

954.93

954.70

R5'

4.42%

3.69%

955.50

955.20

955.25

APPROX. EXISTING UTIL. EASEMENT

TRANSFORMER

CONTROL PANEL

4" GV & BOX
(FLOOR DRAIN)

4" DIP SAN FM

4" DIP FLOOR DRAIN

4" DIP SAN FM

18' C-C

4" GV & BOX

DIP TO PVC TRANSITION

PI: 202+33.09

4" DIP SAN FM

4" PVC SAN FM

203+00

202+00

108" PRECAST CONC.
VALVE VAULT
R = 955.40

YARD LIGHT

72" PRECAST CONC.
LIFT STATION W. WELL
R = 955.50

TEMP
EASEMENT

955

954

953

952

957

956

1 REVISED NOTES FROM ABANDON LIFT STATION TO REMOVE LIFT STATION.

HORZ. SCALE 0 5 10 FEET

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CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
LIFT STATION SITE PLAN

SHEET C3.01

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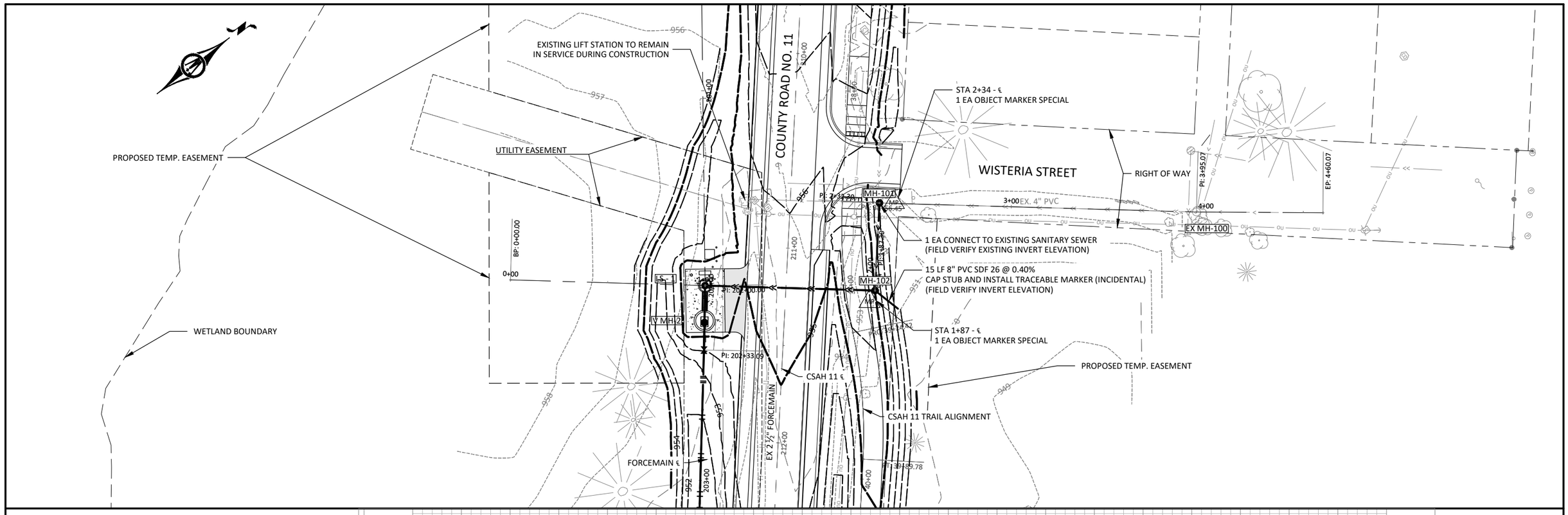

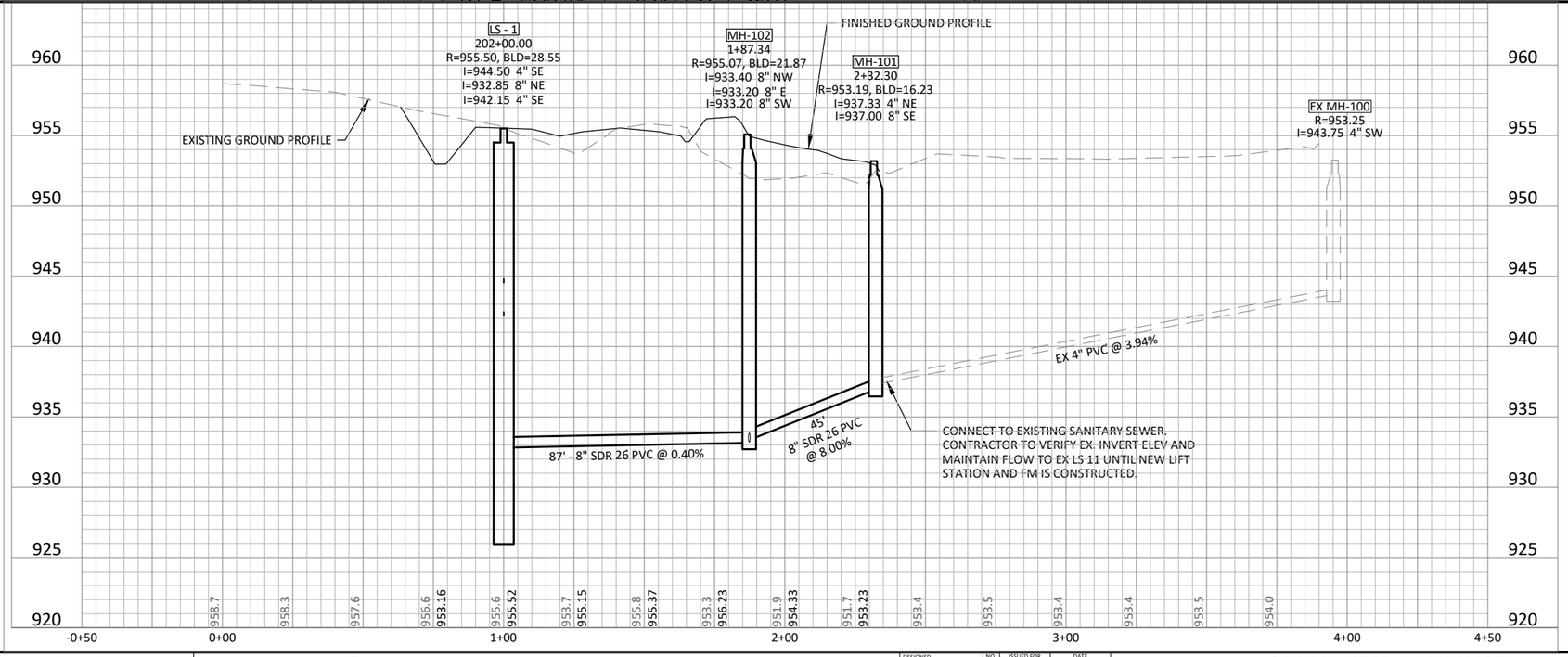

HORZ. SCALE 0 25 50 FEET

VERT. SCALE 0 5 10 FEET

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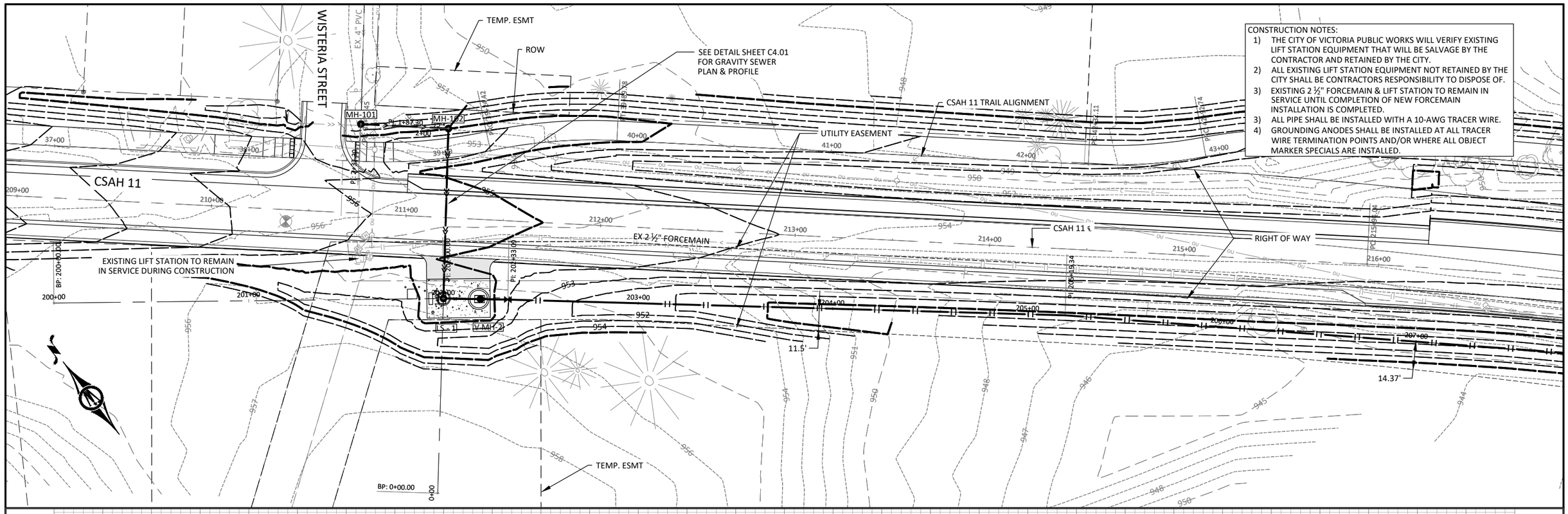
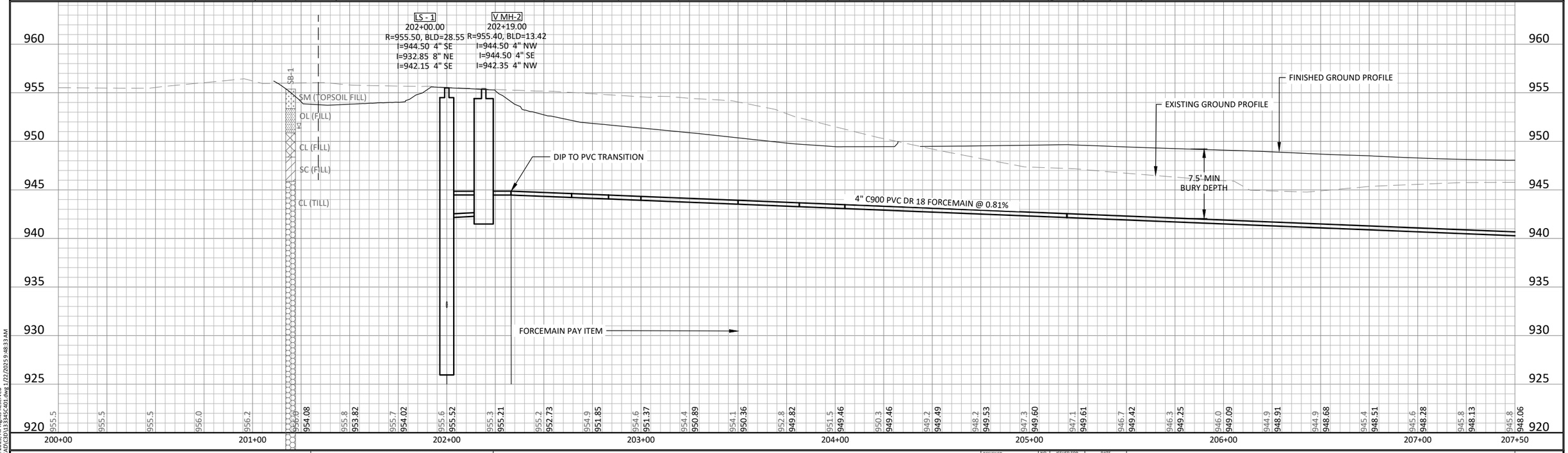
CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
FORCEMAIN
SANITARY SEWER PLAN & PROFILE

SHEET C4.01





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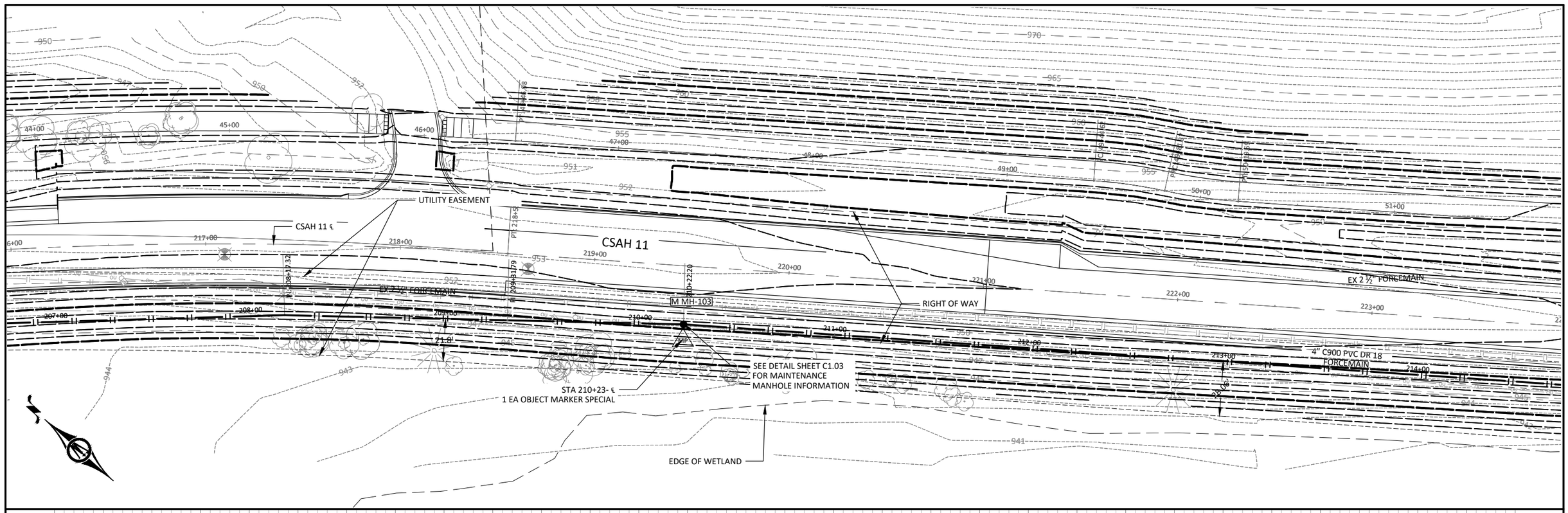
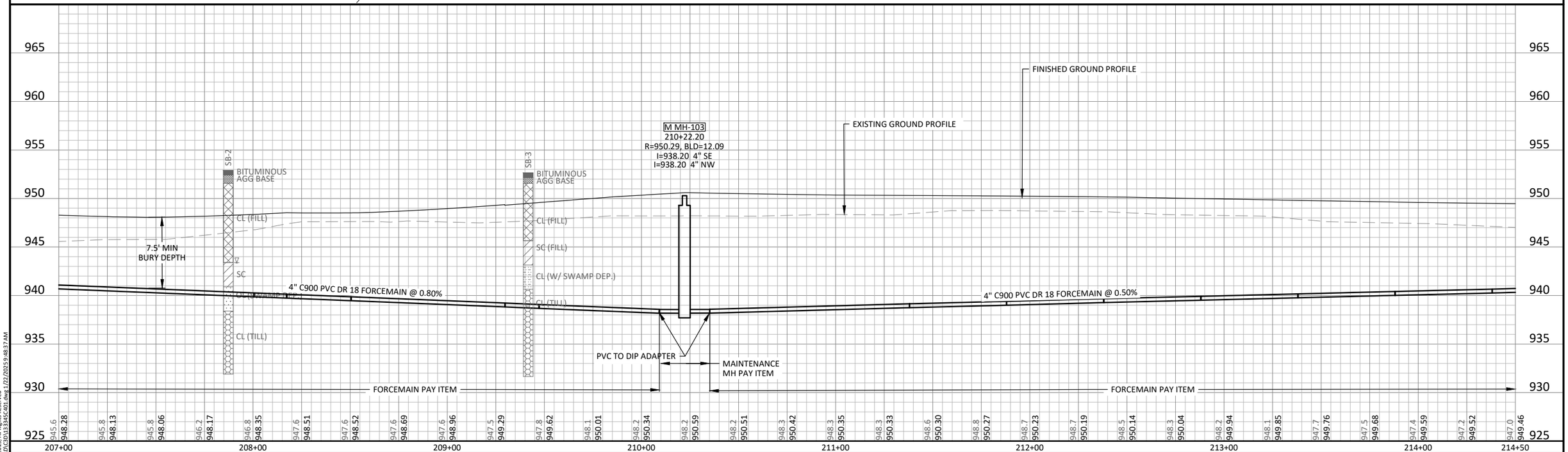
FORCEMAIN
FORCEMAIN PLAN & PROFILE

SHEET C4.02





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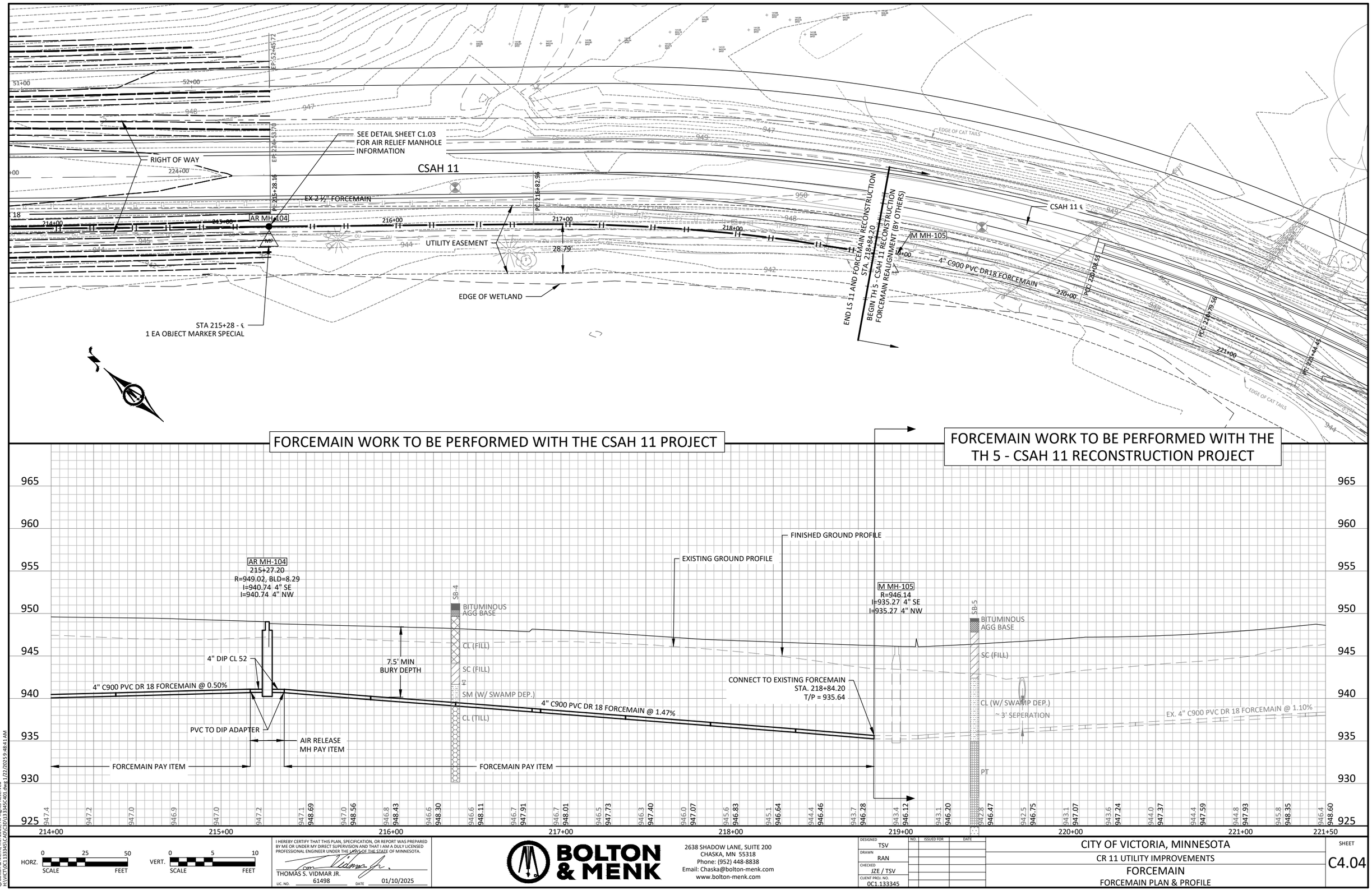
FORCEMAIN
FORCEMAIN PLAN & PROFILE

SHEET C4.03



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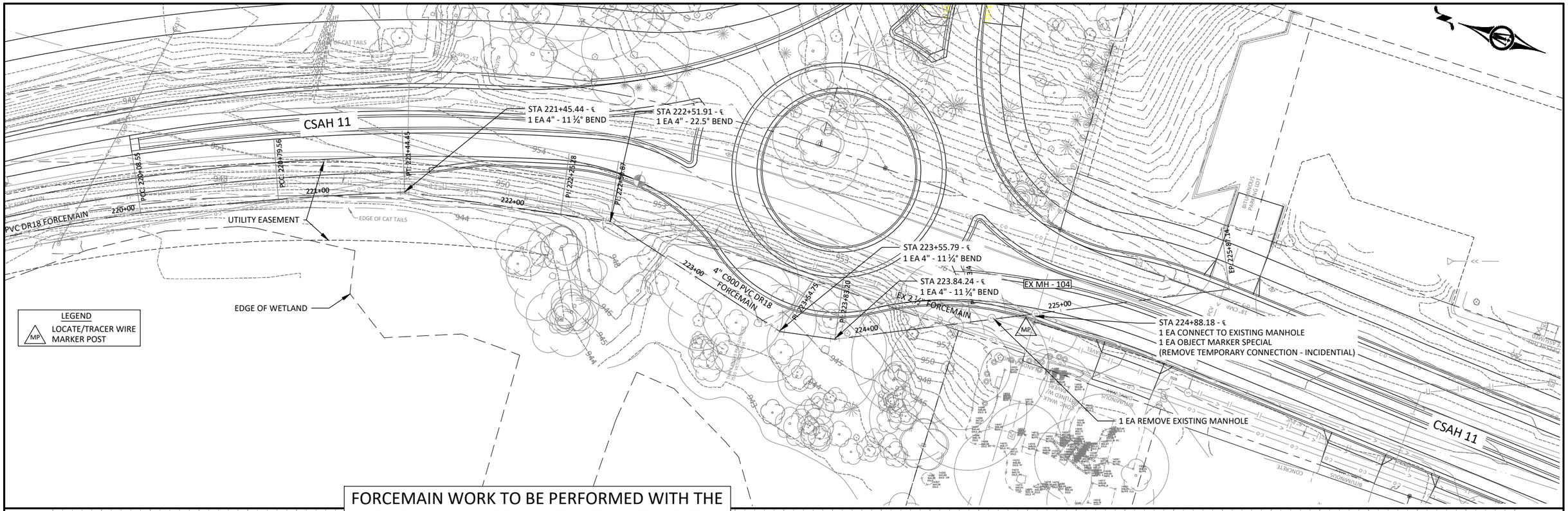
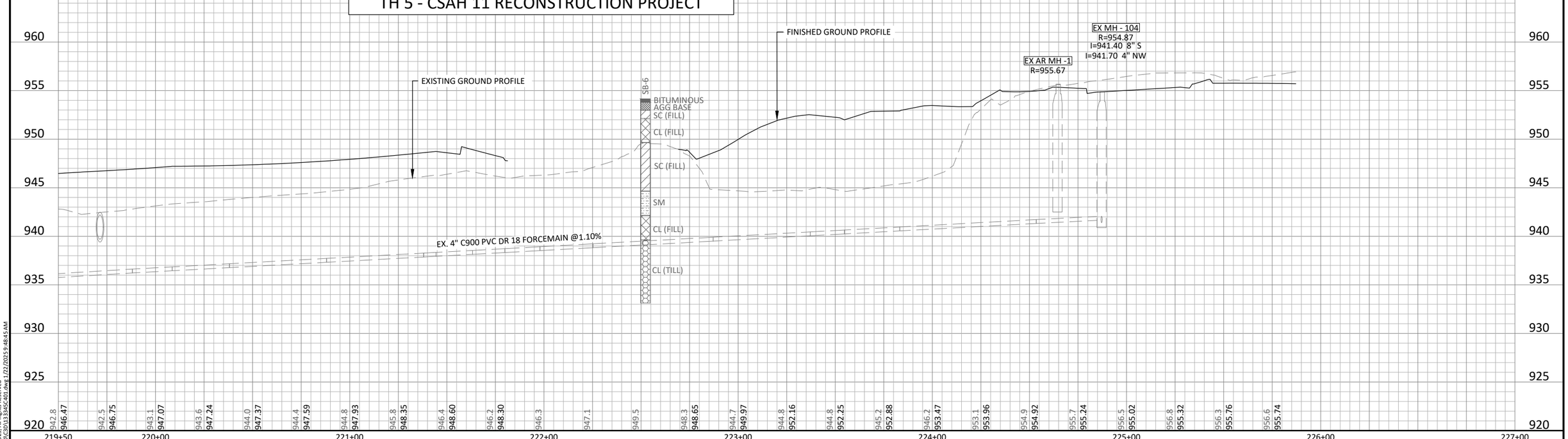
FORCEMAIN
FORCEMAIN PLAN & PROFILE

SHEET C4.04



FORCEMAIN WORK TO BE PERFORMED WITH THE TH 5 - CSAH 11 RECONSTRUCTION PROJECT



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FORCEMAIN
SANITARY SEWER PLAN & PROFILE

SHEET C4.05

LUMINAIRE & DEVICE LEGEND

WALL MOUNTED LUMINIARE. ALL LUMINAIRES: LOWERCASE LETTER INDICATES SWITCHLEG

B1/3 — J (GFI) WP — POLE MOUNTED LUMINAIRE, WITH WP GFI OUTLET.

BB1/3 — GROUND-MOUNTED BUILDING SIGN FLOODLIGHT.

BB2/3 — GROUND-MOUNTED LANDSCAPE LIGHTING.

C1/3 — LUMINAIRE.

D/3 — LUMINAIRE.

E/3 — EMERGENCY FIXTURE. AIM FOR MAXIMUM COVERAGE OF EGRESS PATHS.

F/3 — HAZARDOUS LOCATION FIXTURE, WITH RATING PER LIGHT FIXTURE SCHEDULE.

H/3 — STANCHION MOUNTED LUMINAIRE.

X/3 — COMBINATION EXIT WITH HEADS. ARROWS, IF ANY, INDICATE CHEVRON ARROWS WHERE REQUIRED. AIM HEADS FOR MAXIMUM COVERAGE OF EGRESS PATHS.

3way $ a — SWITCH WITH NO MARKING IS SINGLE POLE, 2P=DOUBLE POLE, 3 IS 3way, 4=4way, M=MOTOR RATED DISC SW, D=DIMMER, SMALL LETTER INDICATES SWITCH LEG.

V / D — TELEPHONE/DATA OUTLET (OR PROVISION). V=VOICE LINE, D=DATA. 4"x 4" DEEP BOX W/ SINGLE GANG MUD RING & 1" CONDUIT TO DESTINATION.

VS TYPE 1 — OCCUPANCY SENSOR FOR LIGHTING CONTROL, WALL-MOUNTED, ARROW INDICATES DIRECTIONALITY. SEE SPECIFICATION FOR TYPE.

VS TYPE 2 — OCCUPANCY SENSOR FOR LIGHTING CONTROL, CEILING-MOUNTED, SEE SPECIFICATION FOR TYPE.

D — DAYLIGHT SENSOR, SEE SPECIFICATIONS.

2 / 48" / GFI / WP — ISO / EP — DUPLEX CONVENIENCE RECEPTACLE. NUMERAL INDICATES BRANCH CIRCUIT, INCHES ABOVE FLOOR IF OTHER THAN PER SPECIFICATION. TEXT INDICATES SPECIAL CONDITIONS: WP=WEATHERPROOF, GFI=GROUND FAULT INTERRUPTER, EP=EXPLOSIONPROOF, ISO=ISOLATED GROUND. TYPICAL.

2 / 48" / GFI — ISO / EP — DOUBLE DUPLEX CONVENIENCE RECEPTACLE.

SURFACE OR WALL JUNCTION BOX.

SURFACE OR WALL THERMOSTAT.

F D — FIRE ALARM DAMPER SUPERVISORY CONNECTION.

F F — FIRE ALARM FLOW SWITCH CONNECTION.

F T — FIRE ALARM TAMPER SWITCH CONNECTION.

F M — FIRE ALARM MANUAL STATION.

48" — NEMA CONFIG 6-30R — 3 #10AWG-3/4" — SPECIAL PURPOSE RECEPTACLE, NEMA CONFIGURATION DEVICE AND HOMERUN SIZE WHERE INDICATED.

2hp — MD — MOTOR, PROVIDE DISCONNECT AS INDICATED. MD=MOTORIZED DAMPER.

◆ EQUIP CONN'S — EQUIPMENT CONNECTION, AS NOTED ON DRAWINGS

NEMA 3R — DISCONNECT SWITCH IN NEMA ENCLOSURE

NEMA 1 — COMBINATION STARTER IN NEMA ENCLOSURE

CS — STRUT MOUNTING STAND, SHOWN W/ DISC AND CONTROL STATION. SEE TYPICAL MOUNTING DETAIL.

LP1 — ELECTRICAL PANEL. SEE PANEL SCHEDULE.

CIRCUITRY - EXPOSED, SURFACE MOUNTED

CIRCUITRY - BELOW GRADE OR UNDERFLOOR

CIRCUITRY - CONCEALED IN WALLS OR CEILING

SOLID SLASHES INDICATE NUMBER OF #12 AWG WIRES IN CONDUIT. i INDICATES AN INSULATED GROUND CONDUCTOR, 'N' INDICATES OVERSIZED NEUTRAL CONDUCTOR (#10AWG).

EXISTING CIRCUITRY

SCHEMATIC SYMBOLS

PRESS TO TEST LAMP-LETTER DENOTES COLOR

RUN / OFF / AUTO — SELECTOR SWITCH

TORQUE SWITCH - NC, NO

SHEAR PIN SWITCH - NC, NO

CIRCUIT BREAKER

MAGNETIC TRIP

THERMAL TRIP

RTM — RUNNING TIME METER

CONTACT - NC, NO

52 / M — OPERATING COIL, LETTER OR NUMBER DENOTES DEVICE

PLUG AND RECEPTACLE

PUSHBUTTON CONTACT - NC, NO

PUSHBUTTON SWITCH, MUSHROOM HEAD - NC, NO

DOUBLE CIRCUIT PUSHBUTTON SWITCH

MAINTAINED CONTACT PUSHBUTTON SWITCH

ENERGIZED TIMER CONTROL - NC, NO

DE-ENERGIZED TIMER CONTROL - NC, NO

FLOW SWITCH - NC, NO

LIQUID LEVEL SWITCH - NC, NO

TEMPERATURE SWITCH - NC, NO

PRESSURE SWITCH - NC, NO

LIMIT SWITCH - NC, NO

FUSE

DISCONNECT SWITCH

FUSED SWITCH

GROUND CONNECTION

CHASSIS GROUND

(R) — INDICATING LIGHT - LETTER DENOTES COLOR

CONTROL TRANSFORMER

THERMAL OVERLOAD TRIP UNITS

STABS

DEVICE MOUNTED IN MOTOR CONTROL CENTER (MCC)

DEVICE MOUNTED IN FIELD

DEVICE MOUNTED IN CONTROL PANEL

ONE-LINE DIAGRAM SYMBOLS

52 — AIR CIRCUIT BREAKER - DRAW OUT TYPE WITH OPERATING MECHANISM

DISCONNECT SWITCH

FUSED SWITCH

LA — LIGHTNING ARRESTER - GENERAL

30A — FUSE - NUMBER DENOTES RATING

GROUND CONNECTION

VS — CONTROL OR INSTRUMENT SWITCH - LETTERS DENOTES FUNCTION

M / 52 — RELAY OR CONTROL DEVICE - NUMBER DENOTES FUNCTION, AMERICAN NATIONAL STANDARD (ANSI)

POTENTIAL TRANSFORMER - DRAW OUT TYPE WITH PRIMARY FUSES

CT — CURRENT TRANSFORMER

CS — CONTROL STATION

AM — INSTRUMENT - LETTER DENOTES TYPE

(R) — INDICATING LIGHT - LETTER DENOTES COLOR

20 — MOTOR - NUMBER DENOTES HORSEPOWER

MOTOR CIRCUIT PROTECTOR (MCP)

MOLDED CASE CIRCUIT BREAKER

CONTROL TRANSFORMER

RTM — RUNNING TIME METER

THERMAL OVERLOAD TRIP UNITS

STABS

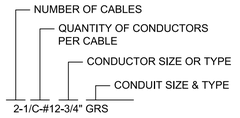
POWER TRANSFORMER

SURGE CAPACITORS

POWER FACTOR CAPACITORS WITH FUSING AND INDICATING LIGHTS

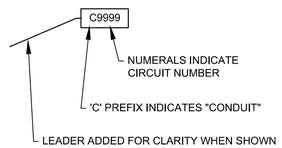
51N — RELAY WITH SHORTING CONTACTS

CIRCUIT LEGEND



CIRCUIT DESIGNATOR

REFER TO CABLE & CONDUIT SCHEDULE(s)



ABBREVIATIONS

A	AMPERES
ACK	ACKNOWLEDGE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISH GRADE
AM	AMMETER
ANN	ANNUNCIATOR
AS	AMMETER SWITCH
AWG	AMERICAN WIRE GAGE
BKR	BREAKER
BLDG	BUILDING
C	CONDUIT
CKT	CIRCUIT
℄	CENTER LINE
CO	CONVENIENCE OUTLET
CONN	CONNECTIONS
CONTR	CONTRACTOR
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CS	CONTROL STATION
CT	CURRENT TRANSFORMER
CU	COPPER
DE	DUAL ELEMENT
DISC	DISCONNECT
DP	DISTRIBUTION PANEL
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
EP	EXPLOSION PROOF
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
F & I	FURNISH AND INSTALL
FU	FUSE OR FUSIBLE
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
GRS	GALVANIZED RIGID STEEL CONDUIT
HD	HEAVY DUTY
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HTR	HEATER
HZ	HERTZ (CYCLES/SECOND)
IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
IND	INDICATING OR INDICATOR
JB	JUNCTION BOX
J-BOX	JUNCTION BOX
kVA	KILOVOLT-AMPERES
kVAR	KILOVOLT-AMPERES REACTIVE
kW	KILOWATTS
LT	LIGHT
LMF	LIQUID-TIGHT METALLIC CORE FLEXIBLE CONDUIT
M	MOTOR STARTER OPERATING COIL
MAX	MAXIMUM
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MH	METAL HALIDE
MIN	MINUTE OR MINIMUM
MTD	MOUNTED
NF	NON-FUSED
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTC	NOT CONNECTED
OL(S)	OVERLOAD RELAY CONTACT(S)
PF	POWER FACTOR
PVC	POLYVINYLCHLORIDE CONDUIT
REQ'D	REQUIRED
RS	RIGID STEEL CONDUIT
RTM	RUNNING TIME METER
SDS	SPECIFIED IN OTHER DIVISION OF SPECIFICATIONS
SE	SERVICE ENTRANCE
SEC	SECOND OR SECONDARY
SIG	SIGNAL
SOL Vv	SOLENOID VALVE
SP	SINGLE POLE
SPECS	SPECIFICATIONS
SSNR	"SOFT START" NON-REVERSING
SSR	"SOFT START" REVERSING
SW	SWITCH
S.S.	STAINLESS STEEL (TYPE 316)
TD	TIME DELAY
TEMP	TEMPERATURE
TSTAT	THERMOSTAT
UH	UNIT HEATER
U.N.O.	UNLESS NOTED OTHERWISE
V	VOLTS
VM	VOLTMETER
VS	VOLTMETER SWITCH
Vv	VALVE
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS OR WIRE
W/	WITH
WHM	WATT-HOUR METER
WM	WATT METER
WW	WIREWAY
WP	WEATHERPROOF
XDCR	TRANSDUCER
XFMR	TRANSFORMER
XFR	TRANSFER

COLORS

A AMBER	O ORANGE
BK BLACK	R RED
BR BROWN	V VIOLET
BU BLUE	W WHITE
GRN GREEN	Y YELLOW
GY GRAY	

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

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DRAWN	CML2
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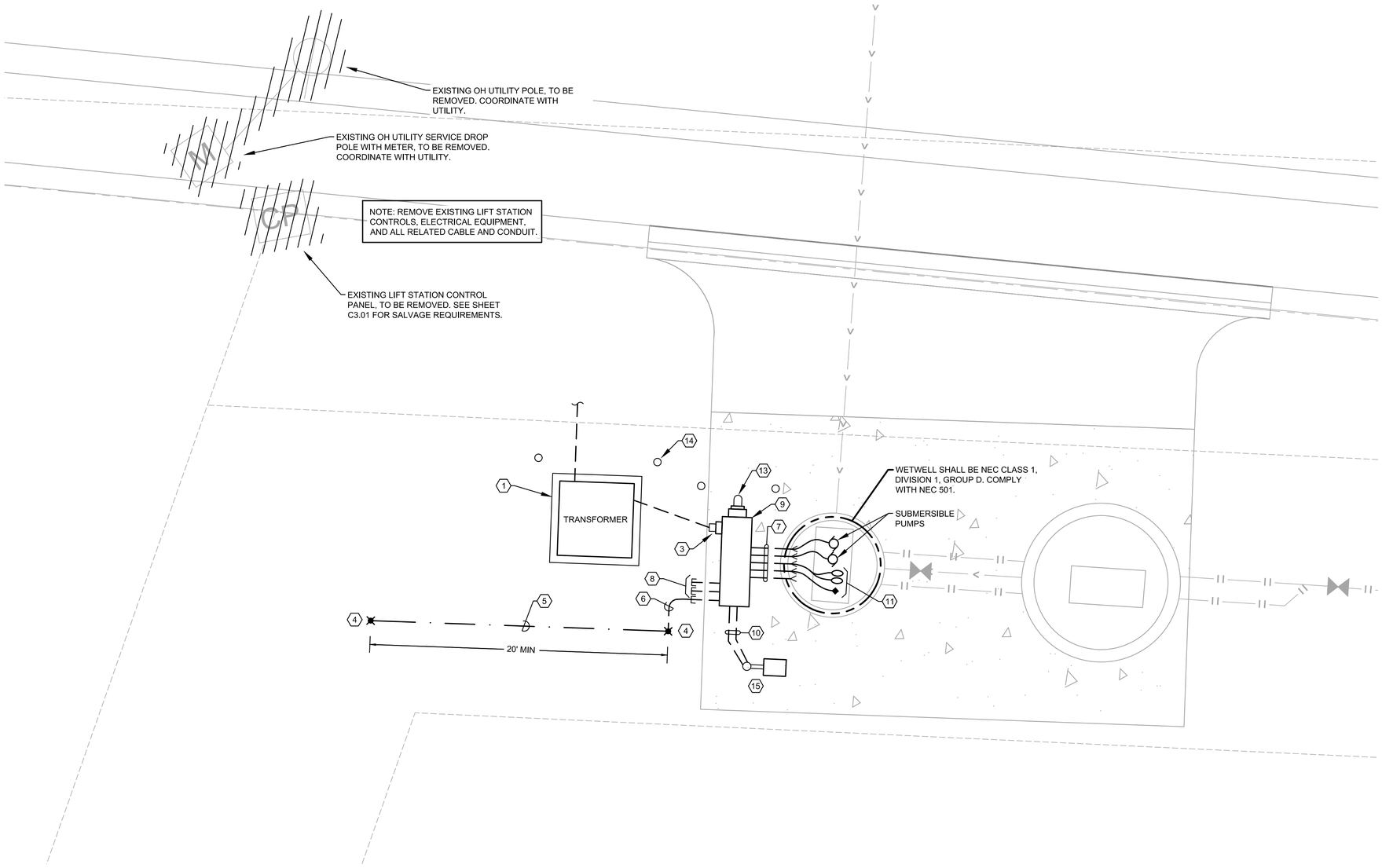
CLIENT PROJ. NO.	0C1.133345

NO.	ISSUED FOR	DATE
0	BID	01/10/2025

CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
ELECTRICAL SYMBOLS & ABBREVIATIONS

SHEET
E.01



LIFT STATION ELECTRICAL PLAN

0 1 5
SCALE

GENERAL NOTES:

1. CONDUCT WORK SO THAT EXISTING LIFT STATION REMAINS IN OPERATION. COORDINATE ALL OUTAGES AND CUTOVERS WITH OWNER AND ENGINEER IN ADVANCE, AND ONLY TO OCCUR AT TIMES APPROVED BY OWNER. SEE SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
2. COORDINATE NEW ELECTRIC SERVICES AND METERING REQUIREMENTS WITH SERVING UTILITY. VERIFY EQUIPMENT LOCATIONS AND ROUTES OF UNDERGROUND SERVICES.
3. FIELD CONFIRM LOCATIONS OF ALL EXISTING UNDERGROUND UTILITIES, CABLES, CONDUITS, ETC. PRIOR TO CONSTRUCTION. CONTRACTOR SHALL REPAIR ALL SUCH ITEMS AT NO EXTRA COST IF DAMAGED BY CONTRACTOR.
4. ELECTRONICALLY-LOCATE ALL PRIVATE UNDERGROUND LINES IN AREAS THAT WILL BE DISTURBED. PROTECT ALL EXISTING UNDERGROUND FACILITIES.
5. FIELD CONFIRM ALL CONDUIT ROUTES WITH ENGINEER.
6. USE DIRECTIONAL BORING OR SIMILAR METHOD FOR NEW CONDUITS TO BE INSTALLED UNDER EXISTING SIDEWALKS AND PAVEMENTS. WHERE PITS ARE OPENED, RESTORE ALL SURFACES TO MATCH EXISTING.
7. CORE DRILL EXISTING STRUCTURES AS REQUIRED FOR NEW CONDUIT INSTALLATION.
8. RESTORE ALL SURFACES DISTURBED BY THIS WORK.

NUMBERED NOTES:

1. FURNISH AND INSTALL NEW CONCRETE TRANSFORMER PAD PER UTILITY REQUIREMENTS. COORDINATE LOCATION WITH UTILITY.
2. UNDERGROUND SERVICE CABLES AND CONDUIT. SEE PANEL SCHEMATICS.
3. UTILITY METERING. CONFIRM REQUIREMENTS AND EXACT MOUNTING LOCATION WITH UTILITY AND PANEL SUPPLIER.
4. 3/4" X 10' COPPER CLAD GROUND ROD WITH EXOTHERMIC WELD TO CONDUCTOR(S) SHOWN. SET TOP 12" DEEP.
5. #1/0AWG BARE STRANDED COPPER GROUND CONDUCTOR, 12" DEEP.
6. STUB 1.25" SCHEDULE 80 PVC CONDUIT FOR GROUND.
7. FOUR (4) 3" SCHEDULE 80 PVC CONDUITS FOR PUMPS, SUBMERSIBLE LEVEL TRANSDUCER, AND FLOAT CABLES. SEE LIFT STATION SECTION.
8. TWO (2) SPARE 2" SCHEDULE 80 PVC CONDUITS. STUB OUT PAST CONCRETE PAD AND MARK LOCATION ON RECORD DRAWINGS.
9. LIFT STATION CONTROL PANEL, SEE SPECIFICATIONS.
10. CABLE AND CONDUIT FOR LIGHT CIRCUIT, SEE PANEL SCHEMATICS. ROUTE (1) 1.25" SCH. 80 PVC SPARE FROM PANEL VENTILATED SKIRT TO LUMINAIRE POLE FOR FUTURE USE.
11. WETWELL FLOAT SWITCHES AND LEVEL SENSOR, WITH STAINLESS STEEL CABLE AND WEIGHT ASSEMBLY. PROVIDE STAINLESS STEEL HANGER BRACKET BELOW HATCH, SECURED WITH ALL STAINLESS STEEL HARDWARE.
12. CONSTRUCT REINFORCED CONCRETE PAD, SEE DETAILS.
13. PORTABLE GENERATOR CONNECTOR, SEE PANEL SCHEMATICS. CONFIRM COMPATIBILITY WITH OWNER'S EXISTING GENERATORS.
14. BOLLARDS, SEE DETAILS. FIELD VERIFY LOCATION.
15. LUMINAIRE POLE. SEE DETAILS AND PANEL SCHEMATICS.

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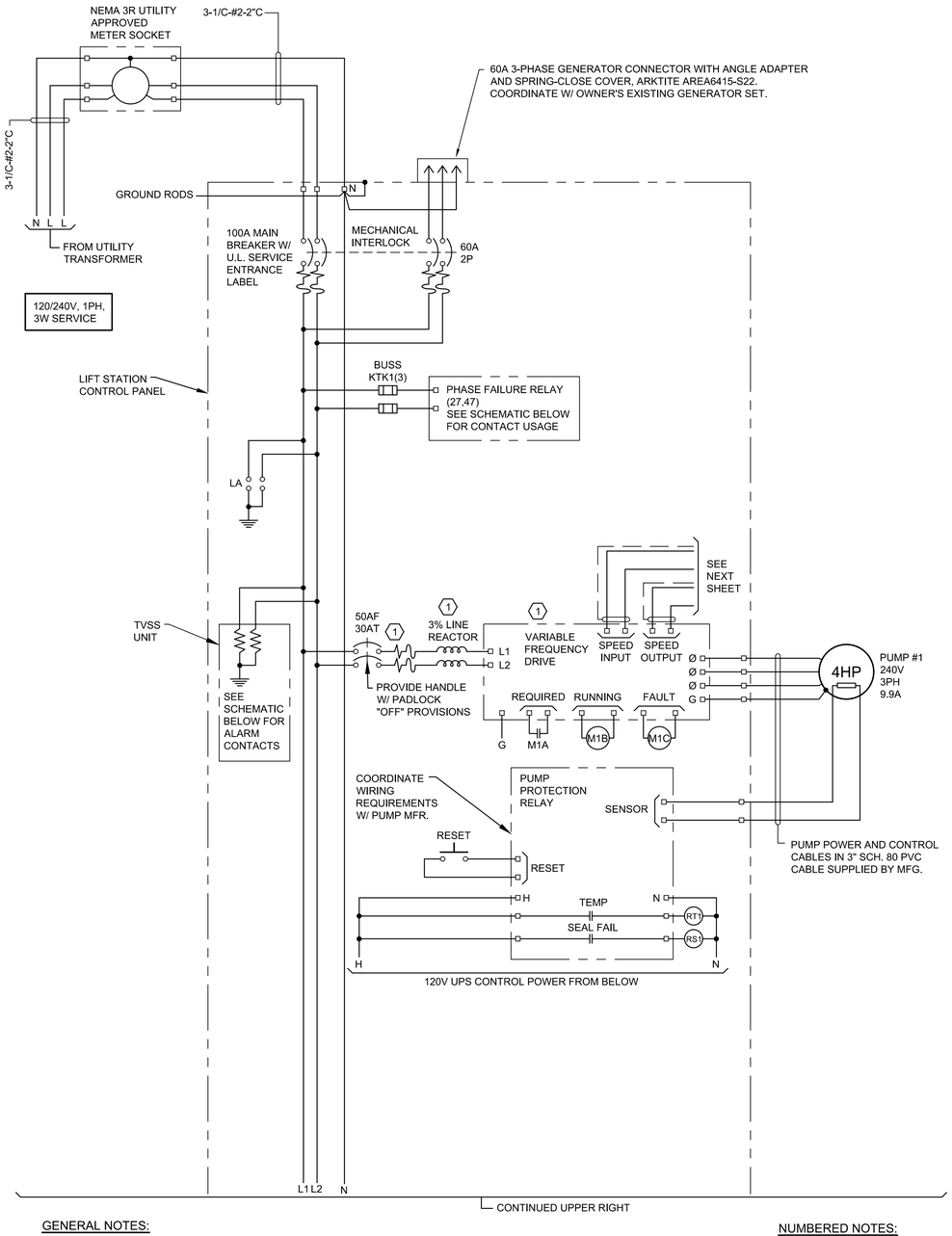
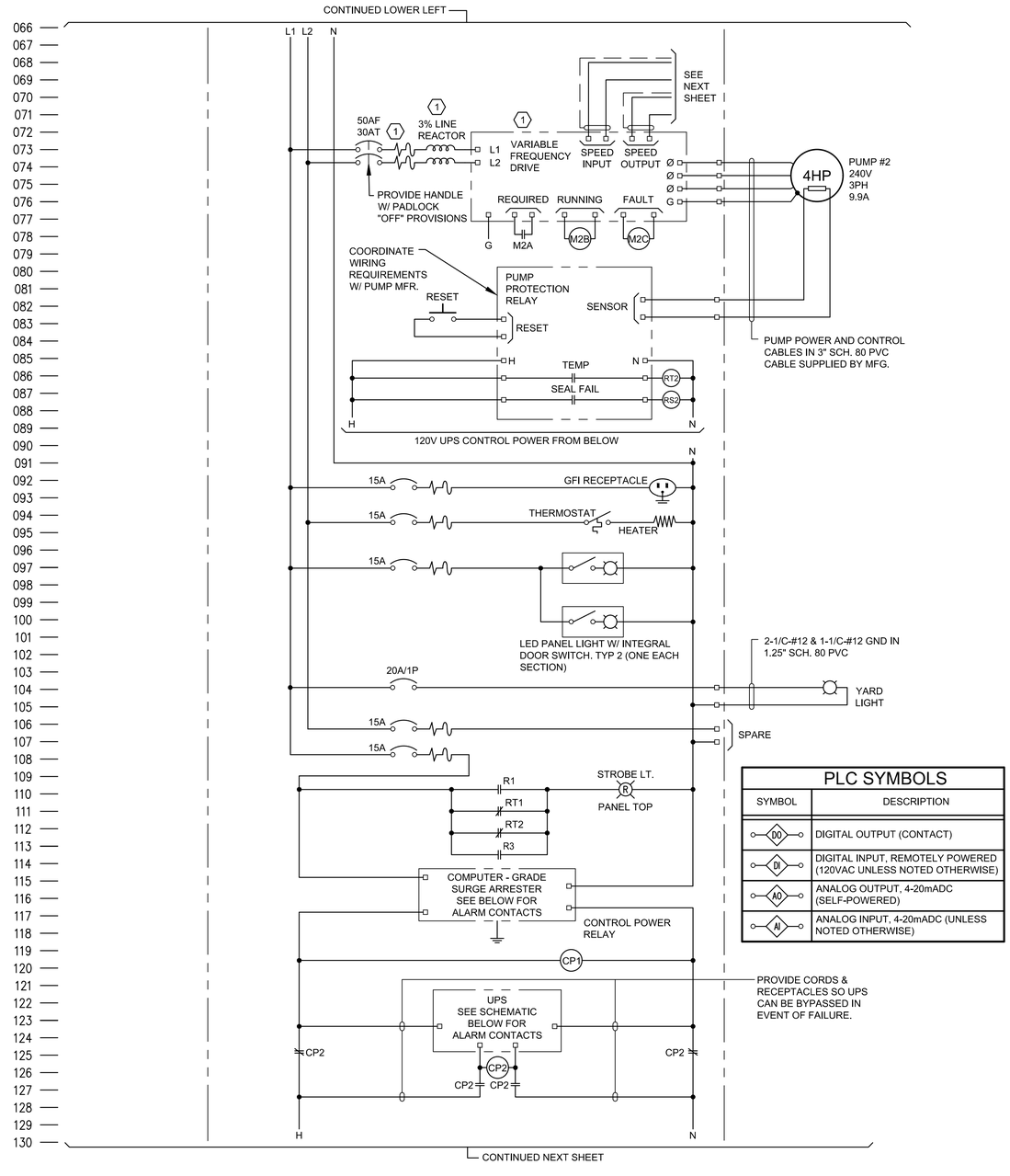
CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
LIFT STATION ELECTRICAL SITE PLAN

SHEET
E.02





PLC SYMBOLS	
SYMBOL	DESCRIPTION
DO	DIGITAL OUTPUT (CONTACT)
DI	DIGITAL INPUT, REMOTELY POWERED (120VAC UNLESS NOTED OTHERWISE)
AO	ANALOG OUTPUT, 4-20mADC (SELF-POWERED)
AI	ANALOG INPUT, 4-20mADC (UNLESS NOTED OTHERWISE)

GENERAL NOTES:

1. MODIFY SCHEMATICS AS REQUIRED FOR UL508 LABEL AT NO ADDITIONAL COST TO THE OWNER.
2. ORGANIZE & LACE ALL WIRING USING NYLON CABLE TIES.
3. PUMP CONTROL MODULE IS BASED ON FLYGHT, ALTERNATE SYSTEMS SHALL INCLUDE PUMP OVERTEMPERATURE AND LEAK DETECTION CIRCUITS WITH CONTROL MODIFICATIONS AS REQUIRED.
4. COORDINATE EQUIPMENT WITH ACTUAL PUMPS BEING SUBMITTED.

NUMBERED NOTES:

(1) VERIFY EQUIPMENT SIZING WITH APPROVED PUMP SIZES.

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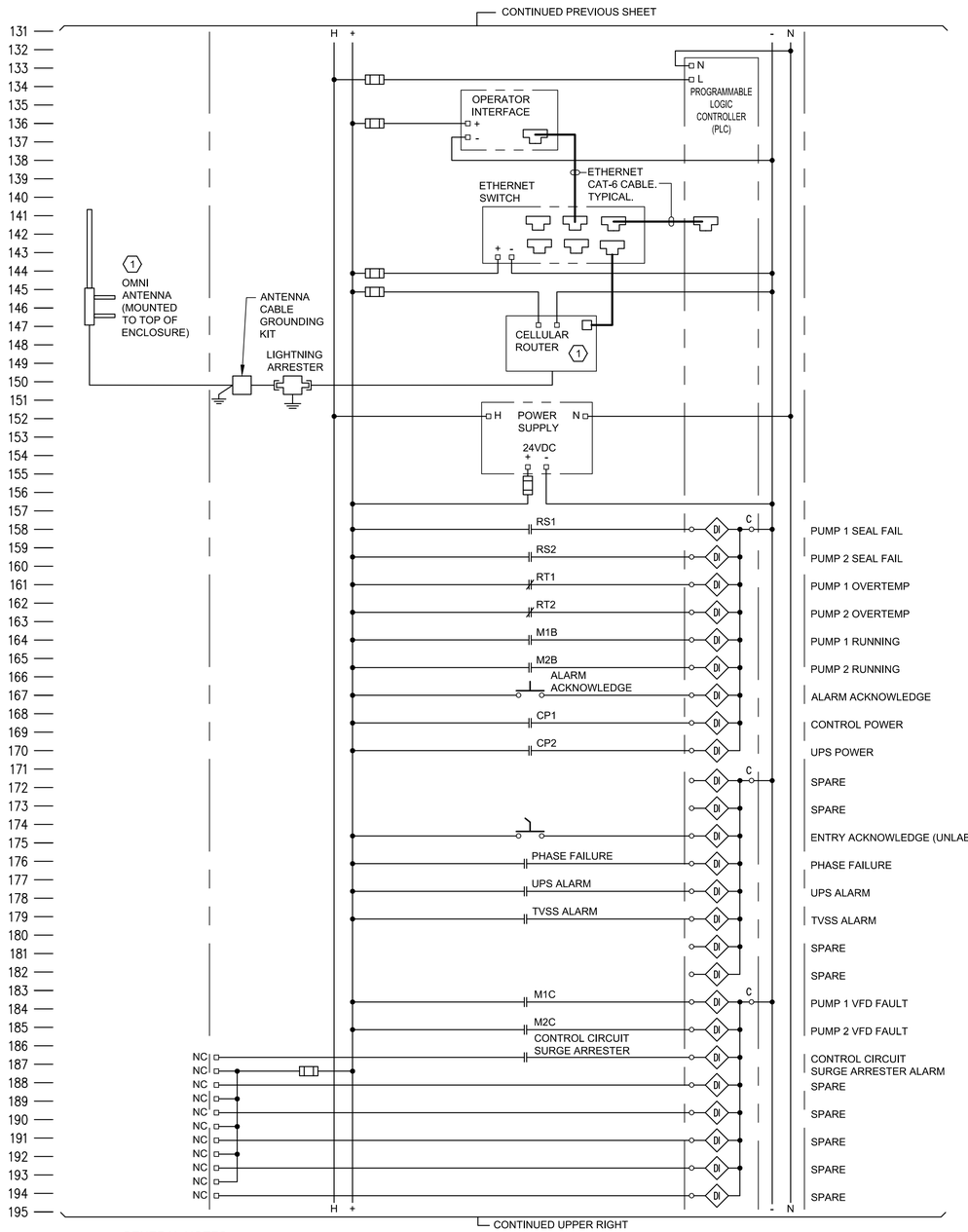
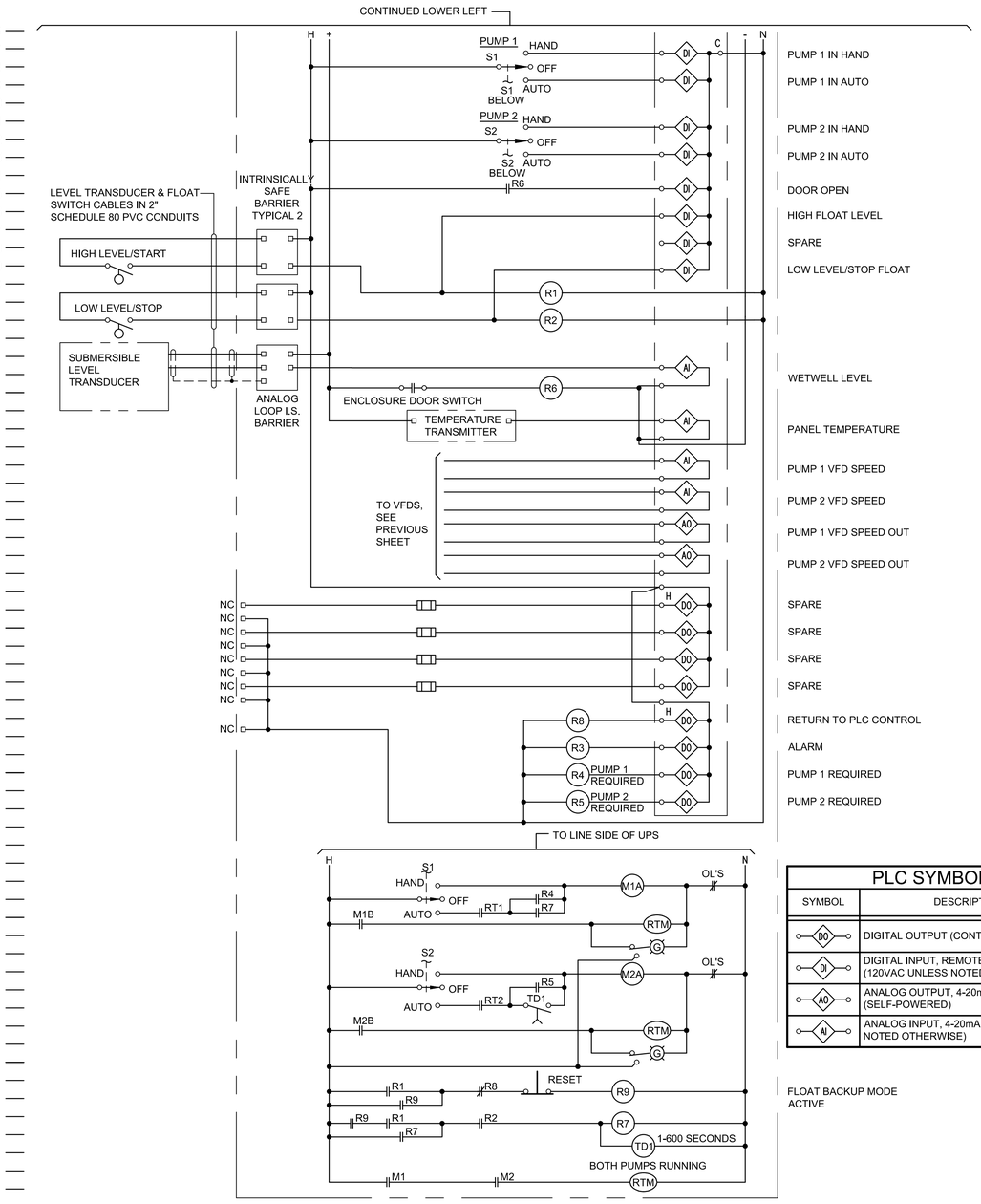
CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
LIFT STATION ELECTRICAL SCHEMATICS

SHEET
E.03





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GENERAL NOTES:

1. MODIFY SCHEMATICS AS REQUIRED FOR UL508 LABEL AT NO ADDITIONAL COST TO THE OWNER.
2. ORGANIZE & LACE ALL WIRING USING NYLON CABLE TIES.
3. PUMP CONTROL MODULE IS BASED ON FLYGHT, ALTERNATE SYSTEMS SHALL INCLUDE PUMP OVERTEMPERATURE AND LEAK DETECTION CIRCUITS WITH CONTROL MODIFICATIONS AS REQUIRED.
4. COORDINATE EQUIPMENT WITH ACTUAL PUMPS BEING SUBMITTED.

NUMBERED NOTES:

(1) VERIFY EQUIPMENT COMPATIBILITY WITH OWNER'S SYSTEM.

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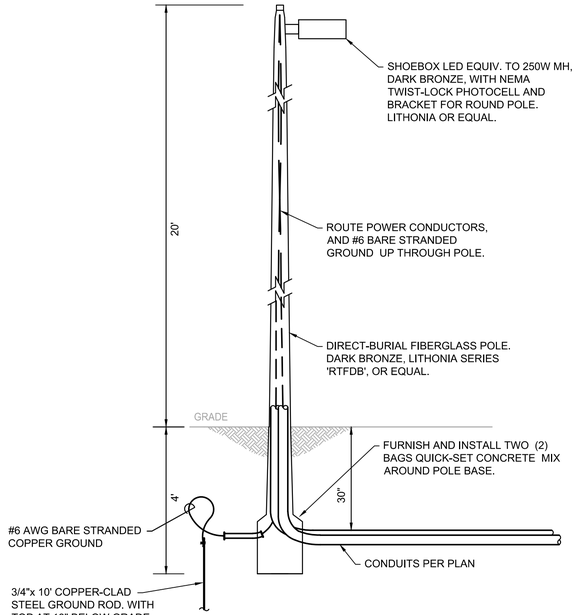
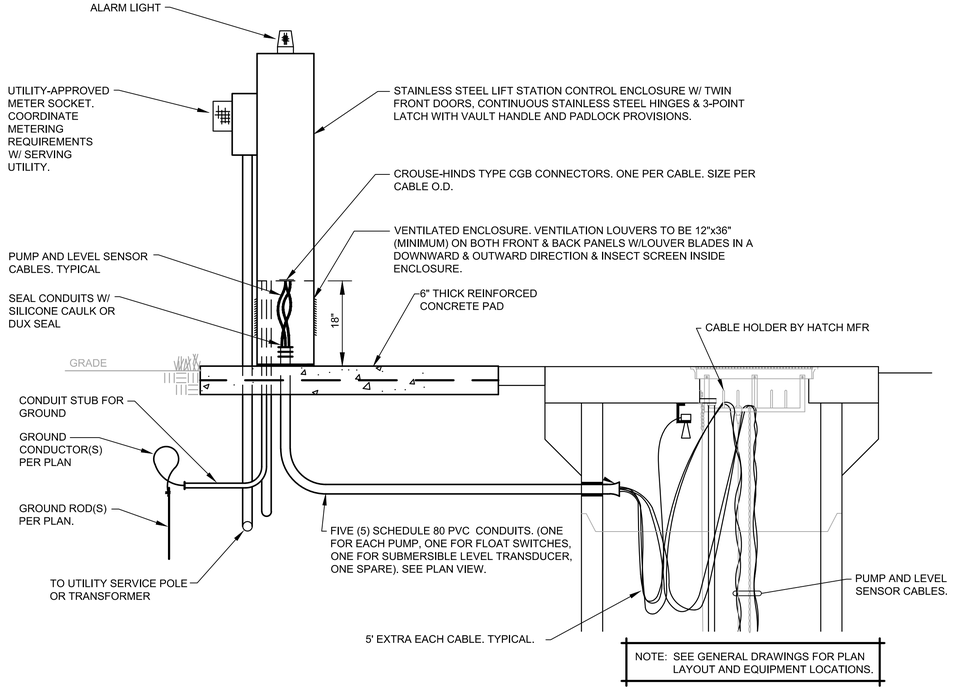
CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
LIFT STATION ELECTRICAL SCHEMATICS

SHEET
E.04



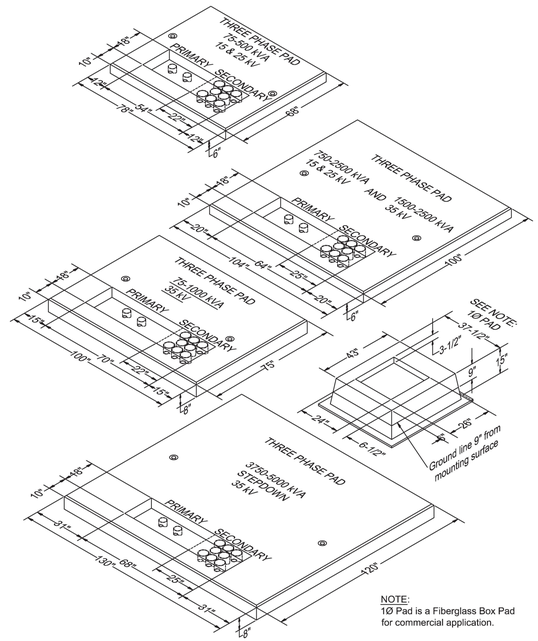
LUMINAIRE DETAIL
NO SCALE



LIFT STATION SECTION
NO SCALE

DRAWING CC-60

TRANSFORMER PAD DIMENSIONS FOR POURED-IN-PLACE



NOTE:
1Ø Pad is a Fiberglass Box Pad for commercial application.

Xcel Energy	Issued	Replaces	Drawn by	Approved	File	STANDARD FOR ELECTRIC INSTALLATION AND USE
	Dec-07	Mar-04	DR		I-6.101	PAGE I-6.101

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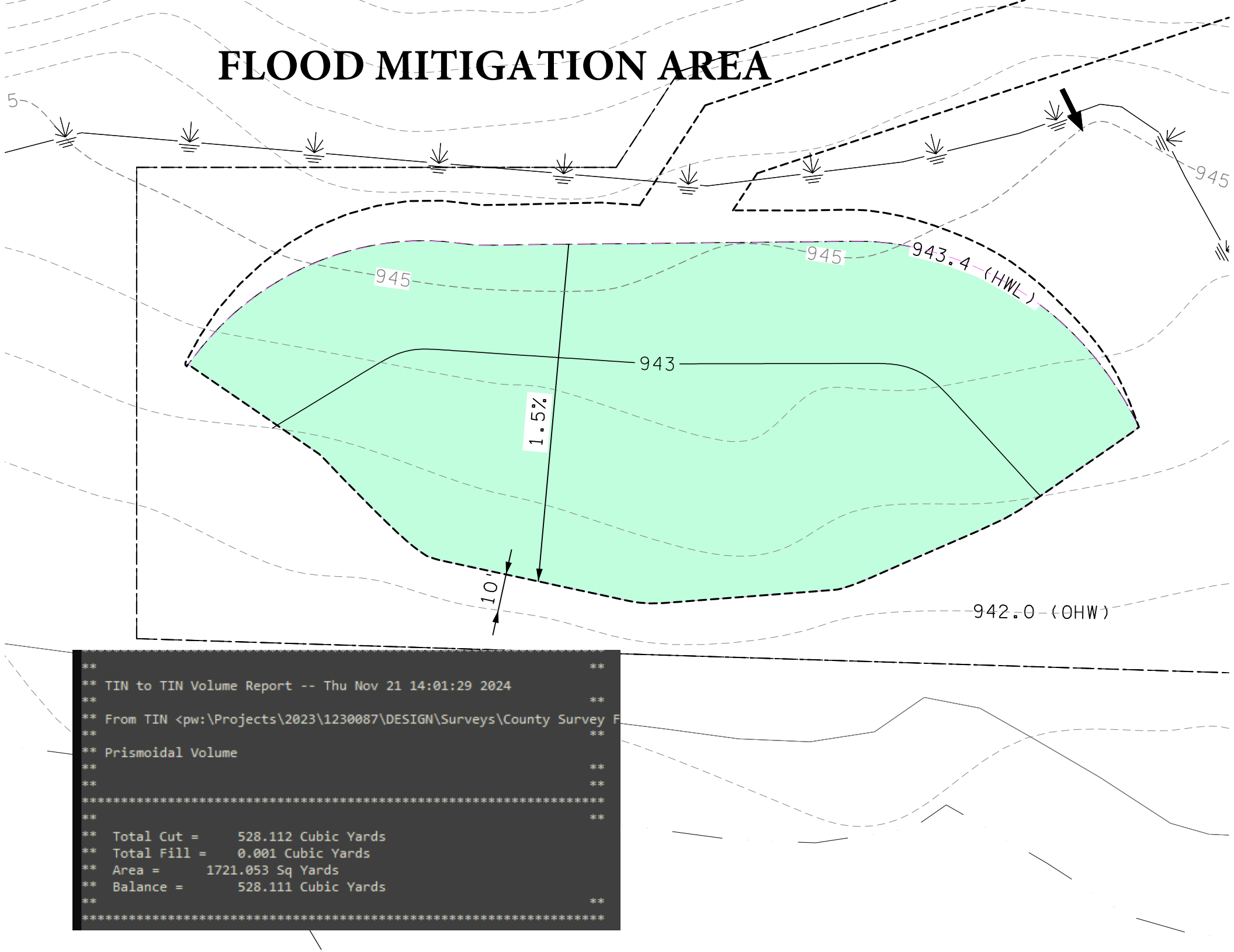
CITY OF VICTORIA, MINNESOTA
CR 11 UTILITY IMPROVEMENTS
LIFT STATION ELECTRICAL DETAILS

SHEET
E.05

FLOOD MITIGATION AREA

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**                                                                   **
** TIN to TIN Volume Report -- Thu Nov 21 14:01:29 2024              **
**                                                                   **
** From TIN <pw:\Projects\2023\1230087\DESIGN\Surveys\County Survey F
**                                                                   **
** Prismoidal Volume                                                 **
**                                                                   **
**                                                                   **
***********************************************************************
**                                                                   **
**  Total Cut =     528.112 Cubic Yards                              
**  Total Fill =    0.001 Cubic Yards                                
**  Area =      1721.053 Sq Yards                                    
**  Balance =       528.111 Cubic Yards                              
**                                                                   **
***********************************************************************
```

ALLIANT

Comp. by:	Sarah Barnett	Date:	12/16/2024	Sheet	1 of 1
Chkd. by:	Eric Nelson	Date:	12/18/2024	Project	CSAH 11
Job No.	SAP 010-611-027; CP 218931				
Element:	Existing and Proposed Drainage Discharges				

Below is a table of the existing and proposed drainage discharges from the four individual outfalls and the total project outfall.

OUTFALL	EX	PR	Δ	EX	PR	Δ	EX	PR	Δ	EX	PR	Δ
	2 YR (CFS)			10 YR (CFS)			50 YR (CFS)			100 YR (CFS)		
STONE LAKE	18.83	17.99	-0.84	34.58	36.56	1.98	73.78	68.21	-5.57	97.07	90.79	-6.28
LAKE AUBURN WEST	21.39	10.97	-10.42	37.40	25.27	-12.13	58.80	46.63	-12.17	69.22	57.43	-11.79
LOW POINT EAST	19.30	14.14	-5.16	35.27	26.97	-8.30	58.88	51.45	-7.43	70.84	65.09	-5.75
LAKE AUBURN EAST	33.72	29.62	-4.10	52.52	50.40	-2.12	79.69	77.56	-2.13	93.59	92.09	-1.50
TOTAL PROJECT	89.87	66.04	-23.83	155.49	131.73	-23.76	254.62	237.62	-17.00	309.05	290.34	-18.71

Technical Memorandum

To:	Minnehaha Creek Watershed District (MCWD)
From:	Eric Nelson, PE Connor Fortune, PE
Date:	1/7/2025
Subject:	Lake Zumbra and Lake Auburn XPSWMM Analysis

1. Introduction and Background

Alliant has developed designs for a safety improvements project along County State Aid Highway (CSAH) 11 in Carver Park Reserve for Carver County. Proposed improvements include curve corrections, widening of existing shoulders, new trail, and pavement rehabilitation. Along the CSAH 11 corridor, existing culverts will be replaced and lengthened to accommodate the new shoulder width and trail.

As part of the design process, Alliant incorporated proposed changes to hydrology and hydraulic structures into the Minnehaha Creek Watershed District (MCWD) XPSWMM model for this area and evaluated the project's impacts to downstream waterbodies at each outfall point. Lake Zumbra and Sunny Lake flow into an unnamed wetland which outlets into Lake Auburn through a culvert under CSAH 11. The design intent is to minimize impacts to HWLs in the area and bring the culvert up to Carver County's current design standards. Although this memo focuses primarily on the culvert design between Lake Auburn and Zumbra, HWL results are provided to demonstrate a no-rise condition for each downstream waterbody that falls under MCWD rules.

Alliant Engineering completed hydrologic and hydraulic modeling of proposed conditions and performed an alternatives analysis. Results of the Proposed model for seven alternatives were compared to a Corrected Existing model. This memo summarizes the methodology and results of this analysis.

2. Modeling Methodology

2.1 CORRECTED EXISTING SCENARIO

Alliant received the Lake Zumbra 100-year, 24-hour storm event XPSWMM model from MCWD on September 13th, 2023. The model was prepared with XPSWMM Version 2023.1 but was updated to

Version 2024.1 for our work. This modeling scenario is referred to as the Effective Existing model for comparison purposes.

Using field survey data obtained by Carver County as part of the CSAH 11 – Carver Park Reserve project, we prepared a Corrected Existing model to reflect the existing conditions along the project corridor. Drainage areas and hydrology in the project area were reviewed and updated to our current understanding of existing conditions. Detailed hydrology modifications are shown in the Appendices of this memo.

Links SMC-15CR11 and SMC-25CR11 were surveyed as part of this project. The inverts of these pipes were converted from the surveyed datum to NGVD29 and updated in the Corrected Existing model. Loss coefficients for Link SMC-25CR11 were updated from the Effective Existing model based on the current understanding of existing conditions. All HWLs reported in this memo are in NGVD29. Tables 1 and 2 summarize the key results from the Effective Existing and Corrected Existing models:

Annotated Screenshot of the MCWD Effective Existing XPSWMM model

Table 1. 100-YR HWL Comparison: Effective Existing vs. Corrected Existing

XPSWMM Model Component	Description	100-YR HWL (ft)		
		Effective Existing	Corrected Effective	Change
SMC-44	Unnamed Wetland	973.530	973.726	0.196
SMC-18	Stone Lake	948.004	948.325	0.321
SMC-31b	Unnamed Wetland	940.422	941.027	0.605
SMC-31a	Unnamed Wetland	942.489	942.501	0.012
SMC-19	Low Point East	962.281	962.570	0.289
SMC-22	Lake Zumbra	943.375	943.651	0.276
SMC-24	Sunny Lake	945.999	946.426	0.427
SMC-25	Unnamed Wetland	945.131	945.429	0.298
SMC-29	Lake Auburn West	943.082	943.048	-0.034
SMC-27	Lake Auburn East	943.122	943.090	-0.032
SMC-15	Unnamed Wetland	944.949	944.328	-0.621

Table 2. Peak Flow and Velocity Comparison: Effective Existing vs. Corrected Existing

XPSWMM Link	Description	Peak Flow (cfs)			Peak Velocity (fps)		
		Effective Existing	Corrected Existing	Change	Effective Existing	Corrected Existing	Change
SMC-25CR11	Project Culvert	12.88	12.38	-0.50	7.19	6.90	-0.29

2.2 PROPOSED SCENARIO / ALTERNATIVES ANALYSIS

The proposed conditions scenario modified the Corrected Existing model to account for highway widening and the addition of the proposed shared use trail. Detailed hydrology modifications are shown in the Appendices of this memo. Loss coefficients for the project culvert were modified

from the Corrected Existing model when necessary to model losses in pipes for each alternative correctly.

The proposed widened shoulders and shared use trail require the replacement culvert to be longer than the existing culvert. Our proposed culvert design matches the invert elevations of the existing pipe, resulting in a flatter slope than the existing culvert. Seven different design alternatives were considered. For all alternatives, the existing culvert will be upsized from an 18" HDPE. The first alternative is a single 24" RCP culvert. The second alternative is a 24" RCP that connects into an outlet control structure (OCS) with an overflow grate that allows water to enter the culvert should the upstream apron get clogged. The third alternative is dual 24" RCP culverts with the additional culvert upstream invert elevated 3 feet above the invert of the existing culvert. The fourth alternative is a single 21" RCP culvert. The fifth alternative is a 21" RCP connected to an OCS. The sixth alternative is a single 24" CMP culvert. The proposed OCS grate elevation for alternatives two and five is 945.10' (NGVD29). The seventh alternative is a run of 3 pipes – first an 18" PVC connected to an OCS, second a 21" RCP from the OCS that connects into a new manhole that receives water from project BMPs, and third a 21" RCP from the manhole to the outlet. The proposed OCS grate elevation for alternative seven is 945.30' (NGVD29). Tables 3 and 4 summarize the key results from the proposed alternatives analysis. Table 5 summarizes the measured Impacts to Downstream Waterbodies for each project outfall point:

Table 3. 100-YR HWL Comparison: Corrected Existing vs. Proposed Alternatives

XPSWMM Node	Description	Alternative	100-YR HWL (ft)	Change*
SMC-22	Lake Zumbra	24" RCP	943.492	-0.159
		24" RCP w/ OCS	943.509	-0.142
		Dual 24" RCP	943.414	-0.237
		21" RCP	943.581	-0.070
		21" RCP w/ OCS	943.596	-0.055
		24" CMP	943.638	-0.013
		18" PVC to 21" RCP w/ OCS	943.649	-0.002
SMC-24	Sunny Lake	24" RCP	946.424	-0.002
		24" RCP w/ OCS	946.425	-0.001
		Dual 24" RCP	946.423	-0.003
		21" RCP	946.427	0.001
		21" RCP w/ OCS	946.428	0.002
		24" CMP	946.429	0.003
		18" PVC to 21" RCP w/ OCS	946.429	0.003
SMC-25	Unnamed Wetland	24" RCP	945.034	-0.395
		24" RCP w/ OCS	945.088	-0.341
		Dual 24" RCP	944.680	-0.749
		21" RCP	945.283	-0.146
		21" RCP w/ OCS	945.309	-0.120
		24" CMP	945.406	-0.023
		18" PVC to 21" RCP w/ OCS	945.421	-0.008
SMC-27	Lake Auburn East	24" RCP	943.133	0.043
		24" RCP w/ OCS	943.127	0.037
		Dual 24" RCP	943.171	0.081
		21" RCP	943.107	0.017
		21" RCP w/ OCS	943.105	0.015
		24" CMP	943.093	0.003
		18" PVC to 21" RCP w/ OCS	943.092	0.002

**Reported changes for all Proposed Alternatives are relative to the Corrected Existing Model*

XPSWMM Node	Description	Alternative	100-YR HWL (ft)	Change*
SMC-29	Lake Auburn West	24" RCP	943.093	0.045
		24" RCP w/ OCS	943.088	0.040
		Dual 24" RCP	943.133	0.085
		21" RCP	943.066	0.018
		21" RCP w/ OCS	943.064	0.016
		24" CMP	943.052	0.004
		18" PVC to 21" RCP w/ OCS	943.050	0.002

*Reported changes for all Proposed Alternatives are relative to the Corrected Existing Model

Table 4. Peak Flow and Velocity Comparison: Corrected Existing vs. Proposed Alternatives

XPSWMM Link	Description	Alternative	Peak Flow (cfs)	Change*	Peak Velocity (fps)	Change*
Link 27/ SMC-25CR11	Project Culvert	24" RCP	21.08	8.70	6.71	-0.19
		24" RCP w/ OCS	19.94	7.56	6.38	-0.52
		Dual 24" RCP	21.05	8.67	6.71	-0.19
		21" RCP	15.65	3.27	6.48	-0.42
		21" RCP w/ OCS	15.20	2.82	6.25	-0.65
		24" CMP	13.06	0.68	4.13	-2.77
		18" PVC to 21" RCP w/ OCS	15.42	3.03	6.46	-0.44

*Reported changes for all Proposed Alternatives are relative to the Corrected Existing Model

Table 5. Impacts to Downstream Waterbodies

XPSWMM Model Component	Outfall Description	100-YR HWL (ft)		
		Corrected Effective	Proposed	Change
SMC-44	Unnamed Wetland	973.726	973.726	0.000
SMC-18	Stone Lake	948.325	948.326	0.001
SMC-31b	Unnamed Wetland	941.027	941.027	0.000
SMC-31a	Unnamed Wetland	942.501	942.502	0.001
SMC-19	Low Point East	962.570	962.577	0.007*
SMC-22	Lake Zumbra	943.651	943.649	-0.002
SMC-24	Sunny Lake	946.426	946.429	0.003
SMC-25	Unnamed Wetland	945.429	945.421	-0.008
SMC-29	Lake Auburn West	943.048	943.050	0.002
SMC-27	Lake Auburn East	943.090	943.092	0.002
SMC-15	Unnamed Wetland	944.328	944.328	0.000

**SMC-19 is labeled a "Depression" in the Existing XP Modeling. It is not identified as an unnamed wetland or Lake, but it does drain to Sunny Lake which sees less than 0.004 feet of rise as a result of the project.*

3. Conclusions

The seventh alternative is the preferred design solution as seen in the construction plans. The first 18" PVC pipe helps to maintain the HWL upstream, the OCS grate provides a secondary outlet for large storm events and redundancy in case the culvert gets clogged, and the two 21" RCP culverts after the OCS connection allows overflow from the upstream wetland and additional runoff from the project to discharge without affecting the performance of the upstream pipe. The alternative is below the threshold of a 0.004' rise of the existing HWLs in Lake Zumbra and both branches of Lake Auburn. This alternative is also at the threshold of a 0.004' rise in Sunny Lake. The dual culvert alternative is not recommended due to larger impacts to existing HWLs.

These modeling results also demonstrate that the project meets MCWD's rules for impacts to downstream waterbodies, as shown in Table 5.

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Appendix A

HYDROLOGY MODIFICATION TABLES

Corrected Existing Drainage Area	Area (ac)	Impervious (%)	Width (1)	Slope (2)	Impervious (ac)	Longest Flow Path	Contour Length	Contour Interval	Infiltration	Storage Updated?	Notes
SMC-15	145.84	63.0	1311	0.056	91.88	4844.7	176297	2.00	SMC-15	X	Area decreased - added to SMC-27
SMC-18	808.28	39.3	3373	0.065	317.65	10438.0	1146562	2.00	SMC-18		Area increased - taken from SMC-44
SMC-19	84.05	1.9	1021	0.071	1.60	3585.5	129422	2.00	SMC-19		Area increased - taken from SMC-29
SMC-20	179.13	24.4	1264	0.076	43.71	6175.2	297023	2.00	SMC-20		Area decreased - added to SMC-31A
SMC-25	118.47	37.6	904	0.077	44.54	5708.6	198402	2.00	SMC-25	X	No area change in existing. Slope recalculated for consistent methodology between existing and proposed
SMC-27	361.49	67.6	5154	0.044	244.37	3055.3	343544	2.00	SMC-27	X	Area increased - taken from SMC-15
SMC-29	325.72	54.9	7056	0.048	178.82	2010.7	343993	2.00	SMC-29		Area decreased - added to SMC-19
SMC-31	21.54	28.0	599	0.115	6.03	1566.8	53797	2.00	SMC-31	X	Missing delineation from existing information. No area change
SMC-31A	130.37	15.0	1930	0.078	19.56	2942.4	222217	2.00	SMC-31	X	Area decreased - added to SMC-19
SMC-31b	85.37	11.0	1143	0.084	9.39	3254.6	155355	2.00	SMC-31	X	Missing delineation from existing information. No area change
SMC-44	117.52	28.8	1310	0.063	33.85	3909.3	161929	2.00	SMC-44		Area decreased - added to SMC-18

Proposed Drainage Area	Area (ac)	Impervious (%)	Width (1)	Slope (2)	Impervious (ac)	Longest Flow Path	Contour Length	Contour Interval	Infiltration	Storage Updated?	Notes
SMC-15	145.87	63.1	1312	0.056	92.06	4844.7	176818	2.00	SMC-15	X	Area updated due to ditch BMP
SMC-18	808.40	39.5	3374	0.065	319.22	10438.0	1146729	2.00	SMC-18		Area updated due to curve correction
SMC-19	83.93	3.5	1020	0.071	2.96	3585.5	130634	2.00	SMC-19		Area updated due to curve correction and new trail
SMC-20	179.13	24.4	1264	0.076	43.71	6175.2	297023	2.00	SMC-20		Area updated due to ditch BMP
SMC-25	116.65	37.2	898	0.079	43.37	5659.5	200580	2.00	SMC-25	X	Area updated due to curve correction and new trail
CSAH 11	2.40	48.8	72	0.138	1.17	1453.5	7227	2.00	SMC-25		New area for ditch BMP section
SMC-27	360.94	68.1	5146	0.044	245.88	3055.3	345598	2.00	SMC-27	X	Area updated due to curve correction
SMC-29	325.72	55.0	7056	0.048	179.01	2010.7	343993	2.00	SMC-29		Impervious % updated
SMC-31	21.54	28.0	599	0.115	6.03	1566.8	53797	2.00	SMC-31		No change from corrected effective
SMC-31A	130.42	15.0	1931	0.078	20.77	2942.4	222432	2.00	SMC-31		Area updated due to curve correction
SMC-31b	85.25	11.1	1141	0.084	9.46	3254.6	155188	2.00	SMC-31		Area updated due to curve correction
SMC-44	117.52	28.8	1310	0.063	33.85	3909.3	161929	2.00	SMC-44		No change from corrected effective

(1) Width is calculated by the following formula: Width = Total Area / Longest Flow Path

(2) Slope is calculated by the following formula: Slope = (Contour Interval x Contour Length) / Total Area

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Appendix B

CORRECTED EXISTING DRAINAGE OVERVIEW MAP

STONE LAKE

SMC-18

SMC-20

SMC-25

SMC-15

SMC-44

SMC-19

LINK SMC-25CR11

LINK SMC-15CR11

SMC-31b

SMC-31A

LAKE AUBURN - EAST

SMC-27

LAKE AUBURN - WEST

SMC-31

SMC-29

SMC-11

LEGEND

- MCWD DRAINAGE AREA
- UNMODIFIED EXISTING MCWD DRAINAGE AREA
- MODIFIED EXISTING DRAINAGE AREA
- LONGEST FLOW PATH
- EXISTING CULVERT
- XPSWMM STORAGE NODE
- FLOW ARROW

1000

SCALE IN FEET

CARVER COUNTY

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HIGHWAY 11 PROJECT - CARVER PARK RESERVE
EXISTING CONDITIONS XPSWMM
DRAINAGE OVERVIEW MAP

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Appendix C

PROPOSED DRAINAGE OVERVIEW MAP

STONE LAKE

SMC-18

SMC-20

SMC-15

SMC-25

CSAH 11

SMC-44

SMC-19

LINK SMC-25CR11

LINK SMC-15CR11

SMC-31b

LAKE AUBURN - EAST

SMC-31A

SMC-27

LAKE AUBURN - WEST

SMC-31

SMC-29

SMC-11

LEGEND

- UNMODIFIED EXISTING MCWD DRAINAGE AREA
- UNMODIFIED FROM CORRECTED EFFECIVE DRAINAGE AREA
- PROPOSED DRAINAGE AREA
- LONGEST FLOW PATH
- XPSWMM STORAGE NODE
- XPSWMM NODE
- EXISTING CULVERT
- MODIFIED XPSWMM LINK
- FLOW ARROW

1000

SCALE IN FEET

CARVER COUNTY

ALLIANT

HIGHWAY 11 PROJECT - CARVER PARK RESERVE
PROPOSED CONDITIONS XPSWMM
DRAINAGE OVERVIEW MAP

October 19, 2017

VIA ELECTRONIC MAIL

Re. Lake Zumbra Water Levels

Dear all,

Thank you again for your participation in the meeting on Wednesday, October 4 to discuss the residents' concern regarding high water levels on Lake Zumbra. As I have said before, the District greatly appreciates the cross-agency coordination that has been executed to date to understand the issue, define possible solutions, and map out agency roles and process for executing these solutions.

Below is a recap of the meeting. Please let me know if you see any needed clarification.

At the meeting, we covered:

- The chronology over the last two years including information generated, roles and responsibilities defined, meetings held, and actions taken
- New information, including updated field survey data from the DNR and and permit information
- The impact this information had on the hydraulic model and understanding of the system
- Possible next steps

Much of the specific information discussed and within this letter is available in the attachments, which include:

- The meeting agenda, containing a table of the updated hydraulic model results
- Summary chronology
- The 2015 and 2017 Wenck Memos
- Several letters from 1992, one from an attorney on behalf of the residents to the District and TRPD (then Hennepin County Parks Preserve) and one from the DNR to the City regarding construction of new homes on Zumbra
- Zumbra Ridge HOA's original service request, dated January 12, 2017
- Letter's between Victoria's Mayor and the District following the March 1, 2017 interagency meeting
- Zumbra Ridge HOA's request for services submitted to the DNR
- Zumbra Ridge HOA's maintenance request submitted to TRPD
- Results of the DNR's most recent survey
- Permit Information distributed from MCWD September 27, 2017

Please let me know if you have questions about any of these attachments, or if you would like to suggest any revisions to the chronology. I view that as a living document that we will continue to adjust and add to, as additional information becomes available.

Below is a summary of our discussion. Please review and let me know if there are any clarifications you would like to make.

Roles and Responsibilities
The most recent history of this cross-agency coordination began shortly after the 2014 flood of record when the then president of the Zumbra Ridge HOA, Jerry Martin, issued a letter to MCWD, Carver County, Victoria, and TRPD requesting evaluation of, and modifications to, the structures within this drainage area to prevent flooding in events similar to the 2014 event. That request is attached, as is a detailed chronology of the response since that event.

Since that time, we have worked collectively to understand system dynamics in flooding events. We have been consistent about each agency's respective role, though they have come into increasing focus as we have discussed advancing technical solutions. At the October 4 meeting, we reviewed again the following definition of roles:

- Carver County:
  - Involved from the beginning as a constituent issue closely tracked by County policy makers
  - Owns and maintains the culvert under County Road 11, one of the primary structures of concern by the residents

- City of Victoria:
  - Designated flood response agency through the National Flood Insurance Program (NFIP)
  - More recently, staff offered to serve as applicant for any structural solution and advance an engineering scope of services through City Council on behalf of the HOA
  - At the meeting, Cara noted that they are in a unique situation in this case as they do not own or have maintenance obligations over any of the infrastructure

- MnDNR:
  - Establishes and regulates OHW via MN statute 103G.401 and permits modifications to the OHW under Rule 6115.0150-0280
  - Provides technical assistance to residents/other agencies through survey work and permit review
  - Reviews and concurs in regional floodplain models approved by FEMA

- MCWD:
  - Convener of cross agency group
  - Coordinate analysis of issues, potential solutions, and agency roles, and communicate that information to the public
  - Regulatory authority over Wetland Conservation Act, waterbody crossings and structures, development (stormwater, erosion control), etc.

- Regional water quantity management, specifically through (from 2017 Comprehensive Plan):
  - management of the Lake Minnetonka/Minnehaha Creek regional conveyance system through the operation of Grays Bay Dam;
  - providing cities and the public with flood prediction data using the District's Hydraulic and Hydrologic model;
  - preserving local flood storage volume by regulating floodplain fill during development permitting; and
  - implementing and promoting stormwater management practices to address pollutant loading, prevent local peak flow increase and provide for volume reduction

Everyone agreed that these continue to be an accurate working depiction of agency roles.

Jenny mentioned that if we do follow up with a letter to the HOA, and in future correspondence and meetings, it may also be valuable to outline restrictions or limitations in each agency's roles.

System Understanding:
The principal goal of the 2015 of the Wenck analysis, attached, was to provide a coarse picture of system dynamics leading to flood conditions by employing the District's XP-SWMM watershed model, which incorporated historic culvert size and elevation data provided by Three Rivers. The analysis was completed for both the 100 year event and a modeled simulation of the 2014 event. The residents are increasingly raising concerns about the lake under "normal" conditions, which has not been analyzed because the original inquiry from the HOA (attached) referenced flooding concerns specifically.

The system dynamics under flood conditions can be generally summarized as follows:

- Zumbra, Sunny, and Sunny's downstream wetland have very similar normal water levels, partially due to the fact that there is very little elevation difference across the drainage area
- Lake Zumbra has a very small drainage area when compared with Sunny, and especially when compared with Lake Auburn, which receives drainage from all of the upstream Six Mile system
- Because Sunny receives so much more drainage than Zumbra, under high water conditions Sunny's water levels rise faster and higher than that of Zumbra
- This situation causes Sunny to backflow into Zumbra, essentially simultaneously discharging water upstream to Zumbra and downstream to the wetland and ultimately Auburn
- This occurs until conditions water elevations equalize across the system
- The system saturation also slows the rate at which water levels come back down after a backflow event

This first phase analysis concluded that no changes in lake management, crossing elevations, or development within the watershed would have proliferated the flooding event beyond the impact caused by the record precipitation. It also identified those homes not meeting two-foot freeboard above the 100 year lake elevation, the level required in zoning code.

Second Phase Analysis
Following up on the 2015 Wenck analysis, the District, at the request of the HOA, initiated a second phase analysis again utilizing the watershed model to evaluate a range of modifications to structures in the system, to

depict the impact they would have on Lake levels on Zumbra during the 100 year event, and to identifiy the potential impacts on other waterbodies within the system. The results are summarized in the attached, but generally found that:

- Every analyzed structural solution would impact water levels to some degree on adjacent property
- Because of system hydraulics driving backwater into Zumbra and equalization between Zumbra and Sunny, changes to culvert sizes are projected to lead to only modest relief on Zumbra under 100 year conditions
- The solution that the model indicated may provide the greatest benefit to Zumbra under 100 year conditions is the construction of a flap gate on the culvert between Zumbra and Sunny, which could be designed to prevent the backflow effect
- None of the modeled solutions would prevent high water under events similar to the 2014 flood of record, in which all structures are breached and in most cases the roads and trails were overtopped

The results of those analyses were presented to the residents in March of 2017 in a meeting at Victoria City Hall attended by the members of the HOA and agencies. Attendees included:

- HOA: Dick Hawley, Rod Kern, Dick Hackett
- MCWD: Anna Brown, James Wisker
- Carver County: Paul Moline, Commissioner Tom Workman
- City of Victoria: Cara Geheren, Mayor Tom Funk
- Three Rivers Park District: Angie Smith, Rich Brasch, Brian Vlach

At that time, the residents were advised that any solution would need to be accepted by Three Rivers Park District, who own much of the infrastructure and whose property would be impacted by any of these changes.

Follow up with the HOA

On May 30, 2017, MCWD, the City, TRPD and the HOA met at Lowry Nature Center. The meeting was called by the HOA to request TRPD consider allowing the construction of a flap gate on the outlet between Zumbra and Sunny, the identified lowest cost and highest impact structural solution.

At that meeting, roles and responsibilities were outlined should the HOA pursue implementation of the flap gate solution. The roles were delineated as follows:

- The City would solicit proposals and advance an engineering scope of work to provide additional feasibility and design of the flap gate and bring it before Council for consideration. The resultant deliverables would be used to prepare a permit application to advance the solution.
- The District would provide an outline of the permitting framework and requirements to progress such a solution in advance of City scope execution, and would continue to advise and facilitate permitting throughout feasibility and design.
- Three Rivers would review permit information prepared by the City and make a determination as to whether the impact on their property would be acceptable.

Following the meeting, on June 2, the District provided an overview outlining the rules likely triggered by the flap gate solution, and recommended continued meetings across agencies to coordinate on application submittals, following the City's execution of an engineering contract.

Focus Engineering, on behalf of the City, worked with Barr Engineering to develop a scope of work to initiate the design. That scope was placed on a City Council agenda for a Council decision on June 12, 2017. City staff and consultants reported that the residents requested the scope of services be pulled from the agenda due to a perceived conflict of interest between the agencies and Barr Engineering. They have subsequently not followed up with City staff regarding a scope of work to advance the flap gate or any other solution.

I did heard from Scott Leonard (HOA) on July 31 when he called to discuss our Comprehensive Plan, and during that phone call he suggested the HOA had subsequently determined that they did not believe the flap gate would adequately address the issue and were no longer interested in advancing that solution. I advised him at that time that the inter-agency approach and roles would be nearly identical regardless of which solution they choose to advance.

DNR Analysis

On August 10, Dick Hawley (HOA) submitted a written request to the DNR for hydrologic modeling, also attached. The letter cited a lack of cooperation from the District and questions the modeling analyses done to date. The DNR informed him that the DNR did not have the capacity to perform hydrologic modeling and trusted the work done to date by the District, but did commit to the following:

- Requesting permit information from the District
- Resurveying the culverts in Carver Park Reserve (the HOA's request had suggested that the culverts were higher than previously reported)

Permit Results

The response to the request for permit information from the DNR was distributed to this group on September 27, 2017. MCWD staff conducted a search of permits within Carver Park Reserve that may contain information pertinent to the hydraulic connection of Stone Lake, Lake Sunny, Lake Zumbra, and Lake Auburn. The review revealed two proposed culvert modifications, within the 2005 and 2006 Carver Park Trail Rehabilitation and Reclamation Project.

1. The culvert between Sunny Lake and the Auburn Lake wetland (Culvert 2 in the Wenck report) was proposed to be lengthened to accommodate the proposed trail widening, with no proposed change to the hydraulic capacity.
2. An existing outlet control structure between Maple Marsh and Sunny Lake was proposed to be modified to replace a 24-inch corrugated metal pipe with a 24-inch reinforced concrete pipe. The modification also proposed to replace the existing pre-cast grate with a beehive grate at the existing elevation. There was no proposed change to pipe diameter, invert elevation, or hydraulic capacity.

The review of information within the District's permit database did not reveal records pertaining to the culvert between Lake Zumbra and Sunny Lake, the Stone Lake Outlet, nor the culvert under County Road 11. These findings, along with plan sets, were distributed to the DNR on September 27, as well as agency representatives from this group. See attached.

Survey Results and Model Update
The results of the resurvey conducted by the DNR are attached. The survey identified some areas where the model could be updated to improve information accuracy. In all cases however, the survey found culvert elevations to be lower than thought, not higher, as suggested by the HOA.

Wenck updated the District's hydrologic model with this higher resolution data. The resultant change in 100 year elevations are summarized below. Note that with the updates Zumbra's modeled elevation does not change substantially, though both Sunny and the wetland are lower as more water is held back in Stone than previously estimated.

Atlas-14, 10day 100-yr HWLs (ft)						
Scenario	Stone Lake	Marsh	Sunny	Zumbra	Wetland*	E. Auburn
Existing	947.7	945.1	945.1	943.1	944.7	943.0
Updated 10/3/17	948.1	945.0	944.1	943.0	944.1	943.1

*This refers to the wetland between Sunny and East Auburn

The results of survey and permit review reaffirm that no changes to structures in the system are exacerbating lake levels on Zumbra based on known historic and current elevations.

New Information – District Comprehensive Plan Hearing
On Thursday October 12, Dick Hawley and Scott Leonard (HOA) attended the MCWD Board Meeting to issue public comment on our Draft Comprehensive Plan. The HOA had previously issued a comment letter in response to the release of the Draft Comprehensive Plan which included the following recommendations to the District:

- "Find a permanent solution and take a leadership role in rectifying the underlying flooding issues at Lake Zumbra-Sunny, resulting in elimination of the excessive level fluctuations, the back flowing, and extended draw down periods following cycles of heavy rainfall; and
- Work with the Association, City of Victoria, Carver County and DNR to facilitate permitting of physical infrastructure and hydrologic changes required to normalize lake levels in a timely manner to prevent further flooding."

The District records all Board hearings and you can watch their statement to the Board here (or available through our website). Mr. Leonard's testimony begins just after the 16 minute mark. Their principal request the Board for the Comprehensive Plan to be amended to include a "permanent solution" to Zumbra's high water issues, and requested additional dedicated District human and financial resources to implement changes in the watershed, and to memorialize those resources in the Comprehensive Plan. Some of the issues they raised were:

- Stated that their concerns are related to drainage in both normal and high water conditions and do not step from the 2014 flooding event

- Stated that the current hydrologic conditions lead to shoreline erosion, damage to vegetation, and reduced recreation enjoyment on the property
- Stated that the District had managed updates to three culverts in 2012 that exacerbated problems, while in fact there is no record of any changes to structures in 2012, that is just the year TRPD surveyed
- Said that District staff had intentionally misled the Board as to the nature of the issue on Zumbra
- Took issue with staff's characterization of the meeting at the Lowry Nature Center on May 30 and the roles and next steps determined at that meeting

Our Board did not elect to make any modifications to the Comprehensive Plan. Staff expressed a commitment to continue working within the role defined throughout the process thus far.

Next Steps
At the October 4 meeting, this group agreed to the follow actions as next steps:

- TRPD will review the maintenance request and respond to the HOA directly on that request. TRPD may engage the Watershed District to provide some technical review of that request.
- MCWD will develop a follow up statement to the HOA for review and signature by all agency staff.
- With the new information now assembled and reviewed, the group agreed that it is timely to schedule an informational meeting to review information and affirm roles and responsibilities.

Again, I would like to extend my gratitude to this group for their engagement on the issue thus far. Please let me know if you have additional questions.

Sincerely,

Anna Brown
Planner-Project Manager
Minnehaha Creek Watershed District

c/ James Wisker, Minnehaha Creek Watershed District; Cara Geheren, Focus Engineering and City of Victoria; Brian Vlach, Three Rivers Park District; Jennie Skancke, Minneosta Department of Natural Resources; Paul Moline, Carver County Water Management Organization.

Attachment 1: Inter-Agency Meeting Agenda October 4, 2017

Lake Zumbra Meeting Agenda

October 4, 2017

1:00 – 2:00 pm

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1. Introductions and Meeting Purpose

2. Review Chronology

    - 2014 Flood Analysis
    - 2017 Solutions Modeling
    - May 2017 Meeting with Residents

3. Roles and Responsibilities

4. New Information/Information Requests
    - Open Agency Discussion
    - Permit search results
    - 2017 Model Update results

Atlas-14, 10day 100-yr HWLs (ft)						
Scenario	Stone Lake	Marsh	Sunny	Zumbra	Wetland*	E. Auburn
Existing	947.7	945.1	945.1	943.1	944.7	943.0
Updated 10/3/17	948.1	945.0	944.1	943.0	944.1	943.1

*This refers to the wetland between Sunny and East Auburn

5. Next Steps
    - Issue letter to HOA
        - Chronology
        - Roles and responsibilities
        - Next steps
    - Meeting with HOA
    - Advancing Engineering services
    - All requests and communications to be routed through this group

Handouts:

- Chronology
- DNR field survey
- Phase II Analysis Summary: Solutions Modeling

Attachment 2: Chronology

ZUMBRA LAKE LEVEL RESPONSE

Chronology:

2014: highest water year on record, flooding across the District

- Total reported damage across 16 properties of $371,000, 4 homes report structural damage

January 29, 2015: MCWD Board authorizes staff to execute a contract with Wenck to examine flooding problems in Zumbra Ridge

- Study purpose was to develop scientifically informed analysis to guide decision making moving forward
- Found no changes to lake management, crossing elevations, or development that would have proliferated the 2014 flooding beyond the record precipitation
- Recommendation to monitor and respond to culvert clogging and that City develop robust monitoring and flood response plan
- Briefly explored flap-gate, which was not advanced because it would modify OHW

July 9, 2015: following a public meeting with residents of Zumbra Ridge NA, the District board adopted to the Zumbra report (res 15-063) and pledged to continue to work with City staff

September 2016: Zumbra Ridge residents reengaged with the District seeking clarity on report recommendations and next steps

January 2017: Public agencies reconvene to discuss new questions from residents; decides to issues a second phase analysis looking at the impact of modifying culvert elevations and sizes

- Study finds that all solutions impact water levels on TRPD property

March 1, 2017: Agencies meet with Zumbra Ridge HOA. At the meeting:

- District recapped the events of 2014 and subsequent Wenck report
- Presented the structure modification options and their impact across all system waterbodies
- Defined agency roles of District, DNR, City, Three Rivers, and County
- Victoria Mayor volunteered to lead on convening policy makers from each agency to discuss advancing a solution

March 8, 2017: Mayor issues letter stating that they are supportive of District taking the lead in coordinating government agencies and identifying possible solutions

April 8, 2017: District responds restating the work done to date and the need for the City and TRPD to coordinate to determine whether and to what extent TRPD is willing to accept changes to lake and wetland elevations on their property, no entity can advance any solution without this understanding reached

May 31, 2017: District attends a meeting with TRPD, Victoria, and residents to discuss issues and TRPD/City role in advancing solution. Meeting has been called by residents seeking to advance the flap-gate solution. Outcomes:

- City volunteers to bring a scope of engineering services to council to advance a solution and serve as lead on preparing a permit application
- District commits to providing City with an outline of permitting requirements, and guidance through process
- TRPD commits to responding to a specific proposal as to whether they are willing to accept modified water levels in Carver Park caused by that solution

June 12, 2017: At homeowner request, City pulls engineering scope of work from agenda that would develop conceptual project and permitting framework.

August 12, 2017: HOA issues request for services to DNR

Attachment 3: 2015 Wenck Memo

Technical Memo

WENCK ASSOCIATES

Responsive partner.
Exceptional outcomes.

To: Renae Clark, Planner – Project Manager, Minnehaha Creek Watershed District

From: Chris Meehan, Wenck Associates, Inc.
Erik Megow, Wenck Associates, Inc.

Copy: Carver County, Three Rivers Park District, City of Victoria

Date: May 29, 2015

Subject: Lake Zumbra High Water Level Investigation

In the spring and early summer of 2014, a record amount of precipitation was experienced throughout the Minnehaha Creek Watershed District (MCWD). Chaska received 13.24 inches of rain in June, more than triple the precipitation normally received for the month. Throughout the District, flooding and high water issues resulted in many of the lakes and streams. Seventeen lakes in the District experienced record breaking high water levels. One of those lakes was Lake Zumbra.

The water level of Lake Zumbra reached a peak elevation of 944.91 on July 3, 2014 which is 1.61 feet above the lake's ordinary high water level (OHW) of 943.3, established by Minnesota Department of Natural Resources. The 944.91 elevation was the highest recorded since 1958 when the record began. The high lake level caused flooding on improved properties and residences on Zumbra Drive and Zumbra Circle and several of them experienced surface flooding issues and wet basements. Several had been installing sand bags supplied by the City of Victoria to limit structure impacts.

Minnehaha Creek Watershed District (MCWD) received communications from the City of Victoria regarding complaints from residents with flooding issues. MCWD representatives met with residents, City staff and representatives from Three Rivers Park District to share information and discuss issues being experienced by homeowners. Homeowners were seeking relief from the high water condition and were looking for help to increase the outlet capacity of Lake Zumbra. While that sounds straightforward, there are many complexities involved like determining and communicating what downstream impacts would be and seeking emergency approvals from the Minnesota Department of Natural Resources and Three Rivers Park District.

MCWD is not an emergency response authority, but it's high level of water resources expertise was offered to methodically investigate the behavior of the lake outlet and help inform homeowners and local partner agencies about Lake Zumbra water levels. MCWD agreed to review the hydrology of Lake Zumbra and its outlet, and to collect lake level information on both Lake Zumbra and Sunny Lake. The purpose of the review was to understand the lake level response and to inform all parties involved of the facts.

Wenck Associates, Inc. completed a review of lake levels and precipitation, constructed an XP-SWMM hydrologic response model, ran multiple model scenarios including the actual precipitation time series received, both TP-40 and Atlas 14 storm precipitation, reviewed past water level issues on Lake Zumbra, and surveyed low lying residences sensitive to lake level rises. The balance of this memorandum discusses the results of this hydrologic review.

Lake Zumbra Lake Levels

Since 1958, Lake Zumbra has experienced water levels that have fluctuated almost 8 feet. Figure 1 shows the recorded water levels through the past 57 years showing elevations between 936.7 in 1958 and 944.9 in 2014.

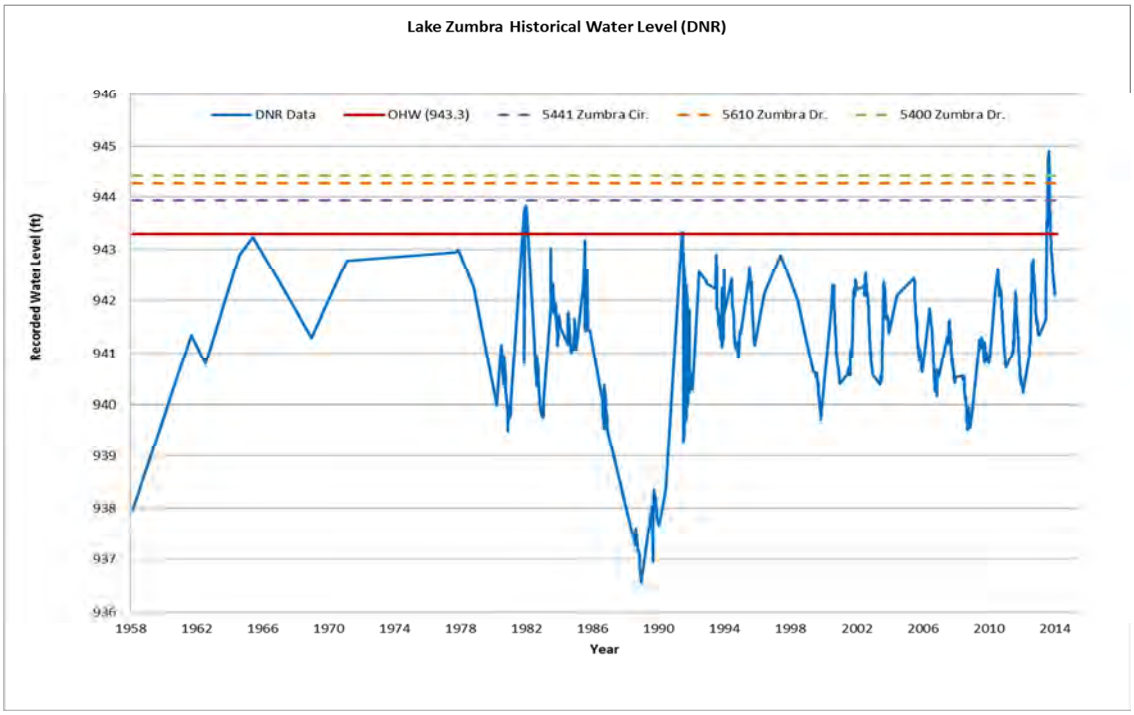


Figure 1. Lake Zumbra water level from 1958 to 2015

To understand the water level fluctuations, the hydrology and hydraulics of both Lake Zumbra and Sunny Lake were investigated. Many of the fluctuations are seasonal, however Figure 1 shows a low lake level period between 1986 and 1992. Lake Minnetonka was also low during this period reflect less than normal precipitation. The high peak during the summer of 2014 demonstrates a large range of lake levels and is the result of an extended period of wet weather.

Lake Zumbra Hydrology

Lake Zumbra is a 207 acre lake located in Carver County. It has a watershed area of 524 acres that is comprised primarily of wetlands and maple-basswood forest. Adjacent to Lake Zumbra is Sunny Lake which has always been hydraulically connected to Zumbra. A large portion of the Lake Zumbra and Sunny Lake watersheds lie in the Carver Park Reserve. Currently, only a small portion around Lake Zumbra is developed for residential use while the rest is made up of wetlands, forest, and other water features such as ponds and Stone Lake. Figure 2 shows the watersheds for Lake Zumbra, Sunny Lake, and an unnamed wetland that is located between Sunny Lake and Lake Auburn. Table 1 shows a comparison of the three waterbodies and their watersheds. It is interesting and informative to note Lake Zumbra has a watershed to lake area ratio of 2.53:1 while Sunny Lake, the tail water on the Lake Zumbra outlet, has a ratio of 45.2:1. Sunny Lake is a much smaller water body yet it receives a great deal more runoff compared to Lake Zumbra.

Table 1. Waterbody Comparisons

Waterbody	NWL (ft)	Lake Surface Area at NWL (ac)	Watershed Area (ac)
Lake Zumbra	941.1	207	524
Sunny Lake	941.1	32	1,445
Unnamed Wetland	940.3	22	118

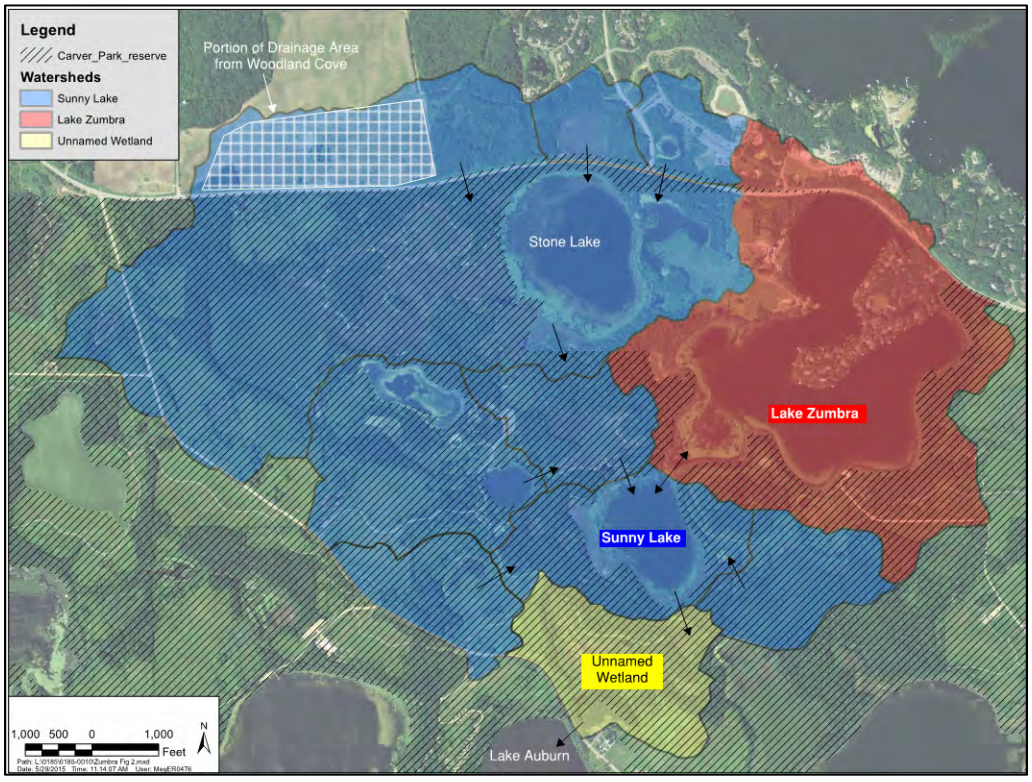


Figure 2. Lake Zumbra and Sunny Lake watersheds *See Appendix E, Figure 3 for the Lake Auburn watershed.*

Looking at historical aerial photos (Appendix A), there does not seem to be many critical changes in hard surfaces in these watersheds. Very little residential development has occurred within the watersheds that would create increases in runoff rates and volumes.

It should also be noted that future developments within these watersheds will be regulated by MCWD's Stormwater Management Rules. These rules make sure that developments include stormwater abstraction BMPs that reduce the runoff rates and volumes leaving a site, for 1-, 10-, and 100-year storm events, ensuring runoff volumes and rates do not increase to Sunny Lake and Lake Zumbra.

Woodland Cove, a development on Lake Minnetonka and contributing runoff to Sunny Lake, can be used as an example for how the stormwater rules will restrict future development. To meet the District's stormwater requirements, the development included a total of 51 sedimentation basins and 58 infiltration basins designed to reduce runoff rates and volumes and increase water quality. Table 2 shows the pre-development and proposed runoff and water quality parameters that were reviewed and permitted in 2011.

Table 2. Woodland Cove Runoff Reductions

Runoff Parameter	*Pre-development*	*Proposed*	*Reduction*
Total Phosphorus Load (lbs/yr)	35.53	5.82	83.2%
Total Suspended Solids (lbs/yr)	9,614.8	284.4	97.0%
Runoff Volume (ac-ft)	34.80	18.41	47.1%

From the aerial photo review and additional historical documents, an increase in runoff rates and volume to Lake Zumbra, due to residential development, does not appear likely based on current stormwater regulations.

Lake Zumbra Outlet Hydraulic Capacity

Through a review of the Minnesota Department of Natural Resources and Three Rivers Park Board records, the overall hydraulic capacity between Lake Zumbra and Lake Auburn has not changed significantly in the past 45 years. The most significant change in the watersheds were the installations of trail and road crossings between Zumbra and Sunny in the early 1960s and the changing culverts at the trail and County Road 11 crossing downstream (see Table 3, Pg. 5)

Since the 1960s, Lake Zumbra has discharged to Sunny Lake and Sunny Lake has discharged to Lake Auburn through an unnamed wetland. Figure 3 shows how water flows from Lake Zumbra to Lake Auburn and where flows from sub-watersheds enter the system at Sunny Lake. Figure 3 also shows the three critical crossings/culverts that regulate flow through the system.

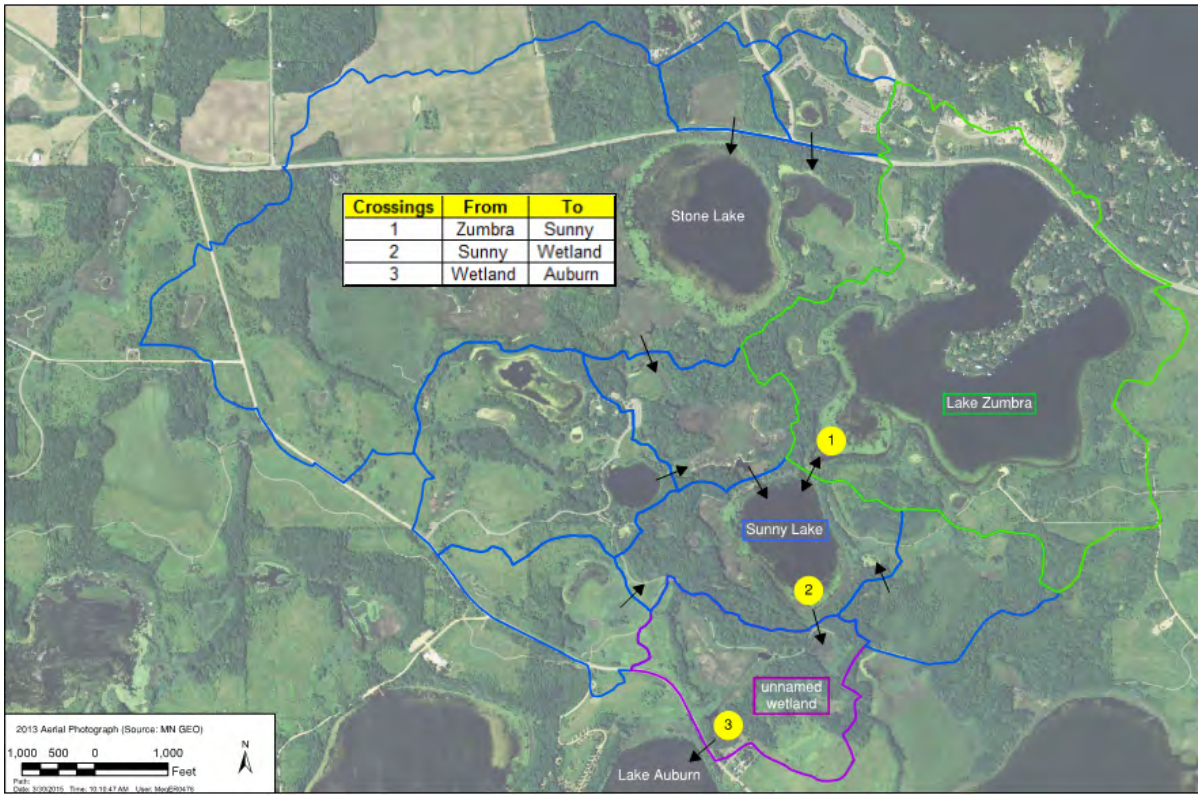


Figure 3. Flow direction of water from Zumbra to Auburn and the three critical crossings

The three crossings shown in Figure 3 regulate flow in between Lake Zumbra and Lake Auburn. A review of historical documents and aerial photos reveals that these three crossings have changed since 1966. Table 3 lists recorded elevations and culvert sizes and how they have changed over time.

Table 3. Culvert sizes at critical crossings

Crossing	From	To	Year[1] Surveyed	Type	Diameter (in.)	Capacity (cfs)	Upstream Elev. (ft)	Downstream Elev.(ft)
1	Zumbra	Sunny	1966	CMP	18	6.3	940.71	940.10
			2012[2]	CMP	24	6.5	940.70	940.80
2	Sunny	Wetland	1966	CMP	18	Unknown	943.80	Not Surveyed
			1978	CMP	24	Unknown	942.50	Not Surveyed
			2012	CMP	30	19.7	941.17	941.46
3	Wetland	Auburn	1976	CMP	24	6.8	941.10	940.00
			2012	HDPE	18	8.3	940.27	939.55

[1]These years represent the years which these crossing were surveyed and not the year they were installed.
[2]According to the Three Rivers Park District, this culvert was installed sometime between 2005 & 2006

The 2012 survey from the Three Rivers Park Department is the most recent survey collected for the crossings. No work at these crossing has been performed since 2012. Table 2 does show that there have been some changes in the size and elevation of the culverts during the last 50 years;

- *Crossing 1 – Zumbra to Sunny*
  - A review of aerial photos (Appendix A) shows that prior to the early 1960s, Lake Zumbra and Sunny Lake were connected without impediment. Sometime during the early 1960s an earthen berm was constructed and an equalization pipe was placed in the berm to connect the two lakes hydraulically. It is assumed the culvert placed in the berm was the 18" CMP Culvert listed in Table 2. At some time between 1966 and 2012, the CMP Culvert was increased to 24 inches, but the slope was decreased such that capacity of the pipe has remained the same.
- *Crossing 2 – Sunny to Unnamed Wetland*
  - A review of aerial photos shows that a trail of some sort has always been at this location. Over the past 50 years the culvert has been both increased in size from 18 inches to 30 inches and has been constructed at a lower invert elevation.
- *Crossing 3 – Unnamed Wetland to Lake Auburn*
  - The culvert under County Road 11 (Victoria Drive) was reduced from a 24" CMP culvert to an 18" HDPE sometime between 1976 and 2012, but the capacity of the pipe was increased by using HDPE, reducing the friction losses.

To evaluate the hydraulic interaction between the different waterbodies, an existing XPSWMM hydrologic and hydraulic model was updated to represent the current hydrology and hydraulics.

XPSWMM Modeling

The 2013 DNR FEMA XPSWMM model was updated with the most current impervious surface calculations and the 2012 TRPD survey of the crossings. The updated model was used to evaluate two scenarios:

1. A 100-year, 24-hour event using an Atlas-14 rainfall distribution and
2. The 2014 Flooding event from April to July using 15-minute rainfall data from Carver County.

Scenario 1:
The 100-year, Atlas 14 storm was modeled first to see how the system responded during an intense rainfall event. Table 4 shows a summary of the Atlas 14, 100-year modeling results, along with the 1-year & 10-year scenarios for comparison. The hydrographs for the lakes and crossings during the Atlas 14 100-year event can be found in Appendix B.

Table 4. Atlas 14 1-, 10-, & 100-year XPSWMM Results

Waterbody	*100-year*		*10-year*	*1-year*
	Peak Elev. (ft)	*Peak Outflow (cfs)*	*Peak Elev. (ft)*	*Peak Elev. (ft)*
Lake Zumbra	943.37	5.98	942.28	941.83
Sunny Lake	945.96	36.71	943.94	942.86
Wetland	945.15	11.71	943.37	942.13

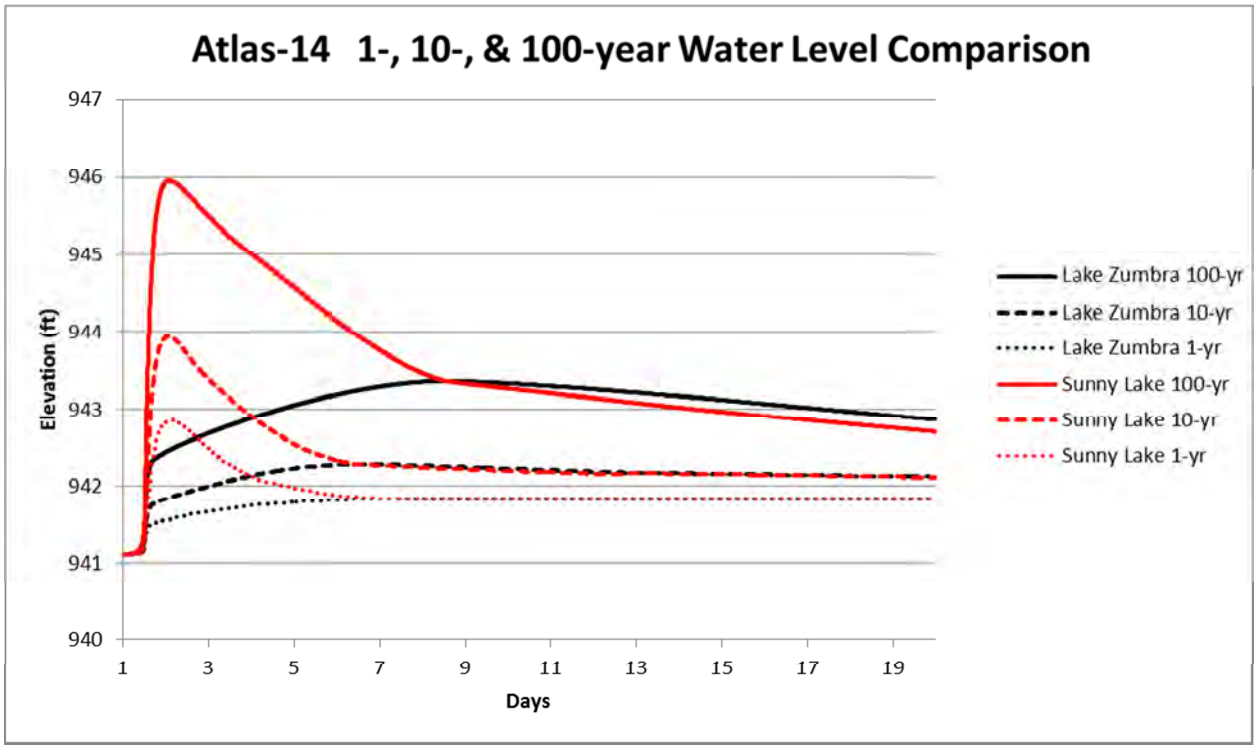


Figure 4. Lake hydrographs from XPSWMM showing the Atlas-14 1-, 10-, and 100-year storm events as modeled in XPSWMM.

The HWL during the Atlas-14, 100-year storm is expected to be 943.37 which is just above Lake Zumbra's OHW of 943.3. More importantly, the HWL of Sunny Lake reaches 945.96. This water level is important, because it shows that Sunny Lake's water level rises faster and higher than Lake Zumbra's and actually creates a backflow of water into Lake Zumbra. As was determined in the 1983 report from E.A. Hickok and Associates (Appendix D), Lake Sunny and the Unnamed wetland rise quickly and begin discharging to Lake Auburn and Lake Zumbra simultaneously. During the Atlas-14, 100-year storm Lake Sunny discharges a total of 229 ac-ft of water through the equalization culvert. This amount of water dispersed over the surface area of Lake Zumbra (207 ac) results in a rise of about 1.1 feet. Indicating that by making the equalization pipe between the two lakes larger would not reduce the HWLs of Lake Zumbra.

Scenario 2:
The summer of 2014 saw record precipitation in the first half of the year. Between January 1 and June 30, Carver County recorded 25.98 inches of precipitation. This precipitation led to many lakes within the watershed district recording record high water elevations, including Lake Zumbra where a water level of 944.91 was recorded.

To determine how the system would handle multiple intense storms, the 2014 Flooding event was modeled. Modeling the 2014 storm event also provides a benchmark to see how high water levels could be compared to recorded water levels. Using rainfall data from Carver County between late April and early July, the model shows that this fast rise of Sunny Lake and the Unnamed wetland drove the HWL of Lake Zumbra higher and higher. Table 5 shows a summary of the 2014 Flooding Event model using Carver County rainfall data. The hydrographs for the lakes and crossings during the 2014 Flooding event can be found in Appendix C.

Table 5. 2014 Flooding XPSWMM Results

Waterbody	*Peak Elevation (ft.)*	*Peak Outflow (cfs)*
Lake Zumbra	944.29	6.47
Sunny Lake	945.47	27.73
Wetland	945.02	10.91

The XPSWMM 2014 Flooding model showed that Lake Zumbra would rise to an elevation of 944.29 which is a foot higher than its OHW (943.3). Additionally, Sunny Lake and the downstream wetland would rise above 945.0 restricting the outflow of Lake Zumbra for extended periods of time. Included in Figure 5 are elevation data from the DNR and MCWD during the summer months.

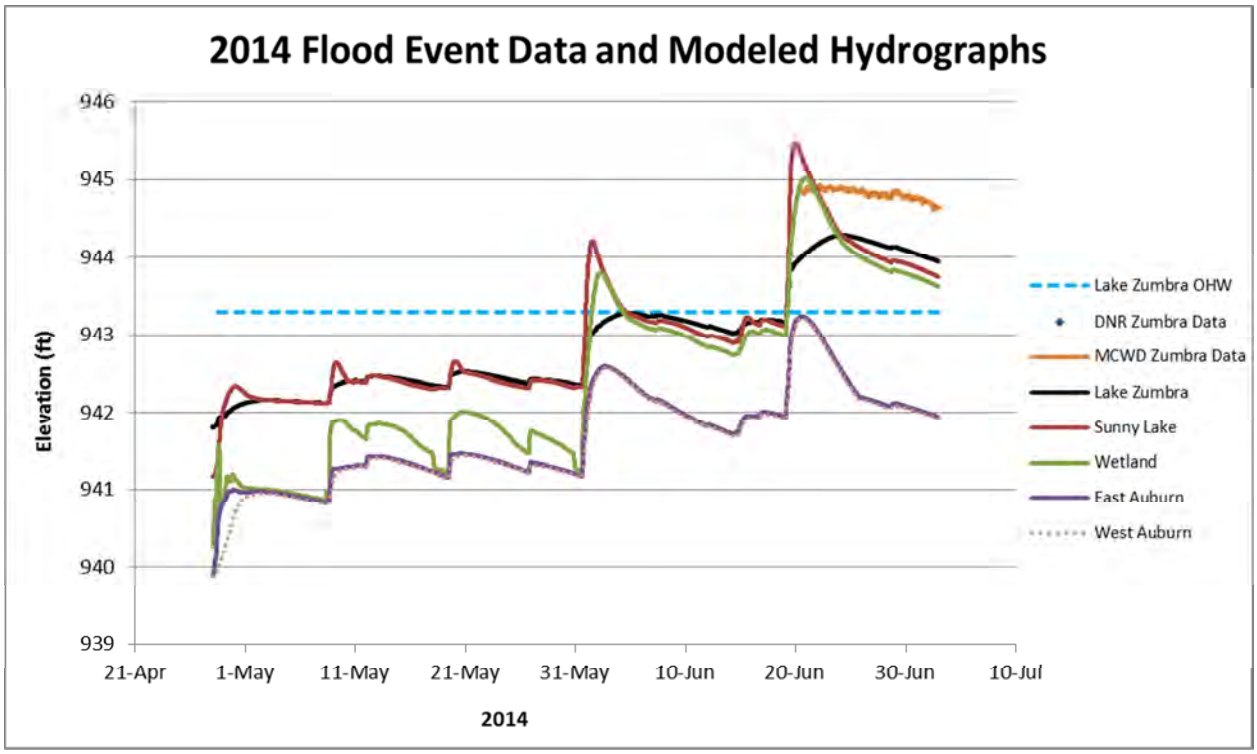


Figure 5. Lake hydrographs from XPSWMM showing the 2014 Flooding event using Carver County precipitation data.

Figure 5 shows how high Lake Auburn, Sunny Lake, and the Unnamed wetland bounced over a foot during the intense rain events at the end of May and on June 19th. These three waterbodies bouncing so high permitted flow out of the system backing up into Lake Zumbra. The model shows that Sunny Lake discharged 251 ac-ft to Lake Zumbra between April 28 and July 3. This amount of water dispersed over the surface area of Lake Zumbra (207 ac) results in a rise of about 1.2 feet. Even with the high elevations that were modeled, the recorded elevations from the DNR data set show that the levels were even higher, possibly alluding to other phenomena that proliferated the water levels even higher. The Three Rivers Park Board noticed that there might have been some clogging due at the outlet of Sunny Lake due to cattail mats and beaver activity. These observations were made in June and early July, with TRPB staff hiring someone to remove the beaver blockage in mid-to-late July.

2014 Flooding Overview and Summary

During the 2014 Flooding event, 16 property owners on Lake Zumbra experience impacts due to high water levels. Five of the 16 properties had structural impacts in the homes due to the Lake Zumbra water rising above their lowest opening. It is estimated that the flooding caused $371,000 in costs which equates to about $23,000 per property (Appendix E). Additionally, the City of Victoria provided $20,000 of sandbagging efforts bringing the total cost to just under $400,000. Figure 6 shows the 16 parcels along Lake Zumbra that experienced damage due to the flooding.

Figure 5. Flood damaged parcels and the 944.0 contour elevation (LiDAR). *See Appendix E, Figure 2 for a more detailed breakdown of the parcel damage.*

A breakdown of the property damage assessment shows that a majority of the damage (64%) was due to landscaping and 32% was due to structural/housing damage. A breakdown of the property damage is shown in Table 6. A detailed breakdown of the damage per parcel is listed in Appendix E.

Table 6. Property Damage Assessment Breakdown

Type of Damage	*Costs*[1]	*% of Total*
Landscape	$237,600	64%
Equipment	$14,900	4%
Structural[2]	$118,500	32%
Total	***$371,000***	***100%***

1. Costs were provided by the Zumbra HOA (Appendix E)
2. Structural elements refer to flooring, falls, furniture, and the exterior of homes

According to a 2015 Survey, low opening elevations along Lake Zumbra are as low as 943.93. Table 7 lists the low opening elevations for parcels which requested to be surveyed. A map of these elevations are shown in Appendix F.

Table 7. 2015 Surveyed Low Opening Elevations

Parcel Address	*Low Opening Elevation (ft)*	*Low Opening Type*
5400 Zumbra Dr.	944.44	Garage
5429 Zumbra Cir.	946.32	Garage
5441 Zumbra Cir.	943.93	Floor
5451 Zumbra Dr.[1]	945.59	Garage
5471 Zumbra Cir.	946.41	Window
5610 Zumbra Dr.	944.26	Floor
5430 Zumbra Dr.[2]	939.23	Floor

1. The basement floor is located at a lower elevation than the lowest opening.
2. Flooding of this residence is caused by flooding in the park and not Lake Zumbra.

Going Forward

A historical review of lake management, crossing elevations, and development within the Zumbra-Sunny watershed does not indicate any changes that would have proliferated the 2014 flooding beyond the record precipitation. The high water levels have been a problem since 1970s and solutions were explored in the 1980s.

Modeling results show that an Atlas-14, 1-year and 10-year storm would not produce flooding elevations above the low openings that were surveyed. MCWD's high water elevation rule states that there should be at least two vertical feet of separation between low openings of structures and the 100-year high water elevations of waterbodies. For events where 2 feet of freeboard is not present, the City of Victoria and homeowners should look into flood protection/proofing measures, such as sandbagging or berming. Table 8 shows which houses would be affected for which storm events and the expected costs of sandbagging for these events.

Table 8. Property Damage Assessment Breakdown

Atlas-14 Event	*Lake Zumbra Elevation (ft)*	*2ft of freeboard (ft)*	*Houses Needing protection*[1]	*Cost of Sandbagging*[2]
1-year	941.83	943.83	**None**	$0
10-year	942.28	944.28	**2** - 5610 Zumbra Drive & 5441 Zumbra Cir.	$4,000
100-year	943.37	945.37	**3** - 5610 Zumbra Drive, 5441 Zumbra Cir., 5400 Zumbra Dr.	$6,000

1. Houses in which 2ft of freeboard are not available
2. The City of Victoria estimates the costs of sandbagging (labor and materials) to be $2,000/home

Modeling results show that Lake Zumbra does not reach its peak elevation for about 7 days after large rain events, which would provide the homeowners and the City of Victoria time to implement flood proofing measures. Additional measures to look at monitoring lake levels on Sunny Lake would help identify potential flooding events when water would flow into Lake Zumbra.

Beyond sandbagging, the City of Victoria and the Three Rivers Park District will add additional measure to make sure the outlet to Lake Zumbra is clear of debris. This will include more regular maintenance inspections by park staff along with implementing a solution to limit the potential of future blockage due to beaver activity.

Appendix D

1983 E.A. Hickok Report

MEMORANDUM

TO: Minnehaha Creek Watershed District
Board of Managers

FROM: Mike Panzer
E. A. Hickok and Associates

DATE: August 1, 1983

SUBJECT: Lake Zumbra/Sunny Lake Outlet Investigation

As directed by the Managers, I have investigated and reviewed the existing outlet system for Lake Zumbra and Sunny Lake in the Hennepin County Park Preserve District (HCPRD), Carver Park Reserve. This investigation was undertaken at the request of HCPRD and authorized by the Board of Managers on July 21, 1983.

The outlet system was analyzed based upon information provided by HCPRD, information contained in the report entitled "Carver Park Reserve Water Management Plan", E. A. Hickok and Associates, February 1975 and miscellaneous information in the Districts files.

1. Overview

Lake Zumbra borders the Carver Park Reserve and outlets through Sunny Lake and into Lake Auburn via a system of culverts, open channel and ponds. Lake Zumbra is connected to Sunny Lake by culvert which acts as a water level equalizer.

Residents who live on Zumbra Lake have frequently complained of high water and have requested HCPRD to increase the capacity of the existing connection between Lake Zumbra and Sunny Lake to relieve high water conditions. It is believed by some residents that the connection restricts flow from Lake Zumbra to Sunny Lake thereby aggravating high water problems on Lake Zumbra.

HCPRD modified the Sunny Lake Outlet after the park property was acquired. The existing Sunny Lake Outlet is lower than the previous outlet and is lower than the outlet elevation stipulated by the DNR permit issued to HCPRD to perform the work. The outlet invert would have to be raised substantially to conform with DNR requirements.

The existing Sunny Lake Outlet is higher than the outlet elevation recommended in the 1975 report. This report takes into account the interrelationships of all lakes within Carver Park Reserve and recommends control elevations. The Managers have reviewed and approved the 1975 report.

The HCPRD wishes to implement recommendations in the 1975 report, cooperate with residents on Lake Zumbra, and meet the requirements of the District and DNR. However, the improvement requested by the residents, in

the opinion of HCPRD, may not be sufficient to adequately address the problem. In addition, the DNR may not allow the work unless the existing outlet invert elevation for Sunny Lake is also raised to comply with DNR permit No. 79-6120 conditions. Finally, HCPRD is hesitant to proceed with any further work until it is known whether DNR requirements, Minnehaha Creek Watershed District requirements and concerns of the residents can all be met.

2. Analyses

Culvert sizes and invert elevations within the Carver Park Reserve were confirmed with HCPRD staff.

Hydrologic model data from the 1975 report were used to estimate runoff hydrographs, and their relationship with time, for Lake Zumbra and Sunny Lake. The runoff hydrographs were routed through the system by a reservoir routing procedure to estimate high water levels, outflow hydrographs and their relationship with time.

3. Conclusions

A. Runoff hydrographs resulting from intense rainfall cause Sunny Lake to rise higher and more quickly than Lake Zumbra. For this reason, Sunny Lake can simultaneously discharge to both Lake Auburn and Lake Zumbra. Under these reverse flow conditions, the modifications requested by residents would cause an increase in the volume of runoff to Lake Zumbra and a slight increase in the high water elevation. This is contrary to the effects anticipated by the residents on Lake Zumbra who have requested modifications.

B. The existing outlet culvert for Sunny Lake has adequate capacity to prevent damaging high water conditions on Lake Zumbra for a 100 year - 24 hour storm. However, channel capacity of the Sunny Lake outlet downstream is inadequate and causing a tailwater condition to develop that restricts flow.

C. The outlet elevation of Sunny Lake is presently higher than that recommended in the 1975 report and is substantially lower than the elevation stipulated by the DNR. It is apparent that raising the outlet elevation to conform with DNR requirements would also require a control structure and improvements to increase the capacity of the waterway between Sunny Lake and Lake Auburn. This would be necessary to prevent increased high water levels on Sunny Lake and Lake Zumbra.

4. Recommendations

A. Sunny Lake Outlet

The outlet channel between Sunny Lake and Lake Auburn controls water levels on Sunny Lake and Lake Zumbra. HCPRD should investigate the feasibility of improvements to increase channel capacity for the purpose of relieving high water problems upstream.

Under no circumstances should the existing Sunny Lake outlet control elevation be raised to conform with requirements set forth by the DNR unless additional improvements are implemented downstream to assure that high water levels on Sunny Lake and Lake Zumbra are not increased.

B. Lake Zumbra/Sunny Lake Culvert Connection

The capacity of the culvert connection between Lake Zumbra and Sunny Lake should not be increased unless the capacity of the Sunny Lake outlet system is also increased.

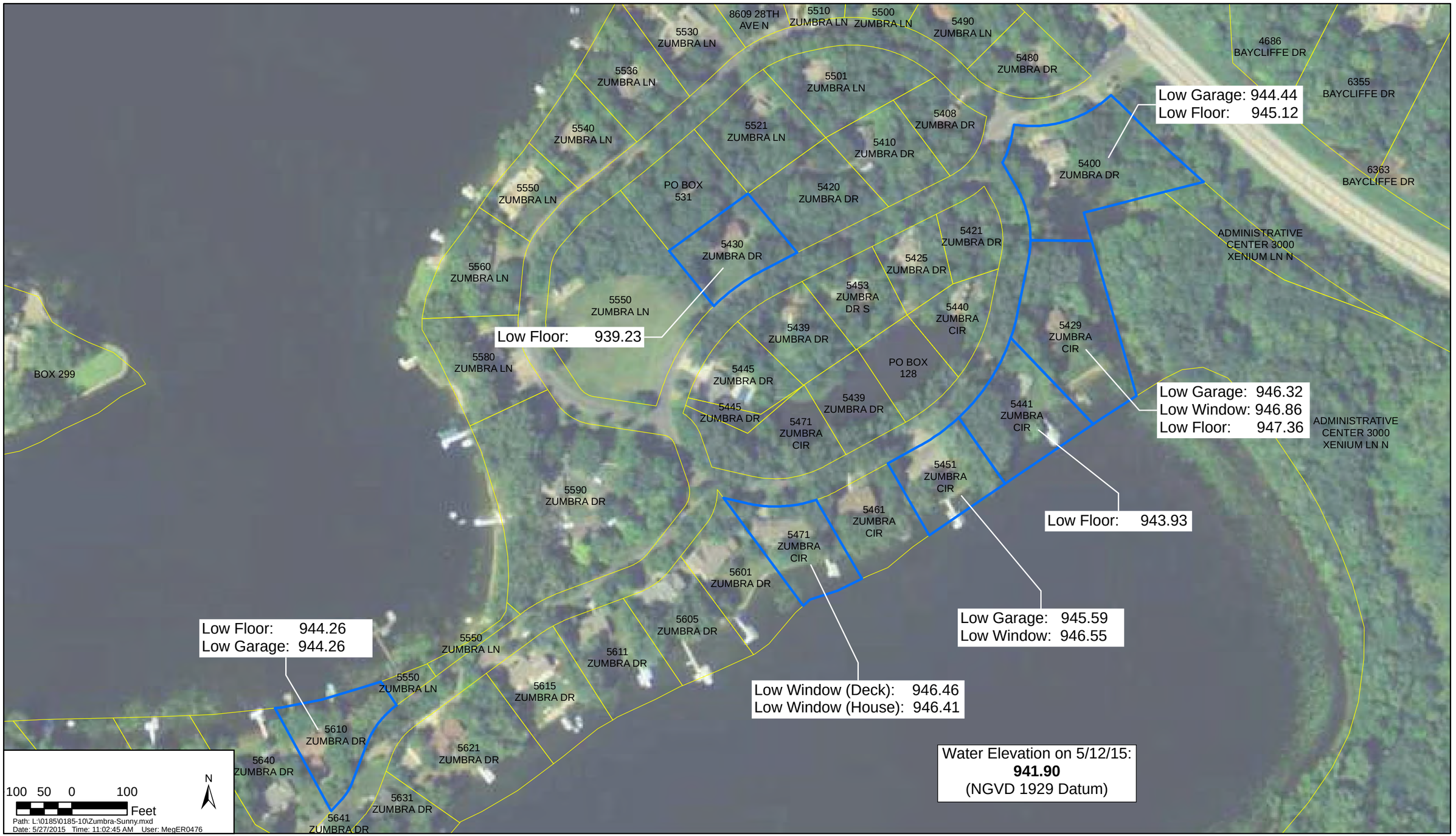
C. Lake Auburn - Auburn East/West Connection

The capacity of the open water connection between Lake Auburn East and Lake Auburn West should be verified by field surveys in conjunction with Item A above.

It is recommended that the Board of Managers accept the conclusions and staff recommendations herein and direct that they be forwarded to HCPRD.

Appendix E

Figures



MINNEHAHA CREEK WATERSHED DISTRICT

Lake Zumbra Survey

WENCK ASSOCIATES
Responsive partner. Exceptional outcomes.

MAY 2015

Figure 1

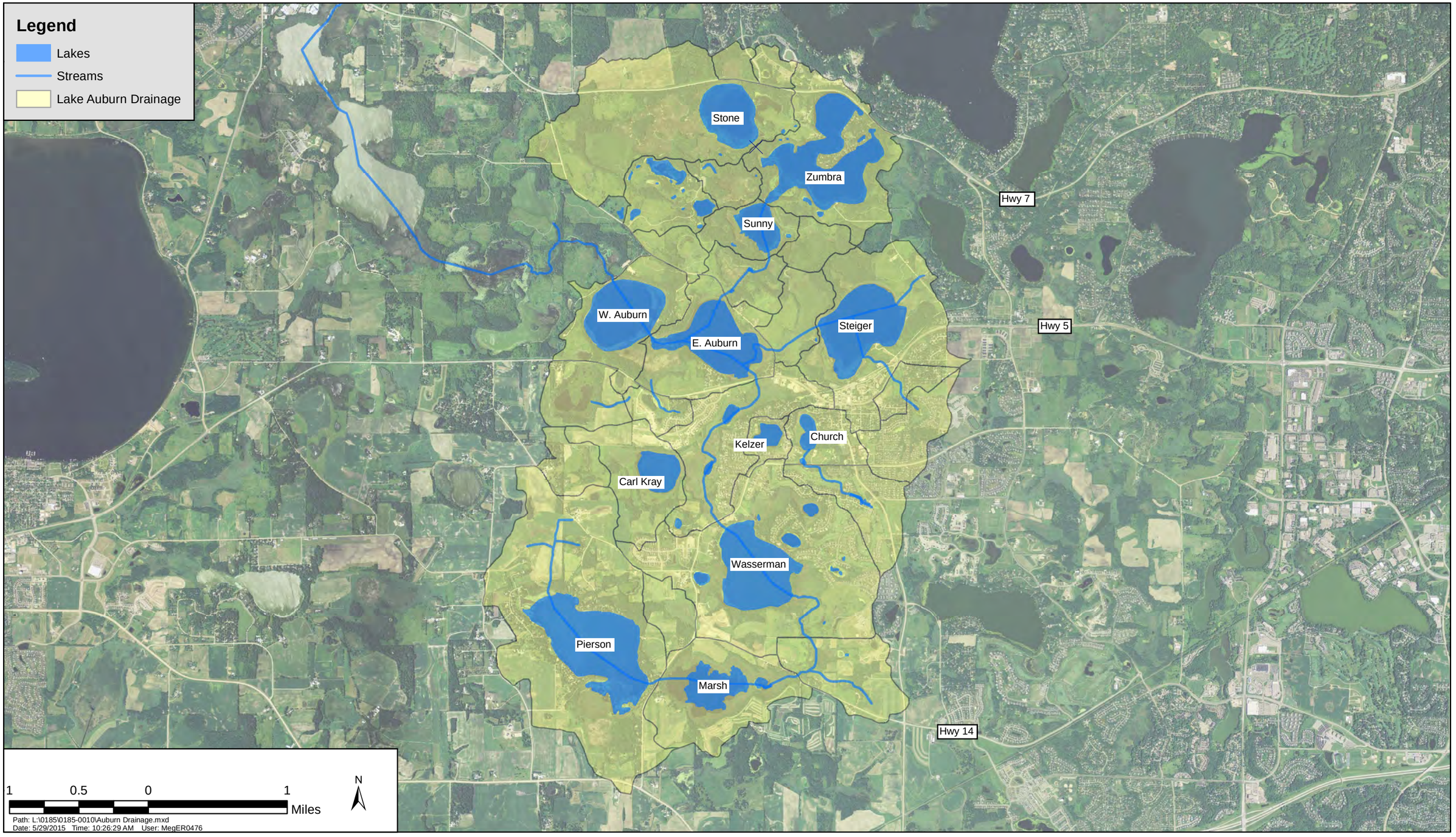
MINNEHAHA CREEK WATERSHED DISTRICT

Lake Zumbra 2014 Flooding Damage

WENCK ASSOCIATES
Responsive partner. Exceptional outcomes.

MAY 2015

Figure 2



MINNEHAHA CREEK WATERSHED DISTRICT

Lake Auburn Drainage Area

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

MAY 2015

Figure 3

Appendix F

Property Damage Assessments

Zumbra Ridge Homeowners Association

Property Damage Assessments
June 2014 Lake Zumbra High Water

Bigalke, 5645 Zumbra Drive:	Equipment:	$1400
	Landscape:	4600
Hackett, 5430 Zumbra Drive:	Flooring/Walls:	15000
	Landscape:	24000
Haroldson, 5691 Zumbra Drive:	Landscape:	7500
Irene, 5730 Zumbra Drive:	Landscape:	10000
Jorgenson, 5441 Zumbra Circle:	Flooring/Walls:	35000
	Landscape:	15000
Kemppainen, 5611 Zumbra Drive:	Landscape:	10000
Kroiss, 5605 Zumbra Drive:	Landscape:	5000
Langva, 5590 Zumbra Lane:	Landscape:	17500
Larson, 5451 Zumbra Circle:	Flooring/Walls:	12000
	Furniture:	2500
	House Exterior:	10000
	Equipment:	7000
	Landscape:	5000
Lee, 5610 Zumbra Drive:	Floors/Walls:	24000
	Landscape:	44000
Leonard, 5601 Zumbra Drive:	Landscape:	16500
	Equipment:	4000
Nauman, 5720 Zumbra Drive:	Equipment:	2500
	Landscape:	7500
Nelson, Charlson Meadows:	Landscape:	28000
Running, 5510 Zumbra Lane:	Landscape:	15000
Steadman, 5429 Zumbra Circle:	Flooring/Walls:	20000
	Landscape:	10000
Swenson, 5530 Zumbra Lane:	Landscape:	18000

Attachment 4: 2017 Wenck Scenario Analysis

Technical Memo

WENCK ASSOCIATES

Responsive partner.
Exceptional outcomes.

To: Minnehaha Creek Watershed District Staff

From: Erik Megow, Wenck Associates, Inc.
Chris Meehan, Wenck Associates, Inc.

Date: March 31, 2017

Subject: Lake Zumbra High Water Level (HWL) Investigation Modeling Scenarios

In 2015, a report[1] was created outlining the hydrologic and hydraulic (H&H) characteristics of Lake Zumbra in Victoria. The report focused on the Lake's outlet, the downstream lakes and hydraulics, and the damage caused from the 2014 flood events. As a follow-up to the 2015 Report, this memo outlines scenarios that were investigated and modeled to lower Lake Zumbra's 100-yr HWL.

The H&H analysis outlined in the 2015 showed that the outlet of Lake Zumbra was not undersized, but rather high water levels in downstream waterbodies (Lake Sunny) provided backflow to Lake Zumbra and limited outflow. Figure 1 (attached) shows flow direction and profile of the waterbodies around and downstream of Lake Zumbra. Figure 2 shows the Lake Zumbra Watershed in relation to the greater Six-mile Creek Watershed, upstream of Lake Auburn. During large storm events, flow from Stone Lake and wetlands upstream of Sunny Lake quickly flow into Sunny and bounce the small (in comparison to Zumbra) lake above the outlet to Zumbra resulting in water flowing into Zumbra and restricting Zumbra from drawing down. To lower the high water level of Lake Zumbra during large storm events, four scenarios were modeled in XPSWMM.

The first three of these Scenarios aimed to lower the Lake Zumbra high water level by reducing the bounce of Sunny Lake and the backflow entering Lake Zumbra. The first three scenarios tried to reduce the Sunny Lake bounce by holding more water and runoff in Stone Lake, upstream of Sunny Lake and by increasing hydraulic crossings downstream of Sunny Lake to increase outflows. The fourth scenario aimed to lower Lake Zumbra's high water level by permitting any flow from Sunny to Zumbra during all storm events. Following, is a description of the 4 Scenarios that were modeled:

- **Scenario 1**: This scenario added a second culvert underneath County Road 11 (CR 11). The culvert added underneath CR 11 was a second 18-inch HDPE culvert at the same inverts as the existing culvert underneath the Road. This additional culvert was modeled with the idea that the increased flow to Lake Auburn would lower Sunny Lake and the amount of backflow entering Zumbra.

- **Scenario 2**: This scenario adjusted the outlet of Stone Lake by increasing the height of the weir. The outlet of Stone lake was altered from a 100ft long weir at 946.9 to a 100-ft long weir at 948.0 with notches at 946.9 and 947.5 to maintain the existing runout elevation. This scenario aimed to limit the bounce of Sunny Lake to limit backflow to Lake Zumbra more than in Scenario 1.

- **Scenario 3**: This scenario (a) added a culvert underneath CR 11 as in scenario 1, (b) adjusted the outlet of Stone Lake as in Scenario 2, and (c) enlarged the outlet of Lake Sunny from a 30" to a 42" culvert. The outlet of Stone lake was altered from a 100ft long weir at 946.9 to a 100-ft long weir at 948.0 with notches at 946.9 and 947.5 to maintain the existing runout elevation. The combination of these three hydraulic changes aimed to limit backflow to Lake Zumbra by both holding water back and drawing down Sunny Lake as quickly as possible.

- **Scenario 4**: This scenario modeled the outlet culvert of Lake Zumbra as a one-way flow connection to Sunny Lake. This option permitted backflow entirely, mimicking a culvert or outlet with a backflow valve or gate. The scenario bounced Sunny Lake and other downstream waterbodies by permitting backflow to Lake Zumbra entirely. In this scenario, the only water entering Lake Zumbra is the runoff from its direct watershed.

All four scenarios outlined above were modeled in XP-SWMM using the most recent (2012) survey data of the hydraulic connections shown in Figure 1 (attached). The scenarios were modeled using a 100-year, 10-day rainfall event using a TP40 rainfall (10.3 inches). Table 1, below, shows the results of the 4 modeled scenarios by comparing the increases in HWLs. The results for each of the Scenarios are shown, visually, in Figures 3-6 (attached).

Scenario	100-yr, 10-day HWLs and Increases (ft)					
	Zumbra	Stone	Sunny	Wetland	E. Auburn	W. Auburn
Existing HWLs	943.1	947.7	945.1	944.7	943.0	943.0
1	-0.1	0.0	0.0	-0.5	0.0	0.0
2	-0.2	0.5	-1.3	-1.2	0.0	0.0
3	-0.3	0.5	-1.4	-1.5	0.0	0.0
4	-0.7	0.0	0.3	0.4	0.0	0.0

As shown in Table 1, all four scenarios will have a minimal effect on East and West Auburn lakes downstream. The lakes that would be effected the most would be Stone Lake during Scenarios 2 & 3 and Sunny Lake during Scenario 4. The Table also shows that the only Scenario that would make a noticeable difference for residents on Lake Zumbra is Scenario 4 which would lower the 100-year HWL by 0.7 feet from 943.1 to 942.4.

References:

1. Technical Memo, 'Lake Zumbra High Water Level Investigation', by Wenck Associates, dated July 6, 2015. Available electronically, here: http://www.minnehahacreek.org/sites/minnehahacreek.org/files/agendas/10.6%20-%20Zumbra%20Report%20Acceptance_reduced.pdf

Attachment 5: 1992 Letters r.e. Zumbra Development

GRAY, PLANT, MOOTY, MOOTY & BENNETT, P.A.

INCLUDING THE FORMER FIRM OF HARSTAD & RAINBOW

3400 CITY CENTER
THIRTY THREE SOUTH SIXTH STREET
MINNEAPOLIS, MINNESOTA 55402-3796
TELEPHONE 612 • 343 • 2800
FAX 612 • 333 • 0066
TWX 910 • 576 • 2778

DIRECT DIAL 343-2874

May 1, 1992

Minnehaha Creek Watershed District
Attn: Mr. Ron Quanbeck
P.O. Box 387
Wayzata, Minnesota 55391

Hennepin County Parks Preserve
Attn: Mr. Tim Marr, District Engineer
12615 County Road 9
Plymouth, Minnesota 55441-1248

Re: <u>Lake Zumbra Water Level</u>

Dear Sirs:

Thank you for taking the time to discuss the high water situation of Lake Zumbra with me last month. As I indicated in our phone conversation, I have been asked by some homeowners on Lake Zumbra to contact you with respect to this situation. Many homes have flooded back yards, and there is a real risk of basement flooding if the lake's level rises.

I have now had a chance to talk with the Department of Natural Resources (DNR), as well as with your organizations. I would like to summarize these conversations, and then request that you and a group of homeowners meet to discuss what steps can be taken to re-examine Lake Zumbra's drainage and determine the alternatives for regulating its level.

As you know, Lake Zumbra flows into Sunny Lake, which in turn flows through Carver Park to Lake Auburn. Ultimately this area drains through Six Mile Creek into Lake Minnetonka. Originally Sunny Lake was part of Lake Zumbra. At some point in the last 25 years, a causeway was built, separating the two lakes. There is a small culvert under the causeway between Zumbra and Sunny Lake. This culvert is the only outlet for the

lake. One issue is the level of this culvert and whether the size of the culvert is adequate. I do not entirely understand why the level of this convert is important inasmuch as the entire causeway is man-made, and interrupts the natural flow of the lake. The causeway has also caused that end of the lake to become weed-choked. As a starting point, it would seem that the flow of water under the causeway could improve.

There is a second culvert at the end of Sunny Lake which drains that lake under a bike path. From Sunny Lake, there is a very shallow slope towards Lake Auburn. Water drains into Lake Auburn through a third culvert under County Road 11.

The DNR informed me that the ordinary high water level of the lake has been set at 943.3' above sea level. Their file contains a letter from Doug Barr of Barr Engineering stating that in the last 35 years, the lake level has been anywhere from 938' to 943.24' above sea level. Mr. Barr's letter also stated that prior to 1930, the lake's level was 944'. (It is not clear whether Mr. Barr's statements with respect to recent lake levels were based on personal observations. However, Mr. Barr is a client of this firm, and, given his age, I can safely assume he did not make personal observations prior to 1930.) The DNR stated that changing the ordinary lake level is complicated but that they may be willing to re-examine this issue if there were evidence that the 100 year flood elevation would cause flooding of the basements of homes along the lake.

Tim Marr seemed well-versed on the history of the Lake Zumbra water level controversy. He indicated that part of the problem concerned a dispute between the DNR and the watershed district as to the proper level for the lake, and that this dispute had in the past prevented the construction of an appropriate outlet for the lake. A second problem concerned downstream obstructions to the flow of water. The basin between Lake Zumbra and Lake Auburn is flat and, as noted above, there are a number of obstacles to the flow of water. Finding a solution for Lake Zumbra depends in part on resolving these obstacles.

Currently the lake level is at approximately 942'. (This observation is based on survey stakes at a recent new home construction site.) At this level, there is flooding of all beaches and the back yards of some homes. One home owner reports basement flooding. However, if the lake rises another foot, there will be flooding of several homes. A major storm could easily raise the lake level by a foot.

The residents can accept periodic flooding of yards and beaches, but they do not believe that homes that have been on the lake for thirty years should be subject to flooding. They recognize that nature is not always predictable and that minor flooding will occur. However, the current situation is not simply the result of nature but of man-made obstacles that have changed the natural pattern of lake levels and discharge.

We would appreciate a review of this matter by your organizations. If the watershed district has data with respect to the 100 year flood levels, it would be useful to share this data with the DNR. Let us try to take a fresh look at the problem and resolve this matter once and for all.

In the meantime, some residents of Zumbra Ridge are checking the culverts to make sure that the drainage culverts are free of debris which may be restricting the flow.

Please contact me if you feel that it would be useful to meet with the residents of Zumbra Ridge to discuss this matter.

Very truly yours,

Richard A. Hackett

RAH/rsp

2326Y

cc: State Representative Larry D. Bodahl

Richard Hawley, President
Zumbra Ridge Homeowners Association

10-41P
Zumbra

METRO WATERS - 1200 WARNER ROAD, ST. PAUL, MN 55106
772-7910

November 25, 1992

Mr. Bill Thibault
City of Victoria
7951 Rose
Victoria, MN 55386

RE: GEZEL REQUEST, LAKE ZUMBRA (10-41P), CITY OF VICTORIA, CARVER COUNTY

Dear Mr. Thibault:

I am responding to your letter of November 9, 1992 in which you pose several questions regarding the Gezel variance request. I have also reviewed the materials you forwarded September 1, 1992 and I viewed the site on August 28, 1992.

1. In general, we do not believe it is appropriate for the city to grant the requested variance. It is unclear whether the 1988 filling was legal and whether the site would be buildable without illegally placing fill.

2-4. It has not been verified that the pond in question is a separate basin from Lake Zumbra. The ordinary high water elevation (OHW) of Lake Zumbra is 943.3' (NGVD, 1929). If there is a strip of land below the 943.3' elevation that connects the pond and Lake Zumbra, the pond is officially considered part of Lake Zumbra. The 9/25/92 survey shows that over half the lot is below the 942 foot contour and that the 942 foot contour line crosses Zumbra Circle. Based on this survey, it is quite possible that the pond is officially connected to Lake Zumbra. I would speculate that if we could find historical aerial photos or survey information, that the pond in question was clearly part of Lake Zumbra and has become separated from the lake by filling for the roads on the peninsula.

The pond water surface elevation of 936.79' on 9/25/92 doesn't tell us anything about the OHW since the water level can fluctuate widely even during a short period of time. (Lake Zumbra fluctuated between 941.4 and 943.2 in 1986)In order to determine an OHW we evaluate the type and elevations of vegetation, slope changes, controlling elevations at outlets, wash lines, stain marks, etc.

5. The Lake Zumbra historical water elevations are very spotty, especially before 1983. The only Lake Zumbra water level elevation I have from 1965 is 942.9' sometime in June (from Minnehaha Creek Watershed District records). The DNR has

recorded higher water elevations on several occasions: 943.0 on 9/19/78, 943.24 on 4/19/66 and 943.34 on 4/14/92. The WSD recorded an elevation of 943.18 on 5/19/86. The 1907 USGS quad showed a water level of 947 (and the 1955 USGS quad showed a water level of 940).

6. Legally, the floor elevation of the proposed structure would need to meet the city's requirement to be 4 feet above the OHW of 943.3' (same as Lake Zumbra), or 947.3' unless it is demonstrated that the two are not connected below the OHW.

   If the city had a state approved floodplain ordinance, the minimum low floor (including basement) elevation would be 1 foot above the 100 year flood elevation. No official 100 year flood elevation has been determined. Based on notes from a meeting involving the DNR, Minnehaha Creek Watershed District (WSD), Hennepin Parks, and the U.S. Army Corps of Engineers back in November 1979, the WSD estimated that the lake would rise 0.85 feet with the 100 year flood. This would indicate a 100 year flood elevation of approximately 944.15 and a minimum lowest floor elevation of 945.15. Since 100 year flood elevations are typically 1-2 feet higher than OHW elevations, a 100 year flood elevation in the 944 range is possibly on the low end.

7. A house built on this property at the proposed elevations (943 range) would have a high risk of flooding damage. The lowest basement we know of on Lake Zumbra is 943.3 (from the November 1979 meeting notes). The filling that has already occurred destroyed valuable habitat and any additional filling would add to the amount of habitat that has been destroyed.

8. Current regulations apply to all lots. The DNR prohibits filling below the OHW if the area is connected below the OHW to Lake Zumbra. The Minnehaha Creek Watershed District regulates wetland filling (of all types and sizes of wetlands) in accordance with the Wetland Conservation Act of 1991 and filling in the floodplain. The District is unlikely to permit any filling for purposes of constructing structures. The filling that occurred on the Gezel property in 1988 was, most likely, a violation of WSD rules and possibly a violation of DNR regulations. The U.S. Army Corps of Engineers also regulates wetland filling (in all types and sizes of wetlands). If filling is required to fit the size of structure requested, that's unfortunate for the owner.

   The lot owners may contend that they have a right to build a house on the lot since it was a legally platted lot, but that is

not the case. The landowners must meet the regulations in effect at the time they build. I can show you hundreds of lots which were legally platted in wetlands or lakes (including Forest Lake in Orono and Minnehaha Creek Marsh just west of T.H. 169 in Minnetonka). The legal case history has supported the local units of governments which did not permit construction that was not in conformance with existing regulations. (The case history is especially clear for situations where a structure has never been built, but less so if an existing structure is destroyed.)

The applicant has the burden of proof that the pond is not connected to Lake Zumbra (or was not as of April 4, 1986 when the protected waters inventory for Carver County was made official). We could treat the 1988 filling as a potential violation and have the DNR-Waters survey crew check the elevations in the area. However, if we found that a violation had occurred we would order the fill to be removed and charge the violator for the cost of the survey and our field inspection time.

Let me know if you have further questions on this matter.

Sincerely,

CS

Ceil Strauss
Area Hydrologist

cc: Ellen Klanderman, Minnehaha Creek Watershed District
Victoria Shoreland file

Attachment 6: 2015 HOA Request for Service

Zumbra Ridge Homeowners Association

January 12, 2015

From: Jerry Martin
President

To: Bill Olson, MCWD Board of Managers
Randy Maluchnik, Carver County Commissioner
Tom Workman, Carver County Commissioner
Tom O'Connell, Mayor, City of Victoria
John Barten, Director of Natural Resources, Three Rivers Park District

Subject: Lake Zumbra Outflow

As is well documented, Zumbra Ridge property owners experienced severe flooding in the Spring of 2014 due to high water levels in Lake Zumbra. Damage to homes and property exceeded $400,000 and residents are still working to finish repairs.

Lake Zumbra experiences inflow from surrounding land much of which is higher in elevation. Historically, the Lake drained into a large watershed to the south. This natural watershed has been altered with the construction of elevated roadways and hiking/biking trails. The natural watershed drainage is now restricted to culverts installed under the roadways and trails.

Lake Zumbra outflow is restricted to a single 24" culvert draining into Sunny Lake and Sunny Lake outflow is restricted to a single 24" culvert that drains into a watershed.

Prior to construction of the trails in Carver Park Reserve, Lakes Zumbra and Sunny were connected as part of the natural watershed. Construction of the trials brought major changes. The trails are elevated above the natural terrain thus blocking and redirecting natural drainage into and through the watershed. Culverts were installed under the elevated roads/trails to allow water to drain but these are limited in capacity and subject to blockage. When inflow to any one or more of the culverts is higher than the culvert can accommodate or the culvert becomes blocked or clogged, little to no water can flow through causing water to backup within the watershed.

This is what occurred in the Spring of 2014. Due to heavy rainfall throughout the watershed, the culverts were unable to handle the water flowage due to inadequate capacity and blockage. Adding to the problem, the outflow culvert for Lake Zumbra, that has limited capacity, was blocked and unable to allow water to drain out of Lake Zumbra. In addition, the outflow culvert from Sunny Lake was unable to handle the water flow causing Sunny Lake water levels to rise and create back pressure on the Lake

Zumbra outflow culvert. This resulted in historically high lake water levels in both Zumbra and Sunny. On Lake Zumbra, the water exceeded it's banks resulting in flooding and considerable damage to Zumbra Ridge homes and property.

To further exacerbate the problem, once water levels in surrounding lakes and watershed began receding Lake Zumbra remained at a very high level due to the clogged outflow culvert. This significantly extended the psychological and physical misery for affected homeowners. Added to his, was a prolonged no wake restriction depriving all Zumbra Ridge property owners the opportunity of enjoying the lake for which they pay a premium to live on.

The Zumbra Ridge Homeowners Association considers the outflow restrictions to Lake Zumbra to be a significant threat to our property and way of life. Therefore we are requesting you, as representatives of responsible agencies, to work together to find a permanent solution so we don't have a repeat of the 2014 flooding. If a watershed drainage study was completed prior to construction of the hiking/biking trails then this study needs to be revisited to determine why it was inadequate. If a study was not completed, we question why as major changes were made to the watershed that had significant impact on the drainage. If there is no study, we request that one be initiated immediately so as to come up with a permanent solution. This could be elevated hiking/biking trails, additional culverts, an adjustable weir or other improvements. It is our understanding that a weir system has been discussed previously but not acted upon.

At a meeting of responsible agencies, MCWD, city of Victoria, Carver County and Three Rivers Park District with the Zumbra Ridge Homeowners Association representatives in June 2014 to discuss the situation, MCWD voiced support of budgeting for a watershed study to come up with a solution to the problems. Our Association feels MCWD should take the lead on this issue as they are ultimately responsible for the watershed. Carver County and the City of Victoria should be closely involved as local government agencies. In that the drainage restrictions and culverts are on Three Rivers Park District property they will need to be involved also.

Zumbra Ridge Homeowners experienced major damage to real property and impact to lives due to the 2014 high water levels in the Lake and surrounding flooding. Without permanent changes to the Lake Zumbra outflow this could very likely happen again. We urgently request immediate action on finding a permanent solution.

Sincerely,

Jerry Martin
President
Zumbra Ridge Homeowners Association

Attachment 7: Victoria Mayor and District Correspondence

City of Victoria

1670 Stieger Lake Lane
P.O. Box 36
Victoria, MN 55386
952.443.4210

James Wisker
Director of Planning Projects and Land Conservation
Minnehaha Creek Watershed District
15320 Minnetonka Blvd
Minnetonka, MN 55345

March 8, 2017

Dear Mr. Wisker,

In March 2015, the City of Victoria and the Minnehaha Creek Watershed District entered into a Memorandum of Understanding that provided the opportunity for the District and the City to formalize their mutual commitment to integrating efforts and aligning resources. The City has been pleased with the range of projects that have been undertaken since that time and appreciates our relationship.

We are writing today specifically in reference to Item 1/b/ii: Technical Assessment of Zumbra Lake. The City understands that the Watershed District is willing to take the lead in coordinating all government agencies (Carver County, Three Rivers District, City of Victoria) to find a solution(s) to the Lake Zumbra flooding issue. The City is supportive of the District taking that role and appreciates your efforts.

If you have any questions, please do not hesitate to contact me or Cara Geheren, City Engineer.

Sincerely,

Thomas C. Funk
Mayor

CC: Bill Olson, MCWD Board of Managers

MINNEHAHA CREEK WATERSHED DISTRICT

QUALITY OF WATER QUALITY OF LIFE

April 18, 2017

Honorable Mayor Funk
City of Victoria
1670 Stieger Lake Lane
P.O. Box 36
Victoria, MN 55386

RE: Zumbra Lake High Water

Dear Mayor,

Thank you for your letter regarding the flooding issues on Lake Zumbra, received on March 15.

As you know, the Minnehaha Creek Watershed District (MCWD or District) and the City of Victoria enjoy a very strong working partnership. The District and the City have worked closely over the last two years to advance a number of initiatives that benefit the taxpayers and natural resources of Victoria and the MCWD.

These efforts have included a privately funded wetland restoration project within the Laketown Development, which exceeded regulatory requirements, and a recently awarded $262,520 Clean Water Grant to upgrade municipal stormwater facilities to treat stormwater runoff from downtown and improve water quality in East Auburn Lake. This past week, the City Council expressed its support for a partnership with the District to acquire land to improve water quality in Wasserman Lake while creating new parkland, both identified priorities for the City of Victoria.

Also, as you noted in your letter, pursuant to the MOU the District committed to performing a technical assessment of Zumbra Lake outlet, water level issues and options. Since 2014, the District has assembled historic data, published technical memoranda outlining the issue, and facilitated community meetings with the Zumbra Ridge Homeowners Association, Three Rivers Park District, the Department of Natural Resources, and the City of Victoria.

Most recently, at the request of stakeholders, the District presented an additional round of analysis at a public meeting at Victoria City Hall on March 1, 2017. The focus of this meeting was to (1) refine a mutual technical understanding of the high water issues; (2) outline potential solutions and their respective benefits and impacts; and (3) provide a forum for additional input from the Zumbra Ridge Homeowners Association.

As outlined during the public meeting, no options exist which completely eliminate the risk of flooding on Zumbra Lake due to the elevation at which many of the homes were constructed. Moreover, options that provide some relief during high water conditions also increase high water elevations on downstream properties, including property owned and operated by Three Rivers Park District.

MINNEHAHA CREEK WATERSHED DISTRICT

QUALITY OF WATER QUALITY OF LIFE

As we discussed at the meeting, consent of downstream property owners would be required to advance any structural solution. Given the District's role has been limited to technical assessment and discussion facilitation, I was pleased that you volunteered to take a lead role in advancing the next steps on behalf of the Zumbra Ridge Homeowners Association.

As you are aware, the most immediate next step is obtaining consent for a particular solution from Three Rivers Park District. The District values its partnership with the City of Victoria and remains committed to providing technical assistance, once you have reached agreement with Three Rivers Park District.

I look forward to following up with you as you advance this initiative. Please feel free to call me with any questions.

Warm Regards.

James Wisker
Director of Planning
Minnehaha Creek Watershed District
15320 Minnetonka Boulevard
Minnetonka, MN 55345

CC: Commissioner Workman, Carver County
David Hemze, Carver County
Boe Carlson, Three Rivers Park District
Jennie Skancke, Department of Natural Resources
Laurie Hokkanen, City of Victoria
Zumbra Ridge Homeowners Association

Attachment 8: HOA Request for Service to DNR

August 10, 2017

Dear Jennie Skancke , Area Hydrologist MNDNR and
Ceil Strauss, State Floodplain Manager MNDNR

Rod Kern approached you for assistance with our ongoing flooding issues on Lake Zumbra- Sunny. You responded with your belief that "the watershed district has done a really great job of obtaining technical analysis of all the complex hydrologic issues associated with this lake" and that "it's rare that a single lake receives the amount of staff time and funding that's been dedicated to this issue". You also attached an email from Ceil Strauss' recollections of Lake Zumbra history. We would not have requested your review if either of these documents accurately reflected our historic situation or depicted a complete set of facts and solutions.

MCWD Denial of Service

You asked us to work through MCWD to arrange meetings and engage your services. Unfortunately after meeting directly with MCWD in March of 2017 and refuting many of the underlying technical report facts, MCWD denied a City of Victoria Mayor's request to aide in resolving the flooding issues.

This denial of service by MCWD has made our Lake Association extremely frustrated that MCWD would not pursue a solution to a problem identified nearly 50 years ago and budgeted to be fixed in 1970's. Lake Zumbra Association has become even more resolute due to the MCWD refusal and it has prompted our research into many unanswered questions. Since March we have discovered additional inaccuracies and physical issues, unrecognized by MCWD and Wenck Engineering, one in direct contrast to the descriptions of Woodland Cove agreements and assurances of quantity and quality resultants and another depicting culvert installation and performance issues. With lack of cooperation from MCWD, we desired to engage hydrologic service from the DNR, as the oversight agency to MCWD.

Purpose of Requested DNR Services

While the DNR delegates permitting and management to MCWD, we expect that ultimate responsibility and governance for State services resides within the DNR. We would like to review our perspectives and findings with the two of you. We are prepared to present the same information provided to MCWD and Wenck & Associates in our March meeting and disclose to you our more recent findings.

It is believed that: existing illegal, cross water body and wetland structures inhibit natural watershed flows; culverts have been errantly installed; culvert throughputs overlook debris and vegetation blockages; culverts are inadequately sized for water volumes and recovery; and water quality is being aggravated by recent developments.

Initial Shortcomings of MCWD Analyses

While numerous hours of staff time and funding have been focused on the water control issues on Lake Zumbra –Sunny, 'quantity of hours' does not reflect 'quality of work' or 'sound outcomes'. This referenced MCWD/Wenck Technical Memo did not recognize:

1. the root causes uncovered in the 1970's by prior hydrological analyses,
2. prior engineering designs of a proposed weir in the early 1970's, and
3. data incorporated into their hydrology modeling studies was tainted from time periods negatively impacted by these long existing problems.

The resultant report conclusions were adversely impacted by artificially high lake elevations and flow data.

This alone would normally be enough to question the conclusions and the quality of the report, but the recommendations turned a weak document into a ludicrous one. MCWD and Wenck proposed that the City should support the lake shore owners with sandbagging to be triggered by predictable 5 to 7 day delays in the rise of lake elevations and that earthen berms could be deployed against high waters on other properties. Sandbagging was quickly denounced by the City as impractical. MCWD was then reminded of regulations for berms, which they oversee, and no answers were provided by them for waiving restrictions listed in their own documented procedures.

Without cooperative permitting and project management by MCWD, Lake Zumbra was forced to assume project leadership and was left to pursue permitting processes on its own. We requested some outline of normal permitting processes and agency approval requirements from MCWD. In the response from James Wisker of MCWD, he added additional commentary to support their original analysis and findings, to which we responded and further clarified our perspective. This email with my response is attached. Please be mindful that the response was prior to two new discoveries detailed below, Woodland Cove and Culvert 2 elevations.

Newly Identified MCWD Shortcomings

Subsequent to these discussions, our Lake Association made discoveries that further discredit the Technical Memo findings, but MCWD is not responding to our requests for additional meetings. Two major oversights recently uncovered are incomplete Woodland Cove facts and an errant 2012 culvert replacement. Two other factors need consideration: Interconnections to Stieger and State Highway 7 erosion.

Woodland Cove Misleading Runoff Assumptions

While MCWD, the City of Minnetrista, MPCA, Three Rivers Park, and other agencies have negotiated a meaningful agreement with the developers of Woodland Cove and are toting their laurels and successes in reducing the overall storm water runoff; this is not a complete and true picture of results. Prior to its purchase, this property was used for agricultural purposes and supported corn fields. The Developer's Agreement does not take full effect until construction is initiated in each of the individual phases of the development. Ground has been broken in the first Phase, which flows toward Lake Minnetonka, and holding ponds and basins are evident. In this section roads and wetland areas are well identified and runoff is now controlled.

Unfortunately, neither Phase 2 nor 3 have commenced construction and may not for 10 to 15 years. Interim agricultural use of the property has not been required of the property owner and developer.

Phase 2 properties flow toward a catch pond near the roundabout intersection of State Hwy 7 and County Road 11 and then proceeds through wetlands to Lake Zumbra-Sunny. In heavy storm conditions this basin overflows.

Runoff from Phase 3 properties flows east into the Three Rivers Park property and then down ravines to the wetland adjacent to Stone Lake, then through a culvert under Hwy 7 into Stone. Following the 2014 heavy rain conditions, Three Rivers Park reinforced these ravines to prevent erosion, creating a stone lined creek bed which channels the water directly to the culvert into Stone, eliminating prior absorption of water in the forested area. Last Spring this Phase 3 section was an unfarmed raw field and storm water runoff rushed off its barren field carrying sediment on an accelerated basis to Stone Lake. It can be inferred from these observations that nutrient loaded storm runoff is further contaminating Stone Lake, a previously targeted Lake, identified for nutrient loading issues.

Both of these Phase 2 and 3 alterations do not reduce the volume of storm water flowing to Lake Zumbra-Sunny, in fact more water runs off a barren field then an active corn field. Both of these new flow patterns are reducing the absorption of water along its downstream travel path and facilitating an increased rate of flow from the upland properties into Lake Zumbra-Sunny.

2012 Culvert Errant Placement

In July the Zumbra Lake Association uncovered and verified another key issue exacerbating our high lake elevations. As the water has been receding, we have continued to monitor the rate of decline and the flow in the 3 key culverts draining our sub-watershed into Lake Auburn. The rate of discharge began to reduce. At a level of 942.63 on July 17 lake level decline virtually stopped. Upon examination of the culverts, we noticed presence of water but no flow through Culverts 1 & 3. Culvert 2 revealed the heart of the problem and cause. While water was present on the inlet side and in the ditch coming out of Sunny, the outlet side of Culvert 2 was blocking the flow of any downstream water. In fact the ditch to the wetland and Lake Auburn held minimal water and was stagnant.

Our inference is that Culvert 2 replacement of 2012 was not installed at the elevations reported in MCWD engineering documents and is in fact higher. Furthermore the bottom of ditch exiting Culvert 2 has not been maintained; has accumulated sediment, wood and debris; and consequently restricts flow. This blockage is taking place at 942.63 feet of elevation. Allow me to elaborate more about Lake Zumbra-Sunny levels. The only drop below this new level will be resultant of evaporation, which occurs at an estimated rate of .01 feet per day. This prevents the lake from dropping to its DNR Recorded Average elevation of 940.99 ft and is far from the lowest recorded lake level of 936.56 ft during the drought of 1989. So our lowest level is about 6 feet below this new Culvert 2 barrier and our average level is about 1.6 feet below this new artificial elevation. OHW (Ordinary High Water) which is 943.3, only .7 feet higher than this height.

According to the MCWD/Wenck Technical Memo all three culverts were replaced in 2012. We are unsure of the correct placement of Culverts and their permitted levels.

The resultants of a raised culvert and ditch are blockage of downstream flow, an artificially high low water level, slower discharges with extended recovery durations, and a condition which precariously facilitates future flood water levels. The scenario for this conclusion is:

1. Culvert 2 and its associated ditch maintain the Lake at an artificially high elevation, now until the end of the year.
2. Heavy precipitation normally occurs in the Spring, further raising water levels.
3. As previously described in assessments and provided photographic evidence to MCWD, Culvert 3 restricts water flow and quick level recovery. Culvert 3 is undersized and unable to handle blockages from debris, branches and weeds. We recommended replacement with an arched or flood plain culvert design capable of relieving OWHL elevations more rapidly and minimizing obstructions from debris and weed clogging.
4. Unable to exit the sub-watershed, water accumulates and backs up. With any additional precipitation, the Zumbra-Sunny elevation quickly exceeds OWHL, creating flooding conditions.

This strategy of 'holding back water' and 'allowing backup' is contrary to accepted hydrology management practices and adversely impacts natural watershed flows. Yet MCWD in their April 2007 Six Mile Marsh Subwatershed Plan on page 62 confirm this to be their strategy. Goal 13.1 Action C. states "Work cooperatively with the Three Rivers Park to evaluate and implement strategies for operating control structures in the Carver Park Reserve to maximize storage capacities and manage flows." Action D.i. further states "Promote the acceptability of minor flooding within the floodplain."

Today the system of culverts appears to be engineered to hold water in our section of the watershed, causing our flood prone conditions. Improper placements of culverts could readily refute and invalidate any hydrology modeling results from MCWD and Wenck & Associates. We are inclined now to believe that this scenario exacerbated the flood levels of 2014, when rainfalls exceeded normal intensities and durations, causing both home and property damage.

From the DNR we would like an expedited verification of the culvert placements and a clarification of properly permitted culvert levels based on historic Lake Zumbra-Sunny elevation data, to validate our observations and avoid any additional high water problems in Spring 2018.

Blocked Connection to Lake Stieger

References by MCWD recognized previous historic natural outflow from Zumbra-Sunny to Lake Stieger, but failed to document any flow characteristics. Members of the Zumbra Lake Association have uncovered further evidence of previous interconnections between Zumbra-Sunny and Stieger and current restrictions and encumbrances to present day water flow. Two wetland paths between the two water bodies have been traced with exploratory walks and physical observation.

One pathway exists from Sunny, proceeding east and then turning south through a recognized bog. In the past it interconnected with a wetland on the north side of Stieger, now obstructed by the bike path a few hundred yards east of Culvert 2.

The second pathway originates right at the exit of Culvert 2. To carry water from Culvert 2 toward Culvert 3, a ditch was created along the bike path as it proceeded west and south to a wetland

extending north from Culvert 3. Directly adjacent to the ditch as it leaves Culvert 2 is a wetland on the east side of the ditch. Unfortunately when the ditch exiting Culvert 2 was dug, the fill from the ditch was deposited as a wall on the east and south side of the ditch along its entire length to the wetland extending to Lake Auburn and Culvert 3. This wall now prevents the natural historic water flow into the eastside wetland immediately next to ditch. This wetland proceeds south and bends around to the east, where it previously interconnected with Stieger. This interconnection point is the same north side Stieger wetland to which the earlier described bog interconnects for first pathway above.

In summary, both of these natural historic wetland interconnections out of Lake Zumbra – Sunny to Stieger are encumbered by man-made cross wetland constructs. Current MCWD maps do not depict the correct topography departing Zumbra –Sunny to the east for pathway 1, nor recognize the pathway 2 wetland and its interconnection. The Lake Zumbra Association can provide photographic evidence in support of these pathways.

Unrecognized Highway 7 Erosion

In the follow-up email from Mr. Wisker of MCWD, he questions the Return on Investment of replacing Culvert 3 to correct the flooding issues on Lake Zumbra-Sunny. (Attached email) Contrary to this MCWD response, flood levels and prolonged periods of lake elevations above OHWL do have financial impacts. Unrecognized has been the impact to State Highway 7 on the north side of Lake Zumbra-Sunny. Prolonged water elevations above OHWL have undercut the banks along Highway 7 and an erosion slide has occurred. Costs of repairs to the current erosion are being finalized by MNDOT, but they will not be the only costs. Indirect costs will be incurred by rerouted highway users. Under evaluation is the need for redesign and construction changes for the entire Highway segment along Lake Zumbra –Sunny, involving major capital costs and extended traffic disruptions.

The recent erosion slide is only a small segment of the high Zumbra banks along the Highway, which support the highways foundation. But the repair will be quite involved. The steepness of the bank and a minimum width highway shoulder do not facilitate easy examination or easy repair of the underlying road foundation. The current slide is scheduled for an immediate stop gap repair, which involves placement of stones to re-enforce the existing foundation and prevent interim deterioration. It also includes extracting the eroded materials, shrubs and trees from the 20 foot deep waters of the lake. The permanent solution under design is more protracted. Per MNDOT engineers, it will in likelihood involve a curb and gutter approach to assure no further incidents.

As the Highway has minimum shoulder width on the lake side, repairs will be a major disruption for commuters. This is a critical section of transportation infrastructure interlinking cities of Victoria, Minnetrista, Mound and other western areas to the major metro area with only a few inconvenient alternative routes. Known alternative routes such as Hwy 5 through the City of Victoria or county roads north around Lake Minnetonka are not well suited for major traffic density increases. This will be a financial and inconvenience impacts to commuters.

The Lake has been exceeding normal water levels for an extended period of time, the worst of which has been described as a 500 year event that occurred in 2014. This year was again witness to elevations near or above Ordinary High Water Levels (OWHL) for over 2 months, and as you know this should only happen 1% of the time or once in a 100 year time period.

This is not the only time an erosion slide has occurred during past years and unfortunately may not be the last. Water elevations on this water body fluctuate wildly (up to 8 feet) and have not been corrected by the Watershed District since identification of the cause in the early 1970's.

The protracted periods of high water are having detrimental impact on the banks and there are signs of undercutting that have merited MNDOT's attention and further assessment of the entire stretch of highway along Lake Zumbra-Sunny. Under assessment and evaluation is the need to replace and repair the entire lakeshore bank along Highway 7 in this section. It is expected to be a major cost and budget expense, as well as a major disruption to transportation in the western areas..

Historical Commentary

With regard to Lake Zumbra-Sunny history, my residency on Lake Zumbra began in 1975. This was the period of great contention about lake elevations in the aftermath of the illegal construction by a farmer of a causeway separating the long connected Zumbra and Sunny water bodies. This property became park property in 1973, currently called Three Rivers Park District. We purchased our home from Dale Palmatier, a respected founder and contributor to MCWD. As a young engineer I was elected to President of the Zumbra Association to oversee road and sewer construction and the City of Victoria initiatives to Annex the Zumbra neighborhood from Laketown Township. Subsequently the issues and history pertaining to water levels were learned first-hand from long time neighbors and knowledgeable sources, many of these landowners were residents and home builders from the late 1950's to the early 1960's. For example my current home was custom built and originally completed in 1962 on a plot, specified prior to its purchase in a development defined in a 1957 agreement on real-estate owned by Northwest National Bank. It is with this first hand history that I have added commentary to Ceil Strauss's email attachment in an Addendum at the end of this document.

To Jennie's comments in her email about homes not having been built to current FEMA requirements, I personally object to this misleading information and careless statement. No homes built in the 1950's and 1960's would have had codes requiring these FEMA standards. In fact FEMA mapping in Carver County was only partially completed this year and still are not scheduled for Lake Zumbra-Sunny. Ceil can probably recall numerous conversations between us this year regarding FEMA map schedules. It should be noted that improperly sized and placed culverts were in place in the late 1960's and have been an identified problem since the early 1970's. These known infrastructure shortcomings have disrupted historical and normal lake discharges and resulted in artificially high elevations, including the established OHWL. Also of note is the absence of any home flooding until the 2014 record level, described now as a 500 year event.

It is with this background that I believe that I can bring some clarity to the nearly 50 year old Lake Zumbra-Sunny water level control issues. Initially these elevation issues were cooperatively undertaken by MCWD, the Park, the residents, and the DNR in the early 1970's until contentious litigation amongst the Agencies sabotaged the planned weir and funding disappeared. Lack of consensus amongst government units has prevented any corrective action since then.

Attempts to rejuvenate this early root cause driven solution, have repeatedly failed. Now instead of re-examining the situation in an open and impartial manner and rectifying the real issues, the problem is being swept under a rug of rhetoric and push back has even included clouded facts and disparaging comments about the residents.

This is a source of extreme frustration for the Zumbra residents, especially in the face of the 2014 flooding and recent extended periods with lake elevations above OWHL.

Lake Zumbra-Sunny Hydrological Summary

Natural watershed flows for Lake Zumbra-Sunny have numerous man-made obstructions which result in prolonged periods above OHWL and persistent flooding. The flooding is avoidable by eliminating backwater flows, removing barriers to normal Recorded Average lake elevations, and enabling reasonably short duration draw downs of high water.

Flooding elevations above the 100 year or 1% levels are recently being exceeded frequently. This is a relatively new phenomenon. Key to understanding why is two of the culverts replaced in 2012. The One – Two punch repeatedly delivered to Lake Zumbra-Sunny is directly attributable to Culvert 2 at the lake outlet and Culvert 3, the funnel point for sub-watershed drainage into Lake Auburn.

First Culvert 2 sets up the knockout punch by forcing artificially high lake elevations above known, historical average elevations. This culvert and its associated run out ditch are too high. Water is being held in the Lake and is restricted from naturally flowing through its outlet, Culvert 2 its ditch proceeding toward Culvert 3. This first punch reduces resiliency by reducing the capacity of the Lake to absorb any incoming water loads prior to reaching OHWL. The present engineered holding level is less than 1 is a foot below OWHL, setting up the second punch.

The knockout punch is then delivered by Culvert 3. Culvert 3 is undersized and prone to blockages and debris. This 18 inch culvert must drain a watershed area of over 2000 acres before the next rainfall to prevent elevation increases. When higher periods of heavy precipitation are experienced in the Spring, the intensity of rain and frequency of occurrence increase. Culvert 3 backs up. It is over whelmed by the volume of water it is expected to handle and is unable to draw down in a timely matter. The next rainfall adds to the backup. Subsequent storms cause the upward stair stepping of lake elevations, quickly surpassing OHWL.

This scenario was modeled in engineering studies by Hickok & Associates in the 1970's and again in 1985. In that analysis a reconstructed outlet was modeled at an elevation of 942.5 and concluded: if constructed "flooding will occur" This is precisely what is now being observed and experienced today following the Culvert 2 replacement in 2012.

This 1985 study also modeled changes in Culvert 3 increasing its size to a 65 inch by 40 inch CPM Arch culvert. It concluded that: "Improvements to Sunny Lake outlet and downstream will not drastically lower the 100-year level in Lake Zumbra –Sunny. However, the improvements can reduce, by about one-half, the time for draining the lakes to their normal water level thereby substantially increasing the probability that full storage capacity will exist prior to occurrence of a major runoff event."

Additionally options and alternatives for reducing storm water runoff directly into Lake Zumbra- Sunny may merit examination. Temporary retention of storm water in Stone Lake and its adjacent wetlands would reduce bounce and wide fluctuations in Zumbra-Sunny elevations and smooth discharge rates to other downstream water bodies during critical high water events.

These historical engineering conclusions reaffirm our Zumbra Association analyses. Eliminating backwater flows, removing barriers to achieving normal Recorded Average lake elevations, and enabling reasonably

short duration draw downs of high water can alleviate the probability of flooding. The key issues are the Culvert 2 outlet elevation and the Culvert 3 designed capacity.

Appeal for DNR Support

We need your engagement and assistance to rectify this long time known problem and avoid any additional hardship!!

Our request is based on the background and details presented above. We have not received the level of professional and technical assistance merited by our situation, have not had open minded and critical thinking exchanges, and have been refused first line services from MCWD.

It is probably obvious that we are frustrated by 50 years and no resolution. Admittedly we are resolute and not going away. What we need is an open minded partner, not hamstrung by past actions, and committed to rectifying man-made flooding problems.

You are being approached as the best suited organization to start a fresh, objective review of facts and apply today's known best practices to the physical environment. There currently are multiple man-made obstructions to open public waters and wetlands that violate State laws and yet have not been addressed. These same cross water body obstructions are inhibiting natural discharge of water down the sub-watershed and exacerbating flooding conditions and erosion.

Our requested and required support can be appropriately addressed technically by professional hydrologists and pertinent regulatory issues reviewed by DNR staff.

We would prefer to meet with you directly so that any arising questions may be readily clarified, subsequent actions may be prioritized, and solutions may be pursued efficiently by all involved.

Sincerely,

Dick Hawley

President Ridge Lands Inc

Lake Zumbra Lake and Home Association

Addendum Attached.

Addendum Historical Comments Pertaining to Ceil Strauss email

Ceil's recollection of cabins is inaccurate. Northwestern National Bank had been a single owner of the center peninsula of Zumbra and contracted with Zumbra Ridge, Inc establishing in October of 1957 the conditions, covenants, and restrictions for the subsequent development of residential homes, not cabins. These covenants included the surveyed plot plans with associated registered land surveys and defined formal approval processes for all construction and building plans. It cited minimum construction and building codes, minimal square footage requirements, defined roadways and utility easements. Listed were Construction Committee members and their responsibilities, which included a known Builder, who also became a Zumbra property owner. Lake setbacks and minimal foundation elevations were not specified in this original 1957 document. Unspecified requirements were covered by a general requirement to comply with Carver County and other authorized governmental bodies.

With regard to FEMA, Ceil is accurate and no digital maps have yet been generated as of this date, nor have they been requested by the City of Victoria. With Ceil's wonderful training course and guidance, I have educated the neighborhood about FEMA and had numerous conversations with the City and Carver County regarding ordinance development and administration of shoreland properties within their jurisdictions. These conversations included discussion of Internet based FEMA services for residents. General City ordinance work for sections of the City with FEMA maps has been initiated, but not completed.

The overall permitting of various water related structures is unclear to us as residents. Some items we can provide background. Water levels were an issue in the late 1960's. In the early 1970's a weir was proposed and funding set aside, based on a 1975 Water Management Plan and engineering studies completed by E.A. Hickok & Associates. A summary of the study is remembered. With a 100 year record rainfall of 12 inches, Lake Zumbra would bounce 4 feet and Six Mile Creek would bounce 8-9 feet. These wild fluctuations prompted the proposal of physical water controls. The DNR, the Park and MCWD disagreed on the appropriate level of the weir. Litigation was initiated and E.A. Hickok & Associates was appointed as the arbitrator/mediator, based on their expertise and knowledge. The resultant base level elevation was not available to the home owners association; but in the delay, the funding disappeared.

In 1983, the Park began a review of the previous work with E.A. Hickok & Associates. A 1983 memo from the Hickok firm is included as an attachment within the Wenck Technical Memo. Without consensus from the other Agencies, the Park decided not to continue and dropped any further action.

A copy of a Phase 1 1985 Hickok "Investigation of Zumbra Lake–Sunny Lake Outlet" to determine the adequacy of the existing outlet and investigate the feasibility of reconstructing the outlet as required by a DNR permit No.79-6120 at 942.5 feet MSL, concluded that would "result in significant flooding problems which would be compounded by the time requirement of four to five weeks for drawdown." It also stated that should the Sunny Outlet capacity be increased, the capacity of downstream waterway must also be increased to avoid new problems (referencing Culvert 3 under County 11).

Another culvert mentioned in Ceil's between the main lake and a south bay, would be Culvert 1 under the causeway separating Zumbra and Sunny. Hickok in 1985 recommended no reconstruction of this culvert for hydraulic capacity, as it had no effect on high water levels. As mentioned before this causeway is a cross-

body structure separating the previously two connected water bodies, referred to as Zumbra and Sunny. This was the illegal and non permitted action of a farmer who wanted an easy way to move between his two owned properties on both sides of Zumbra – Sunny. When the Park took ownership of the property, nothing was done to remove the illegal causeway. In fact the Park has re-enforced it as a maintenance path and more recently converted it in to a bicycle pathway. The causeway and culvert restrict water flow, fish migrations, and navigation between the two water areas.

With regard to Ceil's permit notes on the outlet elevations, our Association has many questions regarding culvert elevations. Per the DNR Lakes data for Zumbra-Sunny the Recorded Average is 940.99. In 1985 Hickok states the normal elevation as 940.87 feet. The culvert levels in the Wenck report show a number of changes and variations. Ceil's notes list permit requests for outlets at 942.5 and 941.5. If the base culvert level is set above the Average elevation, are you not engineering the elevation to remain above the lake's natural average level? If the outlet level does not permit outflow below the average, does the subsequent decade result in a new raised Average? Is this not restricting normal watershed discharge rates? If the Lake is held above its normal levels, does it not lose capacity to handle a 100 year storm event without resultant flooding? What are normal draw down time periods for a Lake regulated by culvert with a fixed capacity?

Attachment 9: Maintenance Request to TRPD

MEETING OUTLINE

Date:

August 21, 2017

Location:

- Three Rivers Park District, Administrative Center, Plymouth

Attendees:

- Boe Carlson, Superintendent, Three Rivers Park District
- Scott Leonard, Lake Committee, Ridge Lands Inc., (Lake Association for Lake Zumbra).

Purpose:

- To present and seek approval for several maintenance requests related to flow of water that runs from Lake Zumbra through Three Rivers Park.

Notes:

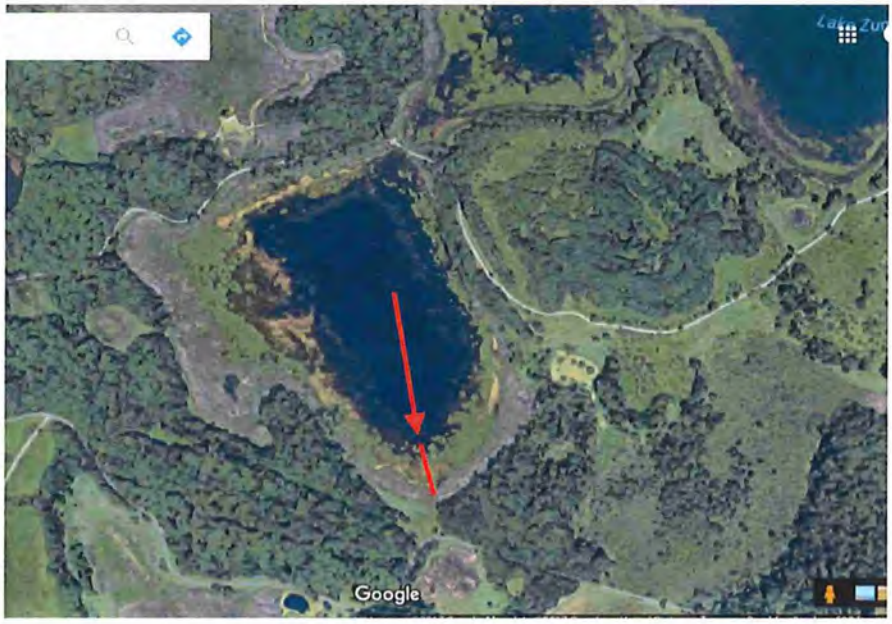
- The homeowners of Ridge lands, Inc., respectfully submit the attached requests for maintenance to the existing watershed located in Three Rivers Park in Carver County.
- We are seeking approval by Boe Carlson for implementation of these maintenance requests.
- We are asking that Park staff, or other designated contractors, perform this maintenance either during the Fall of 2017, but definitely before the 2018 Spring thaw.
- These requests, we believe, will help better prepare the water level of Lake Zumbra for anticipated heavy Spring rains; which often result in extremely high water conditions, slow lake drainage, subsequent flood damage and loss of recreational use of Lake Zumbra during prime summer time periods.

LOCATION: CULVERT #1 - CAUSEWAY BETWEEN ZUMBRA AND SUNNY LAKES

REQUEST: Remove debris fence to allow for unimpeded flow and migration of fish.

LOCATION: SUNNY LAKE OUTLET – TO CULVERT #2 & DRAINAGE DITCH

REQUEST: Cut a distinct 15-foot path through existing cattail bog to allow for a direct, more unimpeded flow from Sunny into Culvert #2 and drainage ditch to wetlands.



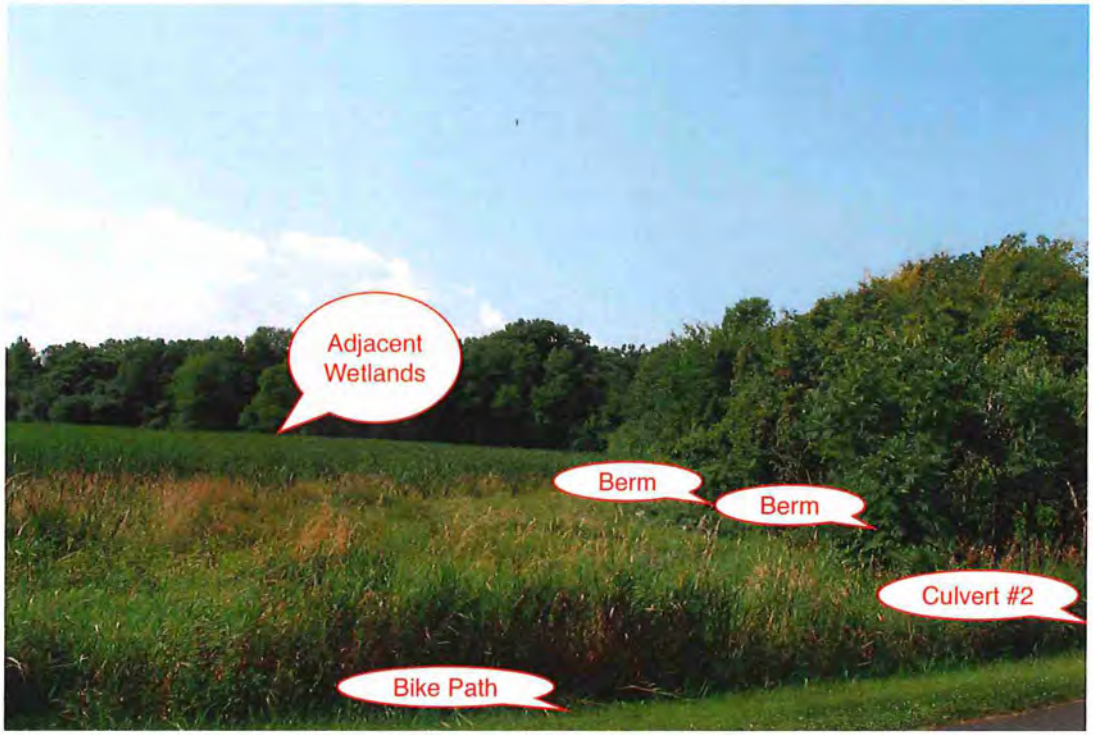
NOTE: A 15-foot channel to open water is permitted by the DNR, without the requirement of a DNR permit.

LOCATION: DRAINAGE DITCH - FROM CULVERT #2 TO UNNAMED WETLANDS

REQUEST: Clean out built-up sediment, bank erosion and debris from the ditch, to allow for a more unrestricted flow from Culvert #2 into the unnamed wetlands.

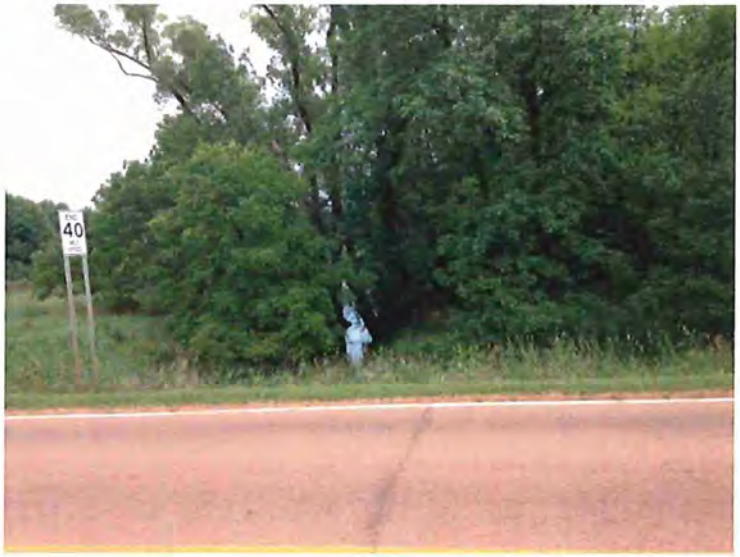
LOCATION: DITCH BERM – BETWEEN CULVERT #2 OUTLET AND ADJACENT WETLANDS SOUTH OF PATHWAY

REQUEST: Remove berm barrier along ditch way at the outlet of Culvert #2, allowing water to flow naturally into adjacent wetlands resulting in more storage capacity downstream and faster drainage of Sunny & Lake Zumbra



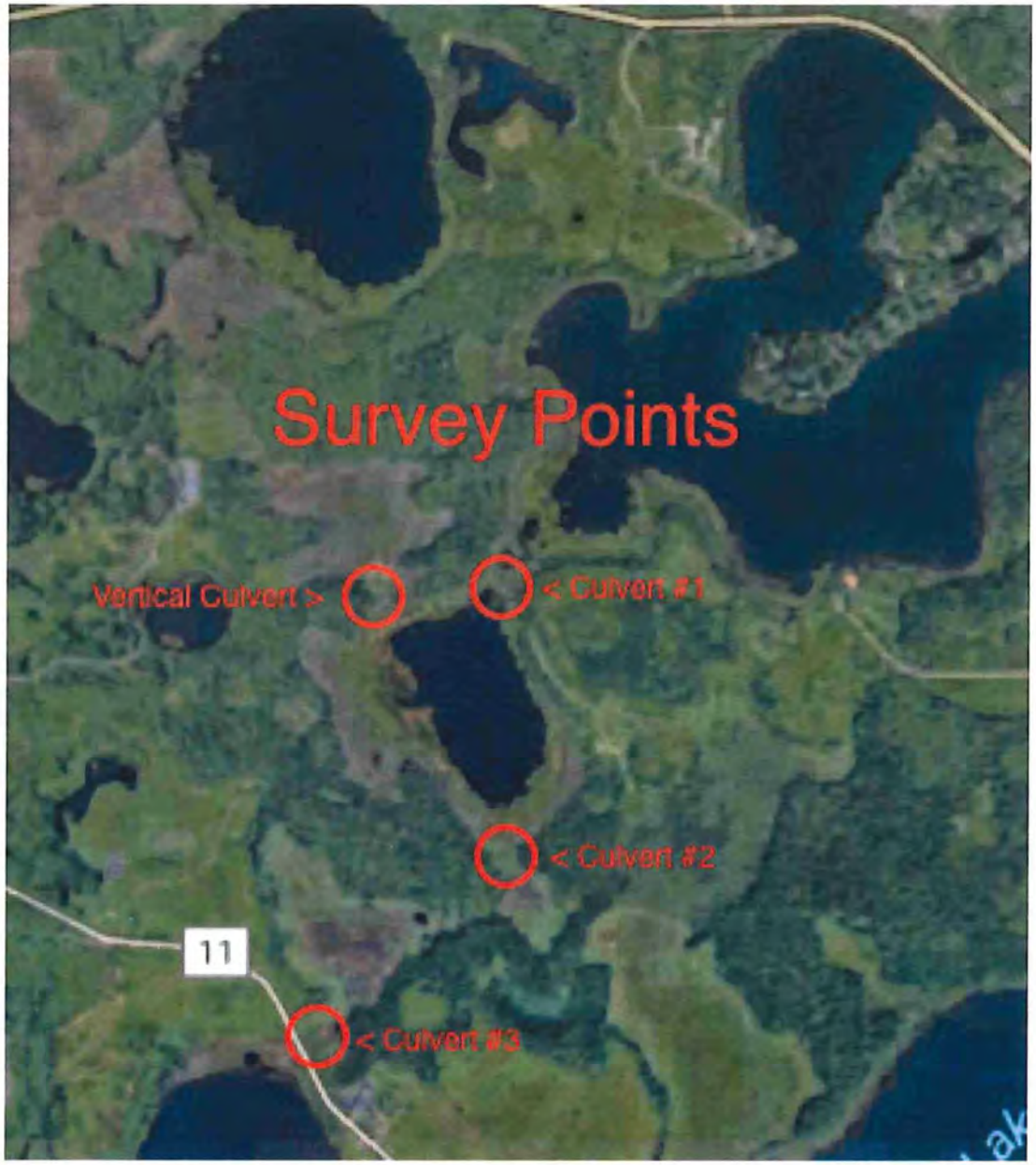
LOCATION: CULVERT #3 - CREEK AREA JUST EAST OF CULVERT #3 AT CO. RD. 11

REQUEST: Remove source of constant debris that clogs the culvert. Remove trees and brush that exist between the culvert and the open wetlands area so water can flow unencumbered to and through Culvert #3. This will allow for proper and faster drainage of Sunny and Lake Zumbra.



LOCATION: FOUR SURVEY POINTS WITHIN THE SUBWATERSHED

REQUEST: Provide permission to an independent surveyor to conduct a survey of the heights of four existing culverts for further study and data clarification. Survey company name, contact information, date of survey and duration on park property would be provided to Three Rivers Park staff prior to commencing survey.



Attachment 10: DNR Survey Results

Minnesota
DEPARTMENT OF NATURAL RESOURCES

REQUISITION FOR TECHNICAL SERVICES

Project: culvert and OHW survey – Zumbra to Auburn			**Lake No.** PW #10-41, 10-56
City: Victoria	**County:** Carver		**Req. No.** 2018-29
Sec. 2	**Twp.** 116	**Rng.** 24	**Quad No.**

Statement of Problem/Situation (Provide detailed information)

Zumbra residents and City of Victoria are concerned about chronic high water on Zumbra. Culvert between Sunny/Zumbra was replaced in 2012 and maybe surveyed by the park, but we don't have that survey data. Also, multiple culverts have been replaced since the 1978 OHW survey for Zumbra/Sunny, so a new OHW is needed. The flood elevations are determined by the OHW as well as modeling for potential actions.
Our 1979-19 and 1982-38 surveys don't show the same elevations as those in Table 3 of the Wenck report. Please see attached table.

Services Requested (Attach map as necessary)
-Check on current outlet control from Stone (10-56). 2012-53 says it was a beaver dam.
-Invert elevations for equalizer between Sunny/Zumbra – changed since 1978 survey
-OHW for Sunny/Zumbra
-Outlet invert elevations from Sunny to south.

Landowner:
Three Rivers Park District

Permission obtained for access:
Yes

Requested By: Jennie Skancke	**Date:** 9/5/2017	**Phone No.** 651-259-5790
Manager/Supervisor Approval by: Jeanne M. Daniels		**Date** 9/7/17
Assigned By:		**Date** 9/18/2017

Minnesota DNR Waters
Field Survey Report

Project Zumbra/Sunny Lake			**Lake No. 10-41**
City Near Victoria	**County Carver**		**Req. No. 2018-29**
Sec. 1,2,11	**Twp. 116**	**Rng. 24**	**Watershed**

SURVEY DATE: 9/19/2017
SURVEY CREW: Woodrich/Schaffer/Schmitt

LAKE SIZE

Meandered Area 496 Acres — Non-meandered
Planimetered Area 221 Acres — ☐ Unknown

DATUM ADJUSTMENT

Assumed 1912 X 1929 1988 Source: DNR B.M. at public access from MNDOT "2704 F"

CONTROL BENCHMARK

Location: SW-SE-SE, Sec. 2-116-24
Elevation: 945.00 (add 0.13 to equate to NAVD 88)
Description: at public access on south side of Zumbra Lake, vertical 3/8 x 8" pike in lakeside root of 4.0' cottonwood, approx. 30' from water's edge in the NE corner of parking area at PA.

SURVEY WORK COMPLETED

X levels topography cross sections profiles X OHW
establish benchmarks X outlet elevations X other: GPS/VRS/RTK survey

WATER LEVELS

Highest Recorded: 944.91 7/3/14
Lowest Recorded: 936.56 10/19/89
Range: 8.35
Water Surface: 942.69
OHW Elev: 943.0
Highest Known:

OUTLET

General Description: on south end of SW bay/Sunny Lake, NE-SW-NW, Sec. 11-116-24
Runout Elevation and Description: 942.1 top on debris in upstream end of 36" CMP under bike path at south side of SW bay/Sunny lake.

BENCHMARKS SET

Location:
Elevation:
Description:
Location:
Elevation:
Description:

Prepared By Kurt Woodrich	Title Sr. Engineering Specialist	Date 9/21/2017

On 9/19/17 we completed a survey to reevaluate the OHW level of Zumbra-Sunny Lake. The OHW was previously established at 943.3 per a 9/19/78 survey by DNR Division of Water's survey. The OHW level of Zumbra Lake obtained on the recent survey is based on the average reduced elevation of the best 22 of the 25 trees (ash, elm, oak, and cottonwoods) we documented around the main (north) portion of Zumbra-Sunny Lake. We recorded washlines at elevation 943.2 and recorded stainlines at 943.2-943.3. The lake is shown at elevation 940 on the 1958 USGS quadrangle.

Zumbra-Sunny Lake outlets to the south towards Auburn Lake. We obtained elevations on the culverts between Zumbra and the southwest portion of Zumbra (Sunny Lake) and elevations on the outlet culvert from Sunny Lake under the bike path. There is a bike path separating Zumbra to the north and Sunny Lake. In addition we obtained an elevation on the beaver dam downstream of Stone Lake.

Following are the pertinent elevations we obtained:

Headwater of beaver dam just downstream of Stone Lake	946.29
Top on 3' wide opening in beaver dam controlling Stone Lake	945.8
Water level at downstream side of bike path at water control structure CV12	942.78
At bike path crossing between Zumbra and Sunny	
Water surface Zumbra Lake	942.69
Top upstream (N) end of 24" CMP under bike path between Zumbra and Sunny (SW bay)	942.45
Flowline on rocks at upstream/north end of 24"CMP	940.5
Top centerline of trail over culvert	946.1
Top downstream (S) end of 24" CMP under bike path between Zumbra and Sunny	942.61
Downstream/south invert of 24" CMP	940.58
Downstream end of apron	940.48
Water surface Sunny Lake/SW bay	946.29
At outlet of Sunny Lake/SW bay	
Water surface in cattails=Sunny Lake	942.69
Channel bottom where channel leaves basin and suts thru higher ground	941.4
Headwater at culvert under bike path	942.68
Flowline at upstream end of apron	941.5
Top on debris at upstream end of culvert (present runout)	942.1
Flowline at upstream end of culvert upstream side of debris	941.7
Top upstream end of 36" CMP under bike path	943.85
Top centerline of bike path over culvert	947.3
Top downstream end of 36" CMP under bike path	943.86
Downstream invert of 36" CMP	940.98
Downstream flowline at end of apron	941.5
Tailwater at culvert	942.18
Channel bottom 10' downstream on sand buildup-steady flow from here downstream	941.7
Water surface at above	942.17

Additionally we tied into Three Rivers Park District CV 12 water control structure and the benchmark they used for their surveys MNDOT "2704 B" within .01' and 0.06', within tolerance of a GPS survey. Additional survey information can be found from Three Rivers Park District surveys and previous DNR surveys on 9/19/78 requisition #79-19 and 10/15/81 requisition #82-38.

Attachment 11: MCWD Permit Results

September 27, 2017

Jennie Skancke
Minnesota Department of Natural Resources
1200 Warner Road
St. Paul, MN 55106

Re: Minnehaha Creek Watershed District (MCWD) Permit Files- Carver Park Reserve

Dear Ms. Skancke,

The enclosed is in response to your request for historical information that may further advance the analysis of high water conditions on Lake Zumbra.

In 2014, record rain events resulted in flooding throughout the District. This flooding led to damage across 16 properties in the Zumbra Ridge Neighborhood, including 4 homes reporting structural damage. As you know, the Minnehaha Creek Watershed District (the District), Carver County, the City of Victoria, Three Rivers Park District (TRPD), the Department of Natural Resources (DNR), and Zumbra Ridge Homeowners Association (HOA) have been working since that event to identify the causes of high water on Lake Zumbra and identify a range of potential solutions. In playing a coordinating role, the District organized a joint meeting with the HOA and our agency partners to discuss the District's preliminary findings and collective next steps. Notable information gathered and discussed to date includes:

- A modeling analysis of high water conditions leading to the 2014 event
- Modeling of downstream impacts and anticipated high water alleviation on Lake Zumbra for a range of potential high water solutions

These analyses are summarized in a Technical Memo dated May 26, 2015 which was subsequently reviewed by agency partners and was distributed and discussed with the HOA through a series of meetings. The modeling analyses conducted were based on data that TRPD provided for the three culverts identified as Crossings 1, 2, and 3 in the memo. Based on our recent discussions, I understand the DNR conducted a survey to verify current field conditions for Crossings 1 and 2 and the Stone Lake Outlet. You have outlined that the DNR intends to use the survey data, accompanied with historical permit information, to assist in the calibration of modeling and continue refining the partners' understanding of system hydraulics, causes of high water conditions, and the benefit and impact of potential solutions.

In response to your request, MCWD staff performed a search of permits within Carver Park Reserve that may contain information pertinent to the hydraulic connection of Stone Lake, Lake Sunny, Lake Zumbra,

and Lake Auburn. The review revealed two proposed culvert modifications, within the 2005 and 2006 Carver Park Trail Rehabilitation and Reclamation Project.

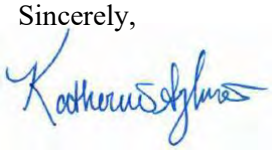
1. The culvert between Sunny Lake and the Auburn Lake wetland (Culvert 2 in the Wenck report) was proposed to be lengthened to accommodate the proposed trail widening, with no proposed change to the hydraulic capacity. (Depicted on Sheet 18/26 of Attachment 1)

2. An existing outlet control structure between Maple Marsh and Sunny Lake was proposed to be modified to replace a 24-inch corrugated metal pipe with a 24-inch reinforced concrete pipe as shown on Sheets 9 and C501/02 of Attachment 2. The modification also proposed to replace the existing pre-cast grate shown in Attachment 3 with a beehive grate at the existing elevation as shown on Sheet C502 of Attachment 2. There was no proposed change to pipe diameter, invert elevation, or hydraulic capacity.

The review of information within the District's permit database did not reveal records pertaining to the culvert between Lake Zumbra and Sunny Lake, the Stone Lake Outlet, nor the culvert under County Road 11.

We look forward to continuing to partner with you, TRPD, Carver County, the City of Victoria, and the HOA to discuss this issue and identify potential solutions.

Sincerely,



Katherine Sylvia
Permitting Program Lead

CC: Anna Brown, MCWD
James Wisker, MCWD
Paul Moline, Carver County
Cara Geheren, City of Victoria
Brian Vlach, TRPD

Attachment 1- Permit 05-130 Plan Set
Attachment 2- Permit 06-097 Plan Set
Attachment 3- TRPD Inventory of Water Control Structures, 2009

ATTACHMENT 1

Permit 05-130 Plan Set

LEGEND

EXISTING
- STREET CENTERLINE
- CORPORATE LIMITS
- RIGHT OF WAY
- PERMANENT EASEMENT
- PROPERTY LINE
- CULVERT
- BULKHEAD
- UNDERGROUND ELECTRIC CABLE OR CONDUIT
- UNDERGROUND ELECTRIC DUCT
- GAS MAIN
- UNDERGROUND TELEPHONE CABLE OR CONDUIT
- UNDERGROUND TELEPHONE DUCT
- UNDERGROUND TELEVISION CABLE OR CONDUIT
- UNDERGROUND TELEVISION DUCT
- ELECTRIC CONTROL CABINET/BOX
- ELECTRIC MANHOLE
- ELECTRIC TRANSFORMER/PEDESTAL
- POWER POLE & GUY ANCHOR
- LIGHT POLE
- GAS VALVE, GAS SIGN & GAS VENT
- TRAFFIC SIGNAL, STANDARD
- HAND HOLE
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- CABLE TV PEDESTAL
- SOIL BORING
- TRAVERSE POINT
- CONCRETE CURB AND GUTTER
- EXISTING BIT TRAIL TRAIL
- EXISTING ROAD EDGE
- EXISTING GRAVEL EDGE
- TRUF TRAIL
- EXISTING PAVEMENT OR SIDEWALK
- SIGN (HWY, PARK, STOP, ETC.)
- STREET SIGN
- DITCH
- RAILROAD TRACKS
- BARBED WIRE FENCE
- CHAIN LINK FENCE
- ELECTRIC WIRE FENCE
- WOOD FENCE
- WOVEN WIRE FENCE
- GUARD RAIL
- TREE (DECIDUOUS)
- TREE (CONIFEROUS)
- BUSH-SHRUB
- WOODS DRIPLINE
- BUILDING
- WETLAND DELINEATIONI
- WATERS EDGE

PROPOSED
- NEW RIGHT OF WAY
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- CONSTRUCTION LIMITS
- CONSTRUCTION FENCE
- CULVERT
- BULKHEAD
- DRAIN TILE
- CONCRETE CURB AND GUTTER
- TRAIL CENTERLINE ALIGNMENT
- SILT FENCE
- HAYBALES
- LIGHT POLE
- SIGN (HWY, PARK, STOP, ETC.)
- REMOVE TREE

THREE RIVERS PARK DISTRICT

PRELIMINARY NOT FOR CONSTRUCTION

CONSTRUCTION PLANS FOR TRAIL RECLAMATION AND REHABILITATION CARVER PARK RESERVE

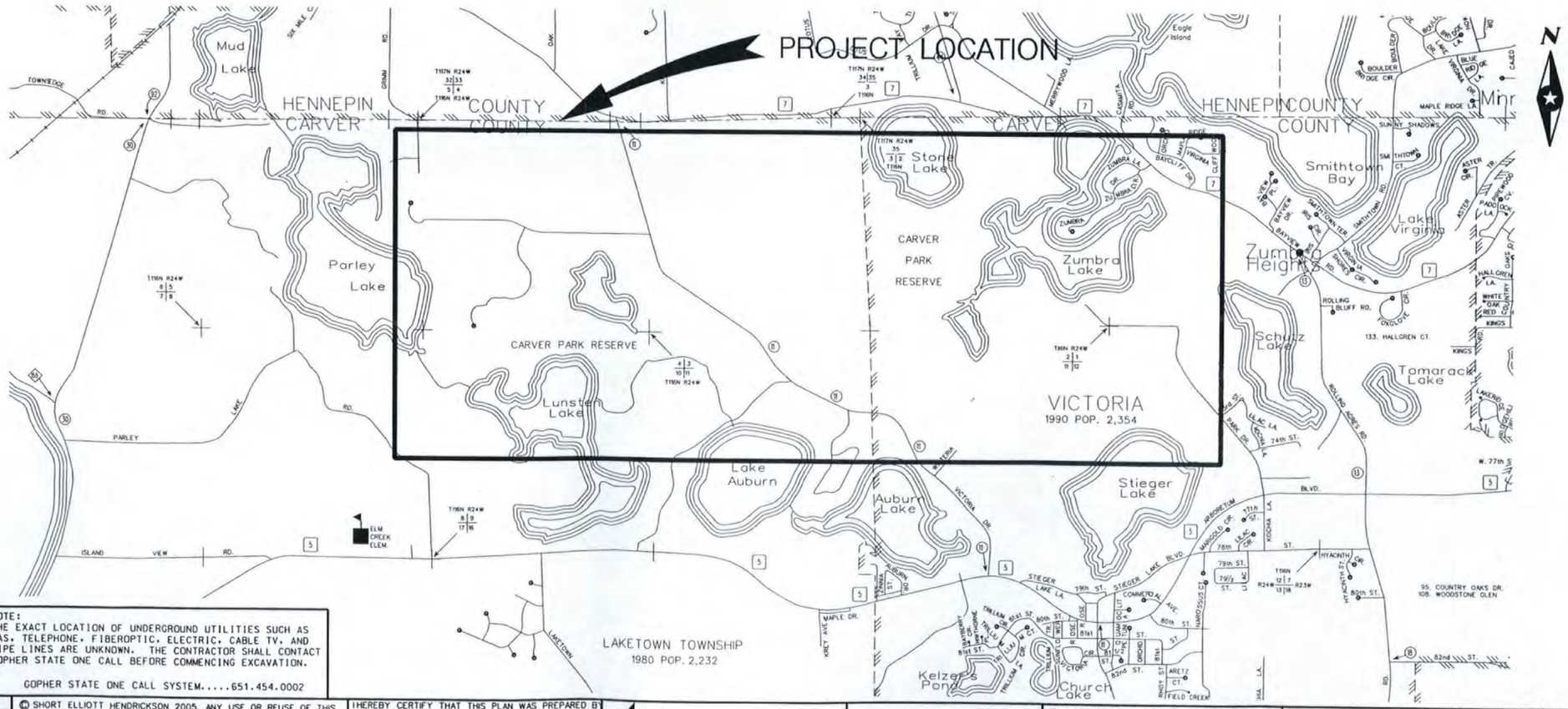
PHASE I & WETLAND RESTORATION PROJECT

RECEIVED MAR 1 0 2005

INDEX

SHEET NO.	DESCRIPTION
	PHASE I
1	TITLE SHEET
2	GENERAL LAYOUT
3	STATEMENT OF ESTIMATED QUANITIES
4	DETAILS AND TYPICAL SECTIONS
5	DETAILS AND TYPICAL SECTIONS
6	EARTHWORK TABULATION, GENERAL NOTES AND STANDARD PLATES
7	SIGNING DETAILS AND TABULATION
8	STATION 1+00 TO 32+75
9	STATION 32+75 TO 49+75
10	STATION 49+75 TO 66+50, 200+00 TO 204+00
11	STATION 66+50 TO 86+00
12	STATION 86+00 TO 101+50, 120+75 TO 125+50
13	STATION 101+50 TO 116+10
14	STATION 204+00 TO 220+50
15	STATION 220+50 TO 236+50, 291+00 TO 291+50
16	STATION 338+00 TO 354+00
17	STATION 354+00 TO 372+00
18	STATION 372+00 TO 389+00
19	STATION 389+00 TO 418+75
20	STATION 418+75 TO 435+50
21	STATION 435+50 TO 450+50
22	STATION 450+50 TO 466+25
23	STATION 466+25 TO 565+50, 473+00 TO 474+00
	WETLAND RESTORATION PROJECT
24	SITE LAYOUT
25	WETLAND AND CULVERT PLAN AND PROFILE
26	WETLAND PLANTING PLAN

THIS PLAN CONTAINS 26 SHEETS.



GOVERNING SPECIFICATIONS

THE 2000 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION SHALL GOVERN, EXCEPT AS MODIFIED BY THE SPECIFICATIONS FOR THIS PROJECT.

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MMUTCD, INCLUDING FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS, JANUARY 2001.

NOTE:
THE EXACT LOCATION OF UNDERGROUND UTILITIES SUCH AS GAS, TELEPHONE, FIBEROPTIC, ELECTRIC, CABLE TV, AND PIPE LINES ARE UNKNOWN. THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL BEFORE COMMENCING EXCAVATION.

GOPHER STATE ONE CALL SYSTEM.....651.454.0002

DESIGNER: ATD
CHECKED BY: RSH
APPROVED BY: RSH

DESIGN TEAM	NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Date: 3/xx/05
signature:
AARON T. DITZLER
printed signature:
Reg. No. 42003

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE BIKE / HIKE TRAIL IMPLEMENTATION PHASE I

TITLE SHEET

FILE NO. ATHRIV0410.01
DATE 3/xx/05

1 / 26

STONE LAKE

GRIMM FARM HISTORIC SITE

LOWRY NATURE CENTER

LAKE ZUMBRA

SPRINGVIEW PICNIC AREA

LAKE 2

BASIN 'A'

SUNNY LAKE

SCHUTZ LAKE

CAMPION OVERLOOK SPUR

KING OVERLOOK SPUR

LUNSTEN LAKE

MAINTENANCE FACILITY

LAKE AUBURN

CAMPGROUND

LAKE AUBURN

STEIGER LAKE

DESIGNER ATD					© SHORT ELLIOTT HENDRICKSON 2005 ANY USE OR REUSE OF THIS PLAN/DRAWING AND THE CORRESPONDING COMPUTER AIDED DESIGN/DRAFTING FILES WITHOUT THE EXPRESS WRITTEN CONSENT OF SEH IS PROHIBITED SEH SHALL NOT BE RESPONSIBLE FOR ANY UNAUTHORIZED USE OR REUSE OF THESE MATERIALS, OR DAMAGES RESULTING THEREFROM	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. Date 3/xx/05 signature AARON T. DITZLER printed signature Reg No 42003	SEH 10901 RED CIRCLE DRIVE, SUITE 200 MINNETONKA, MN 55343-9100 PH 952 912 2600 FAX 952-912-2601 PH 800 734-6757	Three Rivers PARK DISTRICT	CARVER PARK RESERVE BIKE / HIKE TRAIL IMPLEMENTATION PHASE I	GENERAL LAYOUT	FILE NO. ATHRIV0410.01	2
CHECKED BY: RSH												DATE 3/xx/05	26
APPROVED BY: RSH													
DESIGN TEAM	NO	BY	DATE	REVISIONS									

3/3/2005 3:57:04 PM

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STATEMENT OF ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL PROJECT QUANTITIES		Ⓐ WEST TRAIL LOOP STA 1+00 TO XXX+00		Ⓐ EAST TRAIL LOOP STA XXX+00 TO XXX+00		Ⓐ CHAMPION OVERLOOK SPUR STA XX+00 TO XX+00		Ⓐ KING OVERLOOK SPUR STA XX+00 TO XX+00		Ⓑ WETLAND RESTORATION PROJECT	
			ESTIMATED	FINAL	ESTIMATED	FINAL	ESTIMATED	FINAL	ESTIMATED	FINAL	ESTIMATED	FINAL	ESTIMATED	FINAL
1	MOBILIZATION	LUMP SUM	1.0		0.5		0.5							
2	CLEARING	TREE	1		0		1							
3	GRUBBING	TREE	1		0		1							
4	REMOVE PIPE STORM SEWER CULVERT	LIN FT	60		30		30							
5	REMOVE BITUMINOUS PAVEMENT	SQ YD	139		139		0							
6	REMOVE AND REPLACE CONCRETE CURB AND GUTTER	LIN FT	20		20		0							
7	REMOVE AND REPLACE BOLLARDS	EACH	8		4		4							
8	SALVAGE AND REINSTALL FLARED END SECTION	EACH	4		2		2							
9	SAWING BITUMINOUS PAVEMENT	LIN FT	84		50		34							
10	SALVAGE TOPSOIL - STANDARD TRAIL	SQ YD	25,040		12915		12025		100					
11	SALVAGE TOPSOIL - GRADING IMPACTS	SQ YD	7,314		4217		2555		542					
12	COMMON EXCAVATION - REMOVE NON SALVAGEABLE TOPSOIL - STANDARD TRAIL	CU YD	464		239		223		2					
13	COMMON EXCAVATION - REMOVE NON SALVAGEABLE TOPSOIL - GRADING IMPACTS	CU YD	135		78		47		10					
14	COMMON EXCAVATION - NEW TRAIL ALIGNMENTS	SQ YD	0											
15	COMMON EXCAVATION - LOWER TRAIL PROFILE	SQ YD	0											
16	COMMON EXCAVATION - STANDARD TRAIL	CU YD	911		466		445							
17	COMMON EXCAVATION - GRADING IMPACTS	CU YD	3,941		2624		935		249		133			
18	COMMON EXCAVATION - WETLAND	CU YD	15,000										15000	
19	COMMON BORROW (CV)	CU YD	2,382		890		1049		179				264	
20	SUBGRADE CORRECTION	CU YD	1,362		680		612		50		20			
21	SUBGRADE PREPARATION	ROAD STA	66		35		29		1		1			
22	SELECT TOPSOIL BORROW (LV)	CU YD	2,700		1560		940		200					
23	ROCK CONSTRUCTION ENTRANCE	EACH	8		5		3		0					
24	AGGREGATE BASE, CLASS 5	TON	11,706		5957		5309		301		139			
25	AGGREGATE BASE, CLASS 7, FULL DEPTH RECYCLED PRODUCTION	SQ YD	26,205		13468		12248		489					
26	RECLAIMED AGGREGATE CLASS 7 PLACED, 12' WIDTH (STANDARD TRAIL)	SQ YD	33,168		17067		16101							
27	RECLAIMED AGGREGATE CLASS 7 SALVAGED AND PLACED - GRADING IMPACTS	SQ YD	5,380		3147		2233							
28	TYPE 41A WEARING COURSE MIXTURE	TON	6,013		3062		2779		111		61			
29	MAINTENANCE ROAD CROSSINGS	SQ YD	574		373		201		0					
30	CRUSHED ROCK PIPE FOUNDATION	TON	50		25		25							
31	12-INCH RC PIPE CULVERT	LIN FT	40		20		20							
32	12-INCH CS PIPE CULVERT	LIN FT	40		20		20							
33	12-INCH RC PIPE APRON	EACH	4		2		2							
34	12-INCH CS PIPE APRON	EACH	4		2		2							
35	12-INCH HDPE PIPE CULVERT	LIN FT	60		30		30							
36	CONNECT TO EXISTING STORM SEWER	EACH	4		2		2							
37	ROOT PROTECTION	LIN FT	1,870		1870									
38	RANDOM RIPRAP CL III	CU YD	40		20		20							
39	GEOTEXTILE FILTER TYPE IV	SQ YD	120		60		60							
40	GEOTEXTILE FILTER TYPE V	SQ YD	442		225		204		8		5			
41	PEDESTRIAN CURB RAMP	SQ FT	166		166									
42	TRAFFIC CONTROL	LUMP SUM	1		0.5		0.5							
43	FURNISH & INSTALL SIGN PANEL - TYPE "C"	SF	240		120		120							
44	4-INCH BROKEN LINE YELLOW, EPOXY	LIN FT	6,554		2875		3466		138		75			
45	ZEBRA CROSSWALK WHITE, EPOXY	SQ FT	995		620		375							
46	BALE CHECK	EACH	20		10		10							
47	EROSION CONTROL SILT FENCE, HEAVY DUTY	LIN FT	12,691		4799		6092						1800	
48	MULCH MATERIAL, TYPE 1	TON	16		7		6		1				2.4	
49	DISK ANCHORING	ACRE	7.20		3.3		2.7		0.1				1.1	
50	WOOD FIBER BLANKET	SQ YD	1,400		1400									
51	SEEDING	ACRE	7.2		3.3		2.7		0.1				1.1	
52	SEED, MIXTURE 600	POUND	360		165		135		5				55	
53														
54														
55														
56														
57														
58														
59														
60														

Ⓐ BID ALTERNATE A

Ⓑ BID ALTERNATE B

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DESIGNER: ATD				
CHECKED BY: RSH				
APPROVED BY RSH				
DESIGN TEAM	NO	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature Date 3/xx/05
AARON T DITZLER Reg No 42003
printed signature

SEH 10901 RED CIRCLE DRIVE, SUITE 200 MINNETONKA, MN 55343-9100 PH 952 912-2600 FAX 952-912-2601 PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE BIKE / HIKE TRAIL IMPLEMENTATION PHASE I

STATEMENT OF ESTIMATED QUANTITIES

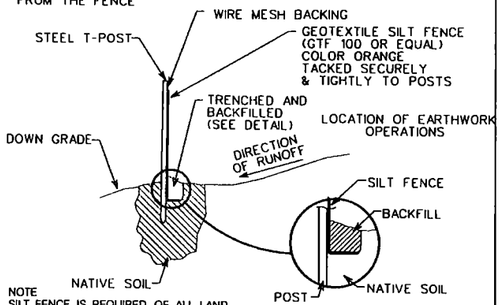
FILE NO. ATHRIV0410.01

DATE 3/xx/05

3 / 26

NOTES
SILT FENCE SHALL BE PLACED PARALLEL TO THE CONTOUR OF THE TERRAIN, WITH THE ENDS WRAPPED UPHILL TO PREVENT FLOW AROUND THEM

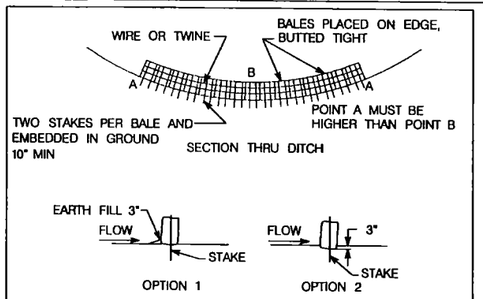
NO EARTHWORK SHALL BE PERFORMED DOWN GRADE FROM THE FENCE



NOTE
SILT FENCE IS REQUIRED OF ALL LAND DISTURBANCES (ON EACH SIDE OF TRAIL) WHEREVER THE DISTURBANCE IS LOCATED WITHIN A WETLAND OR DRAINAGE WAY AREA.

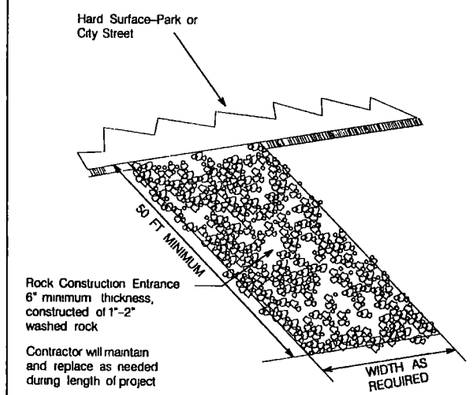
HEAVY DUTY SILT FENCE
MNDOT 3886

NO SCALE



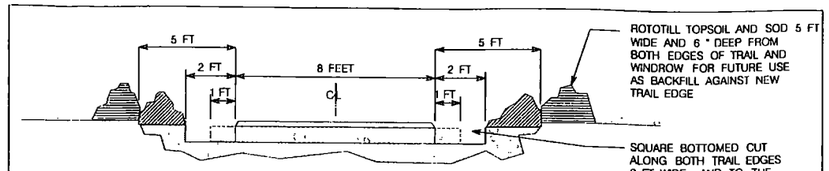
HAY OR STRAW BALE DITCH CHECK

NO SCALE



ROCK CONSTRUCTION ENTRANCE

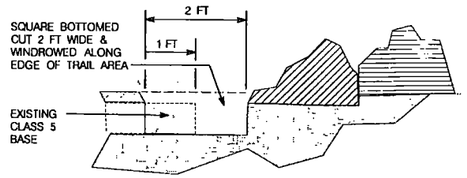
NO SCALE



EXISTING TRAIL AND EDGE CUTS

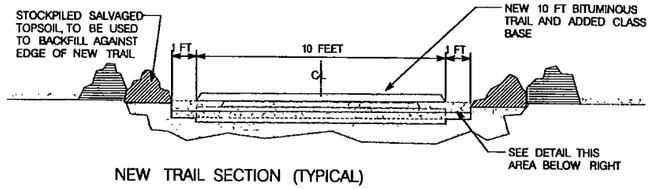
NO SCALE

NOTE
MATERIAL CANNOT BE WINDROWED OUTSIDE OF THE TRAIL EDGES WITHOUT EFFECTIVE SEDIMENT CONTROL. DO NOT STORE MATERIAL NEAR OR ADJACENT TO WETLANDS, WATERBODIES CULVERTS OR DRAINAGE WAYS



DETAIL OF CUT TOPSOIL

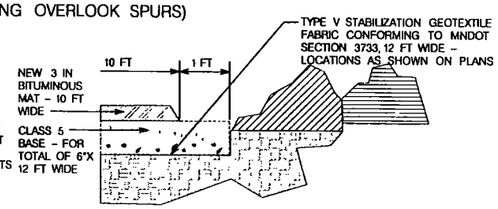
NO SCALE



NEW TRAIL SECTION (TYPICAL)
(CAMPION AND KING OVERLOOK SPURS)

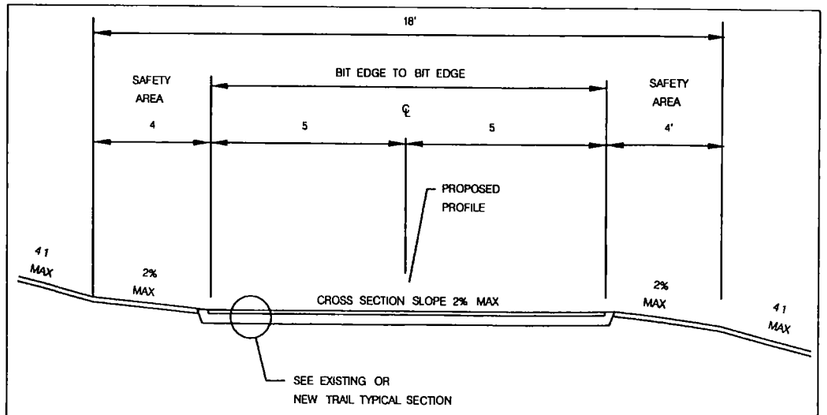
NO SCALE

NOTE
MATERIAL CANNOT BE WINDROWED OUTSIDE OF THE TRAIL EDGES WITHOUT EFFECTIVE SEDIMENT CONTROL. DO NOT STORE MATERIAL NEAR OR ADJACENT TO WETLANDS, WATERBODIES, CULVERTS OR DRAINAGE WAYS

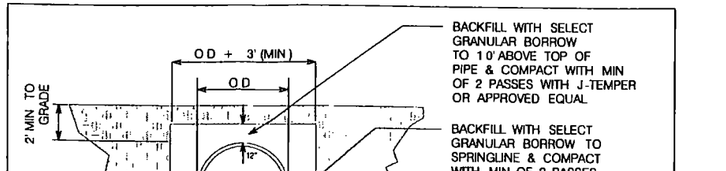


DETAIL OF NEW TRAIL SECTION

NO SCALE

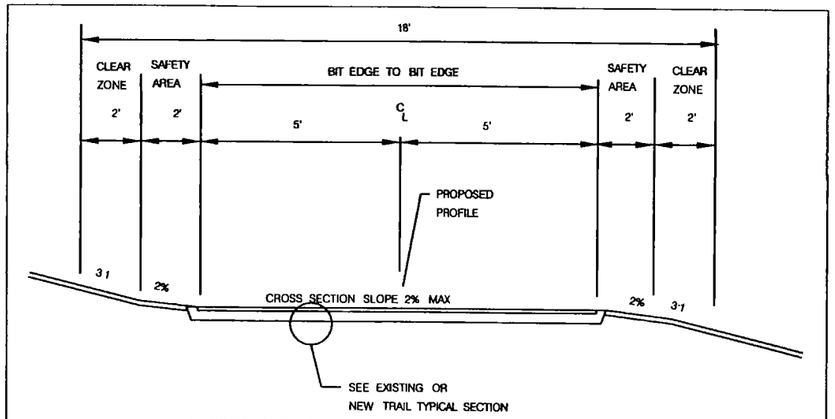


STANDARD SLOPES AND CLEAR ZONES

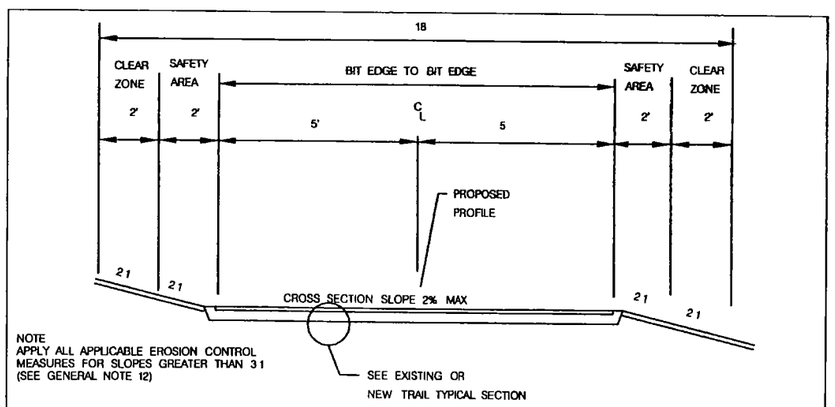


CULVERT DETAIL

NO SCALE



SLOPES AND CLEAR ZONES AT GRADING IMPACTS
(SEE PLANS FOR LOCATIONS)



NOTE
APPLY ALL APPLICABLE EROSION CONTROL MEASURES FOR SLOPES GREATER THAN 3:1 (SEE GENERAL NOTE 12)

SLOPES AND CLEAR ZONES NEAR WETLAND AREAS
(STATION 201+50 TO STATION 204+50
STATION 384+50 TO STATION 392+00)

	NO	BY	DATE	REVISIONS
DESIGNER: ATD	1	ATD	6/2/03	ADDED NOTE TO SILT FENCE DETAIL
CHECKED BY: RSH	2	ATD	6/2/03	ADDED NOTE TO TRAIL SECTION DETAILS
APPROVED BY: RSH				
DESIGN TEAM				

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Date 3/xx/05
signature:
AARON T DITZLER
printed signature
Reg No 42003

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952 912-2601
PH 800 734-6757

Three Rivers PARK DISTRICT

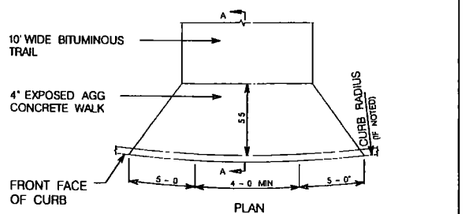
CARVER PARK RESERVE
BIKE / HIKE TRAIL IMPLEMENTATION PHASE I

DETAILS / TYPICAL SECTIONS

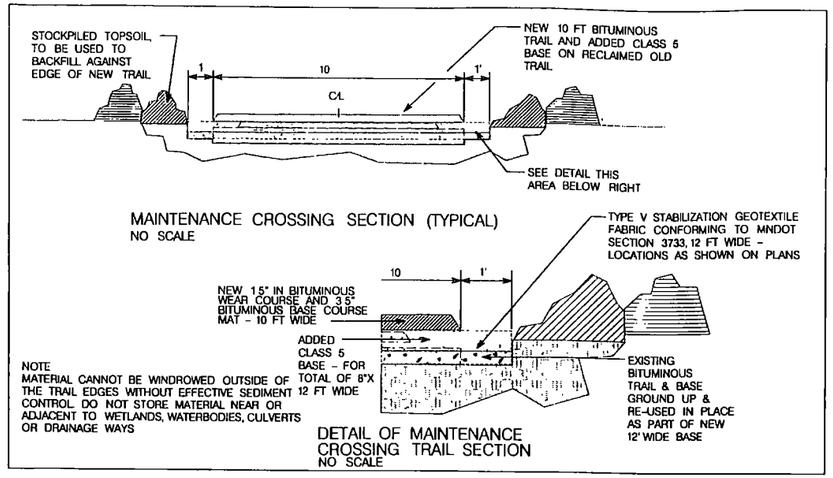
FILE NO ATHRIV0410 01
DATE 3/xx/05

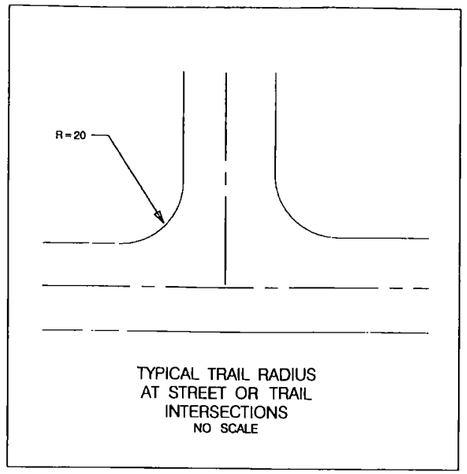
4
26

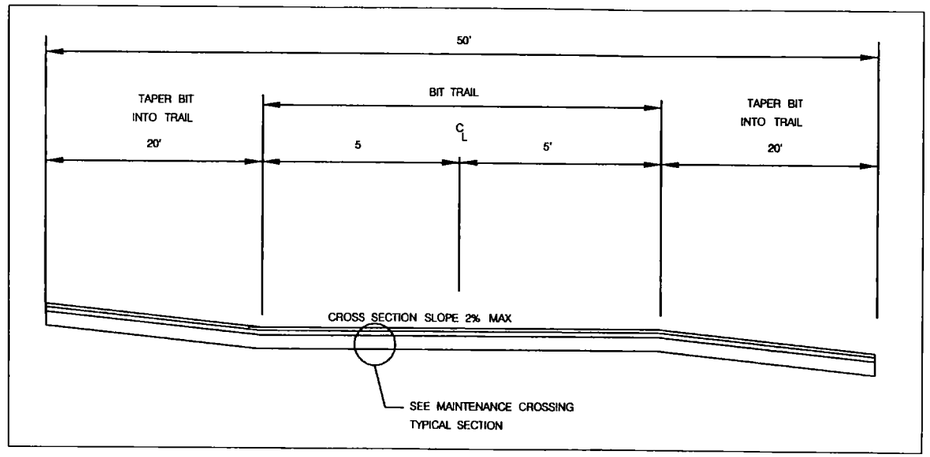
3:57:14 PM
3/3/2005
x:\1\thriv\0410015\civil\cad\plansheets\tr041001dt.dgn

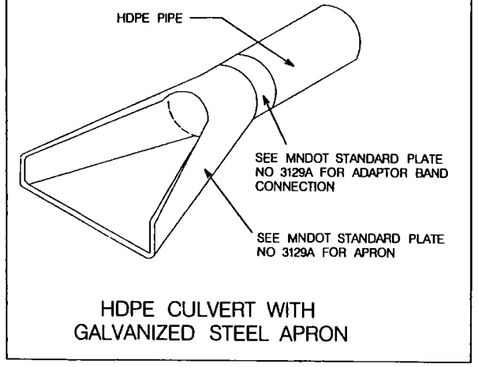


PEDESTRIAN CURB RAMP DETAIL
NO SCALE

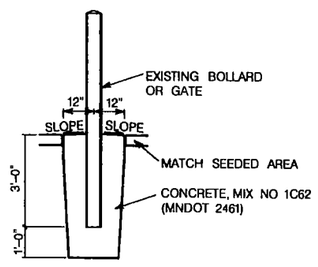




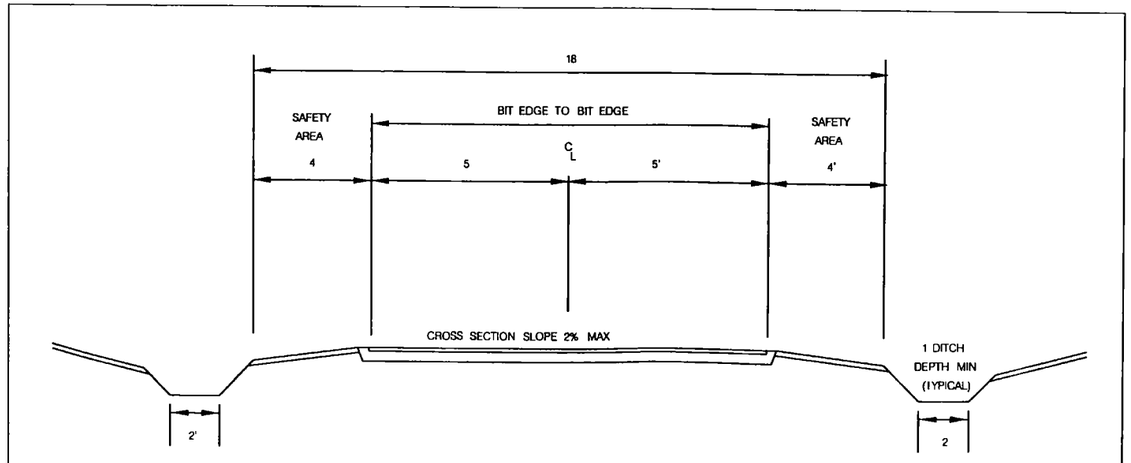


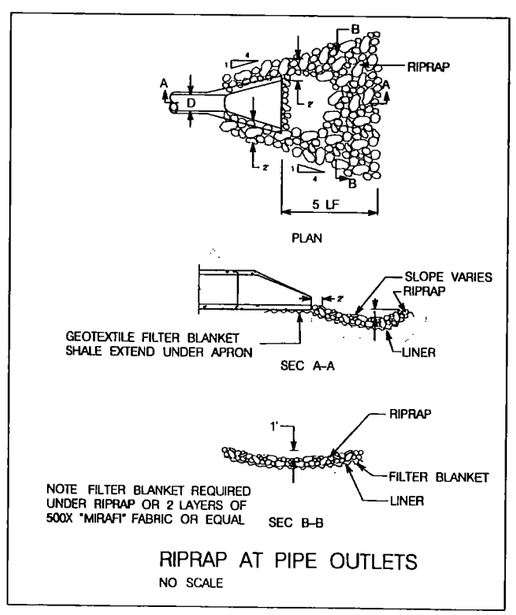


HDPE CULVERT WITH GALVANIZED STEEL APRON



REMOVE AND REPLACE BOLLARD OR GATE DETAIL
NO SCALE





RIPRAP AT PIPE OUTLETS
NO SCALE

DESIGNER: ATD				
CHECKED BY: RSH				
APPROVED BY: RSH				
DESIGN TEAM	NO	BY	DATE	REVISIONS
	1	ATD	6/2/03	ADDED NOTE TO TRAIL SECTION DETAIL

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature Date 3/xx/05
AARON T DITZLER printed signature Reg No 42003

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343 9100
PH 952 912-2600 FAX 952 912 2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

DETAILS / TYPICAL SECTIONS

FILE NO ATHR1V0410 01
DATE 3/xx/05

5
26

LOCATION	BIO ALTERNATE	STATION FROM	STATION TO	COMMON EXCAVATION - NON SALVAGEABLE TOPSOIL STANDARD TRAIL (CY)	COMMON EXCAVATION - NON SALVAGEABLE TOPSOIL GRADING IMPACTS (CY)	COMMON EXCAVATION - STANDARD TRAIL (CY)	COMMON EXCAVATION - GRADING IMPACTS (CY)	COMMON BORROW - GRADING IMPACTS (CY)	SALVAGE TOPSOIL - STANDARD TRAIL (SY)	SALVAGE TOPSOIL - GRADING IMPACTS (SY)	TOPSOIL BORROW (LV) (CY)
WEST LOOP		1+00	47+60	85.8		171.7			4635.0		
		47+60	49+25		4.7		0.0	28.5		251.5	
		49+25	73+50	44.4		88.9			2400.0		
		73+50	80+00		30.4		2287.2	241.2		1639.2	
		80+00	91+90	22.0		44.1			1190.0		
		91+90	94+00		5.8		0.0	16.0		311.0	
		94+00	105+65	21.6		43.1			1165.0		
		105+65	108+00		6.9		7.8	47.4		372.0	
		108+00	110+25	4.2		8.3			225.0		
		110+25	113+50		12.5		54.2	57.0		673.6	
		113+50	116+00	4.6		9.3			250.0		
		200+00	201+75	3.2		6.5			175.0		
		201+75	205+00	6.0		0.0		337.0	325.0		
		205+00	219+75	27.3		54.6			1475.0		
		219+75	223+50		8.2		223.2	44.5		440.6	
		223+50	233+00	17.6		35.2			950.0		
		233+00	236+50		9.8		51.5	118.5		528.6	
		290+00	291+25	2.3		4.6			125.0		
CAMPION		120+00	120+75	1.4		2.8			75.0		
		120+75	125+25		10.0		226.7	179.4		541.9	
		125+25	125+50	0.5		0.9			25.0		
EAST LOOP		336+50	347+00	19.4		38.9			1050.0		
		347+00	352+50		13.6		451.8	86.7		733.0	
		352+50	426+50	137.0		274.1			7400.0		
		426+50	433+50		22.7		217.3	832.9		1223.2	
		433+50	457+75	44.4		88.9			2400.0		
		457+75	462+00		11.1		266.0	129.1		598.4	
		462+00	474+00	21.8		43.5			1175.0		

NOTE: QUANTITIES LISTED IN THE EARTHWORK TABULATION ARE ESTIMATED BASED ON SOIL TESTING AND FIELD INSPECTIONS. ACTUAL QUANTITIES MAY VARY FROM THOSE DEPICTED DUE TO FIELD CONDITIONS.

GENERAL NOTES

1 MAINTENANCE OF THE STAKING AND STATIONING TO BE SOLELY THE CONTRACTOR'S RESPONSIBILITY

2 THE CONTRACTOR SHALL OBTAIN PAY, AND ADHERE TO ALL CONSTRUCTION PERMIT REQUIREMENTS REQUIRED FOR THIS PROJECT OWNER SHALL OBTAIN ALL REGULATORY PERMITS

3. CONTRACTOR SHALL STAY WITHIN CONSTRUCTION LIMITS UNLESS APPROVED OTHERWISE BY THE OWNER THE WORK ZONE SHALL BE KEPT AS MINIMAL AS POSSIBLE DURING CONSTRUCTION MOVEMENT AND PARKING OF EOUIPMENT SHALL STAY WITHIN WORK ZONE AND NOT CROSS AREAS OTHERWISE UNDISTURBED DURING CONSTRUCTION OPERATIONS

4 CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING STRUCTURES, UTILITIES TREES SITE AMENITIES ETC FROM DAMAGE DURING CONSTRUCTION CONTRACTOR TO WORK OUTSIDE OF DRIP ZONE OF TREES EXCEPT IN AREAS DESIGNATED BY OWNER CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ANY DAMAGE (AT CONTRACTORS EXPENSE)

5 STOCKPILE LOCATIONS, MATERIAL AND EQUIPMENT STORAGE LOCATIONS TO BE APPROVED BY OWNER

6 COORDINATION WITH OTHER ON-SITE CONTRACTORS IS CONSIDERED INCIDENTAL TO THE CONTRACT AND SHALL BE THE RESPONSIBLITY OF THE CONTRACTOR AS DESCRIBED IN THE PROJECT SPECIFICATIONS

7 THE CONTRACTOR SHALL MAINTAIN ADJACENT PROPERTY AND CITY STREETS AND CONTINUOUSLY CLEAN FROM CONSTRUCTION CAUSED DIRT AND DEBRIS DURING ALL OPERATIONS ON A DAILY BASIS PROPERTY AND STREET CLEANING SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT

8 APPLY BROKEN LINE TRAIL PAVEMENT MARKINGS IN A PATTERN OF 3 FEET OF MARKING AND 9 FEET OF SPACE

9 ALL PARK SIGNING SHALL BE COMPLETED BY THE OWNER TRAFFIC CONTROL SIGNING IS THE RESPONSIBILITY OF THE CONTRACTOR

10 IN AREAS WHERE EXISTING DRAINTILE IS DISTURBED REMOVE & REPLACE DRAINTILE AS NECESSARY (SEE DETAIL FOR DRAINTILE PLACEMENT)

11 PARK OWNED UTILITIES WILL BE LOCATED BY THE OWNER ONE TIME IT IS THE CONTRACTORS' RESPONSIBILITY TO MAINTAIN LOCATIONS THROUGHOUT THE PROJECT

12. TEMPORARY VEGETATION AND/OR MULCHING SHALL BE USED TO PROTECT THE AREAS EXPOSED DURING THE DEVELOPMENT NO AREA SHALL BE LEFT DENUDED FOR A PERIOD LONGER THAN THREE (3) DAYS AFTER INITIAL SITE GRADING AND OTHER LAND DISTURBING OPERATIONS ON SLOPES 3 1 AND GREATER THESE AREAS SHALL BE SEEDED, MULCHED AND STABILIZED WITH EROSION CONTROL BLANKET TEMPORARY SEED SHALL BE MNDOT MIX 130B @ 100 LBS PER ACRE OR APPROVED EQUAL MULCH SHALL BE MNDOT TYPE 1 (CLEAN OAT STRAW) @ 2 TONS PER ACRE AND DISK ANCHORED IN PLACE OR APPROVED EQUAL EROSION CONTROL BLANKET SHALL BE WOOD FIBER 1S BLANKET MEETING MnDOT SPECIFICATION 3885

13 PERMANENT VEGETATION AND STRUCTURES SHALL BE INSTALLED WITHIN FIVE (5) DAYS AFTER COMPLETION OF INITIAL SITE GRADING IF GRADING IS NOT COMPLETE UNTIL AFTER PLANTING SEASON HAS EXPIRED, TEMPORARY EROSION CONTROL MEASURES, INCLUDING DORMANT SEEDING AND MULCHING SHALL BE IMPLEMENTED PERMANENT SEED SHALL BE MNDOT MIX 50B @ 50 LBS PER ACRE OR APPROVED EQUAL (PLANTING DATES PER SPEC 2575) MULCH SHALL BE MNDOT TYPE 1 (CLEAN OAT STRAW) @ 2 TONS PER ACRE AND DISK ANCHORED IN PLACE OR APPROVED EOUAL

14 IF AFTER 3 (THREE) DAYS THE TEMPORARY VEGETATION AND/OR MULCHING IS NOT COMPLETE, THE SUBURBAN HENNEPIN REGIONAL PARK DISTRICT OR THEIR AUTHORIZED REPRESENTATIVE SHALL NOTIFY THE CONTRACTOR THAT HE HAS 24 HOURS TO COMPLETE THE TEMPORARY VEGETATION AND/OR MULCHING OR THE WORK WILL BE COMPLETED BY OTHERS WITH TWICE THE ACTUAL COST OF WORK BEING DEDUCTED FROM THE CONTRACTORS PAYMENT

15 ALL SEEDED AREAS TO HAVE 6" TOPSOIL EITHER EXISTING OR IMPORTED AND MUST BE TILLED TO REDUCE COMPACTION TO LESS THAN 1 5 MPA TO A DEPTH OF 18" (SITE REPRESENTATIVE AND OWNER TO VERIFY)

16 INSPECT SILT FENCE IMMEDIATELY AFTER EACH RUNOFF EVENT ANY REQUIRED REPAIRS SHOULD BE MADE IMMEDIATELY WHEN SEDIMENT DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE SILT FENCE, REMOVE SEDIMENT OR INSTALL A SECOND SILT FENCE

LIST OF STANDARD PLATES

NO.	TITLE
3000 L	REINFORCED CONCRETE PIPE
3006 G	GASKET JOINT FOR R C. PIPE
3040 F	CORRUGATED METAL PIPE CULVERT
3100 G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3110 G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE - ARCH
3123 J	METAL APRON FOR C S. PIPE
3124 B	METAL APRON CONNECTION
3129 A	METAL APRON FOR CORRUGATED POLYETHYLENE PIPE
3221 C	CORRUGATED STEEL PIPE COUPLING BAND
7035 L	CONCRETE WALK AND CURB RETURNS AT ENTRANCES
7100 G	CONCRETE CURB AND GUTTER
8000 I	STANDARD BARRICADES
9102 G	TURF ESTABLISHMENT AREAS (AT PIPE CULVERT ENDS)

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DESIGNER ATD			
CHECKED BY: RSH			
APPROVED BY RSH			
DESIGN TEAM			

NO.	BY	DATE	REVISIONS
1	ATD	6/2/03	DELETE GENERAL NOTE # 11
2	ATD	6/2/03	ADD SCOTT COUNTY E & SC NOTES
3	ATD	6/2/03	ADD GENERAL NOTE #14
4	ATD	6/2/03	ADD IMPLEMENTATION SCHEDULE

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature Date 3/xx/05
AARON T DITZLER Reg No 42003
printed signature

SEH 10901 RED CIRCLE DRIVE, SUITE 200 MINNETONKA, MN 55343 9100 PH 952 912-2600 FAX 952-912 2601 PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

EARTHWORK TABULATION\ GENERAL NOTES\ STANDARD PLATES

FILE NO ATHRIV0410 01
DATE 3/xx/05

STREET CROSSING SIGNS AND MARKINGS

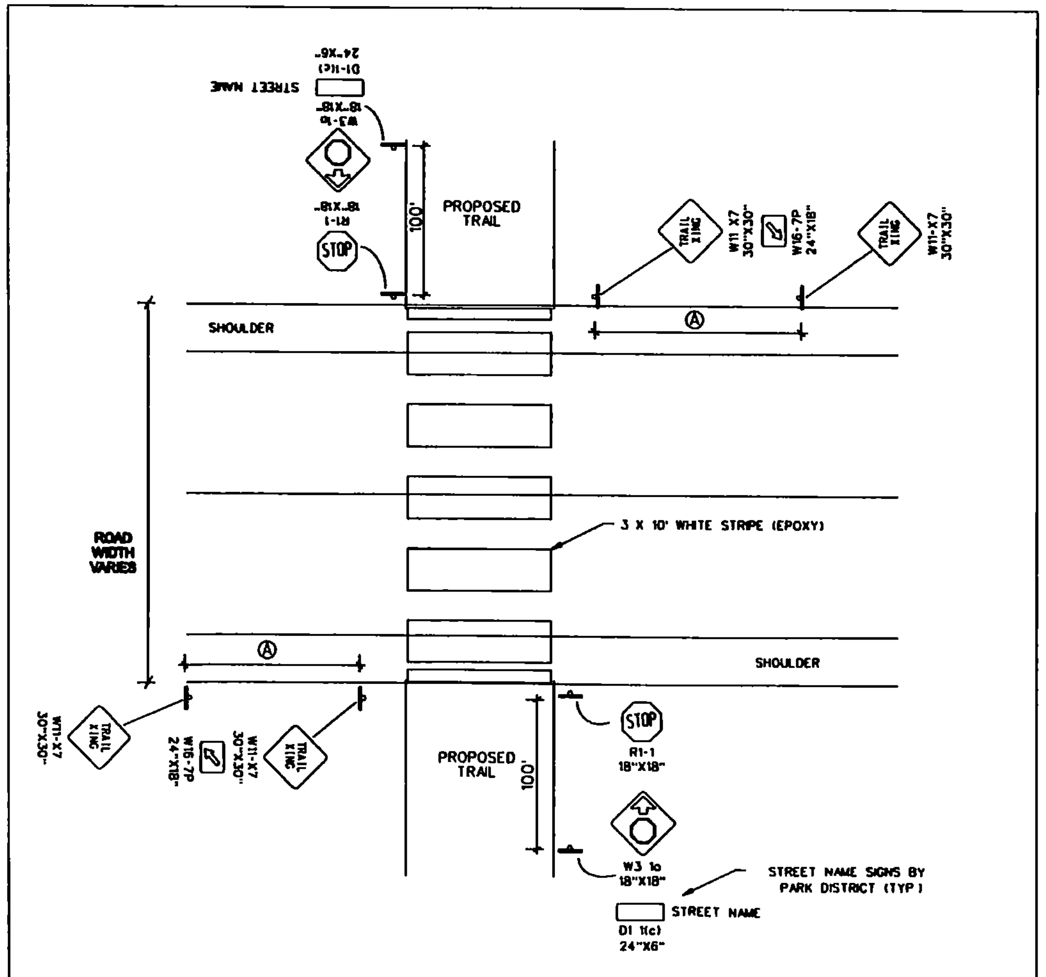
STREET NAME	MPH	STREET WIDTH	NUMBER OF LANES	TRAIL XING W11-X7 EACH	W11-X7 DIST. (A)	TRAIL XING W11-X7 W16-7P EACH	TRAIL STOP R1-1 EACH	TRAIL W3-1a EACH	ZEBRA CROSSWALK SQ FT
GRIMM ROAD	30	36	2	2	100	2	2	2	180
SPRINGVIEW ROAD	30	44	2	2	100	2	2	2	220
CSAH 11	55	44	2	2	375	2	2	2	220
PARK ROAD	30	30	2	2	100	2	2	2	150
PARK ROAD	30	22	2	2	100	2	2	2	110
BOAT ACCESS ROAD	30	23	2	2	100	2	2	2	115

TYPE C SIGNS - FURNISH AND INSTALL

SIGN	QUANTITY	SIGN NO.	COLOR	SIZE (INCHES)	AREA (SQ FT)	NO. OF POSTS AND TYPE
TRAIL XING	24	W11-X7	BLACK ON YELLOW	30" x 30"	150	1-U
	12	W16-7P	BLACK ON YELLOW	24" x 18"	36	COMMON POST
STOP	12	R1-1		18" X 18"	27	SEE NOTE 1
	12	W3-1a		18" X 18"	27	SEE NOTE 1
TOTALS					240	48

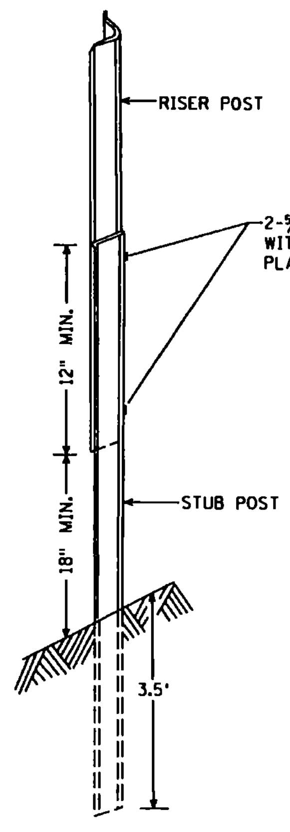
NOTE:

1. USE 8 OR 9 FOOT x 2.5 LB BLACK CHANNEL POSTS. POSTS SHALL BE 7/16" PUNCHED ON 3" CENTERS.

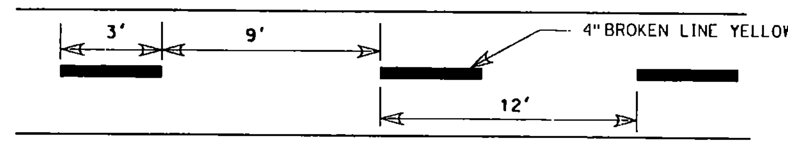


INTERSECTION SIGNING DETAILS (2 LANE OR 4 LANE)

TYPE "C" & "D" POST

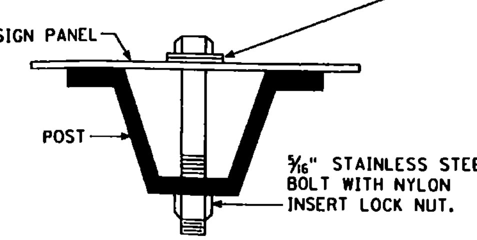


"U POST" SPLICE

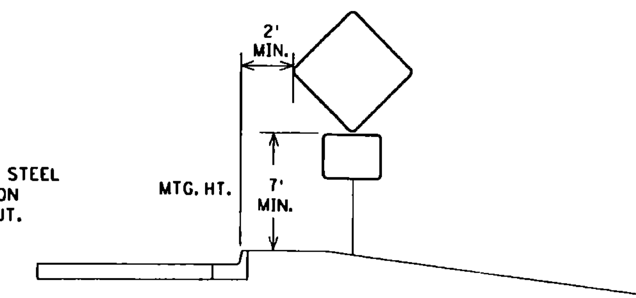


TYPICAL STRIPING DETAIL

NOT TO SCALE



"U POST" MOUNTING TYPE "C" SIGNS



TYPICAL MOUNTING

NOTES:

1. PAINTED AREAS TO BE CENTERED ON CENTERLINE AND LANE LINES.
2. USE 3# STUB POSTS, RISER POSTS, STRINGERS, KNEE BRACES, LATERAL BRACES AND KNEE BRACE STUB POSTS. ALL SHALL CONFORM TO MN/DOT 3401.
3. MOUNTING (PUNCHING CODE) FOR TYPE "C" SIGN PANELS SHALL BE AS INDICATED IN THE STANDARD SIGNS MANUAL UNLESS OTHERWISE SPECIFIED.
4. ALL RISER (VERTICAL) "U POSTS" SHALL BE SPLICED. DRIVEN STUB POSTS SHALL BE AT LEAST 7' LONG.
5. USE STAINLESS STEEL 5/16" BOLTS, WASHERS, AND NYLON INSERT LOCK NUTS AS SHOWN FOR ALL GROUND MOUNTED AND OVERHEAD MOUNTED SIGNS.
6. STAINLESS STEEL WASHER WITH SAME DIMENSIONS SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEADS.

PAVEMENT MARKING

ITEM	QUANTITY
4" BROKEN LINE YELLOW	XX LIN FT
ZEBRA CROSSWALK	995 SQ FT

DESIGNER	ATD	NO	BY	DATE	REVISIONS
CHECKED BY	RSH	1	ATD	9/11/03	ADDITION OF TRAIL SIGNING
APPROVED BY	RSH				
DESIGN TEAM					

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signature ______ Date 3/xx/05
AARON T DITZLER Reg No 42003
printed signature

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
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Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

SIGNING DETAILS AND TABULATIONS

FILE NO ATHRIV0410 01
DATE 3/xx/05

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REMOVE EXISTING CULVERT AND RE-GRADE TO MATCH EXISTING CONTOURS

GRIMM FARM HISTORIC SITE

REVISE CURRENT ALIGNMENT STA 1+45 THROUGH STA 2+90 TO MEET MINIMUM HORIZONTAL CURVE FOR 25 MPH DESIGN.

RCE

GRIMM ROAD

INSTALL 20 LF 8" HDPE CULVERT

RCE

RCE

PARLEY LAKE GROUP CAMP PARKING LOT

RELOCATE PROPOSED 10' TRAIL; USE RECLAIM FROM EXISTING TRAIL FOR PROPOSED TRAIL. RESTORE EXISTING BITUMINOUS TRAIL WITH 6" TOPSOIL AND SEED.

MATCH LINE SEE BELOW LEFT

MATCH LINE SEE ABOVE RIGHT

1ST WETLAND IMPACT - 192 SF

GRIMM ROAD

SPRING ROAD

RCE

RCE

2ND WETLAND IMPACT - 192 SF

SEE FIGURE NO. 8

MATCH LINE SEE SHEET 9 LEFT

LEGEND

- PEDESTRIAN CURB RAMP (SEE DETAIL)
- RCE — ROCK CONSTRUCTION ENTRANCE (SEE DETAIL)
- ROOT BARRIER (CONFIRM LOCATIONS WITH OWNER)
- MAINTENANCE CROSSING LOCATION (SEE TYPICAL SECTION)
- GRADING IMPACTS BASED ON 18' TYP W/3:1 SLOPES
- ① EXTEND EXISTING CULVERT
- ② CLEAN EXISTING CULVERT

scale: 25 — 50 0 50 100 feet

3:57:23 PM 3/3/2005

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DESIGNER	ATD
CHECKED BY:	RSH
APPROVED BY	RSH
DESIGN TEAM	

NO	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Date: 3/xx/05

signature

AARON T DITZLER

printed signature

Reg No 42003

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Three Rivers PARK DISTRICT

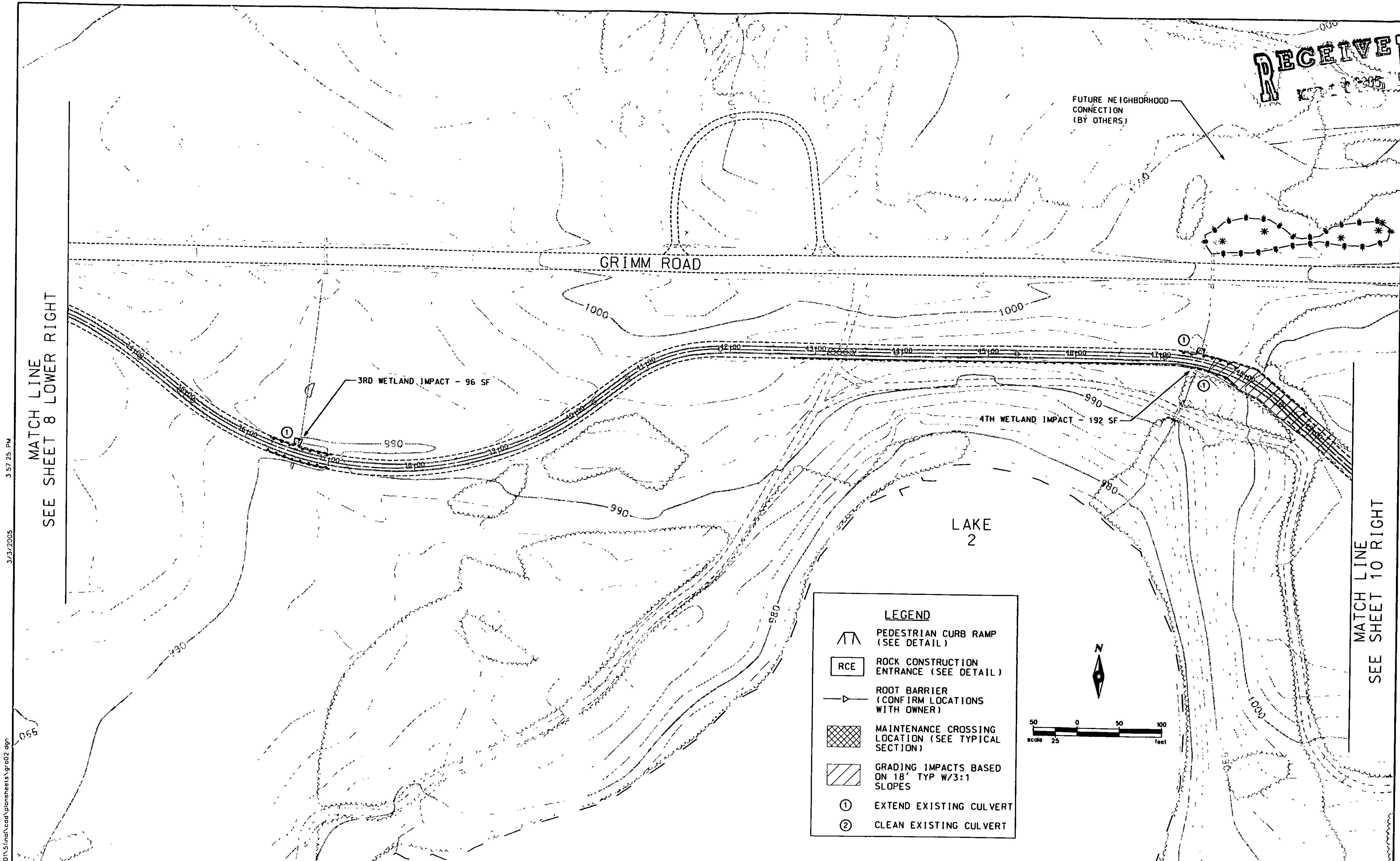
CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

WEST TRAIL LOOP
STA 1+00 TO 32+75

FILE NO. ATHRIV0410 01

DATE 3/xx/05

8 / 26



DESIGNER ATD				
CHECKED BY: RSH				
APPROVED BY RSH				
DESIGN TEAM	NO	BY	DATE	REVISIONS

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signature ____ Date 3/xx/05

AARON T DITZLER Reg No 42003

printed signature

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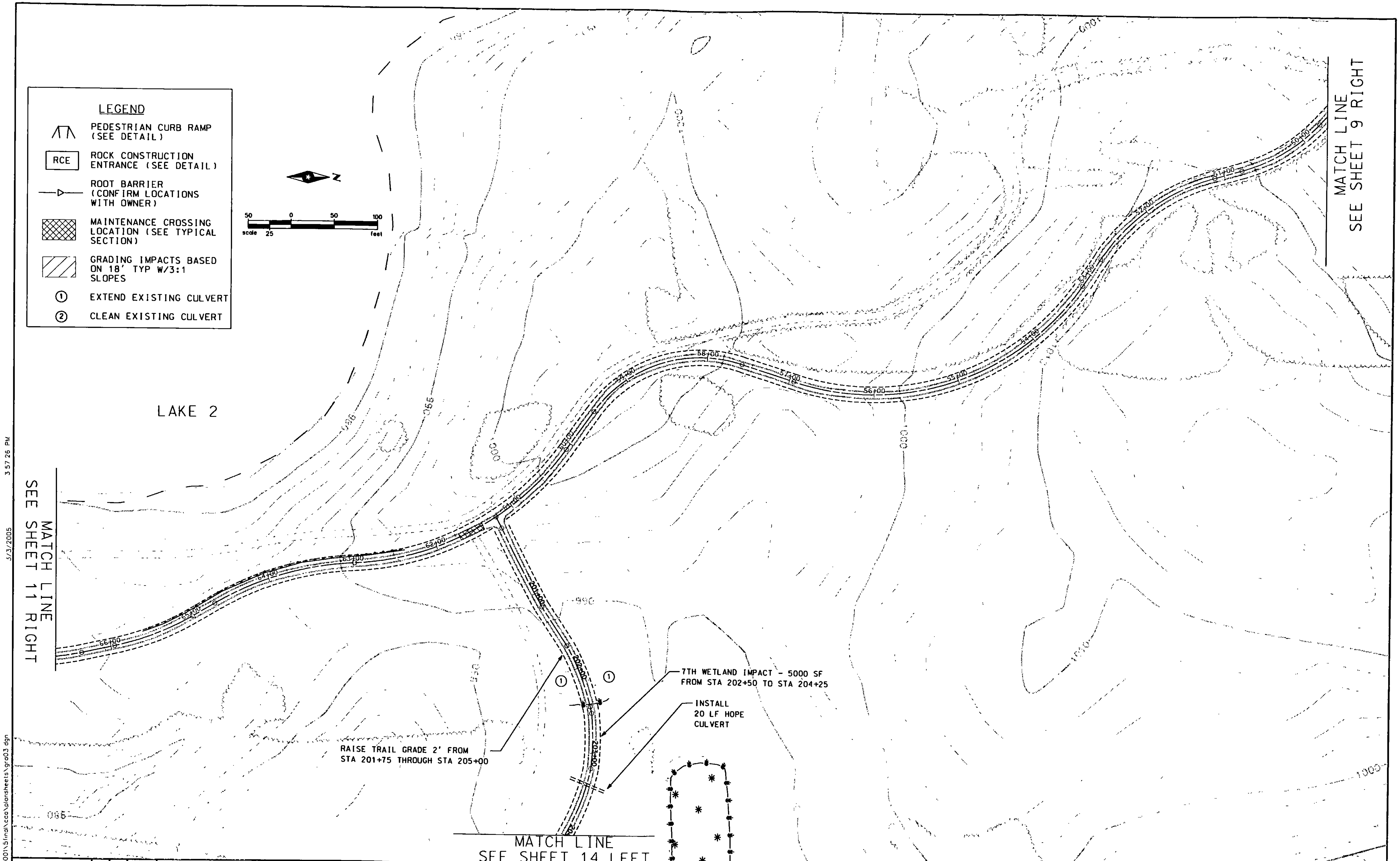
Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

WEST TRAIL LOOP
STA 32+75 TO 49+75

FILE NO ATHRIV0410.01

DATE 3/xx/05



DESIGNER ATD				
CHECKED BY: RSH				
APPROVED BY: RSH				
DESIGN TEAM	NO	BY	DATE	REVISIONS

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BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

WEST TRAIL LOOP
STA 49+75 TO 66+50
STA 200+00 TO 204+00

FILE NO. ATHRIV0410 01
DATE 3/xx/05

MATCH LINE
SEE SHEET 12 RIGHT

LEGEND

- PEDESTRIAN CURB RAMP (SEE DETAIL)
- RCE — ROCK CONSTRUCTION ENTRANCE (SEE DETAIL)
- ROOT BARRIER (CONFIRM LOCATIONS WITH OWNER)
- MAINTENANCE CROSSING LOCATION (SEE TYPICAL SECTION)
- GRADING IMPACTS BASED ON 18' TYP W/3:1 SLOPES
- ① EXTEND EXISTING CULVERT
- ② CLEAN EXISTING CULVERT

N

scale 50 0 50 100 feet
25

LAKE 2

MATCH LINE
SEE SHEET 10 LEFT

KING OVERLOOK SPUR

TURF TRAIL ALIGNMENT TO BE DETERMINED DURING THE DESIGN PHASE. RESTORE WITH TOPSOIL AND SEED AREAS OF TURF TRAIL REALIGNMENT.

5TH WETLAND IMPACT = 96 SF

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3/3/2005
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DESIGNER: AID				
CHECKED BY: RSH				
APPROVED BY: RSH				
DESIGN TEAM	NO	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature Date 3/xx/05
AARON T DITZLER Reg No 42003
printed signature

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

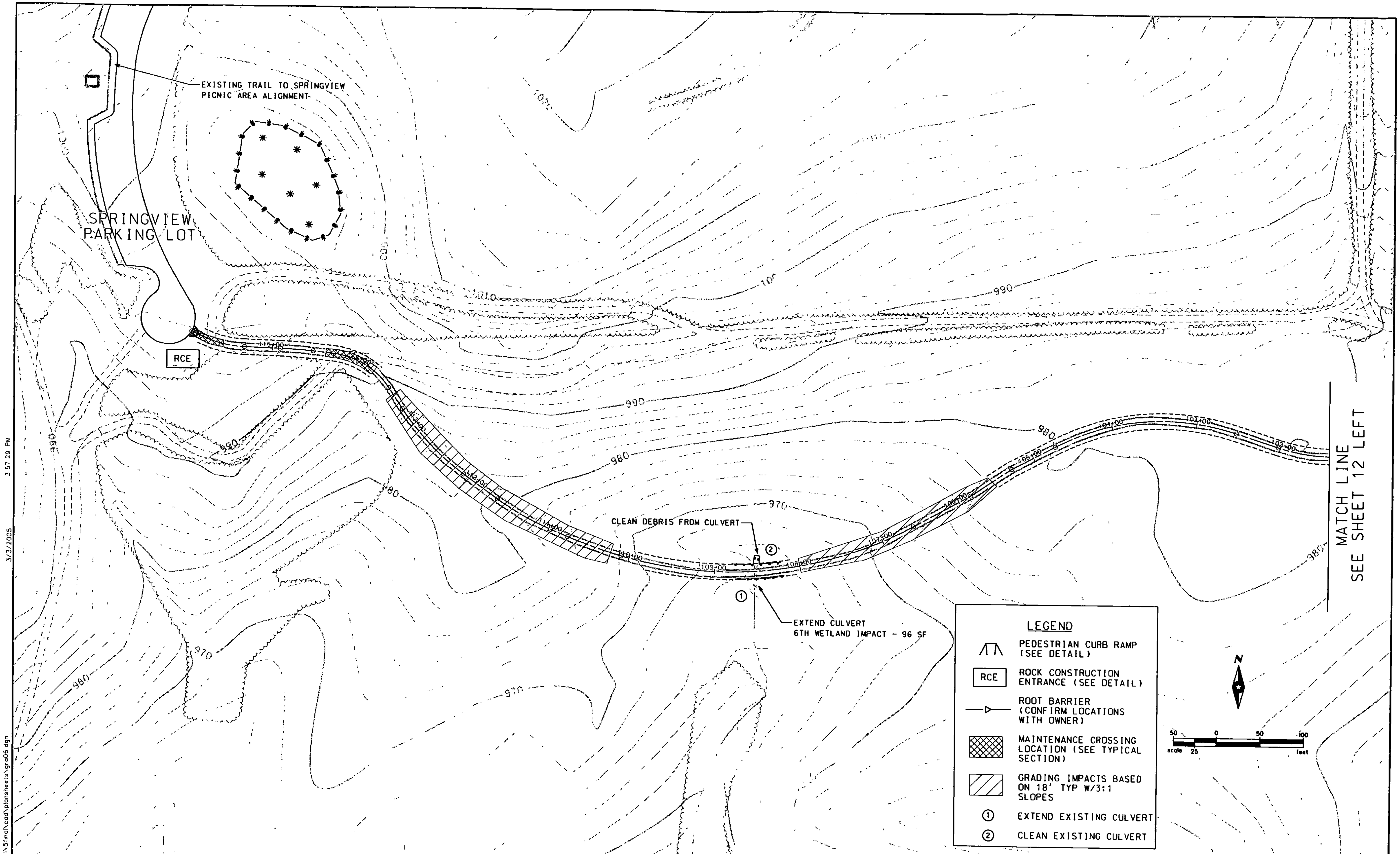
Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

WEST TRAIL LOOP
STA 66+50 TO 86+00
KING OVERLOOK SPUR
STA XX+XX TO XX+XX

FILE NO ATHRIVD410 01
DATE 3/xx/05

11
26



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DESIGNER	ATD	NO.	BY	DATE	REVISIONS
CHECKED BY	RSH				
APPROVED BY	RSH				
DESIGN TEAM					

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

signature ______ Date 3/xx/05
AARON T DITZLER Reg No 42003
printed signature

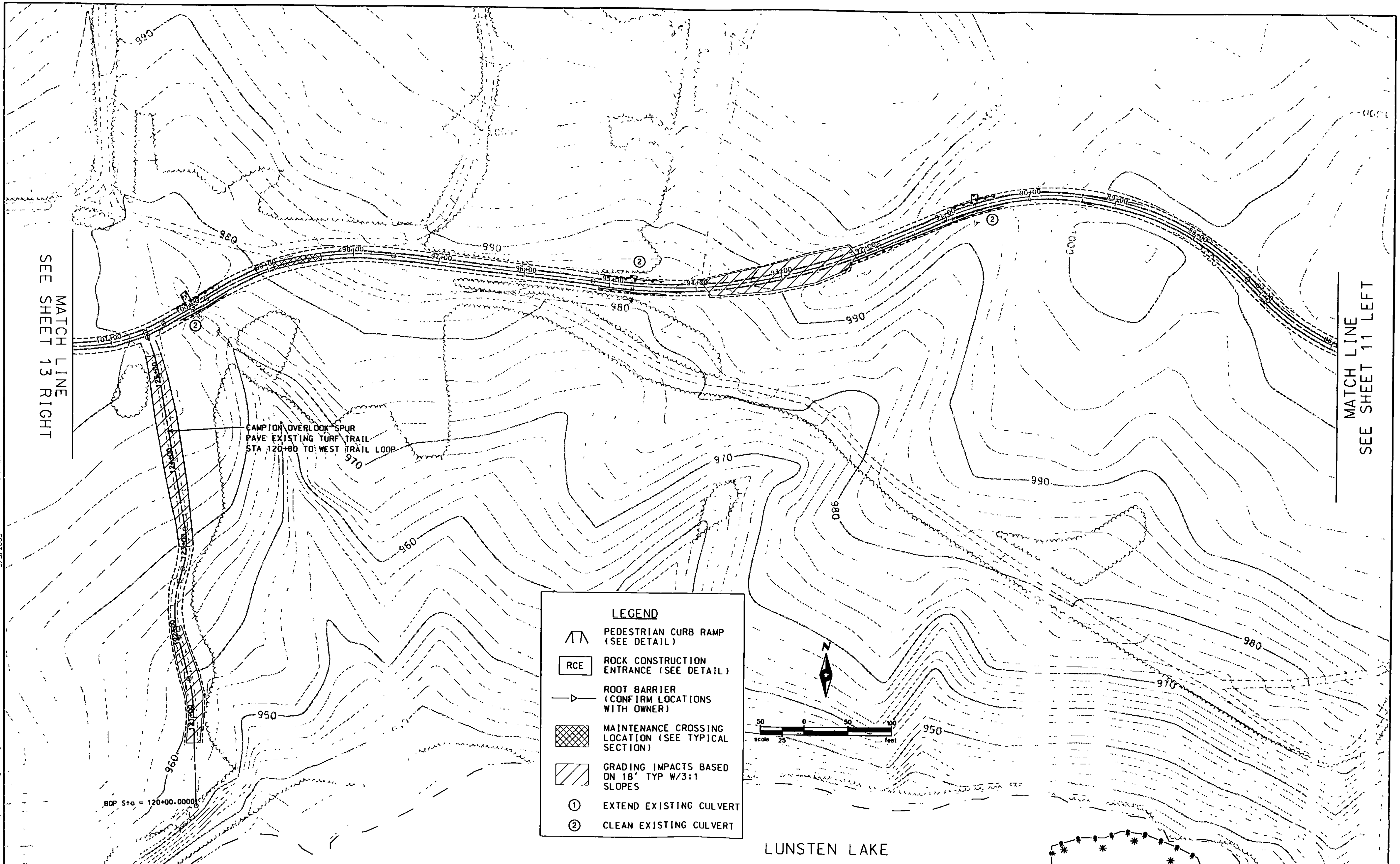
SEH
10901 RED CIRCLE DRIVE SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912 2600 FAX 952 912-2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

WEST TRAIL LOOP
STA 101+50 TO 116+10

FILE NO ATHRIV0410 01
DATE 3/xx/05



DESIGNER. ATD	NO	BY	DATE	REVISIONS
CHECKED BY. RSH				
APPROVED BY RSH				
DESIGN TEAM				

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

signature Date 3/xx/05
AARON T DITZLER Reg No 42003
printed signature

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343 9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

WEST TRAIL LOOP
STA 86+00 TO 101+50
CAMPION OVERLOOK SPUR
STA 120+75 TO 125+50

FILE NO ATHRIV0410 01
DATE 3/xx/05

CSAH 11

MATCH LINE SEE SHEET 10 LOWER

MATCH LINE SEE SHEET 15 LEFT

7TH WETLAND IMPACT - 5000 SF
FROM STA 202+50 TO STA 204+25

LEGEND

- PEDESTRIAN CURB RAMP (SEE DETAIL)
- RCE — ROCK CONSTRUCTION ENTRANCE (SEE DETAIL)
- ROOT BARRIER (CONFIRM LOCATIONS WITH OWNER)
- MAINTENANCE CROSSING LOCATION (SEE TYPICAL SECTION)
- GRADING IMPACTS BASED ON 18' TYP W/3:1 SLOPES
- ① EXTEND EXISTING CULVERT
- ② CLEAN EXISTING CULVERT

N

scale 25 — 50 — 0 — 50 — 100 feet

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DESIGNER: ATD
CHECKED BY: RSH
APPROVED BY: RSH
DESIGN TEAM

NO	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

signature — Date 3/xx/05
AARON T DITZLER — Reg No 42003
printed signature

SEH
10901 RED CIRCLE DRIVE SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912 2601
PH 800 734 6757

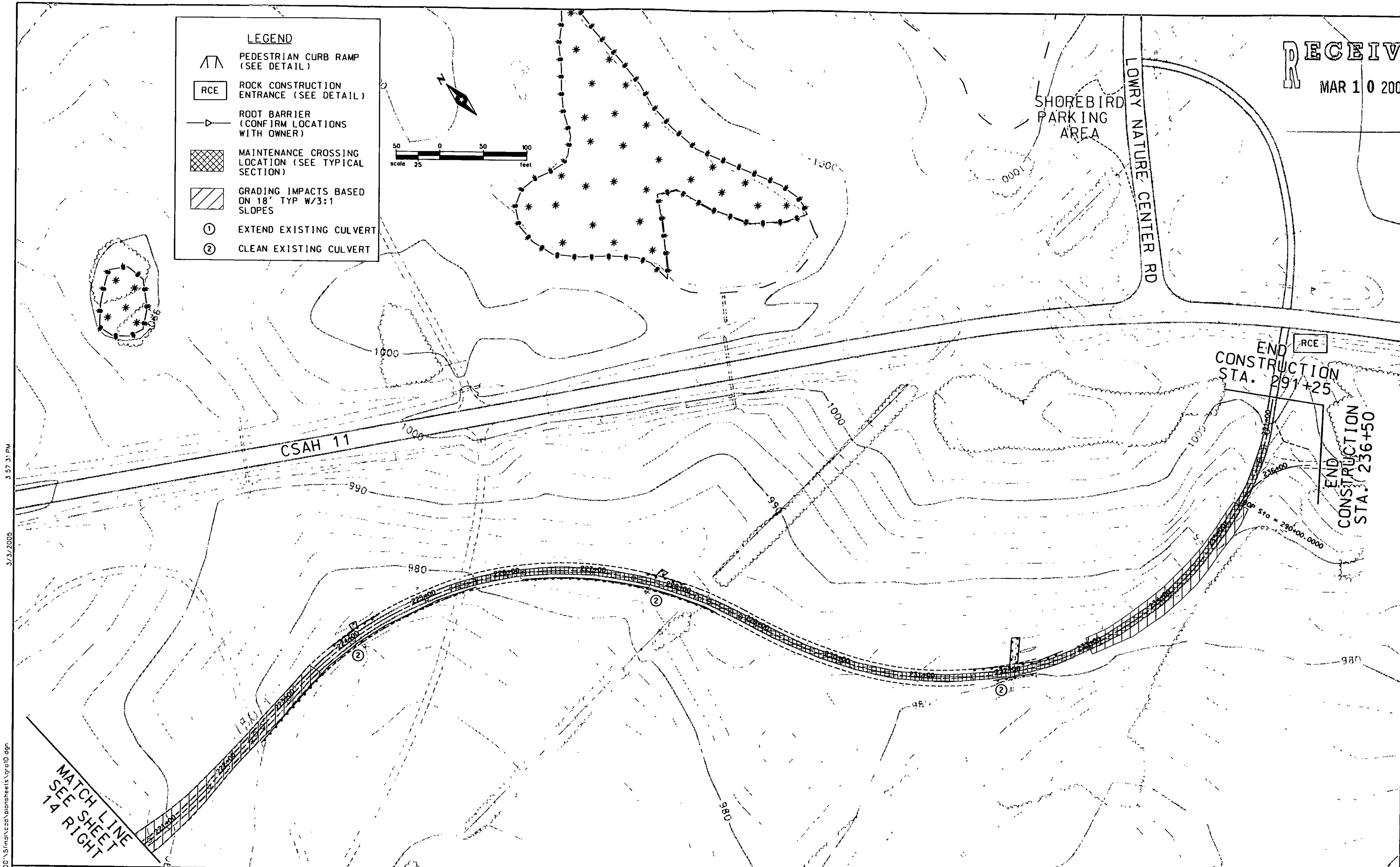
Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL IMPLEMENTATION PHASE I

WEST TRAIL LOOP
STA 204+00 TO 220+50

FILE NO ATHR1V0410.01
DATE 3/xx/05

14
26



DESIGNER:	ATD
CHECKED BY:	RSH
APPROVED BY:	RSH
DESIGN TEAM	

NO	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature: Date 3/xx/05
AARON T DITZLER Reg No 42003
printed signature

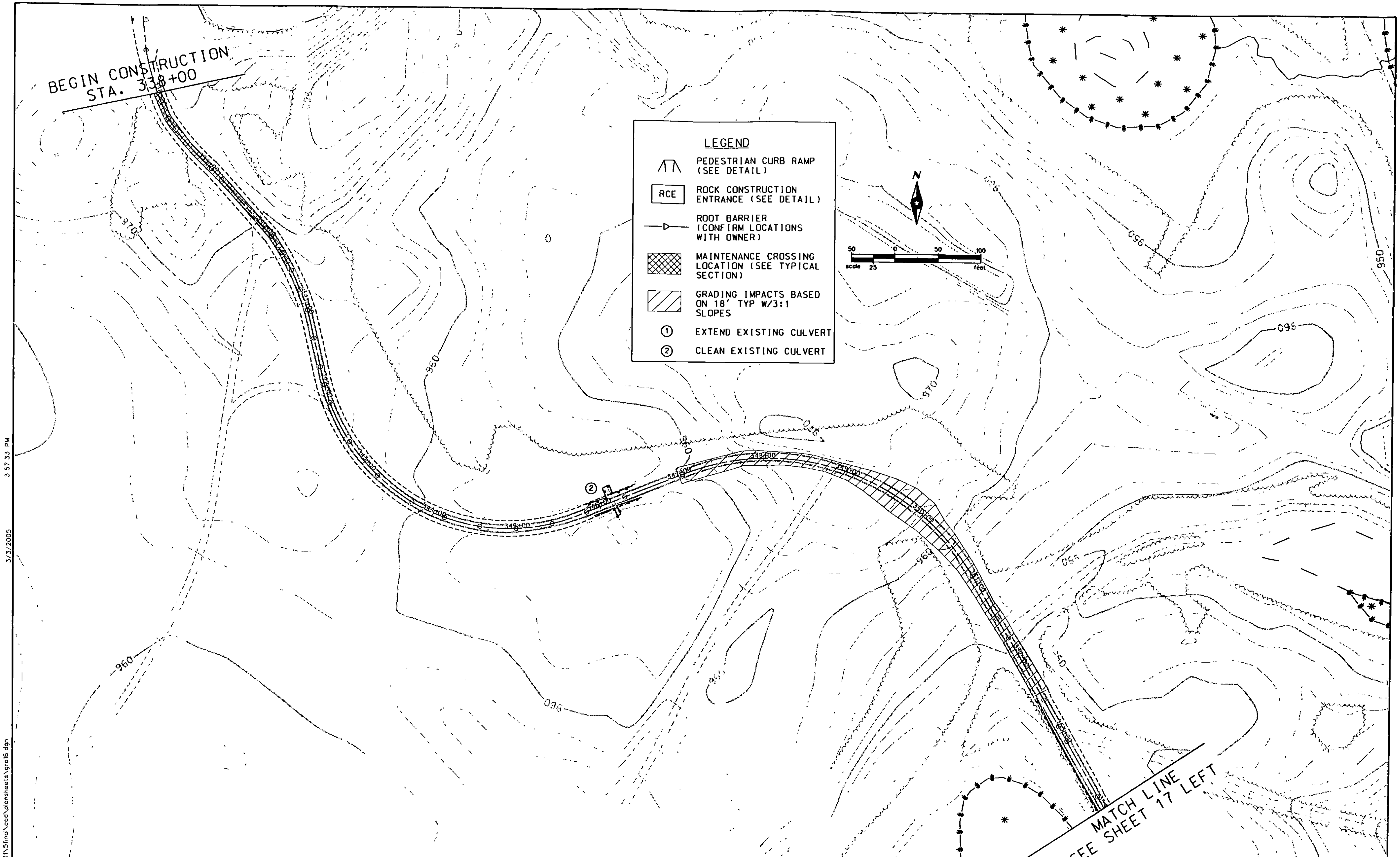
SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952 912-2601
PH 800 734 6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

WEST TRAIL LOOP
STA 220+50 TO 236+50
STA 290+00 TO 291+50

FILE NO. ATHRIV0410 01
DATE 3/xx/05



DESIGNER ATD					© SHORT ELLIOTT HENDRICKSON 2005 ANY USE OR REUSE OF THIS PLAN/DRAWING AND THE CORRESPONDING COMPUTER AIDED DESIGN/DRAFTING FILES WITHOUT THE EXPRESS WRITTEN CONSENT OF SEH. IS PROHIBITED SEH SHALL NOT BE RESPONSIBLE FOR ANY UNAUTHORIZED USE OR REUSE OF THESE MATERIALS. OR DAMAGES RESULTING THEREFROM
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APPROVED BY RSH					
DESIGN TEAM	NO	BY	DATE	REVISIONS	

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

signature Date 3/xx/05
AARON T DITZLER Reg. No 42003
printed signature

SEH
10901 RED CIRCLE DRIVE SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

EAST TRAIL LOOP
STA 338+00 TO 354+00

FILE NO. ATHRIV0410 01
DATE 3/xx/05

16 / 26

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MATCH LINE
SEE SHEET 16 RIGHT

MATCH LINE
SEE SHEET 18 LEFT

LEGEND

- PEDESTRIAN CURB RAMP (SEE DETAIL)
- RCE — ROCK CONSTRUCTION ENTRANCE (SEE DETAIL)
- ROOT BARRIER (CONFIRM LOCATIONS WITH OWNER)
- MAINTENANCE CROSSING LOCATION (SEE TYPICAL SECTION)
- GRADING IMPACTS BASED ON 18' TYP W/3:1 SLOPES
- ① EXTEND EXISTING CULVERT
- ② CLEAN EXISTING CULVERT

N

scale 25 — 50 0 50 100 feet

DESIGNER	ATD
CHECKED BY	RSH
APPROVED BY	RSH

DESIGN TEAM	NO	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature
AARON T DITZLER
printed signature
Date 3/xx/05
Reg No 42003

SEH
10901 RED CIRCLE DRIVE SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952 912-2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

EAST TRAIL LOOP
STA 354+00 TO 372+00

FILE NO ATHRIV0410.01
DATE 3/xx/05

17
26

8TH WETLAND IMPACT - .192 SF

MATCH LINE
SEE SHEET 17
RIGHT

MATCH LINE
SEE SHEET 19
UPPER LEFT

LEGEND

- PEDESTRIAN CURB RAMP (SEE DETAIL)
- RCE — ROCK CONSTRUCTION ENTRANCE (SEE DETAIL)
- ROOT BARRIER (CONFIRM LOCATIONS WITH OWNER)
- MAINTENANCE CROSSING LOCATION (SEE TYPICAL SECTION)
- GRADING IMPACTS BASED ON 18' TYP W/3:1 SLOPES
- ① EXTEND EXISTING CULVERT
- ② CLEAN EXISTING CULVERT

N

50 0 50 100
scale 25 feet

DESIGNER. ATD
CHECKED BY: RSH
APPROVED BY RSH
DESIGN TEAM

NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Date 3/xx/05
signature:
AARON T DITZLER Reg No 42003
printed signature:

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952 912-2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

EAST TRAIL LOOP
STA 372+00 TO 389+00

FILE NO ATHRIV0410.01
DATE 3/xx/05

18 / 26

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MATCH LINE
SEE SHEET 18 RIGHT

LEGEND

- PEDESTRIAN CURB RAMP (SEE DETAIL)
- RCE — ROCK CONSTRUCTION ENTRANCE (SEE DETAIL)
- ROOT BARRIER (CONFIRM LOCATIONS WITH OWNER)
- MAINTENANCE CROSSING LOCATION (SEE TYPICAL SECTION)
- GRADING IMPACTS BASED ON 18' TYP W/3:1 SLOPES
- ① EXTEND EXISTING CULVERT
- ② CLEAN EXISTING CULVERT

N

scale 50 0 50 100 feet
25

50SC

MATCH LINE
SEE BELOW LEFT

9TH WETLAND IMPACT - 96 SF

END ② CONSTRUCTION

MATCH LINE
SEE ABOVE RIGHT

MATCH LINE
SEE SHEET 20 LEFT

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3/3/2005
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DESIGNER. ATD				
CHECKED BY RSH				
APPROVED BY RSH				
DESIGN TEAM	NO	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature/ Date 3/xx/05
AARON T DITZLER Reg No 42003
printed signature

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

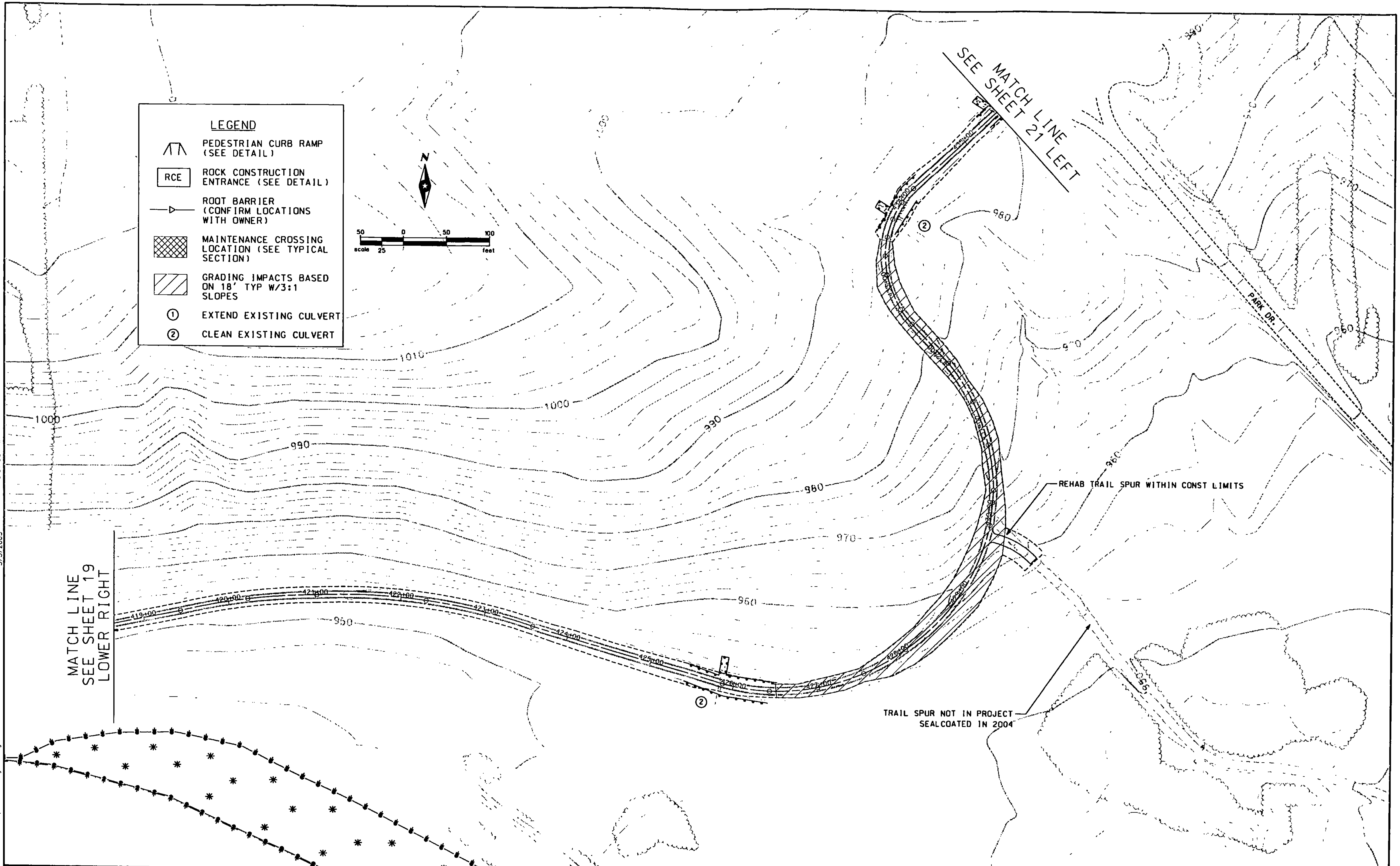
Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

EAST TRAIL LOOP
STA 389+00 TO 418+75

FILE NO. ATHRIV0410 01
DATE 3/xx/05

19 / 26



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DESIGNER. ATD				
CHECKED BY. RSH				
APPROVED BY RSH				
DESIGN TEAM	NO	BY	DATE	REVISIONS

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signature ________ Date 3/xx/05

AARON T DITZLER Reg No 42003

printed signature

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

EAST TRAIL LOOP
STA 418+75 TO 435+50

FILE NO. ATHRIV0410 01

DATE 3/xx/05

SCHUTZ LAKE

MATCH LINE
SEE SHEET 21 RIGHT

MATCH LINE
SEE SHEET 23 RIGHT

LAKE ACCESS ROAD

LEGEND

- PEDESTRIAN CURB RAMP (SEE DETAIL)
- RCE — ROCK CONSTRUCTION ENTRANCE (SEE DETAIL)
- ROOT BARRIER (CONFIRM LOCATIONS WITH OWNER)
- MAINTENANCE CROSSING LOCATION (SEE TYPICAL SECTION)
- GRADING IMPACTS BASED ON 18' TYP W/3:1 SLOPES
- ① EXTEND EXISTING CULVERT
- ② CLEAN EXISTING CULVERT

N

50 0 50 100
Scale 25 feet

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3/3/2005
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DESIGNER: ATD
CHECKED BY: RSH
APPROVED BY: RSH
DESIGN TEAM

NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Date 3/xx/05
signature: AARON T DITZLER Reg No 42003
printed signature

SEH
10901 RED CIRCLE DRIVE SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952 912-2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

EAST TRAIL LOOP
STA 450+50 TO 466+25

FILE NO. ATHRIV0410.01
DATE 3/xx/05

22
26

MATCH LINE
SEE SHEET 22 RIGHT

MATCH LINE
SEE SHEET 20 RIGHT

PARK DR.

SCHUTZ
LAKE

RCE

RCE

LEGEND

- PEDESTRIAN CURB RAMP (SEE DETAIL)
- RCE — ROCK CONSTRUCTION ENTRANCE (SEE DETAIL)
- ROOT BARRIER (CONFIRM LOCATIONS WITH OWNER)
- MAINTENANCE CROSSING LOCATION (SEE TYPICAL SECTION)
- GRADING IMPACTS BASED ON 18' TYP W/3:1 SLOPES
- ① EXTEND EXISTING CULVERT
- ② CLEAN EXISTING CULVERT

N

scale 50 0 50 100 feet
25

DESIGNER. ATD
CHECKED BY: RSH
APPROVED BY: RSH
DESIGN TEAM

NO	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Signature: AARON T DITZLER
printed signature
Date 3/xx/05
Reg No 42003

SEH
10901 RED CIRCLE DRIVE SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912 2600 FAX 952-912-2601
PH 800 734 6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

EAST TRAIL LOOP
STA 435+50 TO 450+50

FILE NO. ATHRIV0410.01
DATE 3/xx/05

21
26

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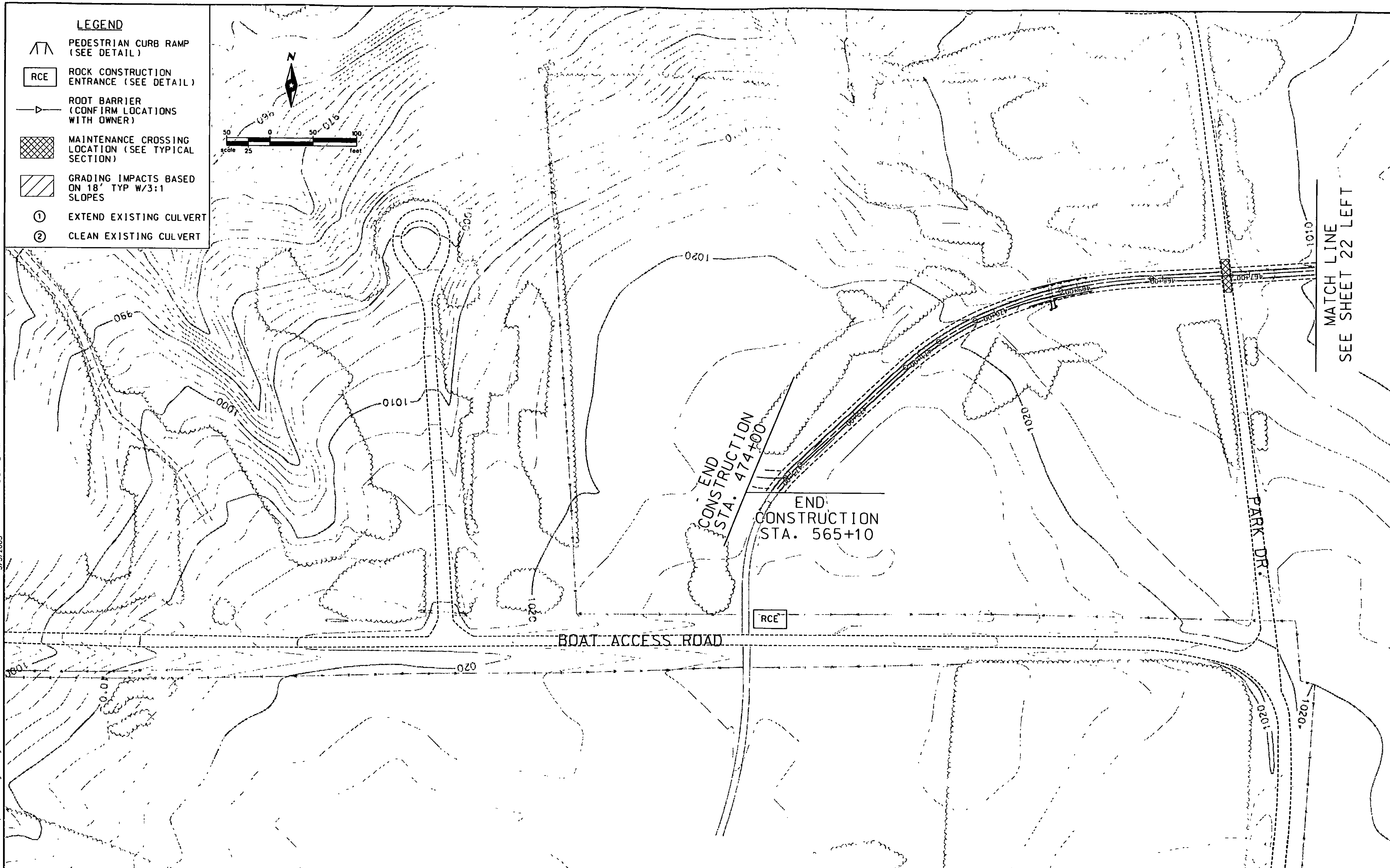

DESIGNER:	ATD
CHECKED BY:	RSH
APPROVED BY:	RSH
DESIGN TEAM	

NO	BY	DATE	REVISIONS

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signature Date: 3/xx/05

AARON T DITZLER Reg No 42003

printed signature

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912 2601
PH 800 734-6757

Three Rivers PARK DISTRICT

CARVER PARK RESERVE
BIKE / HIKE TRAIL
IMPLEMENTATION
PHASE I

EAST TRAIL LOOP
STA 466+25 TO 565+10
STA 473+00 TO 474+00

FILE NO. ATHRIV0410.01
DATE 3/xx/05

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3/4/2005

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EAST TRAIL LOOP ALIGNMENT

HAUL ROAD

SOIL STOCKPILE GRADING LIMITS

SILT FENCE

ACCESS

CSAH 11

N

Scale 1" = 50'

100 0 100 200 feet

DESIGN TEAM	NO	BY	DATE	REVISIONS
DRAWN BY: GRB				
DESIGNER: TU				
CHECKED BY: TU				

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

Certified By: _____ Lic No 00000
Licensed Professional Engineer

Printed Name ENGINEER'S NAME Date: 3/4/2005

SEH
PHONE: (651)490-2000
3535 VADNAIS CENTER DR
ST PAUL MN 55110

THREE RIVERS PARK DISTRICT
CARVER PARK RESERVE
WETLAND MITIGATION

SITE LAYOUT

FILE NO. ATHRIV0410

DATE X/XX/04

WETLAND MITIGATION NOTES:

1. THE UPPER 6 INCHES OF SOIL FROM THE WETLAND RESTORATION AREA THAT IS DOMINATED BY REED CANARY GRASS. SHALL BE REMOVED AND STOCKPILED. SEE SHEET 24 OF 26 FOR STOCKPILE LOCATION.

2. ANY STOCKPILED MATERIAL SHALL BE SECURED FROM EROSION BY COVERING WITH MN/DOT SEED MIX NO. 50B.

3. THE MITIGATION SITE SHALL BE EXCAVATED TO THE ELEVATIONS SHOWN.

4. SLOPES WITHIN THE MITIGATION AREA SHALL NOT EXCEED 10:1. UNLESS OTHERWISE NOTED.

5. INSTALL SAFETY AND SILT FENCE ALONG THE EDGE OF THE EXISTING WETLAND AREAS AS SHOWN BEFORE CONSTRUCTION BEGINS. AND ALONG NEWLY CREATED WETLAND AREAS IMMEDIATELY FOLLOWING COMPLETION. REMOVE ALL FENCING WHEN CONSTRUCTION IS COMPLETE AND VEGETATION IN THE MITIGATION SITE HAS BEEN ESTABLISHED.

6. EXISTING TILE WILL BE BROKEN WITHIN THE WETLAND RESTORATION AREA AS DIRECTED BY THE ENGINEER.

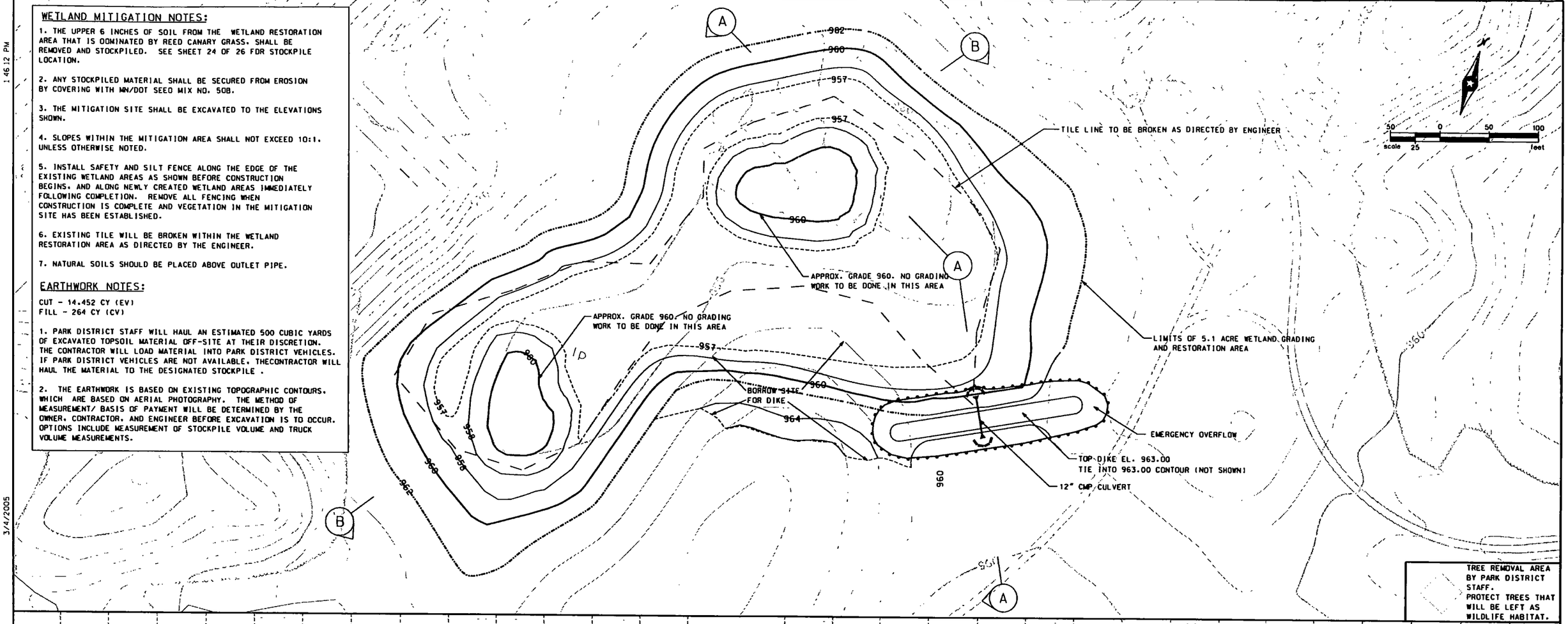
7. NATURAL SOILS SHOULD BE PLACED ABOVE OUTLET PIPE.

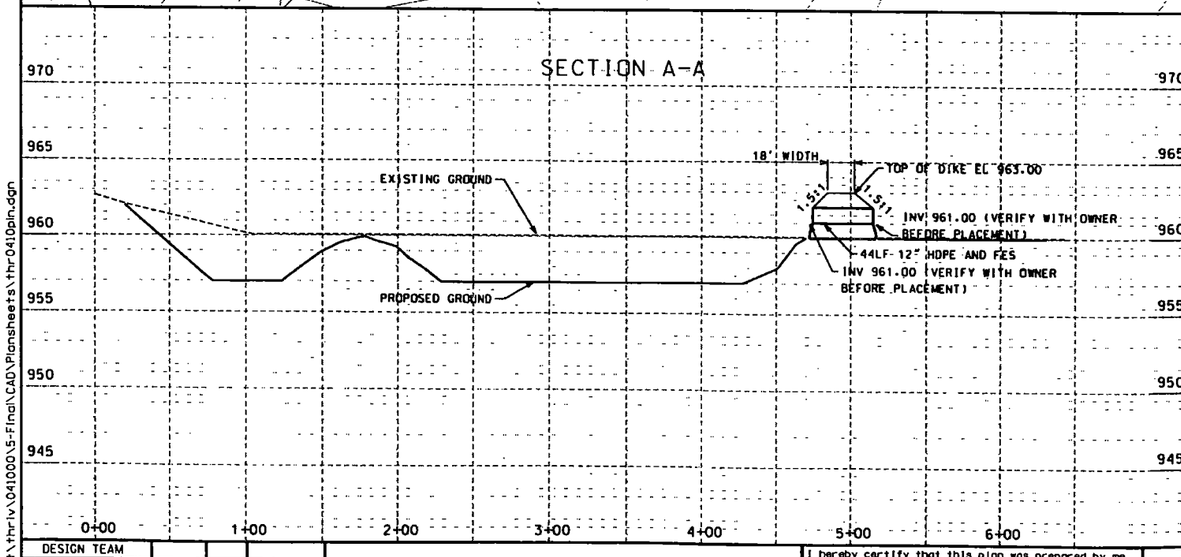
EARTHWORK NOTES:

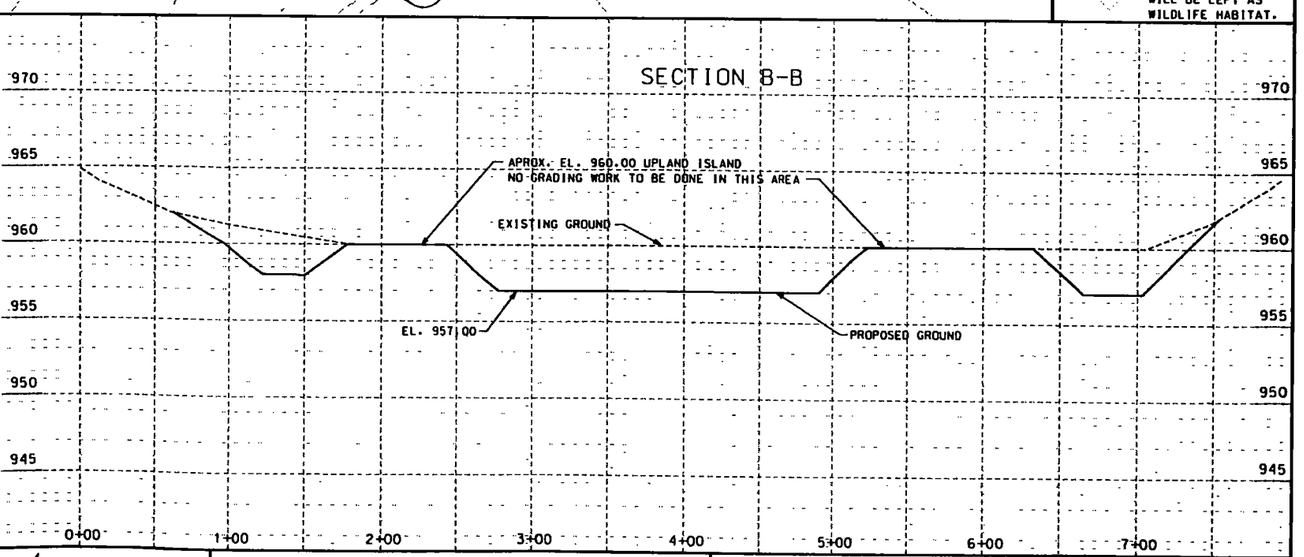
CUT - 14,452 CY (EV)
FILL - 264 CY (CV)

1. PARK DISTRICT STAFF WILL HAUL AN ESTIMATED 500 CUBIC YARDS OF EXCAVATED TOPSOIL MATERIAL OFF-SITE AT THEIR DISCRETION. THE CONTRACTOR WILL LOAD MATERIAL INTO PARK DISTRICT VEHICLES. IF PARK DISTRICT VEHICLES ARE NOT AVAILABLE. THECONTRACTOR WILL HAUL THE MATERIAL TO THE DESIGNATED STOCKPILE .

2. THE EARTHWORK IS BASED ON EXISTING TOPOGRAPHIC CONTOURS. WHICH ARE BASED ON AERIAL PHOTOGRAPHY. THE METHOD OF MEASUREMENT/ BASIS OF PAYMENT WILL BE DETERMINED BY THE OWNER. CONTRACTOR. AND ENGINEER BEFORE EXCAVATION IS TO OCCUR. OPTIONS INCLUDE MEASUREMENT OF STOCKPILE VOLUME AND TRUCK VOLUME MEASUREMENTS.







DESIGN TEAM	NO.	BY	DATE	REVISIONS
DRAWN BY: GRB				
DESIGNER: TU				
CHECKED BY: TU				

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota
Certified By: _____ Licensed Professional Engineer Lic No 00000
Printed Name: ENGINEER'S NAME Date: 3/4/2005

SEH
PHONE: (651)490-2000
3535 VADNAIS CENTER DR
ST. PAUL MN 55110

THREE RIVERS PARK DISTRICT
CARVER PARK RESERVE
WETLAND MITIGATION

WETLAND AND CULVERT PLAN AND PROFILE

FILE NO ATHRIV0410
DATE X/XX/04
25 / 26

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3/4/2005
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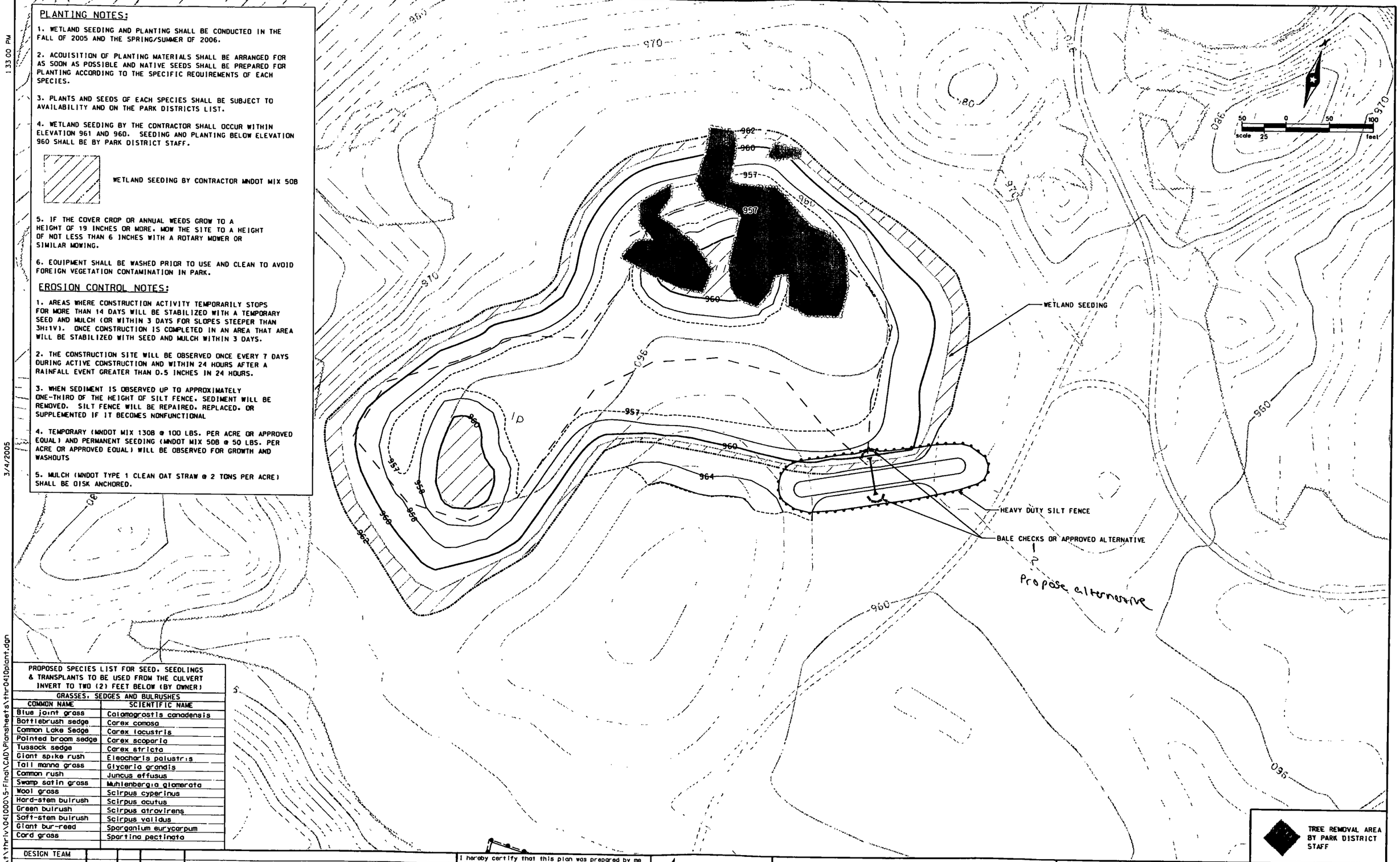

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3/4/2005

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PLANTING NOTES:

1. WETLAND SEEDING AND PLANTING SHALL BE CONDUCTED IN THE FALL OF 2005 AND THE SPRING/SUMMER OF 2006.

2. ACQUISITION OF PLANTING MATERIALS SHALL BE ARRANGED FOR AS SOON AS POSSIBLE AND NATIVE SEEDS SHALL BE PREPARED FOR PLANTING ACCORDING TO THE SPECIFIC REQUIREMENTS OF EACH SPECIES.

3. PLANTS AND SEEDS OF EACH SPECIES SHALL BE SUBJECT TO AVAILABILITY AND ON THE PARK DISTRICTS LIST.

4. WETLAND SEEDING BY THE CONTRACTOR SHALL OCCUR WITHIN ELEVATION 961 AND 960. SEEDING AND PLANTING BELOW ELEVATION 960 SHALL BE BY PARK DISTRICT STAFF.

▨ WETLAND SEEDING BY CONTRACTOR MNDOT MIX 508

5. IF THE COVER CROP OR ANNUAL WEEDS GROW TO A HEIGHT OF 19 INCHES OR MORE. MOW THE SITE TO A HEIGHT OF NOT LESS THAN 6 INCHES WITH A ROTARY MOWER OR SIMILAR MOWING.

6. EQUIPMENT SHALL BE WASHED PRIOR TO USE AND CLEAN TO AVOID FOREIGN VEGETATION CONTAMINATION IN PARK.

EROSION CONTROL NOTES:

1. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY STOPS FOR MORE THAN 14 DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH (OR WITHIN 3 DAYS FOR SLOPES STEEPER THAN 3H:1V). ONCE CONSTRUCTION IS COMPLETED IN AN AREA THAT AREA WILL BE STABILIZED WITH SEED AND MULCH WITHIN 3 DAYS.

2. THE CONSTRUCTION SITE WILL BE OBSERVED ONCE EVERY 7 DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS.

3. WHEN SEDIMENT IS OBSERVED UP TO APPROXIMATELY ONE-THIRD OF THE HEIGHT OF SILT FENCE. SEDIMENT WILL BE REMOVED. SILT FENCE WILL BE REPAIRED. REPLACED. OR SUPPLEMENTED IF IT BECOMES NONFUNCTIONAL

4. TEMPORARY (MNDOT MIX 130B @ 100 LBS. PER ACRE OR APPROVED EQUAL) AND PERMANENT SEEDING (MNDOT MIX 508 @ 50 LBS. PER ACRE OR APPROVED EQUAL) WILL BE OBSERVED FOR GROWTH AND WASHOUTS

5. MULCH (MNDOT TYPE 1 CLEAN OAT STRAW @ 2 TONS PER ACRE) SHALL BE DISK ANCHORED.

◆ TREE REMOVAL AREA BY PARK DISTRICT STAFF

PROPOSED SPECIES LIST FOR SEED, SEEDLINGS & TRANSPLANTS TO BE USED FROM THE CULVERT INVERT TO TWO (2) FEET BELOW (BY OWNER)

GRASSES, SEDGES AND BULRUSHES

COMMON NAME	SCIENTIFIC NAME
Blue joint grass	Calamagrostis canadensis
Bottlebrush sedge	Carex comosa
Common Lake Sedge	Carex lacustris
Pointed broom sedge	Carex scoparia
Tussock sedge	Carex stricta
Giant spike rush	Eleocharis palustris
Tall manna grass	Glyceria grandis
Common rush	Juncus effusus
Swamp satin grass	Muhlenbergia glomerata
Wool grass	Scirpus cyperinus
Hard-stem bulrush	Scirpus acutus
Green bulrush	Scirpus atrovirens
Soft-stem bulrush	Scirpus validus
Giant bur-reed	Sparganium eurycarpum
Cord grass	Spartina pectinata

DESIGN TEAM
DRAWN BY: GRB
DESIGNER: TU
CHECKED BY TU

NO	BY	DATE	REVISIONS

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota
Certified By: ____ Licensed Professional Engineer Lic No 00000
Printed Name ENGINEER'S NAME Date: 3/4/2005

SEH
PHONE: (651)490-2000
3535 VADNAIS CENTER DR
ST PAUL, MN 55110

THREE RIVERS PARK DISTRICT
CARVER PARK RESERVE
WETLAND MITIGATION

WETLAND
PLANTING PLAN

FILE NO ATHRIV0410
DATE X/XX/04
26 / 26

ATTACHMENT 2

Permit 06-097 Plan Set

THREE RIVERS PARK DISTRICT

CONSTRUCTION PLANS FOR

TRAIL RECLAMATION AND REHABILITATION

SUNNY LAKE REFUGE TRAIL DEVELOPMENT

AT CARVER PARK RESERVE

BID DOCUMENT

RECEIVED
MAR 30 2009

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	GENERAL LAYOUT
3	DETAILS AND TYPICAL SECTIONS
4	GENERAL NOTES, STANDARD PLATES, EARTHWORK
5	STORM WATER POLLUTION PREVENTION PLAN
6	EAST LOOP TRAIL STATION 100+00 TO 116+00
7	EAST LOOP TRAIL STATION 116+00 TO 128+00
8	EAST LOOP TRAIL STATION 128+00 TO 143+66
9	SUNNY LAKE TRAIL STATION 400+00 TO 431+00
10	SUNNY LAKE TRAIL STATION 431+00 TO 445+50
11	SUNNY LAKE TRAIL STATION 445+50 TO 461+00
12	SUNNY LAKE TRAIL STATION 461+00 TO 474+00
13	SUNNY LAKE TRAIL STATION 474+00 TO 480+50
14	SUNNY LAKE TRAIL STATION 480+05 TO 489+74

THIS PLAN CONTAINS 14 SHEETS.

LEGEND

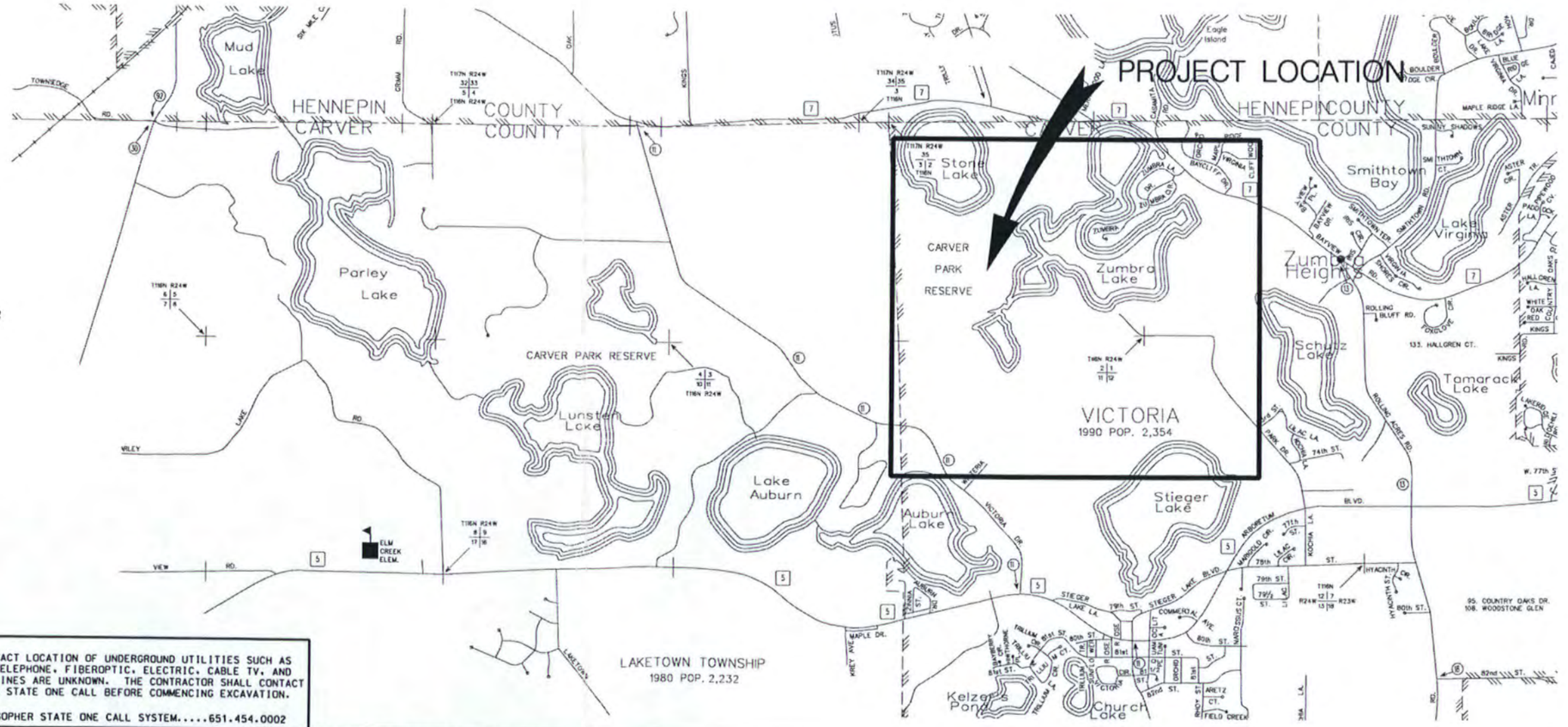
14+00 — TRAIL CENTERLINE ALIGNMENT

EXISTING

- CORPORATE LIMITS
- RIGHT OF WAY
- PERMANENT EASEMENT
- PROPERTY LINE
- CULVERT
- T — UNDERGROUND TELEPHONE CABLE OR CONDUIT
- E — UNDERGROUND ELECTRIC CABLE OR CONDUIT
- P — UNDERGROUND ELECTRIC DUCT
- ELECTRIC TRANSFORMER/PEDESTAL; POWER POLE & GUY ANCHOR; LIGHT POLE
- SOIL BORING
- TRAVERSE POINT
- CONCRETE CURB AND GUTTER
- EXISTING BIT TRAIL EDGE
- EXISTING ROAD EDGE
- EXISTING GRAVEL EDGE
- EXISTING TURF TRAIL EDGE
- CONC / BIT — EXISTING PAVEMENT OR SIDEWALK
- SIGN (HWY, PARK, STOP, ETC.); STREET SIGN
- RAILROAD TRACKS
- BARBED WIRE FENCE
- XC — CHAIN LINK FENCE
- XE — ELECTRIC WIRE FENCE
- WOOD FENCE
- WOVEN WIRE FENCE
- GUARDRAIL
- TREE (DECIDUOUS)
- TREE (CONIFEROUS)
- TREE LINE
- BLDG — BUILDING
- WETLAND DELINEATION; WATERS EDGE

PROPOSED

- CONSTRUCTION LIMITS
- CULVERT w/ APRONS
- DRAIN TILE
- SILT FENCE
- FLOTATION SILT CURTAIN, TYPE STILL WATER
- CLEAR & GRUB TREES/SHRUBS BY AREA
- CLEAR BRUSH BY AREA
- X 12" — CLEAR & GRUB TREE BY EACH
- RCE — ROCK CONSTRUCTION ENTRANCE
- FILTER LOG, TYPE 2 WOOD FIBER BIOROLL
- CONSTRUCTION FENCE



THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02 ENTITLED, "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

GOPHER STATE ONE CALL TICKET NUMBER IS: 80636625

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MMUTCD, INCLUDING FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.

NOTE:
THE EXACT LOCATION OF UNDERGROUND UTILITIES SUCH AS GAS, TELEPHONE, FIBEROPTIC, ELECTRIC, CABLE TV, AND PIPE LINES ARE UNKNOWN. THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL BEFORE COMMENCING EXCAVATION.

GOPHER STATE ONE CALL SYSTEM.....651.454.0002

DESIGNER: TM
CHECKED BY: AD
APPROVED BY: TM
DESIGN TEAM

NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

signature: Toby P. Muse
Date: 03/20/09
TOBY P. MUSE
printed signature:
Reg. No. 43364

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE TRAIL DEVELOPMENT

TITLE SHEET

FILE NO. THRIV106209
DATE 03/20/09

1/14

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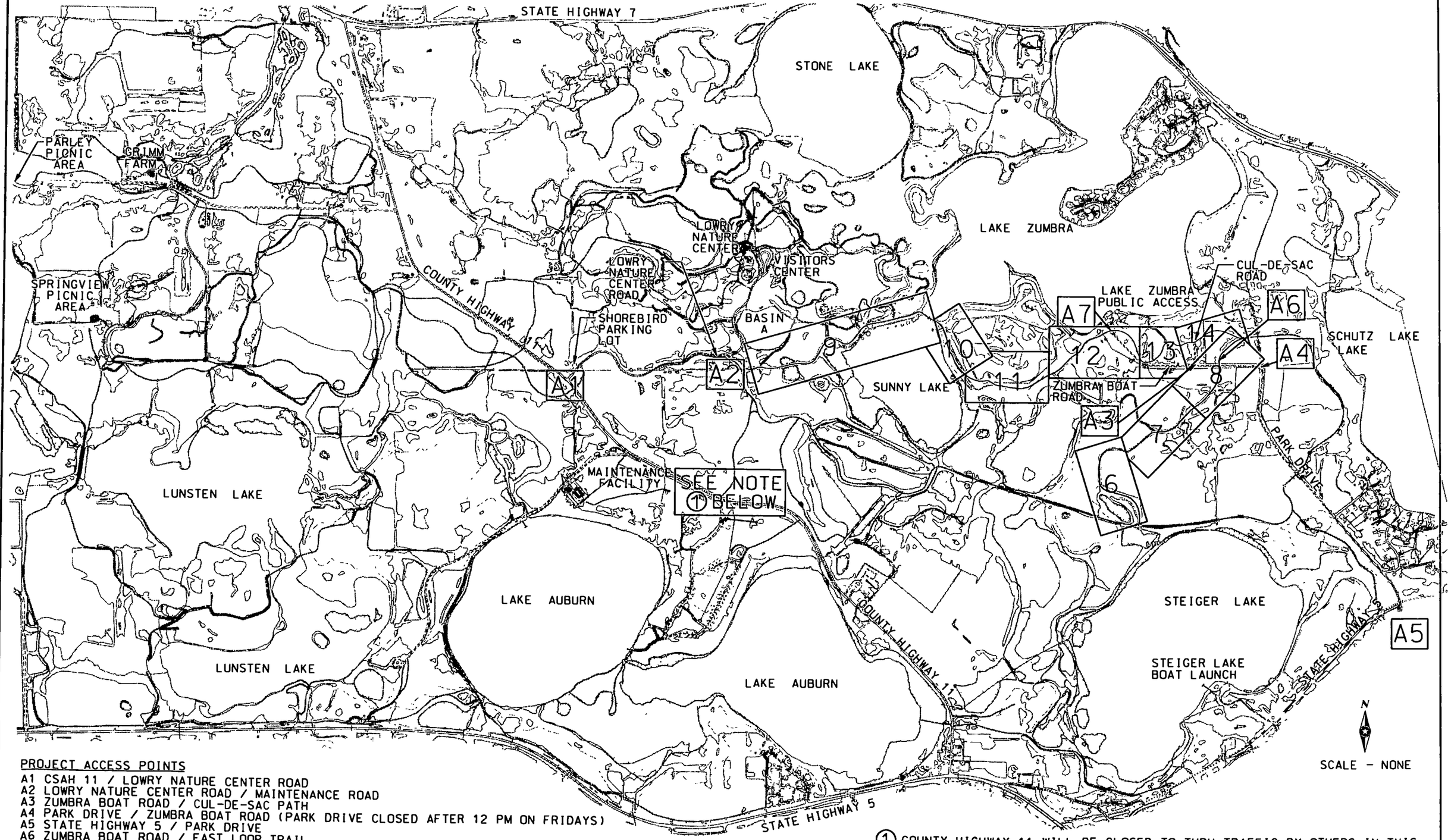

PROJECT ACCESS POINTS

A1 CSAH 11 / LOWRY NATURE CENTER ROAD
A2 LOWRY NATURE CENTER ROAD / MAINTENANCE ROAD
A3 ZUMBRA BOAT ROAD / CUL-DE-SAC PATH
A4 PARK DRIVE / ZUMBRA BOAT ROAD (PARK DRIVE CLOSED AFTER 12 PM ON FRIDAYS)
A5 STATE HIGHWAY 5 / PARK DRIVE
A6 ZUMBRA BOAT ROAD / EAST LOOP TRAIL
A7 ZUMBRA BOAT ROAD / SUNNY LAKE REFUGE TRAIL

① COUNTY HIGHWAY 11 WILL BE CLOSED TO THRU TRAFFIC BY OTHERS IN THIS AREA FOR A PERIOD OF APPROXIMATELY 7-14 DAYS BETWEEN JULY 4, 2009 AND SEPTEMBER 7, 2009. FOLLOW POSTED DETOUR SIGNAGE TO ACCESS CARVER PARK RESERVE.

DESIGNER: TM	NO.	BY	DATE	REVISIONS
CHECKED BY: AD				
APPROVED BY: TM				
DESIGN TEAM				

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature: Toby P Muse
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SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE TRAIL DEVELOPMENT

GENERAL LAYOUT

FILE NO. THRIV106209
DATE 03/20/09

2 / 14

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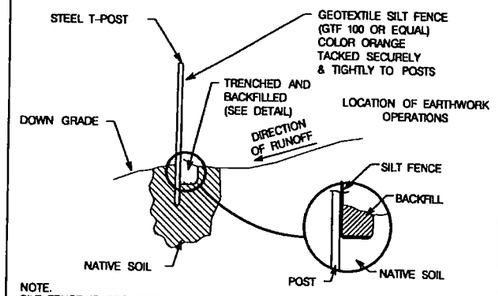
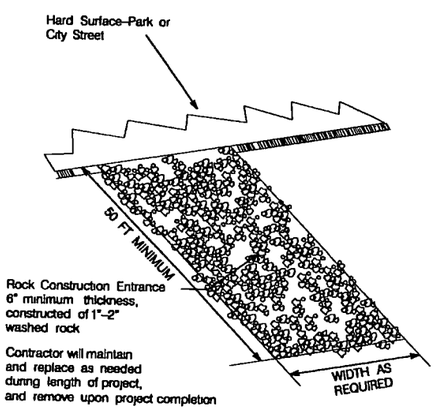
NOTES
SILT FENCE SHALL BE PLACED PARALLEL TO THE CONTOUR OF THE TERRAIN, WITH THE ENDS WRAPPED UPHILL TO PREVENT FLOW AROUND THEM

NO EARTHWORK SHALL BE PERFORMED DOWN GRADE FROM THE FENCE.



NOTE.
SILT FENCE IS REQUIRED IN ACCORDANCE WITH NPDES PERMIT, IN LOCATIONS OF LAND DISTURBANCES (ON EACH SIDE OF TRAIL) AND WHEREVER THE DISTURBANCE IS LOCATED WITHIN A WETLAND OR DRAINAGE WAY AREA.

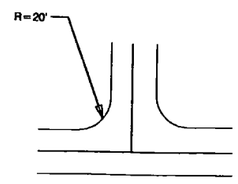
HEAVY DUTY SILT FENCE (MNDOT 3886)
NO SCALE



Rock Construction Entrance
6" minimum thickness, constructed of 1"–2" washed rock

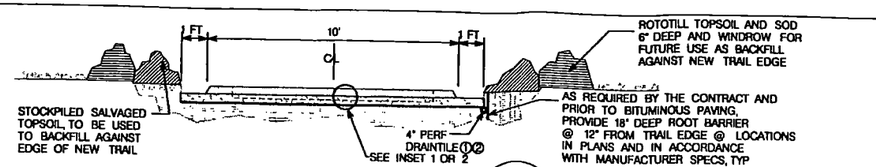
Contractor will maintain and replace as needed during length of project, and remove upon project completion

ROCK CONSTRUCTION ENTRANCE
NO SCALE



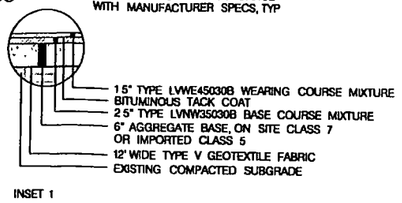
TYPICAL TRAIL RADIUS AT STREET OR TRAIL INTERSECTIONS

NO SCALE

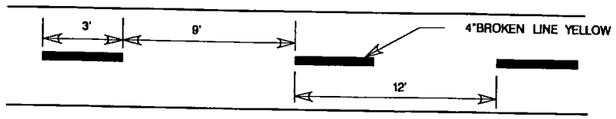


NEW TRAIL SECTION (TYPICAL)
NO SCALE

NOTE.
MATERIAL CANNOT BE WINDROWED OUTSIDE OF THE TRAIL EDGES WITHOUT EFFECTIVE SEDIMENT CONTROL. DO NOT STORE MATERIAL NEAR OR ADJACENT TO WETLANDS, WATERBODIES, CULVERTS OR DRAINAGE WAYS
① INSTALL DRAINTILE MIN 1 FT HORIZONTALLY FROM EDGE OF TRAIL & MIN 0.75 FT VERTICALLY FROM TOP OF BITUMINOUS TRAIL GRADE TO TOP OF PIPE IN LOCATIONS SHOWN IN PLANS OR AS DIRECTED BY THE ENGINEER
② USE 4-INCH PVC SCH 40 NON-PERFORATED DRAINTILE BENEATH THE PROPOSED TRAIL AT ALL CROSSING LOCATIONS



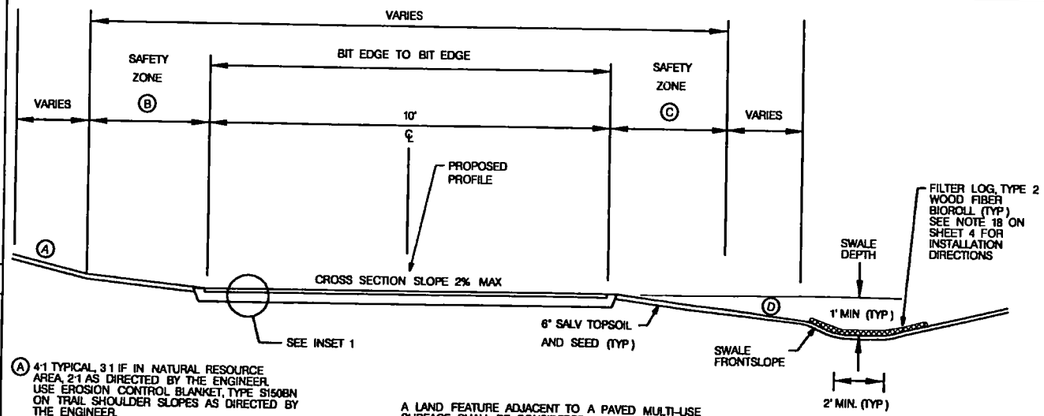
INSET 1



TYPICAL STRIPING DETAIL
NO SCALE

PAVEMENT MARKINGS

ITEM	QUANTITY	PURPOSE
4" BROKEN LINE YELLOW	2,244 LIN FT	TRAIL ℄ STRIPING



Ⓐ 4:1 TYPICAL, 3:1 IF IN NATURAL RESOURCE AREA, 2:1 AS DIRECTED BY THE ENGINEER. USE EROSION CONTROL BLANKET, TYPE SI50BN ON TRAIL SHOULDER SLOPES AS DIRECTED BY THE ENGINEER.

Ⓑ 2' AT 6:1 IN UPSLOPING SAFETY ZONES

Ⓒ 2' AT 50:1 IN DOWNSLOPING SAFETY ZONES
5' AT 50:1 IF ADJACENT TO DEEP SWALE*
SEE DEEP SWALE DEFINITION TO RIGHT

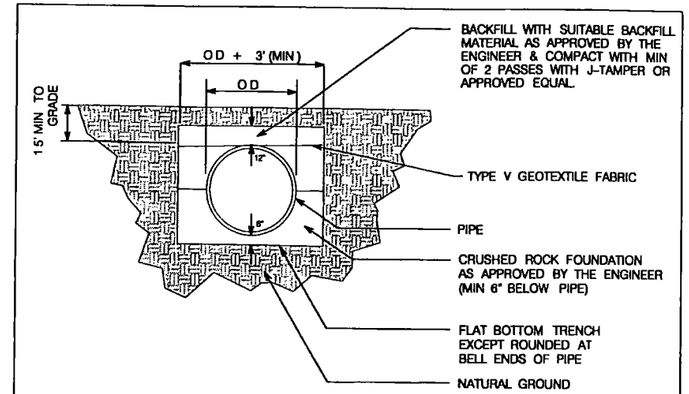
Ⓓ 4:1 TYPICAL, 3:1 IF IN NATURAL RESOURCE AREA, 2:1 IN WETLAND AREA
USE EROSION CONTROL BLANKET, TYPE SI50BN ON TRAIL SHOULDER SLOPES AS DIRECTED BY THE ENGINEER.

A LAND FEATURE ADJACENT TO A PAVED MULTI-USE SURFACE SHALL BE CONSIDERED A 'DEEP SWALE' IN ACCORDANCE WITH THE FOLLOWING CONDITIONS

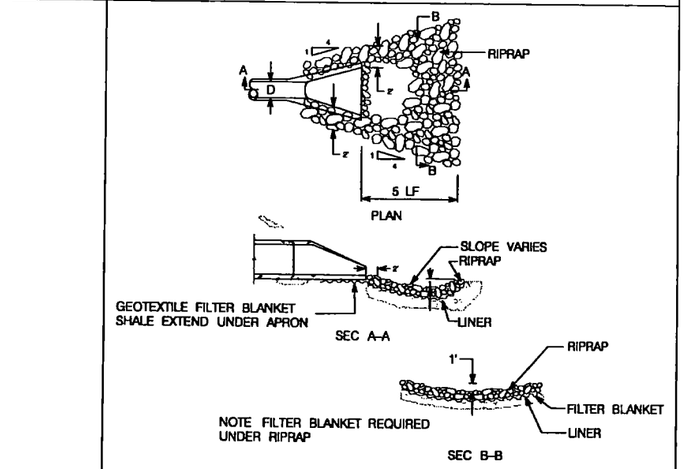
	FRONTSLOPE (H:V RATIO)		SWALE DEPTH (FT)	
IF	3:1 TO 2:1	AND	>6	THEN 'DEEP SWALE' REQUIREMENTS APPLY
	2:1 TO 1:1	AND	>4	
	>1:1	AND	>1	

* IF SHOULDER WIDTH LESS THAN 5' WIDE, PROVIDE SAFETY RAILING OR BARRICADE 2' FROM EDGE OF BITUMINOUS TRAIL IN ACCORDANCE WITH CONTRACT DOCUMENTS
NO RAILING IS ANTICIPATED FOR THIS PROJECT

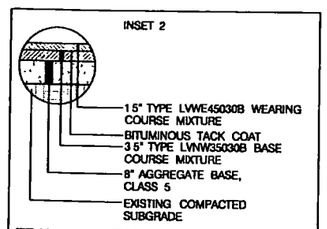
TRAIL CONSTRUCTION AND SAFETY ZONES
NO SCALE



CULVERT DETAIL
NO SCALE

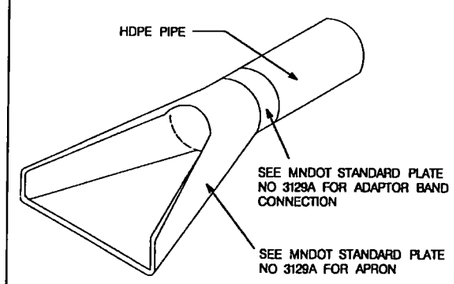


RIPRAP AT PIPE OUTLETS *
NO SCALE
* IF REQUIRED AS DIRECTED BY THE ENGINEER IN LIEU OF RIP RAP, AN EROSION STABILIZATION MAT, CLASS 2 MAY BE USED PER THE DIRECTION OF THE ENGINEER



TRAIL MAINTENANCE CROSSING TYPICAL SECTION
NO SCALE

NOTE
SEE PLANS FOR LOCATIONS
TRAIL MAINTENANCE TYPICAL SECTION SHALL BE CONSTRUCTED ON ALL ROADS A MIMIMUM OF 35' ON EACH SIDE OF THE TRAIL CENTERLINE AT ROAD CROSSINGS



HDPE CULVERT WITH GALVANIZED STEEL APRON

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DESIGNER: TM				
CHECKED BY: AD				
APPROVED BY: TM				
DESIGN TEAM	NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature
Date: 03/20/09
TOBY P MUSE
printed signature
Reg No 43364

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE
TRAIL DEVELOPMENT

DETAILS / TYPICAL SECTIONS

FILE NO. THRIV106209
DATE 03/20/09

EARTHWORK ①

EXCAVATION 3,738 CY
- COMMON EXCAVATION – REMOVE NON SALVAGEABLE TOPSOIL (LV) 156 CY ②
- COMMON EXCAVATION (TRAIL) (EV)(P) 3,071 CY ③
- SUBGRADE EXCAVATION (EV) 511 CY ④ (A)

EMBANKMENT 4,124 CY
- COMMON BORROW (CV)(P) 1,222 CY ⑤
- SELECT TOPSOIL BORROW (LV) 2,902 CY ⑥
  - SUNNY LAKE TRAIL – 1,933 CY
  - EAST LOOP TRAIL – 969 CY

RECLAIM & AGGREGATE BASE

ESTIMATED RECLAIM PRODUCTION DEPTH (IN) – 3 ——— EAST LOOP TRAIL ⑦ (B)

CLASS 7 RECYCLED AGGREGATE BASE PRODUCTION (SY) – 3,633 ——— EAST LOOP TRAIL ⑧ (C)

CLASS 7 RECYCLED AGGREGATE BASE SALVAGED & PLACED (CY) – 250 ——— SUNNY LAKE TRAIL ⑨ (D)

REQUIRED AGGREGATE BASE (CY) – 2,801 ——— SUNNY LAKE TRAIL ⑩ (E)

AGGREGATE BASE CLASS 5 (CY) – 2,551 ——— SUNNY LAKE TRAIL ⑪ ⑫

① QUANTITIES LISTED IN EARTHWORK TABULATION ARE ESTIMATED BASED ON SOIL TESTING AND FIELD INSPECTIONS ACTUAL QUANTITIES MAY VARY FROM THOSE DEPICTED DUE TO CHANGED FIELD CONDITIONS

② ESTIMATED TO BE 5% OF SALVAGE TOPSOIL QUANTITY

③ FOR AREAS WHERE TRAIL GRADES DID NOT CHANGE, QUANTITY BASED ON VOLUME OF TRAIL SECTION BY LENGTH TIMES WIDTH TIMES DEPTH FOR AREAS WHERE TRAIL GRADES CHANGED, QUANTITY BASED ON VOLUME OF MATERIAL IN ITS ORIGINAL POSITION BY AVERAGE END AREA METHOD

④ ESTIMATED TO BE 10% OF THE LENGTH OF TRAIL TIMES ONE (1) FOOT OF DEPTH

⑤ QUANTITY BASED ON VOLUME OF MATERIAL IN ITS FINAL POSITION BY AVERAGE END AREA METHOD

⑥ ESTIMATED TO BE 60% OF SALVAGE TOPSOIL QUANTITY AT SIX-INCH (6") DEPTH AND 100% OF NON SALVAGEABLE TOPSOIL QUANTITY

⑦ THE ESTIMATED RECLAIM PRODUCTION DEPTH IS BASED ON AN ASSUMED DEPTH THE CONTRACTOR SHALL VERIFY IN THE FIELD

⑧ QUANTITY BASED ON AVERAGE EXISTING BITUMINOUS PAVEMENT WIDTH MINUS 1/2 FOOT TIMES LENGTH OF TRAIL.

⑨ = (C) x (B) MINUS ESTIMATED 17 5% RECLAIM WASTE

⑩ QUANTITY BASED ON THE VOLUME REQUIRED BY THE TYPICAL SECTION AND THE VOLUME REQUIRED TO CORRECT (A)

⑪ QUANTITY BASED ON REQUIRED VOLUME OF IMPORTED AGGREGATE BASE WHERE RECLAIMED AGGREGATE BASE VOLUMES ARE INSUFFICIENT = (E) – (D)

⑫ BASIS FOR CONVERSION FROM CY TO TON = 105 LBS/CY/N

TYPE C SIGNS – FURNISH AND INSTALL BY CONTRACTOR

PLAN SYMBOL	COLOR	MMUTCD CODE	SIZE (INCHES)	SUNNY LAKE REFUGE TRAIL QUANTITY	SUNNY LAKE REFUGE TRAIL AREA (SQ FT)
	BLACK ON YELLOW	W2-2	18 x 18	2	4 50
STOP	WHITE ON RED	R1-1	18 x 18	2	4 50
	BLACK and RED ON YELLOW	W3-1	18 x 18	2	4 50
YIELD	WHITE ON RED	R1-2	18	1	1 13
TRAIL XING	BLACK ON YELLOW	W11-X7	30 x 30	4	25 00
	BLACK ON YELLOW	W16-7p	24 x 12	2	4 00
200 FEET	BLACK ON YELLOW	W16-2	18 x 12	2	3 00
TOTALS				15	46 63

NOTE THE CONTRACTOR SHALL REMOVE & SALVAGE SIGNS (REGULATORY) WITHIN THE PROJECT AREA.

THE OWNER SHALL REMOVE ALL PARK INFORMATIONAL AND DIRECTIONAL SIGNS WITHIN THE PROJECT AREA PRIOR TO CONSTRUCTION

THE CONTRACTOR SHALL COORDINATE A REGULATORY SIGN SALVAGE LOCATION WITH THE ENGINEER PRIOR TO CONSTRUCTION

THE OWNER SHALL DISPOSE OF ALL SALVAGED REGULATORY SIGNS

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL PROPOSED REGULATORY SIGNS AS BID AND SHOWN IN THE PLANS

ALL TEMPORARY TRAFFIC CONTROL SIGNS AND CLOSURE SIGNS SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE BID FOR TRAFFIC CONTROL AND PLACED AS SHOWN IN TECHNICAL SPECIFICATION 01 55 25.

GENERAL NOTES

1 MAINTENANCE OF THE STAKING AND STATIONING TO BE SOLELY THE CONTRACTOR'S RESPONSIBILITY

2 THE CONTRACTOR SHALL OBTAIN, PAY, AND ADHERE TO ALL CONSTRUCTION PERMIT REQUIREMENTS REQUIRED FOR THIS PROJECT THE OWNER SHALL OBTAIN ALL REGULATORY PERMITS

3 CONTRACTOR SHALL STAY WITHIN CONSTRUCTION LIMITS UNLESS APPROVED OTHERWISE BY THE OWNER THE WORK ZONE SHALL BE KEPT AS MINIMAL AS POSSIBLE DURING CONSTRUCTION MOVEMENT AND PARKING OF EQUIPMENT SHALL STAY WITHIN WORK ZONE AND NOT CROSS AREAS OTHERWISE UNDISTURBED DURING CONSTRUCTION OPERATIONS

4 CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING STRUCTURES, UTILITIES, TREES, SITE AMENITIES, ETC FROM DAMAGE DURING CONSTRUCTION CONTRACTOR TO WORK OUTSIDE OF DRIP ZONE OF TREES, EXCEPT IN AREAS DESIGNATED BY OWNER CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ANY DAMAGE (AT CONTRACTORS EXPENSE)

5 STOCKPILE LOCATIONS, MATERIAL AND EQUIPMENT STORAGE LOCATIONS ARE AS FOLLOWS
BOTH SIDES OF TRAIL BETWEEN STATIONS 402+00 AND 404+00 AND STATIONS 457+00 AND 463+00 AND IN THE CUL-DE-SAC NEAR TRAIL STATION 481+25
ALL OTHER LOCATIONS TO BE APPROVED BY OWNER

6 COORDINATION WITH OTHER ON-SITE CONTRACTORS IS CONSIDERED INCIDENTAL TO THE CONTRACT AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AS DESCRIBED IN THE PROJECT SPECIFICATIONS

7 THE CONTRACTOR SHALL MAINTAIN ADJACENT PROPERTY AND CITY STREETS AND CONTINUOUSLY CLEAN FROM CONSTRUCTION CAUSED DIRT AND DEBRIS DURING ALL OPERATIONS ON A DAILY BASIS ALL COSTS ASSOCIATED WITH PROPERTY AND STREET CLEANING SHALL BE CONSIDERED INCIDENTAL.

8 APPLY BROKEN LINE TRAIL PAVEMENT MARKINGS IN A PATTERN OF 3 FEET OF MARKING AND 9 FEET OF SPACE.

9 NOT USED

10 NOT USED

11 PRIVATE UTILITIES (NON GOPHER STATE ONE CALL) SHALL BE LOCATED BY THE CONTRACTORS PRIVATE UTILITY LOCATOR AND PAID ONCE AT THE CONTRACT UNIT PRICE AS LISTED ON THE BID FORM IT IS THE CONTRACTORS' REPSONSIBILITY TO MAINTAIN LOCATIONS THROUGHOUT THE PROJECT

12 ALL EXPOSED SOIL AREAS WITH A CONTINUOUS POSITIVE SLOPE WITHIN 200 LINEAL FEET OF A SURFACE WATER MUST HAVE TEMPORARY EROSION PROTECTION OR PERMANENT COVER FOR THE EXPOSED SOIL AREAS YEAR ROUND, ACCORDING TO THE FOLLOWING TABLE OF SLOPES AND TIME FRAMES

TYPE OF SLOPE	
STEEPER THAN 3 1	7 DAYS
10 1 TO 3 1	14 DAYS
FLATTER THAN 10 1	21 DAYS

THESE AREAS INCLUDE CONSTRUCTED STORM WATER MANAGEMENT POND SIDE SLOPES AND ANY EXPOSED SOIL AREAS WITH A POSITIVE SLOPE TO A STORM WATER CONVEYANCE SYSTEM, SUCH AS A CURB AND GUTTER SYSTEM, STORM SEWER INLET, TEMPORARY OR PERMANENT DRAINAGE DITCH OR OTHER NATURAL OR MAN-MADE SYSTEMS THAT DISCHARGE TO A SURFACE WATER. TEMPORARY STOCKPILES WITHOUT SIGNIFICANT SILT, CLAY OR ORGANIC COMPONENTS (e g , CLEAN AGGREGATE STOCKPILES, DEMOLITION CONCRETE STOCKPILES, SAND STOCKPILES) ARE EXEMPT FROM THIS REQUIREMENT BUT MUST COMPLY WITH PART IV C OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

13 PERMANENT VEGETATION AND STRUCTURES SHALL BE INSTALLED AFTER COMPLETION OF INITIAL SITE GRADING WITHIN SEVEN (7) DAYS ON SLOPES GREATER THAN 3·1, FOURTEEN (14) DAYS ON SLOPES BETWEEN 10 1 AND 3 1, AND TWENTY ONE (21) DAYS ON SLOPES FLATTER THAN 10 1 IF FINAL GRADING IS NOT COMPLETED WITHIN THESE TIME LIMITS OR UNTIL AFTER PLANTING SEASON HAS EXPIRED, TEMPORARY EROSION CONTROL MEASURES, INCLUDING MNDOT MIX 150 @ 40 LBS PER ACRE AND MULCHING SHALL BE IMPLEMENTED PERMANENT SEED SHALL BE MNDOT MIX 250 @ 70 LBS PER ACRE OR SHADE MIX @ 300 LBS PER ACRE (PLANTING DATES PER MNDOT SPEC 2575) MULCH SHALL BE MNDOT TYPE 1 (CLEAN OAT STRAW) @ 2 TONS PER ACRE AND DISK ANCHORED IN PLACE USE EROSION CONTROL BLANKET IN PLACE OF MULCH IN AREAS AS DIRECTED BY THE ENGINEER AND IN SWALE AREAS, EROSION CONTROL BLANKET SHALL BE TYPE S150BN WITH ALL NATURAL NETTING AND STITCHING AS MANUFACTURED BY NORTH AMERICAN GREEN OR APPROVED EQUAL.

14 IF THE CONTRACTOR DOES NOT COMPLETE TEMPORARY VEGETATION AND/OR MULCHING AS SPECIFIED, THREE RIVERS PARK DISTRICT OR THEIR AUTHORIZED REPRESENTATIVE SHALL NOTIFY THE CONTRACTOR IN WRITING THAT HE HAS 24 HOURS TO COMPLETE THE TEMPORARY VEGETATION AND/OR MULCHING OR THE CONTRACTOR SHALL BE SUBJECT TO $500 DEDUCTION PER DAY OF NON-COMPLIANCE

15 ALL SEEDED AREAS TO HAVE 6" TOPSOIL EITHER SALVAGED OR IMPORTED SUBSOIL SHALL BE IN A LOOSE CONDITION FOR A UNIFORM DEPTH OF AT LEAST 6" PRIOR TO TOPSOIL PLACEMENT (SITE REPRESENTATIVE AND OWNER TO VERIFY)

16 INSPECT SILT FENCE IMMEDIATELY AFTER EACH RUNOFF EVENT ANY REQUIRED REPAIRS SHOULD BE MADE IMMEDIATELY WHEN SEDIMENT DEPOSITS REACH APPROXIMATELY ONE-THIRD THE HEIGHT OF THE SILT FENCE, REMOVE SEDIMENT OR INSTALL A SECOND SILT FENCE

17 CONSTRUCT TEMPORARY ROCK CONSTRUCTION ENTRANCES AT ALL LOCATIONS WHERE VEHICLE ACCESS TO PUBLIC STREETS WILL BE PERMITTED REMOVE AT COMPLETION OF PROJECT AS PER PERMIT

18 TEMPORARY DITCH CHECKS SHALL BE A FILTER LOG, TYPE 2 WOOD FIBER BIOROLL INSTALLED IMMEDIATELY FOLLOWING SWALE CONSTRUCTION ACTIVITIES ALONG THE TRAILS TEMPORARY DITCH CHECKS SHALL BE PER MNDOT (2005 EDITION) SPECIFICATION 3897 AND INSTALLED AS SHOWN ON SHEET 3 AT A MINIMUM OF EVERY 150' PERPENDICULAR TO DITCH FLOW IN SWALES WHERE STEEP GRADES OR EROSION ARE CONCERNS, TEMPORARY DITCH CHECK SPACING MAY BE REDUCED AS DIRECTED BY THE ENGINEER

19 DURING CULVERT INSTALLATIONS, MINOR GRADING NEAR CULVERT ENDS MAY BE REQUIRED TO ENSURE POSITIVE DRAINAGE MINOR GRADING SHALL BE PERFORMED AS DIRECTED BY THE ENGINEER AND SHALL BE CONSIDERED INCIDENTAL TO CULVERT INSTALLATION

20 THE CONTRACTOR SHALL INSTALL PERMANENT SEEDING WITHIN 72 HOURS OF FINAL GRADING OPERATIONS

LIST OF STANDARD PLATES

NO	TITLE
3129 A	METAL APRON FOR CORRUGATED POLYETHYLENE PIPE
3131 C	PRECAST CONCRETE HEADWALL FOR SUBSURFACE DRAINS
3221 C	CORRUGATED STEEL PIPE COUPLING BAND
8000 I	STANDARD BARRICADES
9102 G	TURF ESTABLISHMENT AREAS (AT PIPE CULVERT ENDS)

DESIGNER: TM
CHECKED BY: AD
APPROVED BY: TM
DESIGN TEAM

NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature: Toby P Muse
Date: 03/20/09
TOBY P MUSE
printed signature
Reg. No 43364

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10901 RED CIRCLE DRIVE, SUITE 200
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ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE TRAIL DEVELOPMENT

GENERAL NOTES\ STANDARD PLATES\ EARTHWORK

FILE NO. THRIV106209
DATE 03/20/09

4 / 14

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STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

NPDES GENERAL STORMWATER PERMIT FOR
CONSTRUCTION ACTIVITY NO. MN R100001
JUNE 1, 2009

PROJECT: SUNNY LAKE REFUGE TRAIL DEVELOPMENT, CARVER COUNTY, MN

OWNER: THREE RIVERS PARK DISTRICT
3000 XENIUM LANE NORTH
PLYMOUTH, MN 55441-1299

CONTACT: AMY GURSKI (SENIOR CIVIL ENGINEER)

SWPPP SUMMARY/OVERVIEW
THIS STORM WATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN DEVELOPED BY THREE RIVERS PARK DISTRICT TO ADDRESS THE REQUIREMENTS OF NPDES PERMIT MN R100001, PART III, SUBPART A. THIS SWPPP INCLUDES A COMBINATION OF NARRATIVE AND ATTACHED FIGURE(S) AND PLAN SHEETS THAT DESCRIBE THE TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL AND STORM WATER MANAGEMENT PLAN FOR THE PROJECT. THE NUMBERED SECTIONS BELOW CORRESPOND TO THE SAME SECTIONS OF THE NPDES PERMIT.

PART III.A. STORM WATER POLLUTION PREVENTION PLAN
NATURE OF CONSTRUCTION ACTIVITY:
THE PROJECT WILL CONSIST OF GRADING, CONSTRUCTION OF BITUMINOUS TRAIL AND CULVERTS.

SOIL DISTURBING ACTIVITIES:
CLEARING AND GRUBBING; REMOVALS; GRADING; EXCAVATION; PAVING; AND FINAL RESTORATION.

1. PERSON KNOWLEDGEABLE IN EROSION PREVENTION AND SEDIMENT CONTROL AND WHO WILL OVERSEE IMPLEMENTATION OF THE SWPPP:
CONTRACTOR SHALL APPOINT AN EROSION SUPERVISOR THAT IS CERTIFIED IN ACCORDANCE WITH MPCA REQUIREMENTS.

RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE: MAINTENANCE SUPERVISOR, PETE HILL

2. NARRATIVE DESCRIBING TIMING OF INSTALLATION OF BMP'S IN PARTS III, IV, APPENDIX A:
SEE NOTES ON SHEET 4 - "GENERAL NOTES/STANDARD PLATES/EARTHWORK"

3. SWPPP REQUIREMENTS:
A. EROSION PREVENTION AND SEDIMENT CONTROL BMP'S
SEE ATTACHED PLANS FOR AREAS PROTECTED BY SILT FENCE.
CONTRACTOR WILL BE RESPONSIBLE FOR STREET SWEEPING.

ROCK CONSTRUCTION ENTRANCES OR EQUIVALENT SYSTEM MUST BE USED TO MINIMIZE TRACKING FROM SITE.
CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING EXISTING PAVED SURFACES CLEAN OF SEDIMENT BY STREET SWEEPING ROADWAYS WHEN ACCUMULATION OF SEDIMENT OCCURS ON THESE SURFACES. ANY SEDIMENT TRACKED OFF-SITE IS TO BE REMOVED WITHIN 24 HOURS (COST IS INCIDENTAL).

DURING CONSTRUCTION, STORMWATER WILL BE CONTAINED WITHIN TOPSOIL WINDROWS ALONG THE TRAIL SHOULDERS. SILT FENCE WILL BE INSTALLED AT LOW AREAS WHERE RUNOFF COULD POTENTIALLY OVERTOP TOPSOIL WINDROWS.

B. SITE MAP WITH EXISTING AND FINAL GRADES AND DRAINAGE AREAS, SOIL BORINGS AND TYPES AND IMPERVIOUS SURFACES:
SEE ATTACHED PLANS AND PROJECT MANUAL

C. LOCATIONS OF AREAS NOT TO BE DISTURBED:
SEE ATTACHED PLANS

D. LOCATIONS WHERE CONSTRUCTION WILL BE PHASED TO MINIMIZE EXPOSED SOIL AREA:
NA

E. SURFACE WATERS AND WETLANDS WITHIN 1/2 MILE THAT WILL RECEIVE STORM WATER:
SUNNY LAKE, LAKE ZUMBRA

F. METHODS FOR FINAL STABILIZATION OF EXPOSED SOILS:
SEE NOTES ON SHEET 4 - "GENERAL NOTES/STANDARD PLATES/EARTHWORK"

4. AMMENDMENTS TO THE SWPPP:
THE SWPPP WILL BE AMENDED AS NEEDED AND/OR AS REQUIRED BY PROVISIONS OF THE PERMIT.

5. MITIGATION MEASURES REQUIRED FROM PREVIOUS REVIEWS (EAW, EIS, LOCAL, ETC.)
NA

6. KARST AND DRINKING WATER SUPPLY MANAGEMENT AREA MEASURES:
NA

7. DISCHARGES TO WATERS WITH APPROVED TMDL:
NA

PART III. C. TEMPORARY SEDIMENT BASINS
NA

PART III. C. PERMANENT STORM WATER MANAGEMENT SYSTEM
THE PERMANENT STORM WATER MANAGEMENT SYSTEM WILL CONSIST OF A COMBINATION OF INFILTRATION (GRANULAR BACKFILL ALONG THE TRAIL WITH UNDERDRAINS TO PROMOTE INFILTRATION), BIOFILTRATION (GRASSY SWALES WHERE SEDIMENT WILL BE FILTERED OUT OF THE WATER) AND SHEET FLOW OF STORMWATER INTO NATIVE VEGETATION IN A 2,000 ACRE PARK RESERVE.

PART IV. CONSTRUCTION ACTIVITY REQUIREMENTS
A. STORM WATER POLLUTION PREVENTION PLAN
THE SWPPP AND BMP'S IDENTIFIED WILL BE IMPLEMENTED AND INSTALLED IN AN APPROPRIATE AND FUNCTIONAL MANNER.
B. EROSION PREVENTION PRACTICES
SEE PART III.A.3.A FOR EROSION PREVENTION AND SEDIMENT CONTROL BMP'S
C. SEDIMENT CONTROL PRACTICES
SEE PART III.A.3.A FOR EROSION PREVENTION AND SEDIMENT CONTROL BMP'S
D. DEWATERING AND BASIN DRAINING
NA
E. INSPECTIONS AND MAINTENANCE
THE CONSTRUCTION SITE WILL BE OBSERVED ONCE EVERY 7 DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS.

A SUMMARY MAINTENANCE/CONSTRUCTION OBSERVATION REPORT WILL BE RECORDED AFTER EACH SITE VISIT/OBSERVATION.

TEMPORARY AND PERMANENT SEEDING WILL BE OBSERVED FOR GROWTH AND WASHOUTS.

F. POLLUTION PREVENTION MANAGMENT MEASURES
THE DISPOSAL AND/OR STORAGE OF HAZARDOUS WASTE AND MATERIALS WILL COMPLY WITH MPCA REGULATIONS
G. FINAL STABALIZATION
SEE PART III.A.3.A FOR EROSION PREVENTION AND SEDIMENT CONTROL BMP'S
THE PERMITTEE WILL SUBMIT A NOTICE OF TERMINATION (NOT) WITHIN 30 DAYS AFTER FINAL STABILIZATION IS COMPLETE.

APPENDIX A.

A. GENERAL REQUIREMENTS
ALL REQUIREMENTS IN THIS APPENDIX ARE IN addition TO BMP'S SPECIFIED. THE PROVISIONS IN THIS APPENDIX TAKE PRECEDENCE. NO SPECIAL REQUIREMENTS APPLY TO THIS PROJECT.

B. REQUIREMENTS FOR DISCHARGE TO SPECIAL WATER
NA

C. ADDITIONAL BMP'S FOR SPECIAL WATERS
NA

D. REQUIREMENTS FOR DISCHARGING TO WETLANDS
STORM WATER FROM THE SITE WILL DISCHARGE TO A BMP BEFORE ANY WETLANDS.
E. DISCHARGES REQUIRING ENVIRONMENTAL REVIEW
NA
F. DISCHARGES AFFECTING ENDANGERED OR THREATENED SPECIES
NA

G. DISCHARGES AFFECTING HISTORIC PLACES OR ARCHEOLOGICAL SITES
NA

DESIGNER: TM
CHECKED BY: AD
APPROVED BY: TM
DESIGN TEAM

NO.	BY	DATE	REVISIONS

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Signature
Date: 03/20/09
TOBY P. MUSE
printed signature
Reg. No 43364

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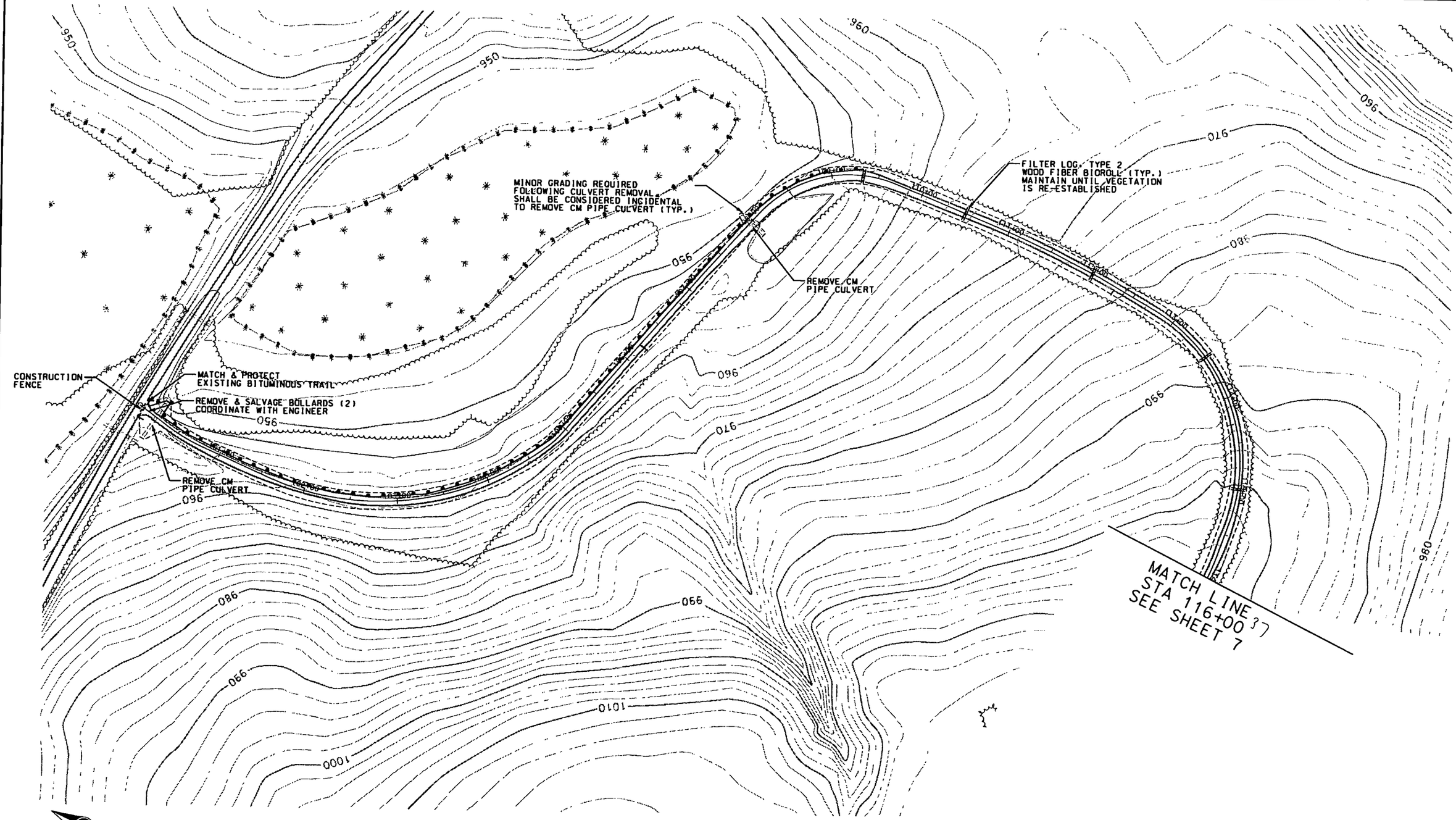
PH 800 734-6757

ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE TRAIL DEVELOPMENT

STORM WATER POLLUTION PREVENTION PLAN

FILE NO. THRIV106209
DATE 03/20/09



NOTE:

RECLAIM EXISTING BITUMINOUS TRAIL. SALVAGE AND TRANSPORT FOR USE ON SUNNY LAKE REFUGE TRAIL AS AGGREGATE BASE CL 7. RESTORE EAST LOOP TRAIL WITH MINIMUM 6" DEPTH OF TOPSOIL AND SEED.

PROVIDE EROSION CONTROL BLANKET IN LOCATIONS AS DIRECTED BY THE ENGINEER

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ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE TRAIL DEVELOPMENT

EAST LOOP TRAIL
STATIONS 100+00 – 116+00

FILE NO. THRIV106209
DATE 03/20/09

6/14

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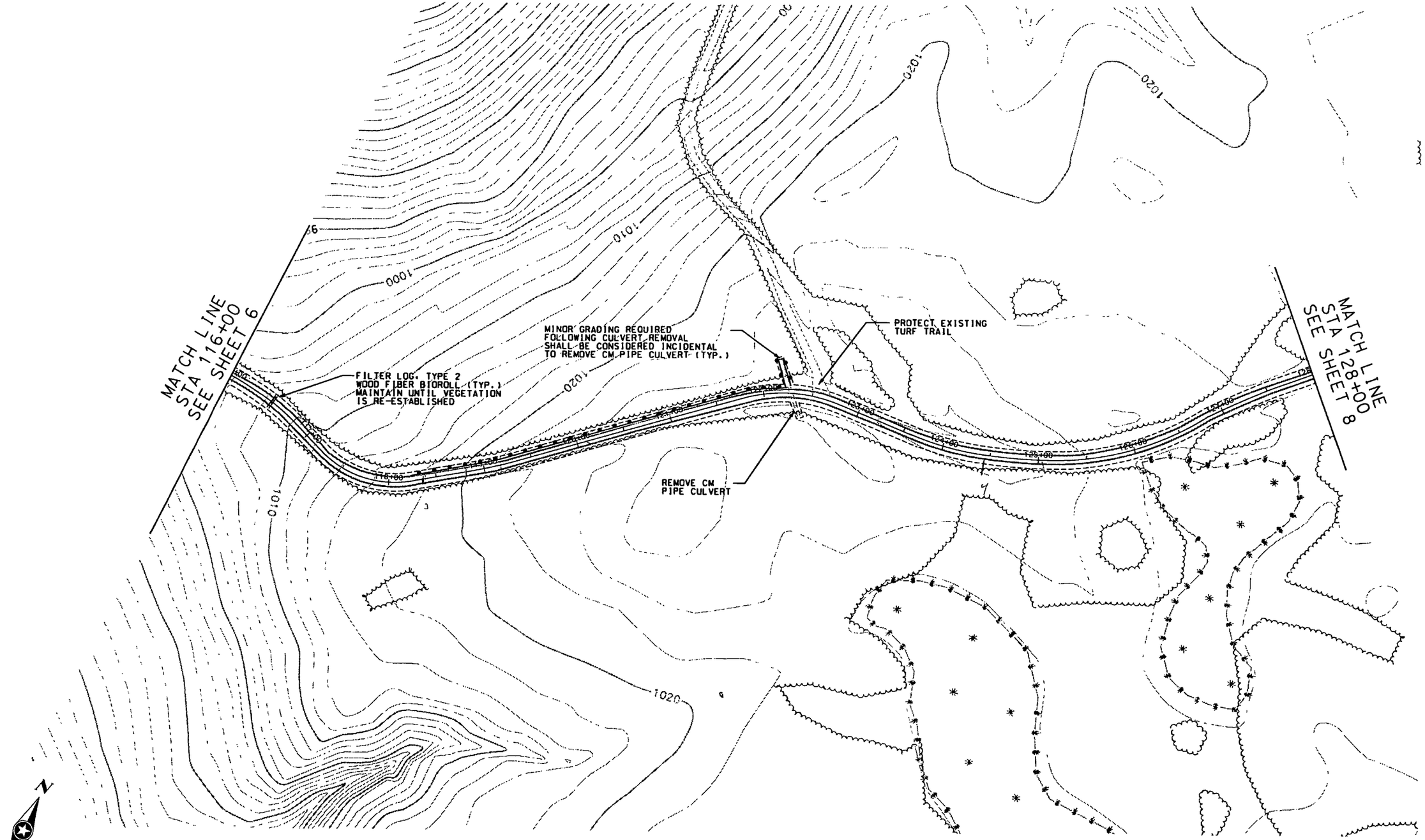

NOTE:

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ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE
TRAIL DEVELOPMENT

EAST LOOP TRAIL
STATIONS
116+00 – 128+00

FILE NO. THRIV106209
DATE 03/20/09

7
14

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MATCH LINE
STA 128+00
SEE SHEET 7

MATCH LINE
STA 486+00
SEE SHEET 14

PROPOSED SUNNY LAKE REFUGE
TRAIL ALIGNMENT SEE SHEET 14

REMOVE & SALVAGE BOLLARDS (4)
COORDINATE WITH ENGINEER

ACCEPTABLE CONTRACTOR
ACCESS POINT

ZUMBRA BOAT ROAD

PROTECT EXISTING
PIPE CULVERT

CONSTRUCTION
FENCE

MATCH & PROTECT
EXISTING TRAIL

PARK DRIVE

ACCEPTABLE CONTRACTOR
ACCESS POINT.
ACCESS ON PARK DRIVE NORTH
OF ZUMBRA BOAT ROAD IS PROHIBITED

1020

4320

N

50 0 50 100
scale 25 feet

NOTE:

RECLAIM EXISTING BITUMINOUS TRAIL. SALVAGE AND TRANSPORT FOR USE ON SUNNY LAKE REFUGE TRAIL AS AGGREGATE BASE CL 7. RESTORE EAST LOOP TRAIL WITH MINIMUM 6" DEPTH OF TOPSOIL AND SEED.

DESIGNER: TM
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ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE
TRAIL DEVELOPMENT

EAST LOOP TRAIL
STATIONS
128+00 – 143+66

FILE NO. THRIV106209
DATE 03/20/09

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14

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LOWRY NATURE CENTER ROAD

EXISTING GRAVEL MAINTENANCE ROAD - ACCEPTABLE CONTRACTOR ACCESS POINT

EXISTING BITUMINOUS TRAIL

SAWCUT AND REMOVE BITUMINOUS PAVEMENT AS REQUIRED TO OBTAIN 10' WIDE PAVED SURFACE AS MARKED BY THE ENGINEER

BEGIN SUNNY LAKE REFUGE TRAIL STA 400+00 MATCH EXISTING BITUMINOUS TRAIL

CONSTRUCTION FENCE

EXISTING BITUMINOUS TRAIL

STOCKPILE, MATERIAL AND EQUIPMENT STORAGE LOCATION BETWEEN TRAIL STATIONS 402+00 TO 404+00

CLEAN BOTH ENDS EXISTING CULVERT (INCIDENTAL)

4" DRAINTILE (TYP.)

SILT FENCE (TYP.)

PROTECT EXISTING TURF TRAIL

CONSTRCUTION FENCE

REMOVE CM PIPE CULVERT INSTALL 28 LF 12" HDPE CULVERT

MATCH LINE STA 415+50 SEE BELOW LEFT

NOTES:
1) ROOT BARRIER AND TREE PROTECTION (CONSTRUCTION) FENCE LOCATIONS TO BE PLACED AS DIRECTED BY THE ENGINEER.
2) THE PROPOSED TRAIL ALIGNMENT BETWEEN STA 400+00 AND 431+00 IS INTENDED TO CLOSELY MATCH BOTH HORIZONTAL AND VERTICAL GEOMETRY OF THE EXISTING MAINTENANCE PATH IN ORDER TO MINIMIZE CONSTRUCTION IMPACTS.

scale 25 50 0 50 100 feet

MAPLE MARSH

INSTALL SILT CURTAIN AS DIRECTED BY THE ENGINEER

EXISTING FENCE REMOVAL BY OWNER

MODIFY OUTLET STRUCTURE SEE FIGURES C501 AND C502 AT THE END OF TECHNICAL SPECIFICATION SECTION 33 44 20

FIELD VERIFY ELEVATIONS WITH ENGINEER PRIOR TO ORDERING MODIFY OUTLET STRUCTURE MATERIALS

PROTECT EXISTING TREES

PROTECT EXISTING TURF TRAIL

CONSTRCUTION FENCE

CROSS SLOPE TRAIL 2% MAX. TO SOUTH BETWEEN STA 420+00 AND 421+50

REMOVE CM PIPE CULVERT INSTALL 40 LF 24" RC CULVERT

INSTALL 100 SY EROSION STABILIZATION MAT, CLASS 2 ON SOUTH TRAIL SHOULDER BETWEEN STA 420+00 AND 421+50

SUNNY LAKE

4" DRAINTILE (TYP.)

CLEAN BOTH ENDS EXISTING CULVERT (INCIDENTAL)

LAKE ZUMBRA

REMOVE BRUSH AS DIRECTED BY ENGINEER FOR SIGHT LINE PURPOSES

INSTALL SILT CURTAIN AS DIRECTED BY THE ENGINEER

MATCH LINE STA 415+50 SEE ABOVE RIGHT

SILT FENCE (TYP.)

MATCH LINE STA 431+00 SEE SHEET 10

scale 25 50 0 50 100 feet

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ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE TRAIL DEVELOPMENT

SUNNY LAKE TRAIL STATIONS 400+00 – 431+00

FILE NO. THRIV106209
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9 / 14

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MATCH LINE
STA 431+00
SEE SHEET 9

MATCH LINE
STA 445+50
SEE SHEET 11

SILT FENCE (TYP.)

4" DRAINTILE (TYP.)

CLEAR AND GRUB TREES (TYP.)

CLEAR 2.00 ACRES BRUSH
(BUCKTHORN/BUCKBRUSH)
TO PROVIDE SCENIC VISTA.
PROTECT ALL TREES IN
BRUSH CLEARING AREA.

SUNNY LAKE

CONSTRUCT SWALE
STA 440+00 TO STA 445+50
LEFT SIDE OF TRAIL
(SEE SHEET 3 FOR SWALE
TYPICAL SECTION)

PROTECT TREES (3)

IMMEDIATELY FOLLOWING GRADING. TOPSOIL AND SEED PLACEMENT. PLACE EROSION CONTROL BLANKET. TYPE S150BN PER THE ENGINEER ON ABANDONED MAINTENANCE PATH (TYP.)

PLACE EXCESS TRAIL EXCAVATION GENERATED BETWEEN STA 439+00 AND 443+00 (228 CY) ON ABANDONED MAINTENANCE PATH TO DECREASE EXISTING SLOPES PER THE ENGINEER (PLACEMENT PAID FOR AS COMMON BORROW). RESTORE WITH MIN. 6" TOPSOIL AND SEED (TYP.)

FILTER LOG: TYPE 2 WOOD FIBER BIOROLL (TYP.)

NOTE:
1) ROOT BARRIER AND TREE PROTECTION (CONSTRUCTION) FENCE LOCATIONS TO BE PLACED AS DIRECTED BY THE ENGINEER.

N

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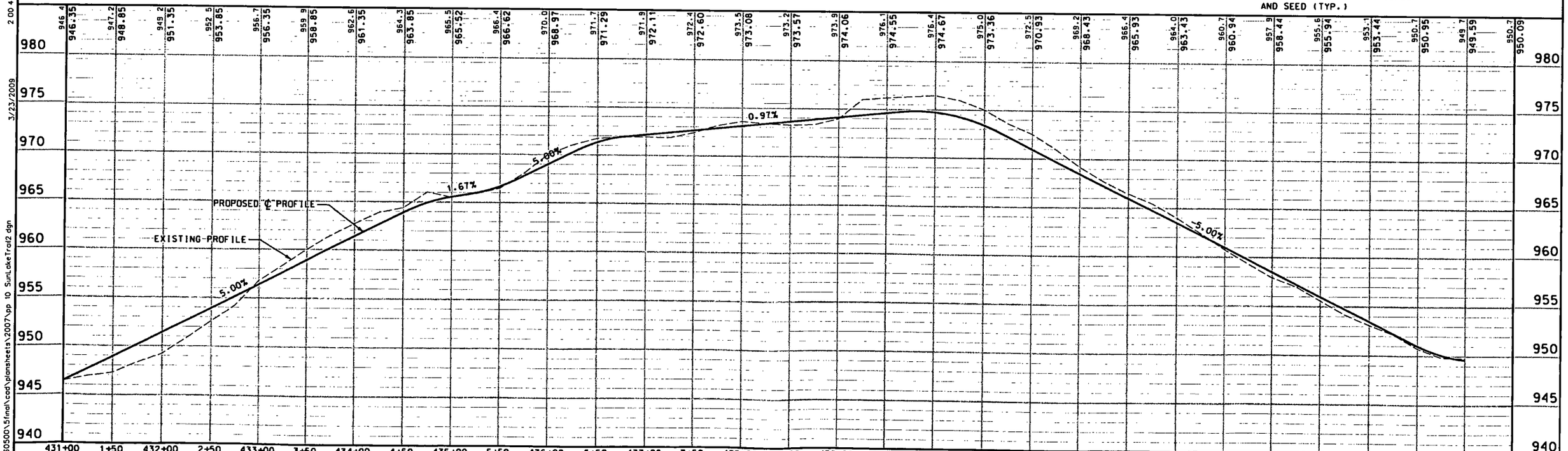
scale 25 feet



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ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE
TRAIL DEVELOPMENT

SUNNY LAKE TRAIL
STATIONS
431+00 – 445+50

FILE NO. THRIV106209
DATE 03/20/09

10 / 14

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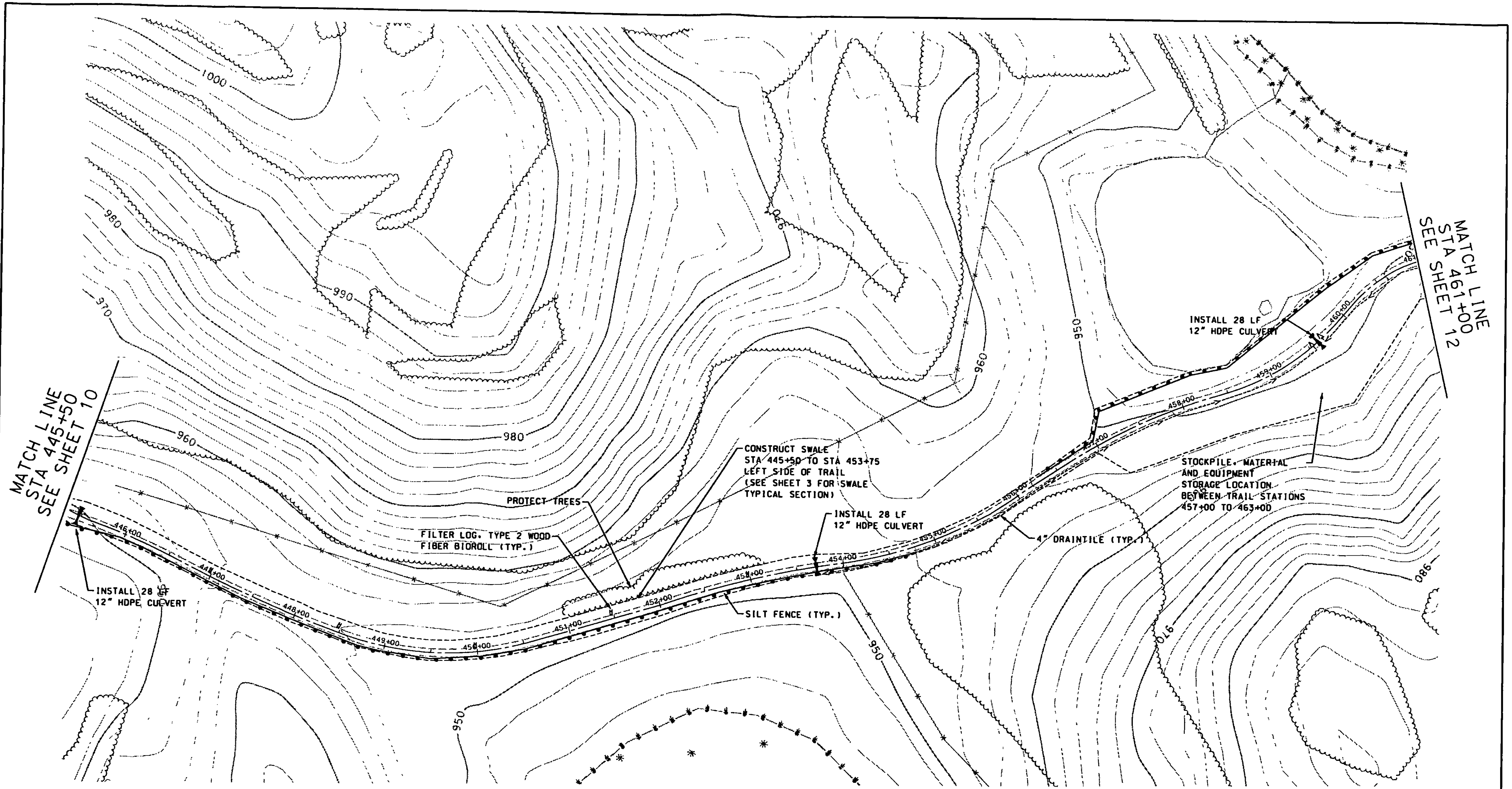

50 0 50 100
scale 25 feet

NOTES:
1) ROOT BARRIER AND TREE PROTECTION (CONSTRUCTION) FENCE LOCATIONS TO BE PLACED AS DIRECTED BY THE ENGINEER.
2) THE PROPOSED TRAIL ALIGNMENT BETWEEN STA 445+50 AND 461+00 IS INTENDED TO MATCH BOTH HORIZONTAL AND VERTICAL GEOMETRY OF THE EXISTING MAINTENANCE PATH IN ORDER TO MINIMIZE CONSTRUCTION IMPACTS.

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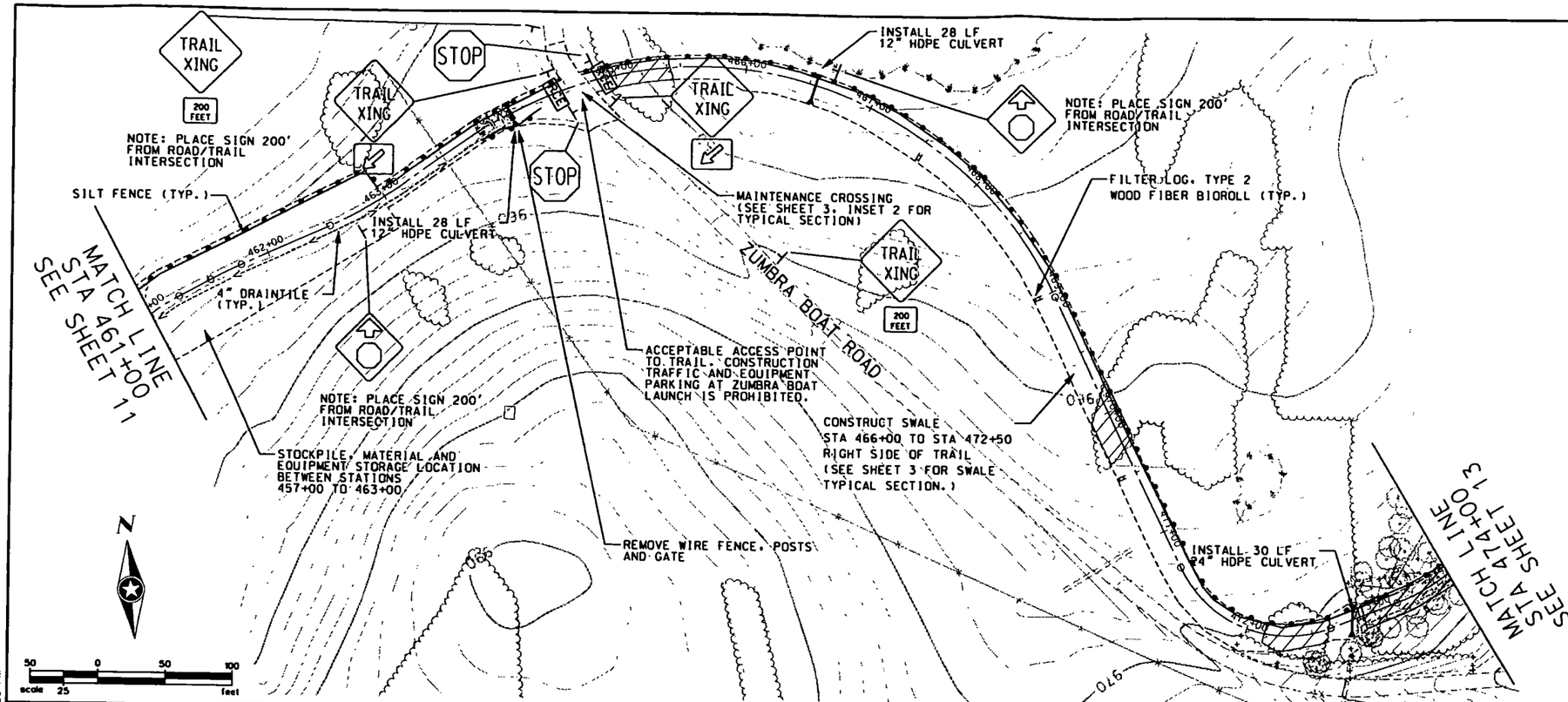
ThreeRivers
PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE
TRAIL DEVELOPMENT

SUNNY LAKE TRAIL
STATIONS
445+50 - 461+00

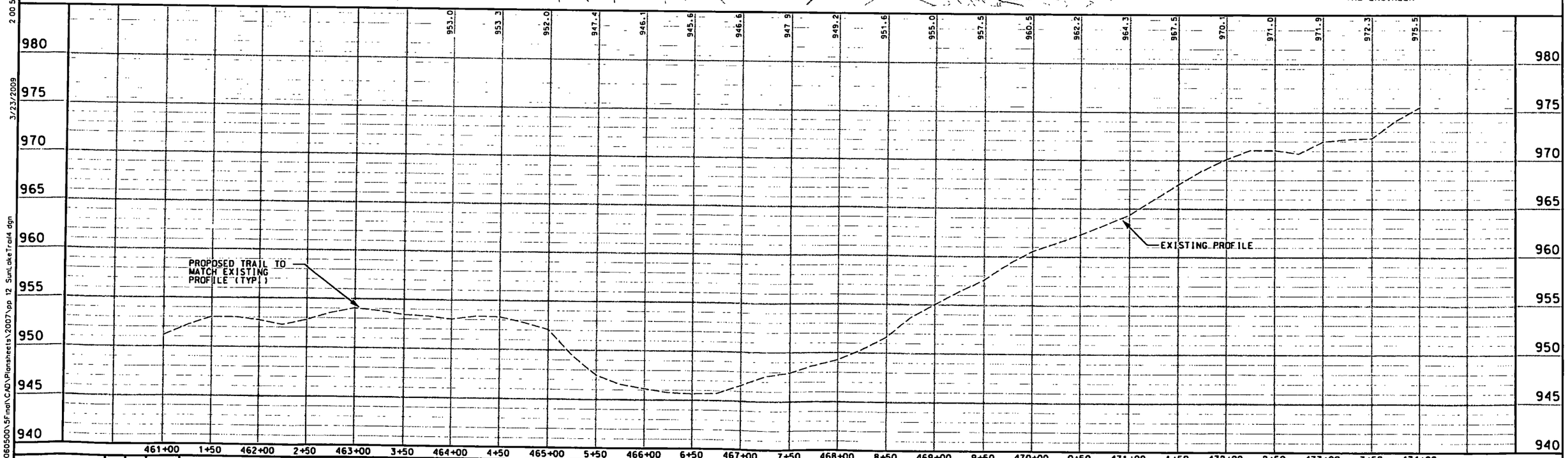
FILE NO. THRIV106209
DATE 03/20/09

11 / 14



NOTE:

ROOT BARRIER AND TREE PROTECTION (CONSTRUCTION) FENCE LOCATIONS TO BE PLACED AS DIRECTED BY THE ENGINEER



DESIGNER: TM
CHECKED BY: AD
APPROVED BY: TM
DESIGN TEAM

NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

signature
TOBY P MUSE
printed signature

Date: 03/20/09
Reg. No 43364

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE
TRAIL DEVELOPMENT

SUNNY LAKE TRAIL
STATIONS
461+00 – 474+00

FILE NO. THRIV106209
DATE 03/20/09

12 / 14

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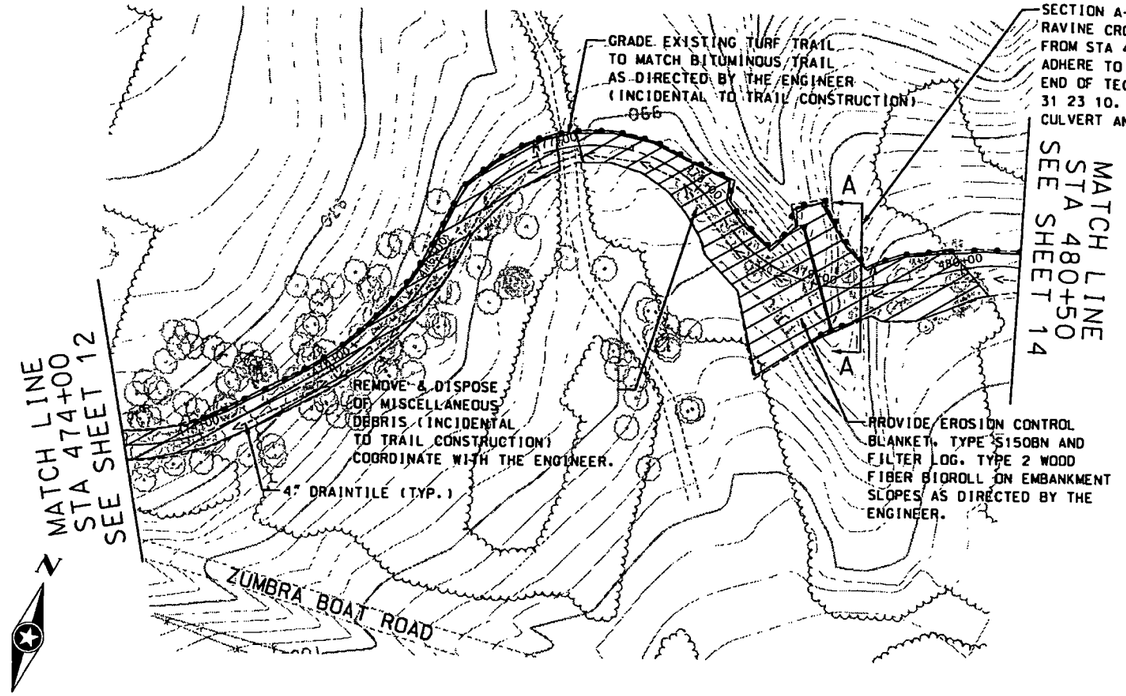
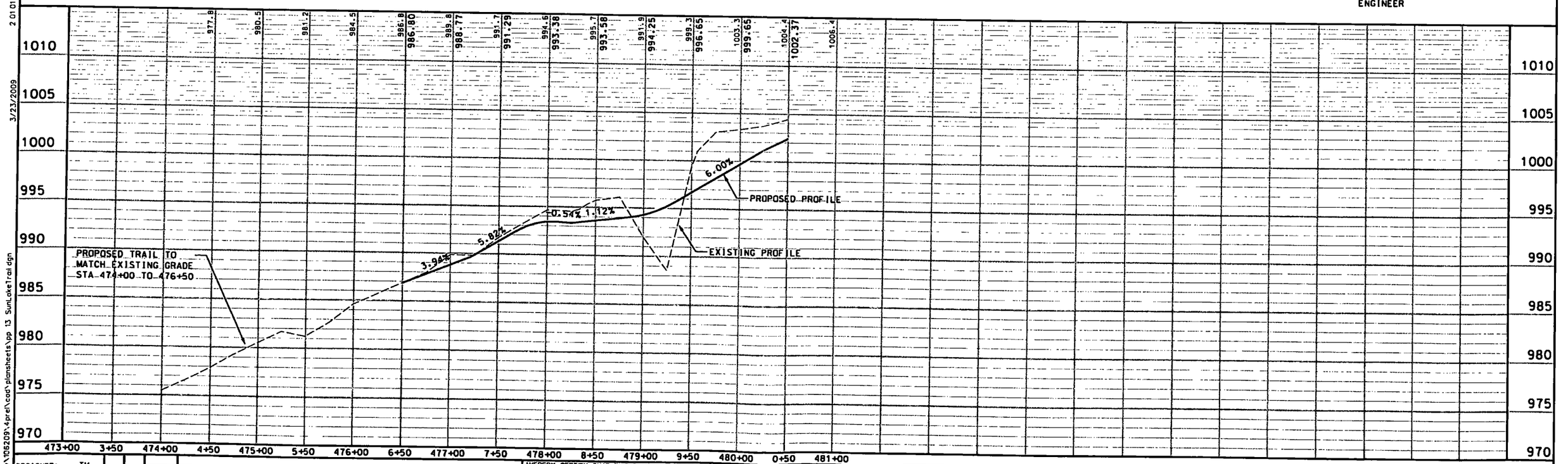


NOTE:

ROOT BARRIER AND TREE PROTECTION (CONSTRUCTION) FENCE LOCATIONS TO BE PLACED AS DIRECTED BY THE ENGINEER



DESIGNER: TM				
CHECKED BY: AD				
APPROVED BY: TM				
DESIGN TEAM	NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
signature
Date: 03/20/09
TOBY P. MUSE
printed signature
Reg No 43364

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE
TRAIL DEVELOPMENT

SUNNY LAKE TRAIL
STATIONS
474+00 TO 480+50

FILE NO. THRIV106209
DATE 03/20/09

13 / 14

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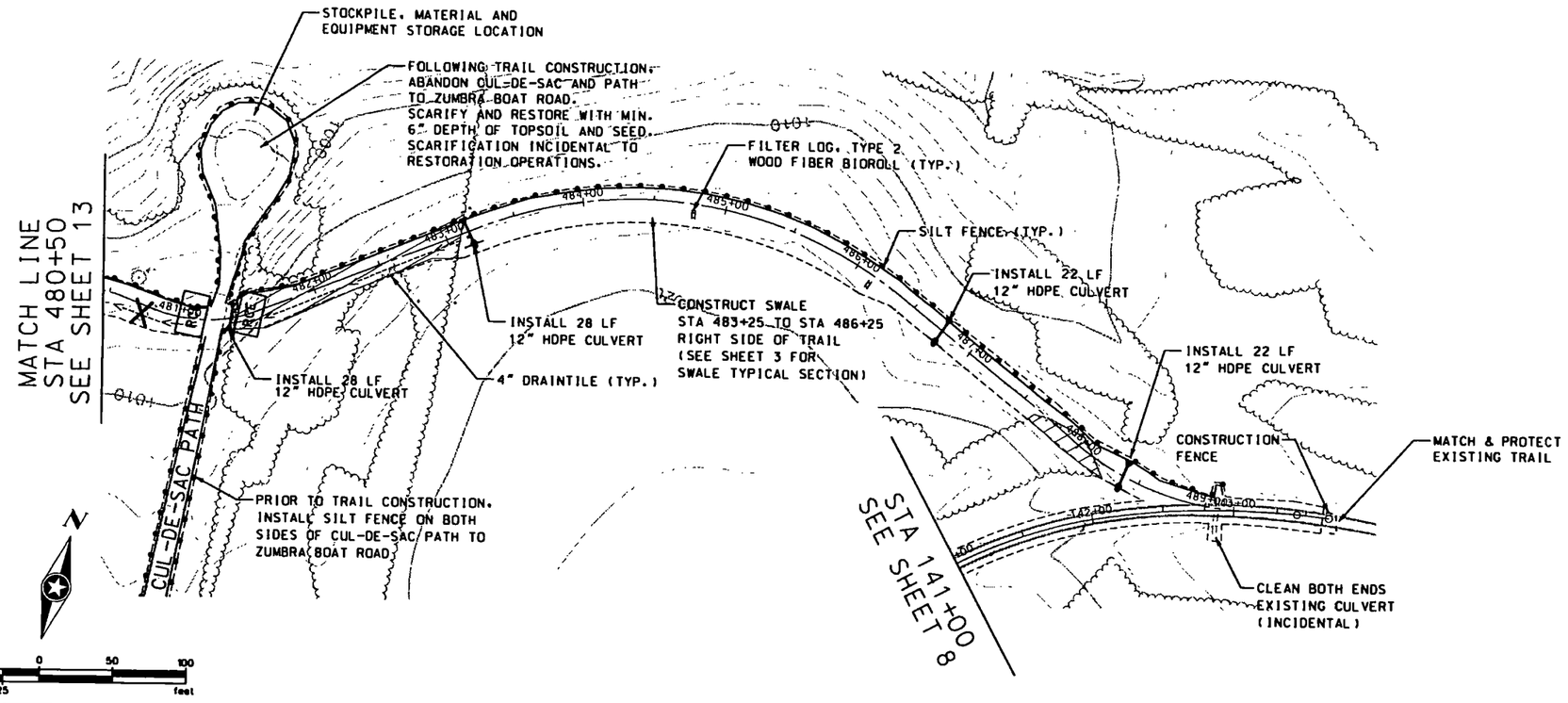

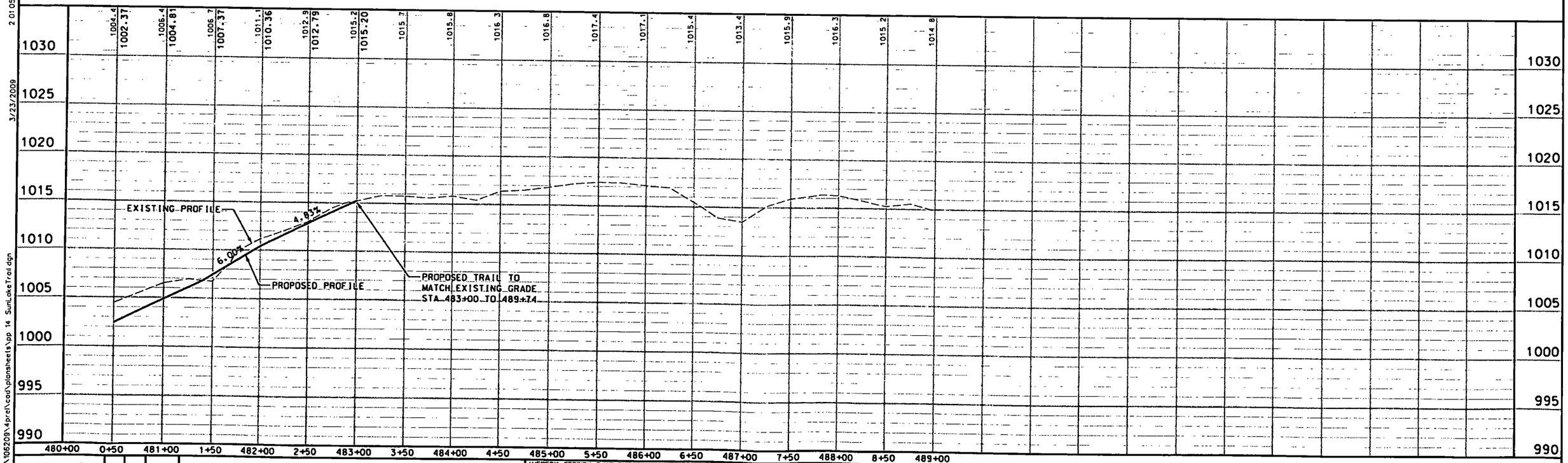

DESIGNER: TM
CHECKED BY: AD
APPROVED BY: TM
DESIGN TEAM

NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Signature: Toby P Muse
Date: 03/20/09
printed signature: TOBY P MUSE
Reg. No 43364

SEH
10901 RED CIRCLE DRIVE, SUITE 200
MINNETONKA, MN 55343-9100
PH 952 912-2600 FAX 952-912-2601
PH 800 734-6757

ThreeRivers PARK DISTRICT

CARVER PARK RESERVE
SUNNY LAKE REFUGE
TRAIL DEVELOPMENT

SUNNY LAKE TRAIL
STATIONS
480+50 TO 489+74

FILE NO. THRIV106209
DATE 03/20/09

14 / 14

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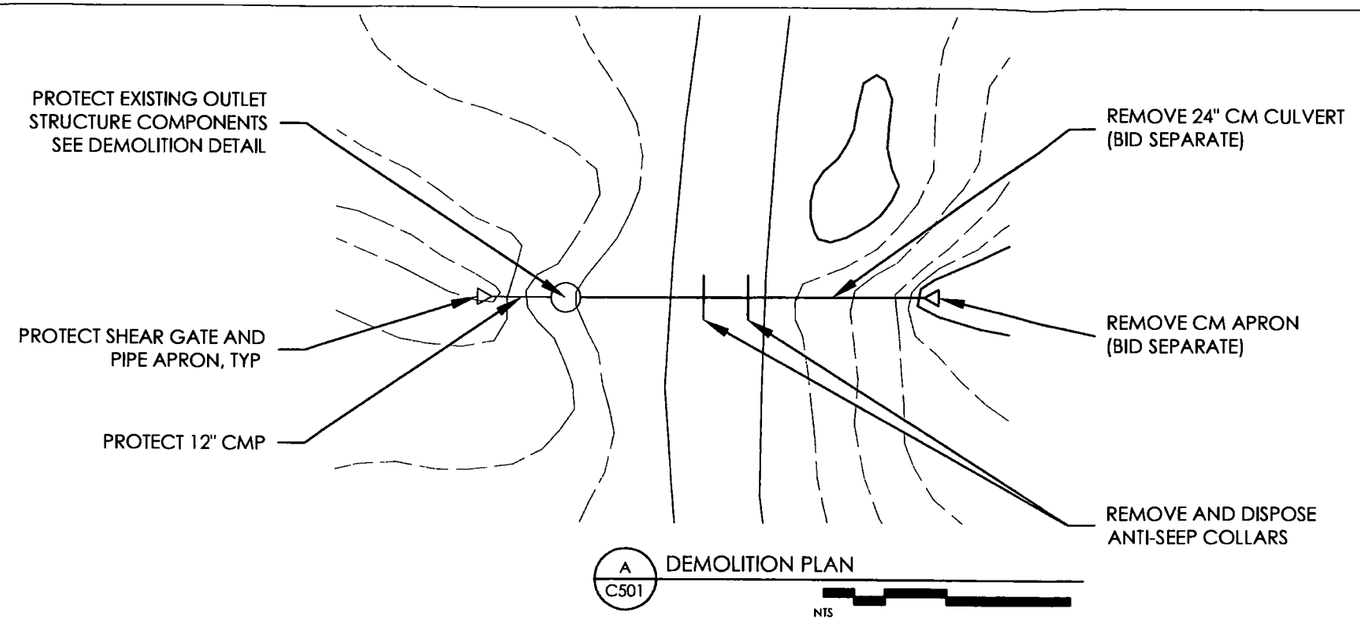
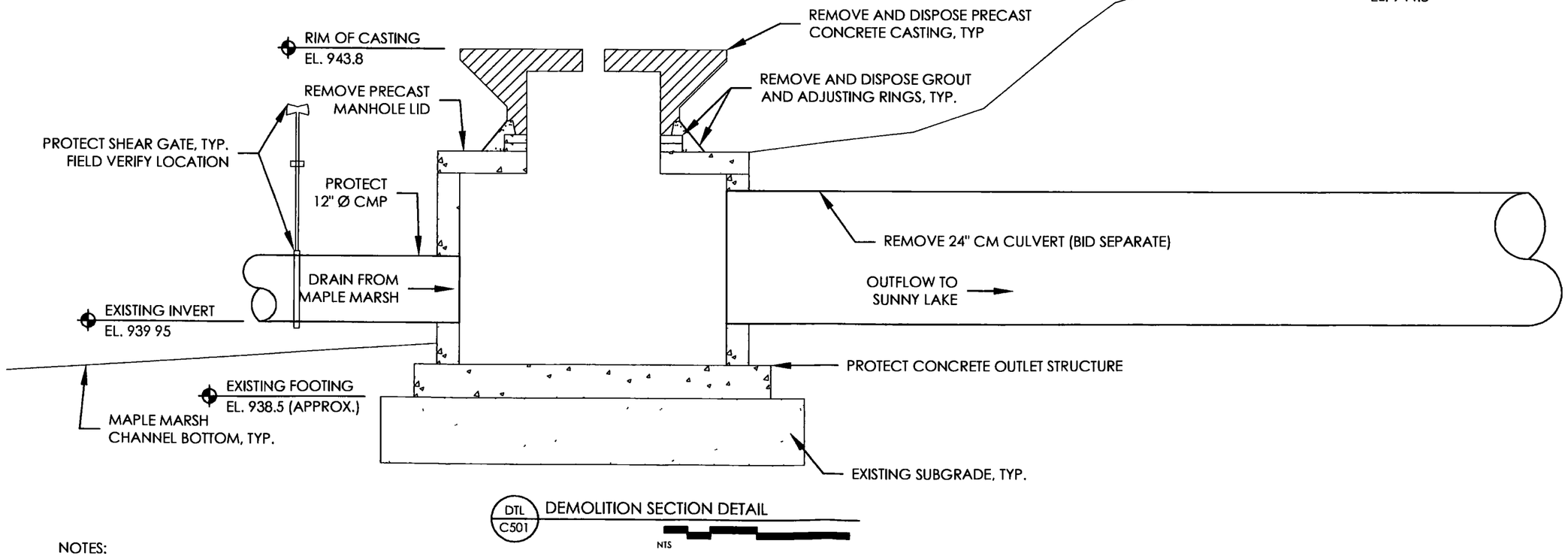


A / C501 DEMOLITION PLAN

NTS



DTL / C501 DEMOLITION SECTION DETAIL

NTS

NOTES:

1. ALL ELEVATIONS SHOWN ARE RELATIVE TO A HISTORICAL BENCHMARK ELEVATION THAT HAS SINCE BEEN DISTURBED. ENGINEER SHALL SET A NEW BENCHMARK ELEVATION AND CONFIRM EXISTING INVERT AND CASTING ELEVATIONS. THE CONTRACTOR SHALL CONFIRM ALL ELEVATIONS WITH THE FIELD ENGINEER PRIOR TO COMMENCING WORK AND SHALL MATCH TO EXISTING FIELD ELEVATIONS.
2. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER'S REVIEW AND APPROVAL FOR ALL PROVIDED OUTLET STRUCTURE COMPONENTS. CONTRACTOR SHALL RECEIVE ENGINEER'S REVIEW AND APPROVAL PRIOR TO ORDERING AND/OR FABRICATING COMPONENTS. CONTRACTOR COSTS INCURRED DUE TO REJECTED AND/OR RETURNED COMPONENTS SHALL BE INCIDENTAL TO THE CONTRACT.

REVISIONS

Mark	Date	Description

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL xxxx UNDER THE LAWS OF THE STATE OF MINNESOTA

NAME _____ REG. NO _____

DATE _____

ThreeRivers PARK DISTRICT
DEPARTMENT OF PLANNING AND DEVELOPMENT
3000 Xenium Lane North Ph 763-559-9000
Plymouth, Minnesota 55441 Fax 763-557-5248

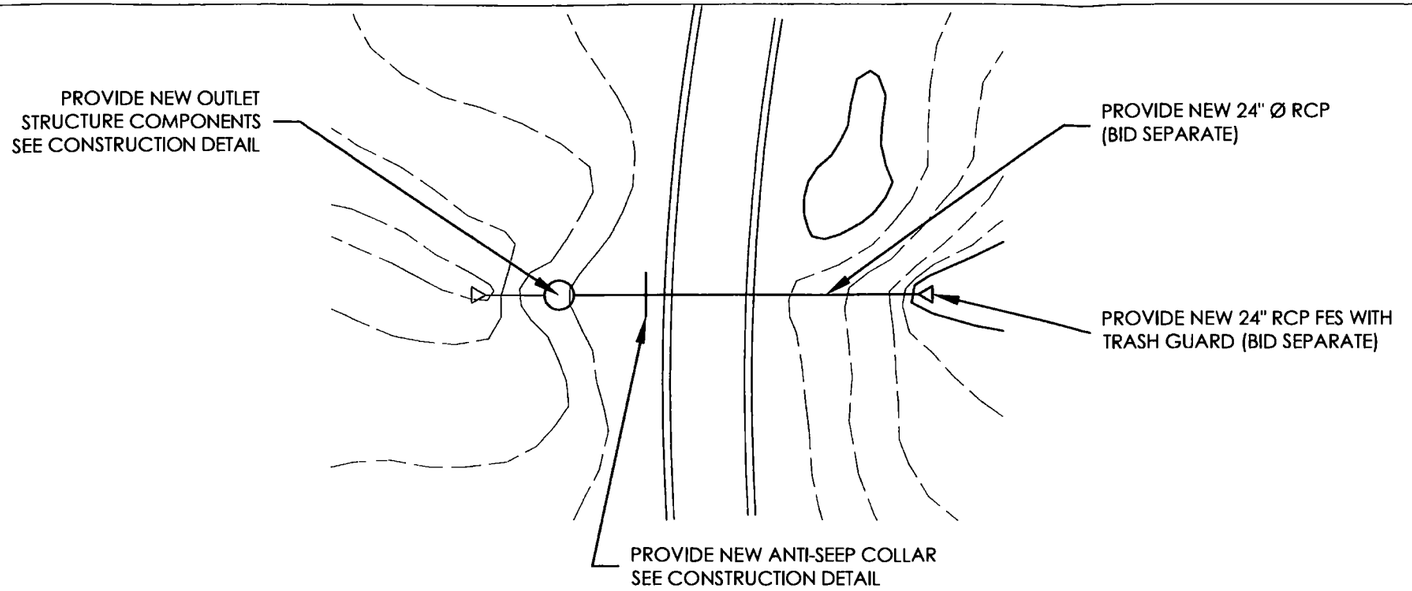
Sunny Lake Trail
Carver Park Reserve

Proj. No.	CAR 0801
Issue Date	MAR 2009
Designed By	BPC
Drawn By	BPC
Checked By	ALG

SHEET TITLE
Demo Plan and Detail

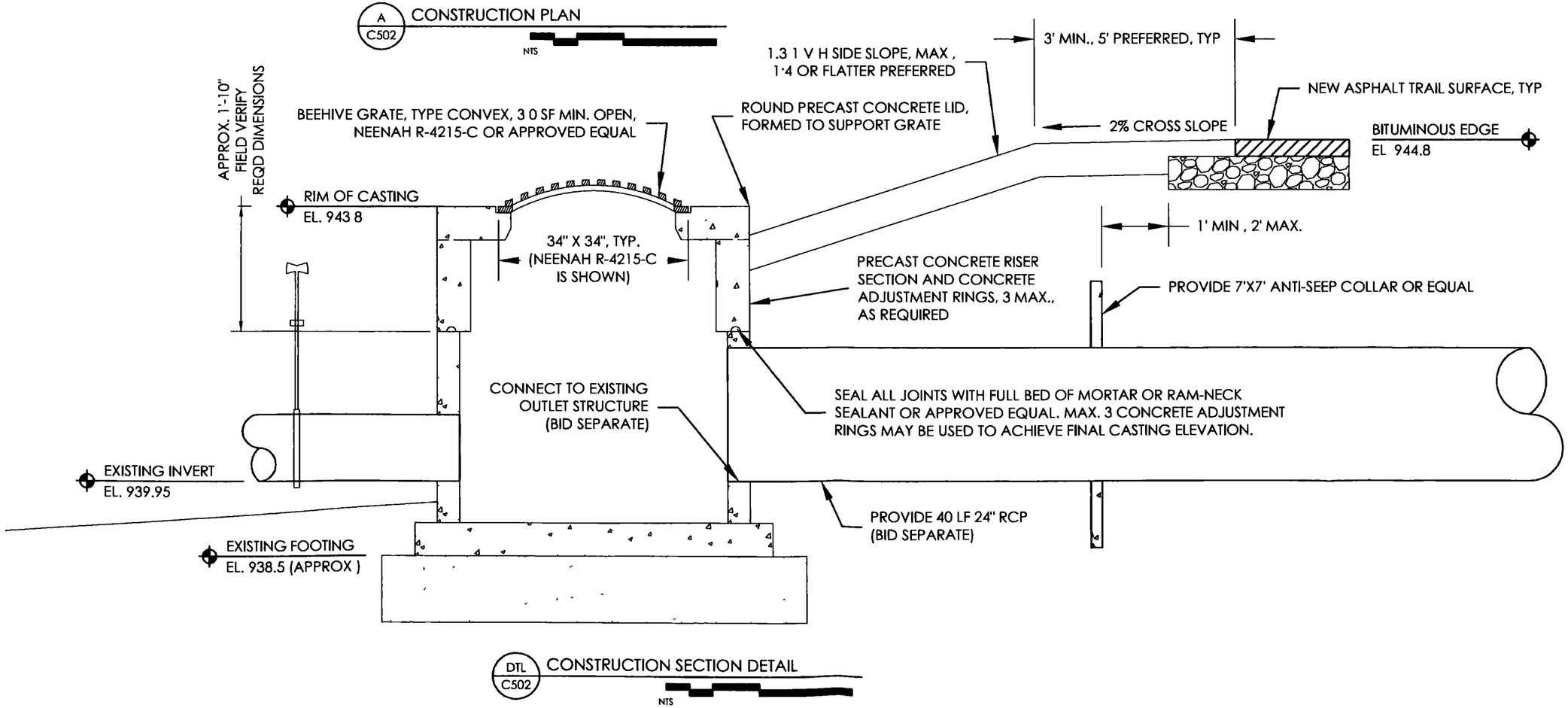
C501

Sheet 1 of



A / C502 CONSTRUCTION PLAN

NTS



DTL / C502 CONSTRUCTION SECTION DETAIL

NTS

REVISIONS

Mark	Date	Description

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL xxxx UNDER THE LAWS OF THE STATE OF MINNESOTA

NAME
DATE
REG. NO

ThreeRivers PARK DISTRICT
DEPARTMENT OF PLANNING AND DEVELOPMENT
3000 Xenium Lane North Ph 763-559-9000
Plymouth, Minnesota 55441 Fax 763-557-5248

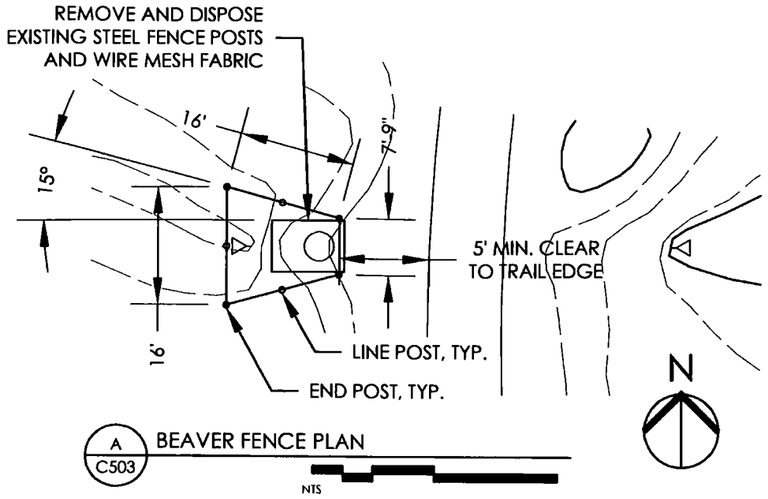
Sunny Lake Trail
Carver Park Reserve

Proj. No.	CAR 0801
Issue Date	MAR 2009
Designed By	BPC
Drawn By	BPC
Checked By	ALG

SHEET TITLE
Construction Plan and Detail

C502

Sheet 2

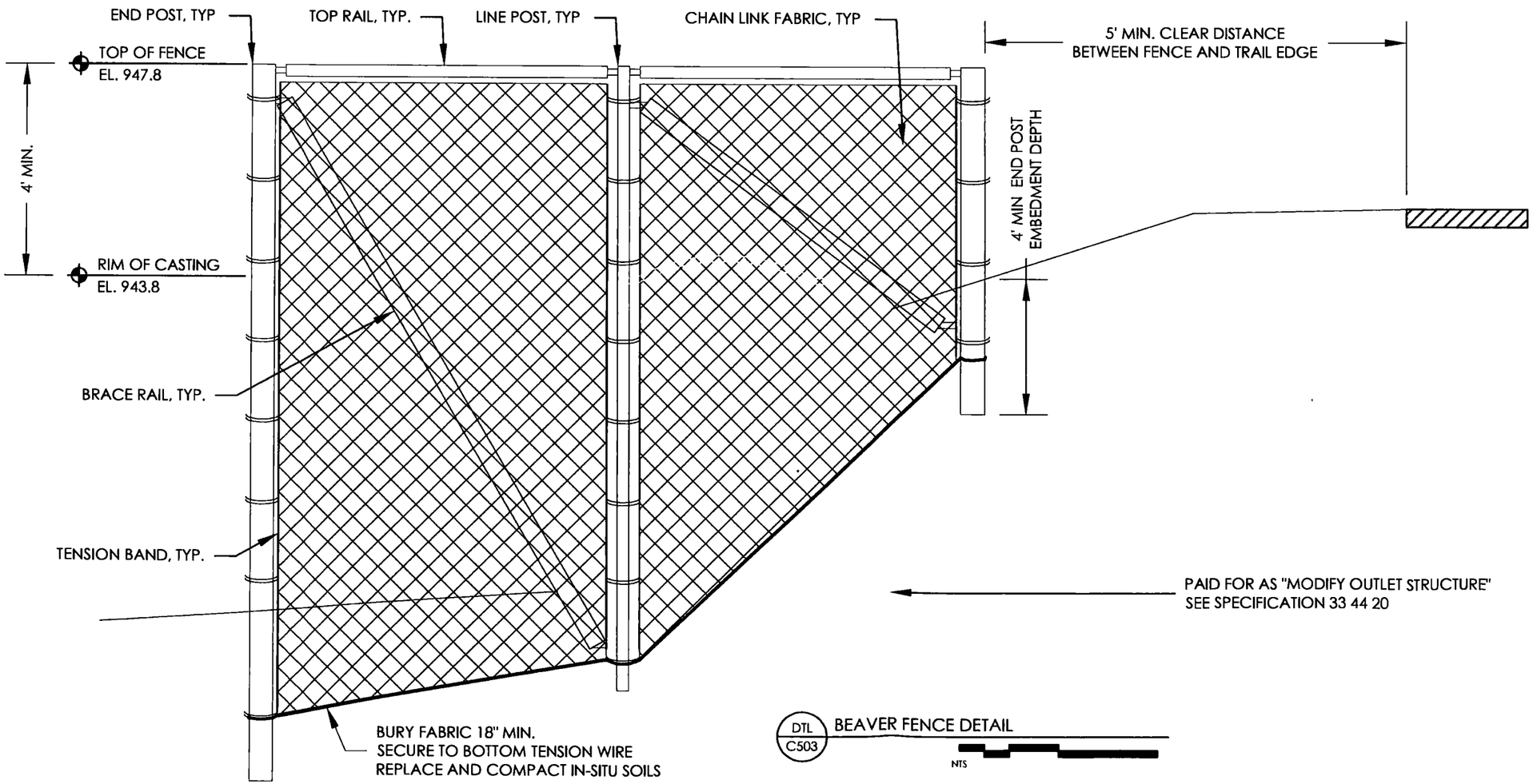


A C503 BEAVER FENCE PLAN

NTS

NOTES·

1. CONFORM TO MNDOT SPEC 2557 AND THE FOLLOWING SPECIFICATIONS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. CHAIN LINK FABRIC SHALL BE TYPE IV, VINYL COATED, BLACK, 8 GAUGE (FINISH), WITH 2" MESH SIZE AND FOLLOWING MIN. SPECIFICATIONS. 11 GAUGE CORE WIRE, .30 GALVANIZED , 22 MILS PVC COATING.
3. END POSTS SHALL BE VINYL COATED, BLACK, GALVANIZED, 3" O.D.
4. LINE POSTS SHALL BE VINYL COATED, BLACK, GALVANIZED, 2-1/2" O.D
5. TOP AND BRACE RAIL SHALL BE VINYL COATED, BLACK, GALVANIZED, 1-5/8" O.D.
6 BOTTOM TENSION WIRE SHALL BE 7 GAUGE GALVANIZED
7. ALL FITTINGS, TIES, BANDS, LOOP CAPS, AND COMPONENT PARTS SHALL BE VINYL COATED, BLACK, GALVANIZED.
8 CHAIN LINK FABRIC SHALL BE TIED BELOW TOP RAIL EVERY 1' WITH 9 GAUGE GALVANIZED TIES, AND ABOVE BOTTOM TENSION WIRE EVERY 3' WITH 11 GAUGE GALVANIZED TIES.
9 FENCE SHALL BE GROUNDED.



DTL C503 BEAVER FENCE DETAIL

NTS

REVISIONS

Mark	Date	Description

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL XXXX UNDER THE LAWS OF THE STATE OF MINNESOTA

NAME REG. NO

DATE

ThreeRivers PARK DISTRICT
DEPARTMENT OF PLANNING AND DEVELOPMENT
3000 Xenium Lane North Ph 763-559-9000
Plymouth, Minnesota 55441 Fax 763-557-5248

Sunny Lake Trail
Carver Park Reserve

Proj. No.	CAR 0801
Issue Date	MAR 2009
Designed By	BPC
Drawn By	BPC
Checked By	ALG

SHEET TITLE
Fence Plan and Detail

C503
Sheet 3 of 3

RECEIVED
MAR 2 6 2009

Plotted 3/20/2009 8:16 AM

J:\PROJECTS\Carver Park Reserve\CAR0801 Sunny Lake Refuge Trail Development\A-E\CAR0801 Maple Marsh Outlet.dwg

ATTACHMENT 3

TRPD Inventory of Water Control Structures, 2009

Three Rivers Park District
Inventory of Water Control Structures

DATE OF SURVEY: 6/30/2009

Location: Carver Park Reserve Maple Marsh

Park and number on attached map: CV 12 GPS coordinates: 446552/4969764

Description of type: Overflow drop pipe

Description of materials: Concrete with steel grate

Condition of water control structure: Failed, water leaking through below concrete overflow lid. Structure to be replaced in 2009 as part of constructing the new bike trail.

Height of high riser: Drop pipe height 6′

Diameter of high riser: 60″ with 3′ steel grate in the middle of the concrete circle

Diameter of discharge pipe: 4′ approximate

Poisonous gas reading for all structures deeper than six feet: N/A

Type of lid: N/A

Condition of lid: N/A

Size of body of water created by structure in acres: 23.0

PWI #: 10-56 P

Year installed: Originally installed in 1980 and redone in 2009 when the bike trail was redone. Was originally a concrete overflow drop pipe similarly to how it operates now.

Picture(s) of Water Control Structure:

Comments: This structure was being replaced and modified as part of the bike trail project in 2009. This photo is of the old structure.

Outlook

Re: HWY 11 Meeting Follow Up

From Scott Leonard <scott@marketingarts.net>
Date Tue 3/4/2025 1:03 PM
To Maggie Menden <mmenden@minnehahacreek.org>
Cc scottp@greatciao.com <scottp@greatciao.com>; kevin.lohmann@gmail.com <kevin.lohmann@gmail.com>; dickhawley@aol.com <dickhawley@aol.com>; cmay427@yahoo.com <cmay427@yahoo.com>; Jordan Van Oort <jvanoort@carvercountymn.gov>; James Wisker <JWisker@minnehahacreek.org>; Meehan, Christopher <christopher.meehan@stantec.com>

Maggie and James.

Thank you for your email and voicemail follow ups regarding our meeting. I didn't recall the 2/28 response deadline, so my apologies for not catching that in my notes.

Officially, we would like the MCWD to not consider the permit for approval, as it is currently designed. Our reason is simply that the current design does not address long standing back-flow problems on Lake Zumbra during high water events, and that the permitting authorities have not adequately addressed this issue at this opportune time.

As an HOA, we are not currently in consensus as to what the best alterations should be to this culvert to alleviate this long standing problem. If we had been directly contacted earlier in the process, (not by public notice, but maybe a call/email to our HOA leaders), we would have had time to discuss mutually agreeable potential remedies.

Be that as it may, this is our official response regarding your upcoming permit consideration meeting. Moving forward, please direct any future correspondence or inquiries regarding this matter to our current HOA president, Kevin Lohmann.
Sincerely,
Scott Leonard

Sent from my iPhone

> On Mar 3, 2025, at 3:25 PM, Maggie Menden <mmenden@minnehahacreek.org> wrote:
>
> Good afternoon, Mr. Leonard and Zumbra Ridge Team,
>
> **February 25, 2025, Meeting Follow Up:**
> Thank you for meeting with us on February 25, 2025, to discuss Carver County's CSAH 11 project as it relates to the Minnehaha Creek Watershed District (MCWD) permitting process.

Below, please find a brief summary of our meeting, and follow up regarding your commitment to let MCWD and Carver County know if you would like the permit to be considered by the MCWD Board of Managers, or if you are satisfied with it being issued administratively.

Attendees
Zumbra Ridge HOA: Dick Hawley, Scott Leonard, Scott Pikovsky, Kevin Lohmann, Chris May
MCWD: James Wisker, Maggie Menden, Veronica Sannes, Chris Meehan (Stantec)
Carver County: Jordan Van Oort

Pending Confirmation on Permit Needing MCWD Board Consideration

- As you know, the meeting we facilitated with Jordan Van Oort, Carver County Design Engineer, and the Zumbra Ridge homeowners was precipitated by the public notice MCWD issued for the permit application for the CSAH 11 reconstruction project. The public comment period concluded on February 17, 2025, with MCWD receiving requests for information from two residents. No request for a Board Meeting has been made.
- At the end of our meeting last week, you committed to following up by Friday February 28, 2025, to confirm whether you would like this permit to be considered by the MCWD Board of Managers. We have not yet heard back. Please confirm if a meeting is being requested or not.

Project Engagement & Communication

- Carver County staff outlined that engagement efforts began in late December 2023 and through the end of 2024, including two publicized open houses, and direct conversations with Mr. Hawley in 2024.

Concern with Drawdown of Water Levels Related to Boating

- Through our conversation related to the Zumbra Ridge HOA's concerns, we heard repeatedly that structural flooding is no longer a primary concern, as residents have implemented measures to increase protection from flood waters. Remaining concerns are focused with the overall drawdown time of Lake Zumbra, as water levels related to no-wake restrictions, which impacts recreational use.

Carver Design of CSAH 11 Culvert

- Carver County outlined the design of the proposed culvert, which includes an emergency overflow that will reduce clogging during high flow events, while not increasing 100-year flood elevations.
- In response to the HOA's request that the crossing be increased to a 6-foot box culvert, or that MCWD specify an alternative increased capacity, Carver County emphasized that the project has been fully designed, aligns with DNR and MCWD permitting requirements, and is scheduled to begin construction.

2017 MCWD-DNR-Carver-TRPD-Victoria Flood Study

- Discussion on system hydraulics during the meeting referred back to the 2017 Flood Study, developed in partnership between MCWD, DNR, Carver County, Three Rivers Park District and the City of Victoria. Several HOA members had copies of this, and MCWD committed to redistributing it for members who did not have a copy (link here).

Next Steps

- The HOA designated Scott Leonard as the point of contact for follow up, and committed to notifying MCWD by Friday, February 28, if the CSAH 11 permit was being requested to be heard by the MCWD Board of Managers.

Thanks,
Maggie

Maggie Menden
Permitting Technician

Office: 952.641.4532
Desk: 952.641.4586
mmenden@minnehahacreek.org

https://minnehahacreek.org/permits/
MCWD Permit Portal: Link


Outlook

Culver county rd 11 and Zumbra

From Dornik, Matthew L <matthew.l.dornik@ampf.com>
Date Tue 3/11/2025 11:34 AM
To Maggie Menden <mmenden@minnehahacreek.org>

Maggie,

I have been told that you are the one that we should email regarding the culvert under county road 11. I have lived in the Zumbra neighborhood for over 10 years now. The lake levels started to dramatically fluctuate after the houses were put in across highway 7. We have been lobbying to get a larger culvert put under county road 11 for years. Now I was just informed that you are planning on replacing it with the same size as the existing. This makes no sense. All the lakes down stream drop at a faster rate that we do, including lake Minnetonka. We should drop faster being at the end of the chain as the water flows down stream. Lake zumbra should not fluctuate feet each summer like it currently does. We get one inch of rain and the lake comes up a foot. That makes no sense and it didn't used to do that. Between the new house on the north side of 7 and the changes Carver park has made there is less wet lands to hold the water and more water getting pushed our way. I ask that you put in a larger culvert under highway 11.

Matt

P.S. I'm proud to have received the following recognitions by industry publications. While these are exciting honors, helping my clients achieve their financial goals is the greatest reward. To learn more, please visit my website.

- Treeline Wealth Management is a recipient of the 2024 *Forbes* Best-in-State Wealth Management Teams
- *Forbes* Best-in-State Wealth Advisors, 2023 & 2024
- Five Star Wealth Manager, 2014-2023
- Ameriprise Circle of Success, 2020-2023
- TreeLine Wealth Management, Ameriprise Client Experience Award, 2021, 2022 & 2023

Matt Dornik, CFA®, CFP®, CPWA®
Private Wealth Advisor
CA License # 1798781
TreeLine Wealth Management
A private wealth advisory practice of Ameriprise Financial Services, LLC

An Ameriprise Private Wealth Advisory Practice

.....

Ameriprise Financial Services, LLC
CA License # 0684538
10159 Wayzata Blvd.
Suite 200
Minnetonka, MN 55305

Office: 952.444.2004 | Fax: 952.444.2038

Support staff contact information is available on my website

Visit my team website

Outlook

Culvert at Zumbra Ridge

From Amy Pabich <amypabich@gmail.com>
Date Mon 3/10/2025 8:49 PM
To Maggie Menden <mmenden@minnehahacreek.org>
Cc Scott Pikovsky <scottp@greatciao.com>

Hello Maggie,

I am a homeowner at Zumbra Ridge and I oppose MCWD approving the permit until we can be guaranteed the new culvert will allow for Lake Zumbra outflow of high water so we do not end up with the city posting Lake Zumbra as a NO WAKE ZONE.

Thank you,
Amy Pabich
5540 Zumbra Ln.

Outlook

"Culvert" permit for Carver Park Highway 11 Project.

From Bruce Steadman <bsteadman6@hotmail.com>
Date Mon 3/10/2025 2:22 PM
To Maggie Menden <mmenden@minnehahacreek.org>
Cc Scott Pikovsky (Great Ciao) <scottp@greatciao.com>

Bruce and Barbara Steadman (35+ year residents) are strongly opposed to MCWD granting the permit.

Outlook

Re: Highway 11 (Permit #24-560)

From Scott Nagel <scottnagel@kw.com>
Date Mon 3/10/2025 10:40 AM
To Scott Pikovsky (Great Ciao) <scottp@greatciao.com>; Maggie Menden <mmenden@minnehahacreek.org>; Kevin Lohmann <kevin.lohmann@gmail.com>; Bruce Quitmeyer <bquitmeyer@gmail.com>; Tony Brown <tony@brownhausdesign.com>

Maggie,

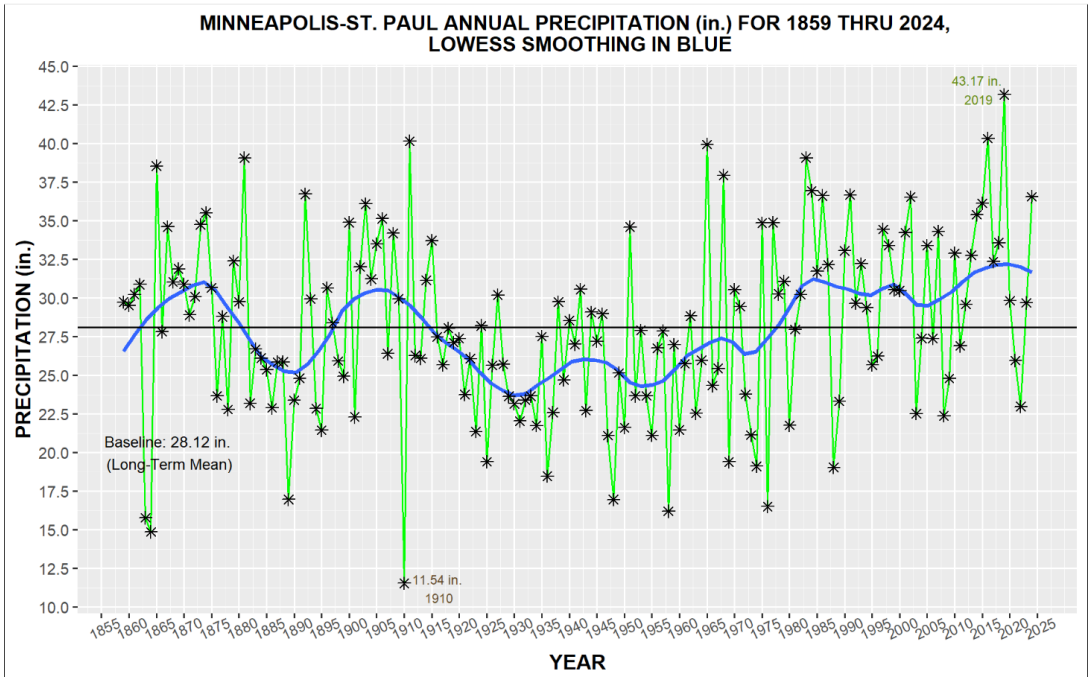
Thanks for the communication you've had with Scott Pikovsky and Scott Leonard regarding the road project on County 11 and the subsequent replacement of the current culvert that permits the outflow from the Lake Zumbra and Sunny Lake watershed. Mr Pikovsky and Mr Leonard have been running point for Ridge Lands HOA, a development of 50 homes. I am on the Ridge Lands Board, serving as Treasurer.

I was able to find Lake Zumbra lake level readings dating back to 1959. The measurements between 1959 and 1981 were scarce with just 11 noted. However, starting in January of 1981 they became more regular, a year for which 57 lake level measurements were noted. Prior to 1982 there was no measurement above the 943.3' mark. Since then, measurements of 943.3' and higher have become much more regular (1982, 1989, 1992, 2014, 2017 and 2019). Coincidentally or not, 2012 plan approval was given to the development of Woodland Cove in Minnetrista, and land sculpting for utilities and road infrastructure kicked off in late-2013, along with the initial home build phase. Model homes in the 1st Addn opened in 2014. While 1st Addn took place in an area that appears to flow towards Lake Minnetonka, earth moving activities that would impact Lake Zumbra and Sunny Lake watershed were initiated at this time. Woodland Cove 3rd Addition homes began construction in 2017, were available to purchase in 2018 and continue to this day. The 3rd addition falls entirely within the watershed of Lake Zumbra and Sunny Lake.

As you're certainly aware, sometime between 1976 and 2012, the culvert under County Road 11 (Victoria Drive) was reduced from a 24" corrugated metal pipe (CMP) culvert to an 18" poly (HDPE) pipe. It has been noted that HDPE has a lower drag coefficient than CMP and thus the 18" HDPE is comparable to the 24" CMP, however the benefits of a lower drag coefficient is minimal when contrasted to a pipe with a cross sectional area of 452 sq inches (24" CMP) vs 254 sq inches (18" HDPE), a factor of 1.8 times. As we so often hear, with climate patterns being disrupted we are clearly entering a period of higher than historical average precipitation (see below graph), taking the time now to correctly assess and correct the situation is critical.

Lake Zumbra levels of 943' or higher occured in 1966, 1982, 1986, 1992, 2014, 2017, 2018, 2019.

Link for Precip Graph



Scott Nagel - (Ridge Lands Board Treasurer)
Cell: 952-484-2126
ScottNagel@KW.com
5550 Zumbra Ln, Excelsior, MN

-----Original Appointment-----
From: Maggie Menden <mmenden@minnehahacreek.org>
Sent: Friday, February 21, 2025 1:27 PM
To: Maggie Menden; James Wisker; Jordan Van Oort; scott@marketingarts.net; bsteadman6@hotmail.com; Deborah Pikovsky; Meehan, Christopher
Cc: Darin Mielke; Veronica Sannes
Subject: Highway 11 Meeting
When: Tuesday, February 25, 2025 12:00 PM-1:00 PM (UTC-06:00) Central Time (US & Canada).
Where: Minnehaha Room; 15320 Minnetonka Blvd

Meeting to discuss Carver County's Highway 11 project and MCWD's permit review.

This meeting will be held at MCWD offices with a virtual option available.

Please forward this meeting invite to anyone else who may be interested in attending.

Let me know if you plan on attending in person or virtually, so we can plan accordingly.

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 237 450 741 075

Passcode: 6jA7Pg6W

Dial in by phone

+1 872-813-0592,,385865326# United States, Chicago

Find a local number

Phone conference ID: 385 865 326#

For organizers: Meeting options | Reset dial-in PIN
